Executive Summary

The California Department of Water Resources (DWR), U.S. Department of the Interior (DOI) Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS) have prepared a joint Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) for the Bay Delta Conservation Plan (BDCP or Plan), a habitat conservation plan (HCP)/natural community conservation plan (NCCP). The EIR/EIS has been prepared pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000–21178.1) and the State CEQA Guidelines; the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321; 40 Code of Federal Regulations [CFR] 1500.1); and the President's Council on Environmental Quality (CEQ), DOI (43 CFR Part 46), and NMFS (NOAA Administrative Order 216-6) regulations for implementing NEPA.

The BDCP proponents—DWR and six State Water Project (SWP) and Central Valley Project (CVP) water contractors[1]—are applying for incidental take permits (ITPs) from USFWS and NMFS, pursuant to Section 10(a)(1)(B) of the federal Endangered Species Act (ESA) and incidental take authorization by the California Department of Fish and Wildlife (DFW), pursuant to California Fish and Game Code Section 2835. The permits would authorize take[2] of certain state- and federally listed species, fully protected species, and some nonlisted species (collectively, *covered species*) during the course of otherwise lawful activities (i.e., covered activities). The BDCP EIR/EIS has been prepared for the purpose of analyzing and disclosing the potential environmental effects and effects on the human environment associated with the alternatives and to identify potentially feasible ways to avoid, minimize, or mitigate adverse effects.

The BDCP has been prepared as a required component of the application for the ITPs/NCCP permit, and to support the issuance of these permits for a term of 50 years. The BDCP is a comprehensive conservation strategy for the Sacramento–San Joaquin Delta (Delta) to advance the planning goal of restoring ecological functions of the Delta and improving water supply reliability in the state of California. The conservation strategy is designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework. The BDCP reflects the outcome of a multiyear collaboration between DWR, Reclamation, state and federal fish and wildlife agencies, state and federal water contractors, nongovernmental organizations, agricultural interests, and the general public. The BDCP sets out a comprehensive conservation strategy for the Delta designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework through the following.

- New and/or modified state water conveyance facilities and operation of the SWP and the CVP in the Delta.
- Conservation through the protection, restoration, and enhancement of habitats for native fish, wildlife, and plants within the Delta.

[1] The BDCP proponents include the following SWP or CVP contractors: Alameda County Flood Control and Water Conservation District, Zone 7; Kern County Water Agency; Metropolitan Water District of Southern California; San Luis & Delta-Mendota Water Authority; Santa Clara Valley Water District; and Westlands Water District. Additional water contractors may become BDCP proponents in the future through the BDCP process.

[2] The broad definition of "take" under the ESA includes actions that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct (16 USC 1532[19]).

- Actions to address other ecological stressors to covered aquatic species in the Delta.
- Adaptive management of water conveyance facilities operations; the protection, restoration and enhancement of habitats; and measures to reduce other ecological stressors.

The BDCP provides a comprehensive conservation strategy to meet a series of broad planning goals and a range of specific biological goals and objectives. The BDCP includes a description of each element of the conservation strategy and the rationale for its inclusion. The BDCP further describes the expected contribution of each Plan element toward advancing both the overall planning goals and specific biological goals and objectives. The conservation strategy was informed by the collective experiences of professionals working in the Delta over the course of several decades, monitoring results and conceptual models developed over time through prior scientific efforts (e.g., those conducted by the California Bay-Delta Authority [CALFED] Science Program), and supplemented by data and analysis developed through the BDCP process. The conservation strategy is based on the best available science and was built upon the following broad conservation goals.

- Increase the value, availability, spatial diversity, and complexity of aquatic habitat in the Delta.
- Create new opportunities to restore the ecological health of the Delta by modifying the water conveyance infrastructure.
- Directly address key ecosystem drivers in addition to freshwater flow patterns rather than manipulation of Delta flow patterns alone.
- Improve connectivity among aquatic habitats; facilitate migration and movement of covered fish among habitats; and provide transport flows for the dispersal of planktonic material (organic carbon), phytoplankton, zooplankton, macroinvertebrates, fish eggs, and larvae.
- Improve synchrony between environmental cues and conditions and the life history of sensitive fish species and their food resources in the upstream rivers, Delta, and Suisun Bay, including seasonal water temperature gradients, salinity gradients, turbidity, and other environmental cues.
- Reduce sources of mortality and other stressors on the covered fish and the aquatic ecosystem in the Delta.
- Improve habitat conditions for covered fish in the Delta and downstream in the low-salinity zone of the estuary in Suisun Bay through the integration of water operations with physical habitat enhancement and restoration.
- Avoid, minimize, and mitigate adverse effects on terrestrial wildlife and plants resulting from implementation of measures to benefit aquatic species.
- Expand the extent and enhance the functions of existing natural communities and habitat of covered wildlife and plants that are permanently protected.
- Restore habitat to expand the populations and distributions of covered wildlife and plant species.
- Emphasize natural physical habitat and biological processes to support and maintain species covered by the Plan (i.e., covered species) and their habitat.

ES.1 Introduction

The BDCP EIR/EIS[3] evaluates and discloses the potential impacts associated with the BDCP action and no action alternatives, and proposed issuance of take permits. Impacts on human, physical, and biological resource areas (see Section ES.8.1 for a list of resource areas/topics included in the evaluation) are presented in the document. The evaluation includes site-specific mitigation for construction and operation of proposed water conveyance facilities, although additional site-specific environmental documents will likely be required for implementation of some conservation measures (related to habitat restoration, protection, and enhancement, as well as those actions intended to reduce the effects of other stressors). Additional information and/or documentation may be necessary during consideration of related permit applications and decision-making processes.

Like the EIR/EIS, the BDCP (described in Section ES.4, *Proposed BDCP*) provides an analysis of the effects of implementing the Plan. Specifically, the BDCP Effects Analysis (BDCP EA) describes how construction, operation, and maintenance of the proposed water conveyance facilities, ecosystem restoration, and other BDCP covered activities will affect ecosystems, natural communities, and covered species. The BDCP presents specific information and analyses needed by the state and federal fish and wildlife agencies to issue ITPs/NCCP permit, or authorization for the take of covered species as a result of implementing the proposed BDCP. Accordingly, the focus of the BDCP EA is on potential Plan effects on covered species and their habitats from construction, operation, and maintenance of new and existing water conveyance facilities, ecosystem restoration actions, and other covered actions as described in the BDCP. These analyses contained in the BDCP EA are utilized, as relevant, in the EIR/EIS evaluations for the potential effects of BDCP implementation on fish and aquatic resources and terrestrial resources. In addition, the EIR/EIS addresses noncovered species and resource topics (see Section ES.8.1, *Resource Areas*) not considered in the BDCP EA as well as various alternatives to the proposed BDCP (see Section ES.5, *Alternatives Considered in the EIR/EIS*).

The following sections provide an overview of the intended uses of the EIR/EIS, describe the various agencies' roles and responsibilities, and provide an overview of the BDCP approval process.

ES.1.1 Intended Uses of the BDCP EIR/EIS and Agency Roles and Responsibilities

The BDCP EIR/EIS is intended to meet the requirements of CEQA and NEPA, provide sufficient analysis to support BDCP decision making, and to inform permit decisions for the issuance of the ITPs/NCCP permit. Before the selection and approval of one of the BDCP alternatives considered in the EIR/EIS, the lead agencies must comply with the necessary state and federal environmental review requirements. The goal of the EIR/EIS is also to provide sufficient evaluation of alternatives so that project-level assessment of the potential effects of selected modified and/or new conveyance facilities (Conservation Measure 1 [CM1]) is possible. For BDCP CM2–CM22, the EIR/EIS intends to present a program-level analysis consistent with the level of detail provided in the BDCP. Therefore, for CM2–CM22, the potential exists for additional CEQA/NEPA environmental review and associated permit actions to be required prior to implementing these conservation measures.

[3] The full BDCP EIR/EIS should be understood to include not only the EIR/EIS and its appendices but also the proposed BDCP documentation including all related appendices.

CEQA requires preparation of an EIR when there is substantial evidence in light of the whole record that an agency action, such as approval and implementation of the BDCP, may have a significant impact on the environment. An EIR is a document that discloses and analyzes the potential environmental effects of a project and discusses ways to mitigate or avoid significant effects. A *program EIR* may be prepared on a series of actions that can be characterized as one large project, such as for an NCCP (State CEQA Guidelines Section 15168). A program EIR generally establishes a framework for subsequent *tiered* or project-level environmental documents that are prepared in accordance with a program. The degree of specificity in a program EIR's impact analysis need only be as detailed as the description of the elements in the program (State CEQA Guidelines Section 15146). A *project EIR*, in contrast, analyzes and discloses the environmental impacts of a specific development project. A project EIR typically examines all aspects of a project, including construction and operation and maintenance, at a greater level of detail than a program EIR. An EIR may include both program and project elements.

NEPA and the CEQ's regulations for implementing NEPA (40 CFR 1502.14) require federal agencies to prepare an EIS for major federal actions that could significantly affect the quality of the human environment.

> The EIS must rigorously explore and objectively evaluate (CEQ 40 questions) the environmental effects of an action, including a range of reasonable alternatives, and identify mitigation measures to minimize adverse effects for the range of impacts of the proposal when they propose to carry out, approve, or fund a project that may have a significant effect on the environment. [T]o ensure environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed and the EIS and Record of Decision should indicate the likelihood that such measures will be adopted or enforced, and when they might be available (40 CFR 1502.16[h] and 1505.2).

A *programmatic EIS* under CEQ regulations for implementing NEPA (40 CFR 1500.4[i], 1502.4[b] and [c], 1502.20) may be prepared to analyze broad-scope actions such as the adoption of new agency programs or regulations. The programmatic EIS addresses the broad issues relating to a project, and additional environmental documentation for project-specific impacts are prepared when necessary. Subsequent analysis of more specific proposals is generally required under NEPA, and information from a programmatic EIS can be referenced (tiered) in the subsequent NEPA document to reduce redundancy. Like that in a project EIR, the effects analysis in a project EIS generally focuses on a specific facility or activity, and is done at a greater level of detail. Like EIRs, an EIS can contain both programmatic and project-level elements.

Accordingly, this BDCP EIR/EIS intends to provide both program- and project-level analyses, which in total intend to provide a sufficient level of detail to comply with NEPA and allow USFWS and NMFS to make an informed decision on their action of considering issuance of an ITP under Section 10 of the ESA. Similarly, this document is intended to provide sufficient level of detail to comply with CEQA to allow for approval of the BDCP as an NCCP by CDFW under the Natural Community Conservation Planning Act (NCCPA). Specifically, the EIR/EIS is intended to provide a project-level assessment of the potential effects of modified and/or new water conveyance facilities and existing facility operational changes (CM1), including project-specific mitigation, and SWP water supply contract amendments and/or funding agreements. Design information for CM1 is available at a project level. Although the EIR/EIS is intended to provide sufficient NEPA coverage for ESA permitting actions by USFWS and NMFS, the U.S. Army Corps of Engineers (USACE), in considering whether to grant "fill permits" under the Clean Water Act, may require additional analyses for NEPA and other permitting necessary for the component pieces of CM1 that affect federally protected

wetlands. CM2–CM22 include restoration and conservation strategies for aquatic and terrestrial habitat and other stressor reduction measures and are currently presented at a conceptual level. Because the design information is currently at a conceptual level of detail, the EIR/EIS provides a program-level analysis of the potential effects that may occur as a result of implementing these conservation measures. Consequently, although USFWS, NMFS, and CDFW may approve and issue permits under the BDCP based on the EIR/EIS, other authorizations by agencies subject to NEPA and CEQA necessary to implement CM2–CM22 may not be obtained until a later date, when more detailed design information is available. At this later time, it will be determined whether a more focused, project-level environmental review is required.

ES.1.1.1 Overview of BDCP Approval Process

In addition to the BDCP proponents, the BDCP is being prepared with the participation of Reclamation, USFWS, NMFS, USACE, the California Natural Resources Agency, CDFW, the State Water Resources Control Board (State Water Board), and various stakeholders. These organizations are helping to guide the preparation of the BDCP. The regulatory agencies—USFWS, NMFS, CDFW, USACE, and the State Water Board—are participating to provide technical input and guidance in support of planning efforts to complete the BDCP. USFWS and NMFS are also NEPA lead agencies with Reclamation. The NEPA lead agencies are working with federal (e.g., USACE and the U.S. Environmental Protection Agency [EPA]) and non-federal (e.g., several Delta counties, North Delta Water Agency, and several reclamation districts) cooperating agencies, DWR (CEQA lead agency), and CEQA responsible agencies (e.g., CDFW, State Water Board) to prepare this EIR/EIS.

Table ES-1 identifies the lead, cooperating, responsible, and trustee agencies that will use the EIR/EIS as part of their decision-making process. Other potential responsible agencies may also utilize this analysis for discretionary approvals.

The BDCP is intended to secure those authorizations that would allow for the actions set out in the BDCP—restoration and protection of ecosystem health, water supply, and water quality—to proceed within a stable regulatory framework. The BDCP proponents have developed a plan that will be submitted to USFWS and NMFS as an HCP under the provisions of ESA Section 10(a)(1)(B) and to CDFW as an NCCP under California Fish and Game Code Sections 2800 et seq. The BDCP EIR/EIS is also intended to inform the associated biological assessment and ESA Section 7 consultations, and provide other appropriate information to make a decision on selecting which alternative to implement regarding approval of the BDCP and issuance of the ITPs/NCCP permit.

As previously indicated, the BDCP proponents will apply for take authorizations under ESA Section 10 (a)(1)(B) and Section 2835 of the California Fish and Game Code for BDCP covered activities. ESA and the California Endangered Species Act (CESA) prohibit the take of endangered or threatened species. The ITPs/NCCP permit will establish a specified level of allowable incidental take[4] for BDCP covered species. BDCP covered activities include operations for transport and delivery of water, construction of new water conveyance infrastructure and other facilities, maintenance and monitoring of that infrastructure, and impacts associated with implementation of the other conservation measures in the BDCP conservation strategy (Section ES.4.3, *Covered Activities*).

[4] *Incidental take* of threatened and endangered species occurs when such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (16 USC 1539[a][1][B]).

Table ES-1. Lead, Cooperating, Responsible and Trustee Agencies

Agency	Role
Lead Agencies	
California Department of Water Resources	CEQA lead agency
U.S. Bureau of Reclamation	NEPA lead agency
U.S. Fish and Wildlife Service	NEPA lead agency
National Marine Fisheries Service	NEPA lead agency
Cooperating Agencies	
U.S. Army Corps of Engineers	NEPA Federal cooperating agency
U.S. Environmental Protection Agency	NEPA Federal cooperating agency
State and Federal Contractors Water Agency	NEPA cooperating agency
Contra Costa County	NEPA cooperating agency
Sacramento County	NEPA cooperating agency
Solano County	NEPA cooperating agency
Yolo County	NEPA cooperating agency
Reclamation District 999	NEPA cooperating agency
Reclamation District 150	NEPA cooperating agency
Reclamation District 551	NEPA cooperating agency
Reclamation District 3	NEPA cooperating agency
North Delta Water Agency	NEPA cooperating agency
Responsible Agencies	
California Department of Fish and Wildlife	CEQA responsible agency
California Department of Transportation	CEQA responsible agency
State Water Resources Control Board	CEQA responsible agency
Delta Stewardship Council	CEQA responsible agency
Trustee Agencies	
California Department of Fish and Wildlife	CEQA trustee agency
California State Lands Commission	CEQA trustee agency
California Department of Parks and Recreation	CEQA trustee agency

ES.1.1.1.1 State Agency Actions

DWR operates and maintains the SWP and would continue to do so as part of the implementation of CM1 related to the SWP. DWR's actions will be to certify the EIR, adopt findings of fact, decide whether to approve the BDCP and its implementation, and carry out obligations under the BDCP. DWR would also be involved in any discretionary action related to coordination with Reclamation or SWP contractors. CDFW is considering whether to approve the BDCP as an NCCP and issue permits under Section 2835 of the California Fish and Game Code.

ES.1.1.1.2 Federal Agency Actions

USFWS and NMFS will make a decision regarding the issuance of ITPs for the incidental take of federally listed species (included in Table ES-2) from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other covered activities. The

applicant's proposed duration of the ITPs is 50 years. USFWS and NMFS would issue separate ITPs covering species under their respective authorities. This EIR/EIS and the alternatives analyzed here or screened from further analysis, as well as the intraservice consultation under ESA Section 7, will provide USFWS and NMFS with information to assist in making permit issuance decisions under ESA Section 10(a)(1)(B) and implementing regulations.

Reclamation operates the CVP in coordination with the SWP through the Coordinated Operation Agreement (COA), which was entered into at the direction of Congress by the United States of America and the State of California in November 1986. Operation of new conveyance facilities and/or flow patterns proposed under the BDCP would result in changes to existing CVP operations specific to the Delta that provide for diversion, storage, and conveyance of CVP water consistent with applicable law and contractual obligations. Reclamation's action in relation to the BDCP would be to adjust CVP operations specific to the Delta to accommodate new conveyance facility operations and/or flow requirements under the BDCP, in coordination with SWP operations.

ES.1.1.2 Use of the EIR/EIS by Other Entities

Implementation of the BDCP will require permits and approvals from public agencies other than the lead agencies. These other public agencies are referred to as responsible agencies and trustee agencies under CEQA (State CEQA Guidelines Sections 15381 and 15386) and cooperating agencies under NEPA (e.g., USACE, EPA).

As described in CEQ's NEPA regulations (40 CFR 1501.6), federal agencies other than the NEPA lead agency that have jurisdiction by law or special expertise with respect to the environmental effects anticipated from the project can be included as cooperating agencies. A cooperating agency participates in the NEPA process and may provide input (i.e., expertise) during preparation of the NEPA document. Federal agencies may designate and encourage nonfederal public agencies, such as state, local, and tribal agencies that meet the same criteria as federal cooperating agencies, to participate in the NEPA process as cooperating agencies (40 CFR 1508.5). Additionally, other federal and state agencies may contribute to and rely on information prepared as part of the environmental compliance process for the BDCP, including the EIR/EIS and supporting materials.

ES.2 Project Objectives/Purpose and Need

The CEQA project objectives are important to document the reasons the BDCP proponents are undertaking the proposal and what objectives they intend to achieve by that proposal. NEPA requires that an EIS include a statement of "purpose and need" to which the federal agency is responding in proposing the alternatives, including the proposed action (40 CFR 1502.13). The project objectives and purpose and need statement are the starting points for the state and federal agencies in developing the reasonable range of alternatives to be evaluated in detail in the EIR/EIS (State CEQA Guidelines Sections 15124[b], 15126.6[a]); 40 CFR 1502.13).

The following sections present the Project Objectives for the BDCP in compliance with the requirements of CEQA and the Project Purpose and Project Need for the BDCP in compliance with the requirements of NEPA.

ES.2.1 Project Objectives

CEQA requires an EIR to contain a statement of the objectives of the project proponents in proposing the project and alternatives. DWR's fundamental purpose in proposing the BDCP is to make physical and operational improvements to the SWP system in the Delta necessary to restore and protect ecosystem health, water supplies of the SWP and CVP south-of-Delta, and water quality within a stable regulatory framework, consistent with statutory and contractual obligations. The intent of the BDCP proponents is to formulate a plan that could ultimately be approved by USFWS and NMFS as an HCP under the provisions of ESA Section 10(a)(1)(B) and by CDFW as an NCCP under California Fish and Game Code Sections 2800 et seq.

The fundamental purpose is informed by past efforts taken within the Delta and the watersheds of the Sacramento and San Joaquin Rivers, including those undertaken through the CALFED Program and Delta Risk Management Strategy. The fundamental purpose, in turn, gives rise to the following project objectives, which were presented in the Notice of Preparation (NOP) for the BDCP EIR/EIS.

- Respond to the applications for ITPs[5] for the covered species that authorize take related to the following.
    - The operation of existing SWP Delta facilities and construction and operation of facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
    - The implementation of any conservation actions that have the potential to result in take of species that are or may become listed under the ESA, pursuant to the ESA at Section 10(a)(1)(B) and its implementing regulations and policies.
    - The diversion and discharge of water by Mirant LLC for power generation in the Western Delta[6].
- To improve the ecosystem of the Delta by the following.
    - Providing for the conservation and management of covered species through actions within the BDCP Plan Area that will contribute to the recovery of the species.
    - Protecting, restoring, and enhancing certain aquatic, riparian, and associated terrestrial natural communities and ecosystems.
    - Reducing the adverse effects on certain listed species of diverting water by relocating the intakes of the SWP and CVP[7].
- Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts and other existing applicable agreements.

[5] In this instance, ITPs should also be understood to include the NCCP permit for the purposes of CDFW.

[6] Since publication of the NOP, Mirant LLC is no longer an active participant in the BDCP.

[7] Subsequent to publication of the NOP, this was revised to refer to adding additional intakes, instead of relocating intakes.

In addition to the project objectives enumerated above, the following additional project objectives guide the development of the proposed project and alternatives.

- To ensure that the BDCP meets the standards for an NCCP by, among other things, protecting, restoring, and enhancing aquatic and terrestrial natural communities and ecosystems that support covered species within the Plan Area.
- To make physical improvements to the conveyance system in anticipation of rising sea levels and other reasonably foreseeable consequences of climate change.
- To make physical improvements to the conveyance system that will minimize the potential for public health and safety impacts resulting from a major earthquake that causes breaching of Delta levees and the inundation of brackish water into the areas in which the SWP and CVP pumping plants operate in the southern Delta.
- To develop projects that restore and protect water supply and ecosystem health and reduce other stressors on the ecological functions of the Delta in a manner that creates a stable regulatory framework under the ESA and NCCPA.
- To identify new operations and a new configuration for conveyance of water entering the Delta from the Sacramento River watershed to the existing SWP and CVP pumping plants in the southern Delta by considering conveyance options in the north Delta that can reliably deliver water at costs that are not so high as to preclude, and in amounts that are sufficient to support, the financing of the investments necessary to fund construction and operation of facilities and/or improvements.

ES.2.2 Project Purpose and Need

NEPA requires an EIS to briefly describe the underlying purpose and need for the federal lead agency's action, as well as alternatives to the proposed action, including the no action alternative. The project purpose and project need described below are consistent with the project objectives identified in Section ES.2.1.

ES.2.2.1 Project Purpose

The purposes of the proposed actions under the BDCP are to achieve the following.

1. Consider the applications for ITPs[8] for the covered species that authorize take related to the actions listed below.
    a. The operation of existing SWP Delta facilities.
    b. The construction and operation of facilities and/or improvements for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
    c. The implementation of any conservation actions that have the potential to result in take of species that are or may become listed under the ESA, pursuant to ESA Section 10(a)(1)(B) and its implementing regulations and policies.

[8] In this instance, ITPs should also be understood to include the NCCP permit for the purposes of CDFW.

2. Improve the ecosystem of the Delta by implementing the actions listed below.
    a. Providing for the conservation and management of covered species through actions within the BDCP Plan Area that will contribute to the recovery of the species.
    b. Protecting, restoring, and enhancing certain aquatic, riparian, and associated terrestrial natural communities and ecosystems.
    c. Reducing the adverse effects on certain listed species due to diverting water.
3. Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.

The above Purpose Statement reflects the intent to advance the coequal goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009 (Delta Reform Act) of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The above phrase—*restore and protect the ability of the SWP and CVP to deliver up to full contract amounts*—is related to the upper limit of legal CVP and SWP contractual water amounts and delineates an upper bound for development of EIR/EIS alternatives, not a target. It is not intended to imply that increased quantities of water will be delivered under the BDCP. As indicated by the "up to full contract amounts" phrase, alternatives need not be capable of delivering full contract amounts on average in order to meet the project purposes. Alternatives that depict design capacities or operational parameters that would result in deliveries of less than full contract amounts are consistent with this purpose.

ES.2.2.2 Project Need

The need for the action is derived from the multiple, and sometimes conflicting, challenges currently faced within the Delta. The Delta has long been an important resource for California, providing municipal, industrial, agricultural, and recreational uses; fish and wildlife habitat; and water supply for large portions of the state. However, by several key criteria, the Delta is now widely perceived to be in crisis. There is an urgent need to improve the conditions for threatened and endangered fish species within the Delta. Improvements to the water supply conveyance system are needed to respond to increased demands upon and risks to the aquatic ecosystem, water supply reliability, and water quality.

ES.2.2.2.1 Delta Ecosystem Health and Productivity

Prior to the 1840s, variability in the location and timing of flows, salinity, and habitat was common in the Delta. But for the past 70 years, the Delta has been managed as a tidal/freshwater system. During this same period, the ecological productivity for Delta native species and their habitats has been in decline. Removal of the mix of fresh- and brackish-water habitats has had a limiting effect on the diversity of native habitat within the Delta. In addition, urban development, large upstream dams and storage reservoirs, water diversions, hydraulic mining, and the development of a managed network of navigation, flood control, and irrigation canals have all affected water flow patterns and altered fish and wildlife habitat availability. These changes, coupled with higher water exports, declines in water quality from urban and agricultural discharges, and changes in the dilution

capacity from managed inflows and diversions, have led to a decline in ecological productivity in the Delta.

ES.2.2.2.2 Water Supply Reliability

The distribution of precipitation and water demand in California is unbalanced. Most of the state's precipitation falls in the north, yet there is substantial water demand south and west of the Delta for irrigation water for southern Central Valley agriculture and for municipal and industrial uses in southern California and the Bay Area. This supply and demand imbalance led to development of two major water projects: the SWP and the CVP.

The SWP and CVP systems are two of the largest and most complex water projects in the nation, and they provide the infrastructure for the movement of water throughout much of California. They function under a suite of Congressional authorizations, interagency agreements, regulatory requirements, and contractual obligations that govern daily operations and seasonal performance. These include various authorizing legislation, the USFWS and NMFS Biological Opinions (BiOps), including the Reasonable and Prudent Alternatives, and the water right permits issued by the State Water Board, among others. Regulations for the combined SWP and CVP operations are intended to protect the beneficial uses of Delta water. These beneficial uses include municipal, industrial, and agricultural water uses; fish and wildlife uses; environmental protection; flood management; navigation; water quality; power; and recreation.

The water rights of the SWP and CVP are conditioned by the State Water Board to protect the beneficial uses of water within the Delta under each respective project's water rights. In addition, under the COA, SWP- and CVP-coordinated reservoir releases and Delta exports enable each water project to achieve benefit from their water supplies and to operate in a manner protective of beneficial uses. It is the responsibility of the SWP and CVP to meet these beneficial uses regardless of hydrologic conditions.

In 2006, Executive Order S-17-06 created the Delta Vision Task Force to address some of the issues facing the Delta. In the closing days of the Task Force's work, the State Water Board presented information indicating that quantities totaling several times the average annual unimpaired flows in the Delta watershed could be available to water users based on the face value of water permits already issued. However, existing hydrologies, SWP and CVP water contracts, and environmental regulations control actual quantities that could be made available for use and diversion.

The current and projected future inability of the SWP and CVP to deliver water to meet the demands of certain south-of-Delta SWP and CVP water contractors—in all water year types and considering ecosystem and species requirements—is a very real concern. More specifically, there is an overall declining ability to meet defined water supply delivery volumes and water quality criteria to support water users' needs for human consumption, manufacturing uses, recreation, and crop irrigation.

ES.2.2.2.3 Delta Hydrology and Water Quality

Generally, Delta hydrodynamics are defined by complex interactions between tributary inflows, tides, in-Delta diversions, and SWP and CVP operations. The degree to which each variable affects the overall hydrology of the Delta varies daily, seasonally, and annually, depending on the magnitude of inflows, the tidal cycle, and the extent of pumping occurring at the SWP and CVP facilities.

Changes in Delta inflow and outflow affect Delta water quality, particularly with regard to salinity. Additionally, other water constituents of concern in the Delta (e.g., mercury, selenium, polychlorinated biphenyls [PCBs]) have been identified through ongoing regulatory, monitoring, and environmental planning processes.

To further compound these challenges, fundamental changes to the Delta are certain to occur; the Delta is not a static ecological system. The anticipated effects of climate change will result in elevated sea levels, altered annual and interannual hydrologic cycles, changed salinity and water temperature regimes in and around the Delta, and accelerated shifts in species composition and distribution. These changes add to the difficulty of resolving the increasingly intensifying conflict between the ecological needs of a range of at-risk Delta species and natural communities and the need to provide adequate and reliable water supplies for people, communities, agriculture, and industry. Anticipating, preparing for, and adapting to these changes are key underlying drivers for the BDCP.

ES.3 Project Area

The project area for the actions evaluated in the EIR/EIS is larger than the proposed BDCP Plan Area because some of the effects of implementing the BDCP or its alternatives would extend beyond the boundaries of this region. The project area consists of the following three geographic regions, as shown in Figure ES-1 and described in the following sections.

- Delta Region (Plan Area) is distinct from the larger Delta region considered for some resource areas in the impact analyses, and consists generally of the statutory Delta, the Yolo Bypass north of the statutory Delta, and Suisun Marsh, as well as the Areas of Additional Analysis[9], which apply to several EIR/EIS alternatives).
- Upstream of the Delta region.
- SWP and CVP Export Service Areas.

ES.3.1 Delta Region (Plan Area)

The Plan Area includes the aquatic and terrestrial ecosystems and natural communities and adjacent riparian and floodplain natural communities within the statutory Delta (as defined in Water Code Section 12220), as well as the Suisun Marsh and the Yolo Bypass north of the statutory Delta. The statutory Delta includes parts of Yolo, Solano, Contra Costa, San Joaquin, and Sacramento Counties. The implementation of conservation measures for all action alternatives would most likely entail actions within and outside the statutory Delta, including in the Suisun Marsh, Suisun Bay, and the Yolo Bypass. Any conservation actions outside the statutory Delta would be implemented pursuant to cooperative agreements or similar mechanisms with local agencies, interested nongovernmental organizations, landowners, and others.

For the purposes of the EIR/EIS, the Delta Region—or Plan Area and Areas of Additional Analysis (Figure ES-2)—encompasses the statutory Delta, as well as the areas where CM1–CM22 would be

[9] The Areas of Additional Analysis are two areas outside the defined Plan Area that encompass power transmission corridors. One area lies west of the Plan Area and is considered in analysis of proposed alternatives that include the west alignment (Alternatives 1C, 2C, and 6C). The other area lies east of the Plan Area and represents one of two potential transmission line alignments for Alternative 4.

implemented outside the statutory Delta. The Areas of Additional Analysis are two areas outside the defined Plan Area that encompass power transmission corridors. All the water conveyance features that would be constructed as part of CM1, including new intake facilities, would be located within the Delta region.

ES.3.2 Upstream of the Delta Region

The Upstream of the Delta region comprises those areas in the SWP and CVP system upstream of the Delta. Operational changes at SWP facilities in these areas may be necessary to move fresh water through and/or around the Delta consistent with operations of CM1.

ES.3.3 SWP and CVP Export Service Areas

The SWP and CVP Export Service Areas region includes water supply delivery infrastructure that may be affected by implementation of CM1 under all the alternatives. DWR has long-term water supply contracts with 29 agencies and districts to provide water from the SWP, and Reclamation has long-term contracts with approximately 250 water districts, irrigation districts, and others for delivery of CVP water.

ES.4 Proposed BDCP

As previously described, the BDCP is a joint HCP/NCCP intended to address ESA and NCCPA compliance for operation of the existing SWP Delta facilities and for the construction and operation of conveyance facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants in the south Delta. The BDCP is also proposed to provide for the conservation and management of covered species through a conservation strategy that includes biological goals and objectives; conservation measures, including the construction and operation of new Delta water conveyance facilities, within the Plan Area and the Areas of Additional Analysis; avoidance and minimization measures; and a monitoring, research, and adaptive management program.

The following sections provide a brief description of HCPs and NCCPs in general; identify the BDCP covered species and covered activities, including brief descriptions of BDCP conservation measures; describe the BDCP's biological goals and objectives; and present the proposed implementation schedule.

ES.4.1 Habitat Conservation Plans/Natural Community Conservation Plans

HCPs are planning documents required as part of an application for an ITP under ESA. They describe the activities that would be covered by the ITPs; the species for which incidental take would be authorized; measures that would, to the maximum extent practicable, minimize the adverse effects on the covered species resulting from implementation of the covered activities; and measures that mitigate any remaining adverse effects through the protection, restoration, creation, and/or enhancement of habitat for the covered species. They also describe the ways in which the HCP is to be funded.

The NCCPA provides a mechanism for compliance with state species regulatory requirements through the development of comprehensive, broad-based conservation plans—NCCPs—that focus on the needs of natural communities and the range of species that inhabit them (California Fish and Game Code Section 2800 et seq.) An NCCP identifies covered plants and wildlife and provides the conservation and management of natural biological diversity within the planning area, while allowing compatible and appropriate economic development, growth, and other human uses. Among other things, the plan must provide for the protection of habitat, natural communities, and species diversity on a landscape or ecosystem level through the creation and long-term management of habitat reserves or other conservation measures. Approved NCCPs provide the basis for issuance of state authorizations for the take of any covered species whose conservation and management is provided for in the plan approved by CDFW, including state-listed endangered and threatened species, nonlisted species, and fully protected species.

ES.4.2 Covered Species

ESA and the NCCPA set forth specific criteria that must be satisfied to support the issuance of regulatory authorizations that provide for the take of species. Incidental take authorization under state law is expected to occur under the NCCPA, which provides an alternative to take authorization under CESA. Pursuant to the 2009 Delta Reform Act, state incidental take authorization for the BDCP must be sought under the NCCPA rather than CESA if the BDCP is to be integrated into the Delta Plan, as adopted by the DSC, under the process set forth in the Delta Reform Act. The incidental take provisions of both ESA Section 10 and the NCCPA allow for applicants to include as *covered species* those species that are not currently listed as threatened or endangered, but that may become listed in the future, are likely to be present in the Plan Area or other areas within the geographic scope, and have a potential to be adversely affected by covered activities. Therefore, the BDCP includes as covered species not only species that are currently listed as threatened or endangered under federal and state law, but also fully protected species and species that are not currently listed but that may become listed in the future. BDCP covered species are listed in Table ES-2.

Table ES-2. BDCP Covered Species

No.	Common Name	Scientific Name	Status (Fed/State/CRPR)[a]
Fish (11 species)			
1	delta smelt‡	*Hypomesus transpacificus*	T/E/–
2	longfin smelt‡	*Spirinchus thaleichthys*	C/T/–
3	Chinook salmon, Sacramento River winter-run ESU*	*Oncorhynchus tshawytscha*	E/E/–
4	Chinook salmon, Central Valley spring-run ESU*	*Oncorhynchus tshawytscha*	T/T/–
5	Chinook salmon, Central Valley fall- and late fall–run ESU*	*Oncorhynchus tshawytscha*	–/SSC/–
6	Steelhead, Central Valley DPS*	*Oncorhynchus mykiss*	T/–/–
7	Sacramento splittail‡	*Pogonichthys macrolepidotus*	–/SSC/–
8	green sturgeon, southern DPS*	*Acipenser medirostris*	T/SSC/–
9	white sturgeon*	*Acipenser transmontanus*	–/–/–
10	Pacific lamprey‡	*Entosphenus tridentatus*	–/–/–
11	river lamprey‡	*Lampetra ayresii*	–/–/–

No.	Common Name	Scientific Name	Status (Fed/State/CRPR)[a]
Mammals (5 species)			
12	riparian brush rabbit‡	*Sylvilagus bachmani riparius*	E/E/–
13	riparian woodrat (San Joaquin Valley) ‡	*Neotoma fuscipes riparia*	E/SSC/–
14	salt marsh harvest mouse‡	*Reithrodontomys raviventris*	E/E, FP/–
15	San Joaquin kit fox‡	*Vulpes macrotis mutica*	E/T/–
16	Suisun shrew‡	*Sorex ornatus sinuosus*	–/SSC/–
Birds (11 species)			
17	California black rail‡	*Laterallus jamaicensis coturniculus*	–/T, FP/–
18	California clapper rail‡	*Rallus longirostris obsoletus*	E/E, FP/–
20	greater sandhill crane‡	*Grus canadensis tabida*	–/T,FP/–
21	least Bell's vireo‡	*Vireo bellii pusillus*	E/E/–
22	Suisun song sparrow‡	*Melospiza melodia maxillaries*	–/SSC/–
23	Swainson's hawk‡	*Buteo swainsoni*	–/T/–
24	tricolored blackbird‡	*Agelaius tricolor*	–/SSC/–
25	western burrowing owl‡	*Athene cunicularia hypugaea*	–/SSC/–
26	western yellow-billed cuckoo‡	*Coccyzus americanus occidentalis*	C/E/–
27	white-tailed kite‡	*Elanus leucurus*	–/FP/–
28	yellow-breasted chat‡	*Icteria virens*	–/SSC/–
Reptiles (2 species)			
29	giant garter snake‡	*Thamnophis gigas*	T/T/–
30	western pond turtle‡	*Actinemys marmorata*	–/SSC/–
Amphibians (2 species)			
31	California red-legged frog‡	*Rana draytonii*	T/SSC/–
32	California tiger salamander (Central Valley DPS) ‡	*Ambystoma californiense*	T/T/–
Invertebrates (7 species)			
33	California linderiella‡	*Linderiella occidentalis*	–/–/–
34	conservancy fairy shrimp‡	*Branchinecta conservation*	E/–/–
35	longhorn fairy shrimp‡	*Branchinecta longiantenna*	E/–/–
36	midvalley fairy shrimp‡	*Branchinecta mesovallensis*	–/–/–
37	valley elderberry longhorn beetle‡	*Desmocerus californicus dimorphus*	T/–/–
38	vernal pool fairy shrimp‡	*Branchinecta lynchi*	T/–/–
39	vernal pool tadpole shrimp‡	*Lepidurus packardi*	E/–/–
Plants (18 species)			
40	alkali milk-vetch‡	*Astragalus tener* var. *Tener*	–/–/1B
41	Boggs Lake hedge-hyssop‡	*Gratiola heterosepala*	–/E/1B
42	Brittlescale‡	*Atriplex depressa*	–/–/1B
43	Carquinez goldenbush‡	*Isocoma arguta*	–/–/1B
44	Delta button celery‡	*Eryngium racemosum*	–/E/1B
45	Delta mudwort‡	*Limosella subulata*	–/–/2
46	Delta tule pea‡	*Lathyrus jepsonii* var. *Jepsonii*	–/–/1B
47	dwarf downingia‡	*Downingia pusilla*	–/–/2
48	Heartscale‡	*Atriplex cordulata*	–/–/1B
49	Heckard's peppergrass‡	*Lepidium latipes* var. *heckardii*	–/–/1B

No.	Common Name	Scientific Name	Status (Fed/State/CRPR)[a]
50	Legenere‡	*Legenere limosa*	–/–/1B
51	Mason's lilaeopsis‡	*Lilaeopsis masonii*	–/R/1B
52	San Joaquin spearscale‡	*Atriplex joaquiniana*	–/–/1B
53	side-flowering skullcap‡	*Scutellaria lateriflora*	–/–/2
54	slough thistle‡	*Cirsium crassicaule*	–/–/1B
55	soft bird's-beak‡	*Cordylanthus mollis* ssp. *Mollis*	E/R/IB
56	Suisun Marsh aster‡	*Symphyotrichum lentum*	–/–/1B
57	Suisun thistle‡	*Cirsium hydrophilum* var. *hydrophilum*	E/–/1B

ESU = Evolutionarily Significant Unit.
DPS = Distinct Population Segment.
‡ Species under USFWS review authority.
* Species under NMFS review authority.
[a] Status:
Federal
E = Listed as endangered under ESA.
T = Listed as threatened under ESA.
C = Candidate for listing under ESA.
State
E = Listed as endangered under CESA.
T = Listed as threatened under CESA.
R = Listed as rare under the California Native Plant Protection Act.
SSC = California species of special concern.
FP = Fully protected under the California Fish and Game Code.
California Rare Plant Rank (CRPR)
1B = rare or endangered in California and elsewhere.
2 = rare and endangered in California, more common elsewhere.

The provisions under ESA Section 10 and the NCCPA can provide for incidental take of covered species within the 50-year life of the permit authorization. The BDCP and BDCP EIR/EIS are also intended for use by Reclamation, USFWS, and NMFS as an element of regulatory compliance with ESA Section 7. Section 7 provides federal agencies proposing actions that might adversely affect endangered or threatened species with a process for obtaining a BiOp from USFWS and/or NMFS regarding whether the action would jeopardize the continued existence of a listed species or adversely modify or destroy critical habitat and may include incidental take authorization. The ESA Section 10 process is not available to federal action agencies.

ES.4.3 Covered Activities

The BDCP includes *covered activities* and *associated federal actions*. Covered activities are those actions that are carried out by nonfederal entities, such as DWR, and that are expected to be covered by regulatory authorizations under ESA and NCCPA. The covered activities consist of activities in the Plan Area associated with the conveyance and export of water supplies from the SWP's Delta facilities and with implementation of the BDCP conservation strategy. Each of these activities falls into one of six categories: (1) new water conveyance facilities construction, operation, and

maintenance; (2) operation and maintenance of SWP facilities; (3) nonproject diversions[10]; (4) habitat protection, restoration, creation, enhancement, and management; (5) monitoring activities; and (6) research.

Associated federal actions are those activities that are carried out, funded, or authorized by Reclamation within the Plan Area and that would receive appropriate ESA coverage through Section 7. These actions would be (1) operation of existing CVP Delta facilities to convey and export water in coordinated operation with the SWP after the BDCP is approved and implemented, (2) associated maintenance and monitoring activities, and (3) the creation of habitat. The federal actions by Reclamation would not be covered activities for the purposes of the ESA Section 10(a)(1)(B) permit. These federal actions are actions that occur within the Delta that would be coordinated with DWR to support DWR's compliance with the ESA Section 10 permit. Reclamation's activities are subject to ESA Section 7.

ES.4.4 Biological Goals and Objectives

The BDCP biological goals and objectives are the foundation of the conservation strategy and reflect the expected ecological outcomes of BDCP implementation. The biological goals and objectives also set out the broad principles used to help guide the development of the conservation strategy, and are intended to provide the following functions.

- Describe the desired biological outcomes of the conservation strategy and how those outcomes will contribute to the long-term conservation of covered species and their habitats.
- Provide, where feasible, quantitative targets and timeframes for achieving the desired outcomes.
- Serve as benchmarks by which to measure progress in achieving those outcomes across multiple temporal and spatial scales.
- Provide metrics for the monitoring program by which to evaluate the effectiveness of the conservation measures and, if necessary, provide a basis to adjust the conservation measures to achieve the desired outcomes.

The biological goals and objectives are organized hierarchically on the basis of the following ecological scale.

- **Landscape.** The landscape-scale biological goals and objectives focus on the extent, distribution, and connectivity among natural communities and improvements to the overall condition of hydrological, physical, chemical, and biological processes in the Plan Area in support of achieving natural community and species-specific biological goals and objectives.
- **Natural community.** Natural Community biological goals and objectives focus on maintaining or enhancing ecological functions and values of specific natural communities. Achieving natural community goals and objectives will also conserve the habitat of associated covered species and other native species.
- **Species.** Species biological goals and objectives address stressors and habitat needs specific to individual species (or, in some cases, groups of species with similar needs) that are not addressed under the landscape and natural community goals and objectives.

[10] Nonproject diversions are those diversions not included as part of SWP and CVP operations.

The biological goals and objectives describe the desired future conditions of the Plan Area and set the benchmarks for evaluating BDCP performance relative to ecological health. They reflect the relationship between projected environmental changes and anticipated species responses and are intended to be attainable through the implementation of the conservation measures (described in Section ES.4.5, *Conservation Measures*).

ES.4.5 Conservation Measures

The 22 BDCP conservation measures comprise the specific actions to be taken to meet the biological the goals and objectives. Most of the conservation measures address several goals and objectives, and most objectives will be met through a combination of conservation measures. Actions implemented as part of the conservation measures will meet the requirements of the ESA and the NCCPA. The conservation measures are designed to contribute to the recovery of the covered species, and include protecting, restoring, creating, and/or enhancing aquatic and terrestrial species habitat, natural communities, and landscape, as well as reducing the adverse effects of water diversions on certain covered species while providing a reliable water supply. The conservation measures fit into the same ecological hierarchy as the biological goals and objectives, as described below.

- **Landscape.** Landscape-scale conservation measures are designed to improve the overall condition of hydrological, physical, chemical, and biological processes in the Plan Area. These measures include improving the method, timing, and amount of flow and quality of water into and through the Delta for the benefit of covered species and natural communities. They also focus on establishing a reserve system, an interconnected system of protected lands across the Plan Area.
- **Natural community.** Natural community conservation measures include actions to restore natural communities to expand the extent and quality of intertidal, floodplain, and other ecological functions and processes.
- **Species.** Species-specific conservation measures are designed to reduce the adverse effects of various stressors on one or more covered species. These include measures addressing toxic contaminants, nonnative predators, illegal harvest, and genetic threats.

The covered activities are included in the proposed conservation measures (Table ES-3). CM1–CM3 are intended to manage the routing, timing, and flow through the Delta while establishing an interconnected system of conserved lands across the Plan Area. CM4–CM11 were developed to restore, create, enhance, and manage physical habitat to expand the extent and quality of intertidal, floodplain, and other habitats across defined Conservation Zones (CZs) and Restoration Opportunity Areas (ROAs)[11] (Figure ES-2). The remaining conservation measures, CM12–CM21, are intended to reduce the adverse effects of various stressors, including but not limited to environmental contaminants, nonnative predators, and illegal harvest, on covered species. CM22 is a suite of activities intended to avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species.

[11] The Plan Area is subdivided into 11 Conservation Zones within which conservation targets for natural communities and covered species' habitats have been established. The five Restoration Opportunity Areas encompass those locations in the Plan Area considered most appropriate for the restoration of tidal habitats and within which restoration goals for tidal and associated upland natural communities will be achieved.

Table ES-3. Proposed BDCP Conservation Measures

CM	Title	General Description
1	Water Facilities and Operation	This CM provides for the construction and operation of a new north Delta water conveyance facility to bring water from the Sacramento River in the north Delta to the existing water export pumping plants in the south Delta, as well as for the operation of existing south Delta export facilities. The 15 action alternatives for the proposed BDCP differ in the location, design, and operation of conveyance facilities/improvements implemented under CM1. The total capacity of the proposed north Delta water conveyance facility would be 3,000–15,000 cubic feet/second, depending on the alternative.
2	Yolo Bypass Fisheries Enhancement	The Fremont Weir and Yolo Bypass would be modified to increase the frequency, duration, and magnitude of floodplain inundation and to improve fish passage in the Yolo Bypass.
3	Natural Communities Protection and Restoration	A system of conservation lands in the Plan Area would be established by acquiring lands for protection and restoration.
4	Tidal Natural Communities Restoration	65,000 acres of tidal natural communities restoration would occur, including a minimum of 24,000 acres of intertidal freshwater wetland and 6,000 acres of brackish wetland. Under Alternative 5, tidal habitat restoration would be limited to 25,000 acres.
5	Seasonally Inundated Floodplain Restoration	10,000 acres of seasonally inundated floodplains that historically existed in the Plan Area, but have been lost as a result of flood control and channelization, would be restored. Under Alternative 7, 20,000 acres of seasonally inundated floodplain would be restored.
6	Channel Margin Enhancement	20 linear miles of channel margin would be enhanced by improving channel geometry and restoring riparian, marsh, and mudflat habitats on the waterside side of levees along channels that provide rearing and outmigration habitat for juvenile salmonids. Under Alternative 7, 40 linear miles of channel margin habitat would be enhanced.
7	Riparian Natural Community Restoration	5,000 acres of native riparian forest and scrub would be restored, and 750 acres would be protected. This restoration would be in association with restoration of tidal and floodplain areas (CM4 and CM5, respectively) and channel margin enhancements (CM6).
8	Grassland Natural Community Restoration	2,000 acres of grassland habitat would be restored, and 8,000 acres would be protected.
9	Vernal Pool and Alkali Seasonal Wetland Complex Restoration	Up to 67 acres of vernal pool complex and 72 acres of alkali seasonal wetland complex would be restored to achieve no net loss in acreage from BDCP covered activities. In addition, at least 600 acres of vernal pool complex would be protected in conjunction with 150 acres of alkali seasonal wetland complex.
10	Nontidal Marsh Restoration	1,200 acres of nontidal marsh would be restored.
11	Natural Communities Enhancement and Management	Natural communities and covered species' habitats would be enhanced and managed.
12	Methylmercury Management	The conditions that promote production of methylmercury in restored areas and its subsequent introduction to the foodweb, and to covered species in particular, would be minimized.
13	Invasive Aquatic Vegetation Control	The introduction and spread of invasive aquatic vegetation in aquatic restoration areas would be prevented and controlled.

CM	Title	General Description
14	Stockton Deep Water Ship Channel Dissolved Oxygen Levels	The Stockton Deep Water Ship Channel DWR Aeration Facility would be operated to maintain dissolved oxygen concentrations above target levels during the BDCP permit term.
15	Localized Reduction of Predatory Fishes (Predator Control)	Populations of nonnative predatory fishes would be reduced at specific locations, and holding habitat for these predatory fishes would be eliminated or modified at selected locations of high predation risk.
16	Nonphysical Fish Barriers	Nonphysical barriers (structures combining sound, light, and bubbles) would be installed at the head of Old River, Delta Cross Channel, Georgiana Slough, and possibly Turner Cut and Columbia Cut to deter juvenile salmonids from using specific channels/migration routes that may contribute to decreased survival.
17	Illegal Harvest Reduction	Funding would be provided to CDFW to increase the enforcement of fishing regulations to reduce illegal harvest of Chinook salmon, Central Valley steelhead, green sturgeon, and white sturgeon in the Delta, bays, and upstream waterways.
18	Conservation Hatcheries	New delta smelt and longfin smelt conservation propagation programs would be established and existing programs would be expanded to ensure the existence of refugial captive populations of these species to help reduce their risks of extinction.
19	Urban Stormwater Treatment	Funding would be provided for implementing stormwater treatment measures in urban areas that would result in decreased discharge of contaminants to the Delta
20	Recreational Users Invasive Species Program	A Delta Recreational Users Invasive Species Program would be funded. This program would implement actions to prevent the introduction of new aquatic species and reduce the spread of existing aquatic invasive species by means of recreational watercraft, trailers, and other mobile recreational equipment used in aquatic environments in the Plan Area.
21	Nonproject Diversions	Funding would be provided for actions that would minimize the potential for entrainment of covered fish species associated with operation of nonproject diversions (diversions other those related to the SWP and CVP).
22	Avoidance and Minimization Measures	Avoidance and minimization measures would be implemented to avoid and minimize effects on covered species and natural communities that could result from BDCP covered activities. These measures would be implemented for all BDCP covered activities through the BDCP permit term.

ES.4.6 Implementation Schedule

The conservation strategy is divided into near-term (NT) and long-term (LT) implementation stages. The NT implementation would last until the north Delta diversions and the new water conveyance facilities are constructed and operational. LT implementation would last 40 years—that is, through the remainder of the proposed 50-year BDCP permit term. The LT implementation stage is further divided into two sub-phases: Early long-term (Year 11 through Year 15) and Late long-term (Year 16 through Year 50). This division of the implementation period was used because dual conveyance from north and south Delta intakes would bring significant flexibility and ecological changes to the system. As a result, many of the conservation measures are interrelated with operations of the new conveyance. NT implementation of conservation measures would be intended to provide a response to currently degraded or absent ecological functions, while building the foundation to improve long-term ecological functions. The NT measures include early habitat creation or restoration actions,

implementation of conservation measures that address other stressors on covered fish species, and acquisition of terrestrial and wetland habitat to facilitate conservation of covered wildlife and plant species.

ES.5 Alternatives Considered in the EIR/EIS

CEQA and NEPA require that an EIR and EIS include a detailed analysis of a reasonable range of alternatives to a proposed project. CEQA requires that an EIR evaluate alternatives to the proposed project that are potentially feasible and would achieve most of the basic project objectives while avoiding or substantially reducing project impacts. NEPA requires that a reasonable range of alternatives that meet the purpose and need of the proposed federal action be analyzed in an EIS at an equivalent level of detail to that of the proposed action. Under NEPA, a range of reasonable alternatives is analyzed to define the issues and provide a clear basis for choice among the options. The joint CEQA/NEPA analysis must also include an analysis of a no project alternative (for CEQA) and a no action alternative (for NEPA).

The BDCP EIR/EIS evaluates 15 action alternatives and a no action alternative (also the CEQA no project alternative; see Section ES.5.1.2, *No Action Alternative*). Alternative 4 is the Proposed Project (the proposed BDCP) and DWR's "Preferred Alternative" for purposes of CEQA. It is consistent with the proposed BDCP published concurrently with publication of the Draft EIR/EIS. Over the course of preparing the environmental analyses, Alternative 4 was refined and improved to identify a form of the proposed BDCP (Proposed Project) that is grounded in solid science and reaches what DWR considers to be an optimal balance between ecological and water supply objectives. Notably, identification of Alternative 4 as the preferred CEQA alternative is tentative, and is subject to change as DWR and its partner lead and responsible agencies receive and consider public and agency input on the EIR/EIS. It is therefore possible that the final version of the BDCP may differ from Alternative 4 as described herein, either because Alternative 4 itself was further refined, because another alternative was determined to be preferable, or because the Lead Agencies, in response to input, developed a new alternative with some features from some existing alternatives and other features from other existing alternatives[12].

The following sections briefly describe the screening/development process and criteria used to develop the range of alternatives considered in the EIR/EIS and the components of those alternatives.

[12] Just as further public and agency input may result in a new preferred CEQA alternative or a modification of Alternative 4 in its current form, the same is true of the text of the proposed BDCP published contemporaneously with this Draft EIR/EIS. In particular, Chapter 9, *Alternatives to Take*, of the BDCP, may be revised in light of further input regarding the practicability of the alternatives tentatively rejected therein. In other words, the current analysis in BDCP Chapter 9 of the impracticability of various alternatives to take, though representing DWR's best thinking as of the date of its release, remains subject to change. It should be noted that the alternatives set out in Chapter 9 of the BDCP are not identical to the EIR/EIS alternatives; nor are they subject to the same analysis. In Chapter 9 of the BDCP, the analysis of the alternatives is focused solely on the potential for each of these alternatives to reduce the take of federally listed species in relationship to the proposed action. The alternatives addressed in the EIR/EIS, in contrast, are subject to a far broader analysis.

ES.5.1 EIR/EIS BDCP Development of Alternatives

A primary goal of the BDCP is to achieve long-term compliance with ESA and the NCCPA with respect to the operation of existing SWP facilities in the Delta, and the construction and operation of new conveyance facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants in the south Delta. Therefore, the primary component of the BDCP related to the focus in development of alternatives was CM1—the water conveyance facilities combined with the operational scenarios under which they would be managed.

ES.5.1.1 Alternatives Development Screening Process

The process for developing the BDCP alternatives was initiated in 2006 with organization of the BDCP Steering Committee. The Steering Committee was composed of representatives from a number of agencies and stakeholder organizations that have interest in or are involved in management of resources in the Delta. All meetings of the Steering Committee were open to the public, and all presentations and documents discussed at the meetings were made available on the BDCP website. The Steering Committee convened various working groups and technical teams to develop technical information or recommendations about aspects of alternative conservation plan concepts. The Steering Committee, working groups, and technical teams met from 2006 through 2010.

In 2006–2007, the Steering Committee conducted a preliminary analysis of broadly defined conveyance alignment concepts to evaluate and consider the benefits and constraints of different water conveyance alignment approaches. During this stage, the committee refined the range of the conveyance alignment concepts to four Conservation Strategy Options. In September 2007 the committee completed the *Conservation Strategy Options Evaluation Report* (BDCP Steering Committee 2007) presenting the four options that generally encompassed two through-Delta conveyance variations, a dual conveyance option utilizing isolated conveyance and through-Delta conveyance, and an isolated conveyance option. As the name suggests, the *through-Delta* options would involve conveyance of water from the Sacramento River through the Delta using existing channels for diversion by the SWP/CVP south Delta facilities. A *dual conveyance* option would involve development of new north Delta diversion facilities to be operated in conjunction with existing SWP/CVP export facilities in the south Delta. An *isolated conveyance* option would consist only of new north Delta diversion facilities, and the existing facilities in the south Delta would no longer be operated.

By early 2008, DWR and the federal Lead Agencies had initiated the public scoping process for the EIR/EIS; additional scoping processes were also conducted in early 2009. Additionally during this time, the Steering Committee continued to meet and there was ongoing correspondence with the California Natural Resources Agency regarding water conveyance alignment approaches. As a result of these combined processes, 15 water conveyance concepts, focused on the possible alternative alignments for the water conveyance facilities (CM1), were developed. These concepts retained variations of the initial concepts of through-Delta, dual conveyance, and isolated conveyance approaches.

These 15 water conveyance concepts were then evaluated in a multi-level screening process referred to as the initial or first screening. The first screening utilized three levels of screening criteria—designed to ensure that the legal requirements under both CEQA and NEPA were met

(Table ES-4). Eight of the 15 initial water conveyance concepts were eliminated through this first screening process.

Table ES-4. Screening Criteria for Water Conveyance Alternative Alignment Concepts

Screening Level	Focus Criteria
First	Allow for the conservation and management of covered species; protect, restore, and enhance certain aquatic, riparian, and associated terrestrial natural communities/ecosystems; reduce adverse effects on certain listed species through use of existing SWP and CVP diversion facilities and new SWP intakes; and restore and protect SWP and CVP water reliability.
Second	Avoid or substantially lessen expected significant environmental effects of the proposed project, and address significant issues related to the proposed action.
Third	Define potentially feasible alternatives under CEQA and reasonable alternatives under NEPA; consider the technical and economic feasibility/practicality of alternatives; consider whether an alternative would violate federal or state statutes or regulations; and if an alternative would balance relevant economic, environmental, social, and technological factors.

In addition to the conveyance facility alignment alternatives, the Steering Committee working groups and technical teams developed screening evaluations to consider operations and habitat restoration activities. By 2011, the state and federal agencies and environmental organizations had identified a range of north Delta intake capacities and conveyance operation alternatives.

The water conveyance alignment concepts developed through the first screening process were combined with the operational concepts identified in 2011 and a second screening process was implemented. This process generated 21 possible alternatives, which were then evaluated using the same First, Second, and Third Level Screening Criteria (Table ES-4). In addition, these alternatives were evaluated against the requirements of the Delta Reform Act and for consistency with scoping comments from responsible and cooperating agencies related to the range of alternatives, and relative to legal rights and entitlements of entities that are not BDCP participants and whose legal rights and entitlements are beyond the authority and reach of CDFW, USFWS, and NMFS. By using these criteria to narrow the range to a more manageable field, the alternatives were reduced by summer 2011 to a proposed project (the proposed BDCP), 14 action alternatives, and a no action/no project alternative.

On July 25, 2012, California Governor Edmund G. Brown Jr., Secretary of the Interior Ken Salazar, and National Oceanic and Atmospheric Administration (NOAA) Assistant Administrator for Fisheries Eric Schwaab outlined revisions to the proposed BDCP. As revised, the proposal includes the following: (1) the construction of water intake facilities with a total capacity of 9,000 cubic feet per second (cfs), down from an earlier proposal of 15,000 cfs; (2) operations that would be phased in over several years; and (3) a conveyance system designed to use gravity flow to maximize energy efficiency and to minimize environmental impacts. This proposal as revised is analyzed in the BDCP Effects Analysis. It involves Intakes 2, 3, and 5; two tunnels to convey water by gravity; no intermediate pumping plant; and operations guided by Scenario H (described in Section ES.5.2.2).

The EIR/EIS analyzes the proposed BDCP as Alternative 4[13]. The proposed project, as embodied in the draft BDCP document published together with the EIR/EIS, will form a major portion of the HCP and NCCP that support applications for take authorization and other permits needed to proceed with implementation of the BDCP.

The action alternatives generally consist of new diversion/intake structures, water conveyance facilities and associated operational criteria, conservation components to provide habitat restoration, and additional conservation components to reduce other stressors that affect covered species and their habitats in the Plan Area. The alternatives selected for analysis in the EIR/EIS are listed below.

- No Action Alternative
- Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario A)
- Alternative 1B—Dual Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario A)
- Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)
- Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)
- Alternative 2B—Dual Conveyance with East Alignment and Five Intakes (15,000 cfs; Operational Scenario B)
- Alternative 2C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario B)
- Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)
- Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H): Proposed Project / CEQA "Preferred Alternative"
- Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)
- Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)
- Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)
- Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D)
- Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)

[13] In February 2012, Alternative 4 included Intakes 1, 2, and 3 and an intermediate pumping plant, along with a set of operational criteria including provisions for Fall X2. This alternative has been updated to reflect the elements introduced in the July 2012 announcement.

- Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario F)
- Alternative 9—Through-Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

These alternatives are briefly described in the following sections.

ES.5.1.2 No Action Alternative

CEQ regulations for implementing NEPA require an EIS to include evaluation of a No Action Alternative (40 CFR 1502.14). At the lead agencies' discretion under NEPA, the No Action Alternative may be described as the future circumstances without the proposed action and can also include predictable actions by persons or entities, other than the federal agencies involved in a project action, acting in accordance with current management direction or level of management intensity. When the proposed action involves updating an adopted management plan or program, the No Action Alternative includes the continuation of the existing management plan or program. The CEQ suggests that the No Action Alternative may provide a benchmark that allows decision makers to compare the magnitude of environmental effects of the action alternatives (46 Federal Register [FR] 18026, March 23, 1981).

Under CEQA, an EIR is required to analyze the No Project Alternative. The No Project Alternative allows decision makers to use the EIR to compare the impacts of approving the proposed project with the future conditions of not approving the proposed project. Under CEQA, the No Project Alternative is not the baseline for assessing the significance of impacts of the Proposed Project. State CEQA Guidelines Section 15126.6, Subdivision (e)(2) indicates that No-Project conditions may include some reasonably foreseeable changes in Existing Conditions and changes that would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

Under the No Action Alternative, also characterized as meaning *no federal action*, the federal ITPs related to the proposed BDCP would not be issued and permit applicants would remain subject to the take prohibition for listed species and other ESA requirements. Ongoing activities or future actions that may result in the incidental take of federally listed species would need to be permitted through ESA Section 7 or Section 10. Reclamation would continue to operate the CVP consistent with current management direction. For the EIR/EIS analysis, the No Action Alternative assumptions are limited to Existing Conditions, programs adopted during the early stages of development of the EIR/EIS, facilities that are permitted or under construction during the early stages of development of the EIR/EIS, projects that are permitted or are assumed to be constructed by 2060, and changes due to climate change that would occur with or without the proposed action or alternatives. These assumptions represent continuation of the existing plans, policies, and operations and conditions that represent continuation of trends in nature.

Because the BDCP No Action Alternative assumptions are consistent with the requirements and limitations prescribed by CEQA, the No Action Alternative also represents the No Project Alternative. For ease of reference, the joint No Action/No Project Alternative is referred to as the No Action Alternative. The No Action Alternative assumptions include the basic description of the No Action Alternative, assumptions related to the SWP and CVP, ongoing programs and policies by governmental and nongovernmental entities, projections related to climate change, and assumptions related to annual actions that vary every year. Among the ongoing programs by

governmental entities that are included in the No Action Alternative are many of the actions required by the 2008 and 2009 USFWS and NMFS BiOps.

ES.5.1.3 BDCP Action Alternatives

The action alternatives evaluated in the EIR/EIS comprise combinations of the following: conservation measures identified in the BDCP conservation strategy that include a proposal for water conveyance facilities, the operation of which is intended to manage the routing, timing, and amount of flow through the Delta while establishing an interconnected system of conservation lands across the Plan Area (CM1–CM3); measures to protect, restore, enhance, and manage physical habitat by expanding the extent and quality of intertidal, floodplain, and other habitats across defined CZs and ROAs (CM2–CM11); and measures to reduce the effect of various ecological stressors on covered species, such as toxic contaminants, nonnative predators, illegal harvest, and nonproject water diversions, many of which are unrelated to operation and conveyance of water through SWP/CVP Delta facilities (CM12–CM21). CM22 includes activities intended to avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species. CM1–CM22 are common to all the BDCP alternatives, with varying designs, locations, and operational scenarios for water conveyance facilities proposed under CM1 and varying amounts of habitat restoration, protection, and enhancement for CM2–CM11. Table ES-5 presents an overview of the action alternatives.

The action alternatives for the EIR/EIS were developed through the screening process described in Section ES.5.1.1, *Alternatives Development Screening Process*, and were developed to meet all or most of the objectives and purpose and need of the BDCP described in Section ES.2, *Project Objectives/Purpose and Need*. The 15 action alternatives are variations of conservation plans that differ primarily in the location of intake structures and conveyance alignment, design, diversion capacities (ranging from 3,000 to 15,000 cfs), and operational scenarios of water conveyance facilities that would be implemented under CM1. Depending on the alternative, the water conveyance facility components would create a new conveyance mechanism or use existing water corridors to divert water from the north Delta to existing SWP and CVP export facilities in the south Delta, utilizing operational guidelines to achieve the BDCP planning goals.

In general, the numbering of alternatives in the EIR/EIS reflects the fact that three sets of three alternatives share many common elements and only one or a handful of differences. Thus, Alternatives 1A, 1B, and 1C would all involve *dual conveyance* scenarios with a total of 15,000 cfs of capacity operated under Operational Scenario A, developed in early 2010. They differ only in that Alternative 1A would use a pipeline/tunnel, rather than a surface canal, as its major conveyance facility. Alternative 1B would entail an eastside canal, while Alternative 1C would entail a combination of a westside canal and pipeline/tunnel. Similarly, Alternatives 2A, 2B, and 2C would use the same three dual conveyance designs as 1A, 1B, and 1C with a total capacity of 15,000 cfs, but they would be operated under Operational Scenario B rather than Scenario A. Scenario B was developed in early 2011 and reflects a greater degree of input from USFWS, NMFS, and CDFW than does Scenario A. Alternatives 6A, 6B, and 6C represent a similar approach—that is, they use the same respective physical alignments as 1A, 1B, and 1C—but they would constitute an *isolated conveyance* facility with 15,000 cfs of capacity operated under Scenario D, which is a modification of Scenario A, eliminating the use of south Delta intakes. Most action alternatives share the same set of conservation components, with variations incorporated into Alternatives 5, 7, and 9. All action alternatives share the same measures to reduce other stressors.

The *dual conveyance* water delivery system would consist of new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate when the north Delta diversion is nonoperational during infrequent maintenance or repair periods. The five intakes that would be constructed and operated under Alternatives 2A, 2B, and 2C would involve either Intakes 1–5 or Intakes 1, 2, 3, 6, and 7.

The *isolated conveyance* water delivery system would consist only of new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

The *through delta / separate corridors* (Alternative 9) water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants.

ES.5.2 Components of the BDCP Action Alternatives

ES.5.2.1 Physical Components

The possible water diversion and conveyance facilities that could be included in one or more of the BDCP action alternatives are listed below. Not all components listed would be found in each alternative (see Table ES-6).

- **Intakes**—any single action alternative would include the construction of between one and five intakes. With the exception of Alternative 9, these would be new on-bank facilities constructed on the Sacramento River between Clarksburg and Walnut Grove. For Alternatives 1C, 2C, and 6C, the intakes would be on the west bank of the river instead of the east bank. Under Alternative 9, intakes would be placed at the Delta Cross Channel and Georgiana Slough. All intakes would be equipped with fish screens designed to be protective of salmonids and delta smelt and comply with CDFW and NMFS fish screening criteria.
- **Pumping plants**—would include sedimentation basins, solids handling facilities, transition structures, surge towers, substation(s), transformers, a mechanical room, an access road, and other associated facilities and utilities. Some or all of these facilities would be associated with pumping plants under each action alternative.
- **Pipelines**—intake pipelines would carry water between intakes and intake pumping plants and conveyance pipelines would carry water between intake pumping plants and other conveyance facilities such as the tunnels, canals, and forebays. In addition, a combination of pipelines/tunnels would be part of the primary conveyance facilities for Alternatives 1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7, and 8 (Table ES-6).
- **Tunnels**—tunnel segments of various length and capacity would be involved to convey water in each of the alternatives, except for Alternative 9. In addition, a combination of pipelines/tunnels would be part of the primary conveyance facilities for Alternatives 1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7, and 8 (Table ES-6).

Table ES-5. Action Alternatives Evaluated in the BDCP EIR/EIS

EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
1A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1B	Dual[a]	East	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5 (or 1,2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2B	Dual[a]	East	1, 2, 3, 4, 5 (or 1, 2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
3	Dual[a]	Pipeline/ Tunnel	1, 2[i]	6,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
4 (CEQA Preferred Alternative)	Dual[a]	Modified Pipeline/ Tunnel	2, 3, 5	9,000	Scenario H	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
5	Dual[a]	Pipeline/ Tunnel	1	3,000	Scenario C	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); tidal habitat restoration limited to 25,000 acres	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6A	Isolated[c]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6B	Isolated[c]	East	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6C	Isolated[c]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
7	Dual[a]	Pipeline/ Tunnel	2, 3, 5[i]	9,000	Scenario E	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); additional 20 linear miles of channel margin habitat enhancement and 10,000 acres of seasonally inundated floodplain	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
8	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario F	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
9	Through-Delta[d]	Through-Delta/ Separate Corridors[d]	Screened intakes at Delta Cross Channel and Georgiana Slough	15,000[d]	Scenario G	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); changes in the south Delta[h]	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

[a] The *Dual Conveyance* water delivery system would consist of the new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair.

[b] Under Alternatives 2A, 2B, and 2C a total of five intakes would be constructed and operated. Intake locations 1–5 or 1, 2, 3, 6, and 7 are analyzed for these alternatives.

[c] The *Isolated Conveyance* water delivery system would consist only of the new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

[d] The *Through-Delta/Separate Corridors* water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants. While the north Delta diversion capacity associated with this alternative is up to 15,000 cfs, it differs from the other action alternatives in that this capacity would be provided by flows through existing channels.

[e] See Table 3-6 for a summary of the individual rules that comprise the operational scenarios and a comparison by scenario and alternative. An overview of operational scenarios is provided in Section 3.4.1.2 while a more detailed description appears in Section 3.6.4.2.

[f] The BDCP Steering Committee Handout of 3/25/10 is available at: <http://baydeltaconservationplan.com/BDCPPlanningProcess/BackgroundDocuments/SteeringCommittee/SteeringCommitteeAgendasAndHandouts.aspx>.

[g] The west side intakes would be located on the west bank of the Sacramento River.

[h] Under this alternative, lands acquired for restoration or enhancement in the south Delta would not be located alongside corridors designated for water supply.

[i] The intake locations listed represent those locations selected for the analysis of each BDCP alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under these alternatives. Once an alternative is selected as part of the final BDCP, a decision regarding intake locations will be made.

- **Canals**—would be unlined (earthen) or lined with concrete. Canal lengths and capacities would vary among alternatives. Canals would be a primary component of the water conveyance structure for Alternatives 1B, 1C, 2B, 2C, 6B, and 6A (Table ES-6).

Table ES-6. Water Conveyance Facilities Components of Each Alternative

	Alternative														
Component	No Action	1A	1B	1C	2A	2B	2C	3	4	5	6A	6B	6C	7	8	9[c]
New north Delta fish-screened intakes		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New intake pumping plants		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
New diversion pumping plants																X
New intermediate pumping plant		X	X	X	X	X	X	X		X	X	X	X	X	X	
Use of existing SWP and CVP south Delta intake facilities	X	X	X	X	X	X	X	X	X	X				X	X	X
Operations of North Bay Aqueduct Alternative Intake Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Byron Tract Forebay[a]		X	X	X	X	X	X	X		X	X	X	X	X	X	
Expanded Clifton Court Forebay[b]									X							
Intermediate forebay		X			X			X	X	X	X			X	X	
Primary Conveyance Facility																
Pipelines/tunnels		X		X	X		X	X	X	X	X		X	X	X	
Canals			X	X		X	X					X	X			
Channels	X															X
New operable barrier(s)					X	X	X		X							X
Fish movement and habitat corridor around Clifton Court Forebay																X

[a] *Byron Tract Forebay* currently refers to proposed forebays both north and south of Clifton Court Forebay.

[b] *Expanded Clifton Court Forebay* refers to modifications to Clifton Court Forebay and expansion on Byron Tract 2.

[c] For Alternative 9, these "intakes" refer to fish screens that would divert water into existing Delta channels (Georgiana Slough and the Delta Cross Channel).

- **Forebays**—an intermediate forebay would store water between intake facilities and other conveyance features depending on the alternative (Table ES-6). Byron Tract Forebay would enhance water supply operational flexibility, using forebay storage capacity to regulate flows from north Delta intakes and flows to south Delta pumping plants. Under Alternative 4, the existing Clifton Court Forebay would be expanded and divided to provide a transition between the new conveyance structures and the existing SWP/CVP south Delta export facilities.

- **Fixed and operable barriers**—would allow the passage of fish, water, and boats through existing Delta channels. Operable barriers would be constructed for the Through Delta/Separate Corridors alternative and those alternatives using Operational Scenarios B and H.

- **New levees or levee modifications**—would vary among the action alternatives and would protect new channel fill areas and serve modified channels and intake facility sites.

- **Culvert siphons**—would convey water under existing channels and between sections of canals (e.g., through tunnels) or other conveyance facilities.

- **Gates or similar control structures**—would control the flow of water through conveyance facilities and facilitate maintenance of conveyance structures under all action alternatives.
- **Concrete batch plants and fuel stations**—would be built and located side by side at various work sites to support construction under each action alternative. Each batch plant would also require a suitable source of clean water.
- **Temporary barge unloading facilities**—would be constructed at locations along the alternative alignments for the delivery of construction materials and would be removed following construction.
- **Other facilities**—new bridges to connect existing roads and highways, new access roads, improvements to local drainage systems affected by the alternatives, and other utilities improvements would be constructed to support the function of the new conveyance facilities.

ES.5.2.2 Operational Components/Scenarios

The BDCP would include modifying operations of SWP and CVP facilities in the Delta (covered activities and BDCP-associated federal actions). Each of the BDCP action alternatives would modify the existing operation of the SWP and CVP in the Delta to further protect fish populations and to accommodate new Delta facilities and proposed habitat restoration. The existing operation of the CVP and SWP in the Delta is determined by rules and objectives that guide daily Delta operational activities. Many of these rules are included in D-1641 (which implemented the 1995 Bay-Delta Water Quality Control Plan [WQCP] objectives). Several additional rules have been added by the 2008 USFWS BiOp and the 2009 NMFS BiOp for long-term operation of the CVP and SWP.

Operation of the SWP and CVP Delta facilities are guided by two main sets of rules that determine the maximum allowable exports and the minimum required Delta outflow. Several different objectives are used to govern the allowable exports, and several more objectives are used to control the minimum required Delta outflow. The proposed BDCP north Delta intakes would require a third category of Delta rules governing maximum allowable north Delta diversions. In some cases, rules governing south Delta exports would not apply to the north Delta intakes. Delta operations for each of the alternatives can be described and compared by the applicable rules under each category. The BDCP alternatives comprise a range of operational rules for the SWP/CVP in the Delta that add to, modify, or eliminate some of the existing Delta operational rules.

While meeting biological goals and objectives of the Plan, the applicable Delta operational rules evaluated for BDCP alternatives are intended to address how much of the Delta inflow can be exported at the south Delta CVP and SWP pumping plants; how much of the Delta inflow can be exported at the BDCP north Delta intakes; and how much of the inflow is needed for Delta outflow.

Addressing these three factors requires determining the most limiting (lowest) objective for south Delta exports, the most limiting (lowest) objective for north Delta intakes, and the most limiting (highest) objective for outflow. Because each alternative has a slightly different set of applicable rules with varying north Delta intake capacities, each BDCP alternative would have different Delta operations in many months.

Table ES-7 provides a summary of the major Delta objectives (rules) for determining the maximum allowable exports and the minimum required outflow under each BDCP alternative. The existing rules are included in the No Action Alternative operations. Each BDCP operational scenario includes

many of the No Action Alternative rules as well as several modified or new rules. The operational scenarios are described briefly below.

- Operational elements common to all scenarios include physical limits of SWP and CVP south Delta pumping plants, available San Luis Reservoir storage, SWP Article 21 delivery, seasonal SWP and CVP delivery patterns, minimum monthly specified outflow, maximum salinity for Delta diversions, and maximum Spring X2 location.
- Scenario A would include most No Action objectives for south Delta exports and required Delta outflow; however, Scenario A does not include Fall X2 objectives nor the San Joaquin River (SJR) Inflow/Export Ratio. Scenario A includes new criteria for north Delta diversion bypass flows and assumed operations of the proposed Fremont Weir (notch) during high Sacramento River flows. The minimum bypass flow ranges from 5,000 cfs to more than 15,000 cfs, depending on time of year. Scenario A was used in the CALSIM modeling for Alternatives 1A, 1B, 1C, and 3. Different north Delta diversion capacities would influence the volume of pumping from the south Delta, resulting in variation of Delta operations.
- Scenario B would include the Fall X2 criteria, but not the SJR Inflow/Export Ratio. Scenario B would also include less negative Old and Middle River (OMR) flow limits, and an operable barrier at the head of Old River. All other No Action rules were assumed to apply, and the north Delta intake bypass rules would be the same as those under Scenario A. Operational Scenario B was used in the CALSIM modeling for Alternatives 2A, 2B, and 2C.
- Scenario C would incorporate all the No Action rules. The north Delta intake bypass flow rules would be the same as those under Scenario A. Operational Scenario C was used in the CALSIM modeling for Alternative 5. The north Delta operations were limited because of the reduced conveyance capacity, entailing a single 3,000 cfs intake on the Sacramento River.
- Scenario D would eliminate use of the south Delta intakes (i.e., an isolated north Delta conveyance only) and would use the same north Delta intake bypass flow rules as those under Scenario A. None of the existing south Delta export rules would apply, including the export/import (E/I) ratio. All the No Action outflow rules would apply. Operational Scenario D was used in the CALSIM modeling for Alternatives 6A, 6B, and 6C.
- Scenario E would use north Delta bypass rules modified from those under Scenario A. Scenario E assumed less negative OMR limits and more restrictive SJR inflow/export ratios (December–March and June) and would eliminate south Delta exports in April and May. Scenario E would include all of the No Action outflow rules, including Fall X2. Operational Scenario E was used in the CALSIM modeling for Alternative 7.
- Scenario F would use the same rules as Scenario E, but would be modified to include specific Delta outflow criteria and cold water pool management criteria for specific reservoirs. Operational Scenario F was used in the CALSIM modeling for Alternative 8.
- Scenario G would include all the No Action rules for south Delta exports and Delta outflow, including the Fall X2 criteria. There would not be any north Delta bypass flow rules; diversions at the proposed fish screens on Delta Cross Channel (DCC) and Georgiana Slough would be controlled by tidal hydraulics and the DCC gate closure rules. Operational Scenario G was used in the CALSIM modeling for Alternative 9. All the south Delta export rules were applied for CALSIM modeling, though the SJR inflow/export ratio would not be required because the migrating SJR fish would be separated from the exports. The No Action OMR flow restrictions would apply.

Table ES-7. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives

Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
Delta Operational Rules Controlling Maximum Allowable CVP and SWP South Delta Exports											
Physical/Permitted Limit for CVP (4,600 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Physical Limit for SWP (10,300 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Permitted Limit for SWP (6,680 cfs plus 1/3 of San Joaquin River Dec 15–March 15)	Jan–Dec	X	O	O	O	O	X	O	O	O	X
Export/Inflow Ratio (65% Jul–Jan; 35% Feb–Jun)	Jan–Dec	X	X[a]	X[a]	X[a]	X[a]	X[a]	O	X[a]	X[a]	X
SJR Inflow/Export Ratio	Apr–May	X	O	O[b]	O	O[b]	X	O	X[c]	X[c]	O[d]
Reverse Old and Middle River Flows	Dec–Jun	X	X	X[e]	X	X[e]	X	O	X[f]	X[f]	X
Available San Luis Reservoir Storage	Jan–Dec	X	X	X	X	X	X	X	X	X	X
SWP Article 21 Delivery (when San Luis Reservoir is Full)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Seasonal CVP and SWP Delivery Pattern	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Delta Operational Rules Controlling Minimum Required Delta Outflow											
Minimum Monthly Specified Outflow	Jan–Dec	X	X	X	X	X	X	X	X	X[g]	X
Maximum Salinity (EC) for Delta Diversions	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Maximum Spring X2 Location	Feb–Jun	X	X	X	X	X[h]	X	X	X	X	X
Maximum Fall X2 Location	Sep–Oct	X	O	X	O	X[h]	X	X	X	X	X
New Operational Rules Controlling Maximum North Delta Intake Diversions											
Maximum Capacity of North Delta Intakes (cfs)	N/A	None	15,000	15,000	6,000	9,000	3,000	15,000	9,000	9,000	None
Bypass Flows (% of Sacramento River at Freeport)	Jan–Dec	O	X	X	X	X	X	X	X	X	O

Note for Table ES-7

Notes: "X" indicates that a BDCP alternative incorporates an operational rule. "O" indicates that a BDCP alternative does not incorporate that operational rule.

[a] In computing the E/I ratio for these scenarios, the Sacramento River inflow is considered to be downstream of the north Delta intakes, with the exception of Scenarios H2 and H4, for which Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

[b] Under these scenarios, a different strategy was applied to achieve similar objectives as the SJR I/E ratio.

[c] SJR I/E ratio is applicable December through June and therefore would apply for five months longer than under the No Action Alternative.

[d] SJR I/E ratio is applicable when the San Joaquin River flow at Vernalis is greater than 10,000 cfs.

[e] More restrictive/protective than Scenario A.

[f] More restrictive/protective than Scenario B.

[g] More restrictive/protective than in the No Action Alternative; the Delta outflow requirement is expressed as a percent of unimpaired flow.

[h] For Alternative 4, maximum Spring X2 Location will be determined based on the results of the decision tree process for spring outflow. Maximum Fall X2 Location will also be determined by the decision tree process under Alternative 4.

- Scenario H would include less negative OMR flow limits and an operable barrier at the head of Old River. All other No Action rules were assumed to apply except the SJR Inflow/Export Ratio, and the north Delta intake bypass rules would be the same as those under Scenario A. Delta Outflow under Scenario H would be determined by the outcome of the decision tree process needed to account for scientific disagreement and uncertainties related to spring outflow and Fall X2 requirements for delta and longfin smelt, salmonids, and sturgeon. Thus, there are different potential outflow requirements that could be used for spring and fall. Operational Scenario H was used in the CALSIM modeling for Alternative 4 and would include criteria for north Delta diversion bypass flows, south Delta OMR flows, south Delta E/I Ratio[14], flows over Fremont Weir into Yolo Bypass by means of operable gates, Delta inflow and outflow, DCC gate operations (per D-1641 and the NMFS BiOp), additional Rio Vista minimum flow requirements, operations for Delta water quality and residence (per D-1641), and water quality for agricultural and municipal/industrial diversions (per D-1641).
- Each of the BDCP operational scenarios can be compared with the assumed No Action Delta operational rules listed in Table ES-7. Delta operations are the combination of the Delta inflow, the assumed Delta operational rules, and the assumed capacity and bypass flow rules for the new BDCP facilities.

ES.5.2.3 Habitat Components

A primary conservation goal of the BDCP is to protect, restore, enhance, and manage tidal, riparian, and seasonally inundated floodplain habitats for the benefit of covered fish, wildlife, and plant species and ecosystem processes in the Plan Area. Habitat restoration, enhancement, and management activities are covered activities under the BDCP; they include all actions that may be undertaken to implement the physical habitat conservation measures CM2–CM11.

Each of the action alternatives would include implementation of protection, restoration, enhancement, and management activities, as summarized below.

- Protection, restoration, and enhancement of the following natural community/habitat types would be undertaken under all action alternatives: freshwater and brackish tidal, subtidal, and transition habitats; seasonally inundated floodplain; channel margin; riparian habitat; grassland communities; vernal pool complex; alkali seasonal wetland complex; managed seasonal wetland; nontidal perennial emergent wetland and nontidal perennial aquatic; and cultivated lands. Target acreages would vary for some alternatives, as indicated in Table ES-8.
- Management plans would be prepared and implemented for protected natural communities and covered species that occupy those communities. The following natural communities would receive protection, restoration, creation, and enhancement, and would be incorporated into a conservation reserve system: tidal perennial aquatic, tidal mudflat, tidal brackish and emergent wetland, tidal freshwater emergent wetland, valley/foothill riparian, grassland, nontidal freshwater perennial emergent wetland, nontidal perennial aquatic habitat, alkali seasonal wetland complex, vernal pool complex, and managed wetland. Although not considered a natural community, cultivated lands are nonetheless a part of the BDCP conservation strategy because, in certain instances, they provide value as habitat for covered species.

[14] In computing the E/I ratio for Scenarios H1 and H3, the Sacramento River inflow is considered to be downstream of the north Delta intakes. However, in computing the E/I ratio for Scenarios H2 and H4, the Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

The habitat conservation components and variations among the alternatives are presented in Table ES-8.

Table ES-8. Comparison of Conservation Component Acreages and Variations among the Action Alternatives

Conservation Component	Variations
65,000 acres of restored tidal perennial aquatic, tidal mudflat, tidal freshwater emergent wetland, and tidal brackish emergent wetland natural communities within the BDCP ROAs (CM4).	Alternative 5, 25,000 acres instead of 65,000 acres of tidal habitat would be restored. Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
10,000 acres of seasonally inundated floodplain habitat within the north, east, and/or south Delta ROAs (CM5).	Alternative 7, 20,000 rather than 10,000 acres of seasonally inundated floodplain would be restored to further improve fish and wildlife habitat, particularly along the San Joaquin River. Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
20 linear miles of channel margin habitat enhancement in the Delta (CM6).	Alternative 7, 40 rather than 20 linear miles of channel margin habitat would be enhanced. Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
5,000 acres of restored native riparian forest and scrub habitat (CM7).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
2,000 acres of restored grassland and 8,000 acres of protected or enhanced grassland within BDCP CZs 1, 8, and/or 11 (CM8 and CM3).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
Up to 67 acres of restored vernal pool complex and 72 acres of restored alkali seasonal wetland within CZs 1, 8, and/or 11(CM9), 600 acres of protected vernal pool complex within CZs 1, 8, and/or 11 (CM3).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
1,200 acres of restored nontidal marsh within CZs 2 and 4 and/or 5, and the creation of 320 acres of managed wetlands (CM10).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
50 acres of protected nontidal marsh (CM3).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
150 acres of protected alkali seasonal wetland complex in CZs 1, 8, and 11 (CM3 and CM11).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
1,500 acres of protected managed wetlands (CM3 and CM11).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
5,000 acres of protected managed wetland natural community (CM3).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.
45,405 acres of cultivated land (non-rice) and up to 1,500 acres of cultivated land (rice) protected (CM3 and CM11).	Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen.

ES.5.2.4 Reduction of Other Stressors

The BDCP has identified several issues, beyond water exports and habitat conditions, that affect the survival of covered fish species in the Delta. These *other stressors* include but are not limited to exposure to contaminants, competition, predation and other changes to the ecosystem caused by nonnative species, entrainment at water intake pumps not operated by the SWP and CVP, and fish passage. BDCP will implement measures intended to address the effects of other stressors (CM12–CM21; Table ES-3) as part of the Plan under all alternatives except the No Action Alternative[15].

- Control of methylmercury load (methylation of inorganic mercury) in BDCP habitat restoration areas.
- Control of nonnative submerged and floating aquatic vegetation in BDCP tidal habitat restoration.
- Improvement of dissolved oxygen levels in the Stockton Deep Water Ship Channel (DWSC) when covered species are present.
- Temporary reduction of local effects of predators on covered fish species.
- Installation of nonphysical barriers to improve survival of emigrating juvenile salmonids at channel junctions.
- Funding of efforts to reduce illegal harvest of covered fish species.
- Establishment of new and expansion of existing conservation propagation programs for delta smelt and longfin smelt.
- Funding of efforts to treat pollutant runoff from urban stormwater.
- Support of current efforts to reduce the risk of introduction of invasive species by recreational vessels.
- Support for installation of screens and alteration of nonproject diversions, as appropriate, to reduce the risk of entrainment of covered fish species.

ES.5.2.5 Avoidance and Minimization Measures

CM22 Avoidance and Minimization Measures entails incorporation of measures into BDCP activities to avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for such species. Examples of these measures include measures to avoid erosion, sedimentation, and contaminant spills. These measures are largely intended to address the effects of constructing water conveyance facilities and restoration activities.

In addition, the BDCP includes adaptive management and monitoring programs. Various types of monitoring activities would be conducted during BDCP implementation: construction monitoring, compliance monitoring, effectiveness monitoring, and system monitoring.

[15] Between the BiOps, specific species' Recovery Plans, and the federal and state regulatory agency actions that monitor some of the other stressors listed (e.g., invasive species control, stormwater runoff), the No Action Alternative could involve reduction of several of these other stressors; however, it would be speculative to assess which would be substantively addressed and to what extent.

ES.6 Public Involvement

ES.6.1 EIR/EIS Scoping Meetings

Scoping is a public participation element of CEQA and NEPA that is intended to assist the lead agencies preparing an EIR/EIS with determining the topics that the document should address. The scoping process invites public comment during a public review period. Comments received during the public scoping process are considered in the preparation of the EIR/EIS. The EIR/EIS Lead Agencies conducted a total of 22 public scoping meetings throughout California during 2008 and 2009 to gather public input on the scope of the EIR/EIS and to involve stakeholders, other agencies, as well as the public early in the decision-making process to identify issues and concerns to examine in the preparation of the EIR/EIS.

On January 24, 2008, USFWS and NMFS issued a Notice of Intent (NOI) to prepare an EIS. A second NOI was issued on April 15, 2008, to include Reclamation as a federal co-lead agency, update the status of the planning process, and provide updated information related to scoping meetings. On March 17, 2008, DWR issued an NOP. The March 17, 2008, NOP and the April 15, 2008, NOI identified scoping meeting locations and stated that written comments would be accepted until May 30, 2008.

At the time of the publication of the NOP and NOI in 2008, the BDCP was in development, and information related to the alternatives to be considered in the EIR/EIS was not available. Additional information was developed to describe the BDCP, and subsequent scoping activities were initiated on February 13, 2009, with the publication of a second NOP and a third NOI. The second NOP and third NOI identified scoping meeting locations and stated that written comments would be accepted until May 14, 2009.

ES.6.2 Public Outreach Activities

In addition to the formal scoping meetings, other opportunities to involve the public in the environmental review process included Steering Committee meetings from 2006 to 2010; public workshops in 2009; working group meetings and public information meetings in 2011; and ongoing briefings, presentations, and meetings with interested stakeholders throughout BDCP development.

ES.6.2.1 BDCP Steering Committee and Working Groups

From 2006 through 2010, the BDCP planning process was guided by a Steering Committee consisting of representatives of many agencies and stakeholder organizations. All Steering Committee meetings were open to the public, and all presentations and documents discussed at the meetings were available on the BDCP website. Both oral and written public comments were accepted, and comments received in writing were posted to the website.

Throughout the process, various working groups and technical teams were convened to develop technical information or recommendations about aspects of the BDCP for consideration by the Steering Committee. Technical teams were tasked with developing proposed approaches to technical and scientific issues. These teams were co-chaired by subject experts and were staffed by appropriate technical experts. Meetings of the working groups and technical teams were noticed on the BDCP website and open to the public.

ES.6.2.2 Stakeholder Briefings and Presentations

Over the course of the planning process, representatives of the BDCP have conducted more than 250 briefings for community organizations, local jurisdictions in and adjacent to the Plan Area, elected officials, environmental organizations, urban and agricultural water user groups, recreational and commercial fishing organizations, and professional conferences or association meetings. These public presentations were made throughout the state, and information about the BDCP was regularly distributed, including updated fact sheets explaining the purpose of the Plan and describing its various components.

ES.6.2.3 Public Meetings

There have been numerous public meetings associated with the development of the BDCP at different milestones in the planning process to share information and solicit input. These meetings included town hall meetings in the Delta; landowner meetings to discuss required field studies needed to support the environmental review process; a webinar broadcast; informational sessions about the purpose, approach, and status of the BDCP; public workshops to review the Draft BDCP Conservation Strategy; and public meetings throughout 2011 and 2012. Public meetings served to discuss the progress of the working groups that were established earlier in the year; update stakeholders on issues being resolved and incorporated into the BDCP; provide information on elements of the administrative draft EIR/EIS, the BDCP Effects Analysis, the decision tree analysis related to the preliminary proposal, biological goals and objectives, and funding; and to provide an opportunity for public comment and questions. In addition, additional public meetings were held in 2013 to provide briefings on BDCP developments.

ES.6.2.4 Environmental Justice

During preparation of the EIR/EIS, public outreach activities were conducted that considered minority and low-income populations. These activities included but were not limited to preparing a draft environmental justice plan to guide public outreach activities directed at minority and low-income populations; conducting translated scoping meetings within affected communities during evening hours in an effort to involve low-income and minority communities outside of working hours; providing a multilingual information hotline for project information; and conducting a survey to assess possible impacts of the BDCP and to identify future outreach opportunities.

ES.6.2.5 Additional and Ongoing Public Participation Opportunities

The BDCP proponents maintained a project website that was updated regularly with information about upcoming meetings; documents of interest, including preliminary draft chapters of the EIR/EIS; announcements; and project schedule information. Numerous fact sheets and brochures were developed for the BDCP and distributed to stakeholders at public meetings or project briefings.

Additional public participation opportunities will continue during preparation of the EIR/EIS, including public meetings to receive formal comments on the Draft EIR/EIS, and during other activities conducted in association with the BDCP.

ES.6.2.6 Public Review of the Draft EIR/EIS

The public Draft EIR/EIS will be available for review and comment following the filing of the Notice of Availability of the EIS with EPA and the Notice of Completion of the EIR with the California State

Clearinghouse. The purpose of public review of the Draft EIR/EIS is to receive comments from interested parties on the document's completeness and adequacy in disclosing potential environmental impacts of the BDCP and alternatives. After the close of the public comment period for the Draft EIR/EIS, a Final EIR/EIS will be prepared containing responses to public and agency comments on the Draft EIR/EIS and explanations regarding how they were addressed. DWR is responsible for certifying the EIR as adequate by issuing a Notice of Determination in compliance with CEQA. Reclamation, NMFS, and USFWS are each responsible for making a decision on the proposed action and preparing a Record of Decision in compliance with NEPA. The agencies will use the BDCP EIR/EIS, ESA Section 7 consultations, and other appropriate information to make a decision on selecting which alternative to implement regarding approval of the BDCP and issuance of the ITPs.

ES.7 Areas of Known Controversy and Issues to be Resolved

NEPA and CEQA require that the lead agencies identify areas of known controversy and issues to be resolved (NEPA) that have been raised during the scoping process and throughout the development of alternatives in the EIR/EIS. Based on input from agency representatives and the general public during public scoping, the following issue areas, several of which are controversial, have been identified.

- **Range of Alternatives.** Because of the nature of water-related issues in California, the selection of a suitable range of alternatives for analysis in the EIR/EIS is an issue of concern to the public as well as to governmental agencies.
- **Biological Resources.** The complexity of the BDCP raises many concerns over environmental consequences for the aquatic ecosystem and fish species, and for the terrestrial ecosystem and plant and wildlife species. These include the effects of changes in existing land uses and habitats; the interrelationship between the BDCP and other HCPs and NCCPs; and the potential disparity between restored habitats and historical conditions, which could result in adverse effects on sensitive resources, including covered species.
- **Biological Goals and Objectives.** Controversy exists related to the potential conflict between conservation goals and the reasonable use of natural resources and lands for economic development. The BDCP sets out extensive biological goals and objectives, including specific measurable targets developed on the basis of the best available scientific information. These goals and objectives have been developed through a collaborative effort between state and federal agencies, local governments, community groups, and private interests, all of whom bring varying interests and concerns.
- **Water Supply, Surface Water Resources, and Water Quality.** Water supply and surface water resources—key drivers for development of the BDCP—remain highly controversial issues for a wide array of stakeholders (e.g., agricultural interests, hunting and fishing interests, water agencies, local jurisdictions) because of the changes in water operations, surface water flow conditions, and diversions that could result from changes to the SWP and CVP systems. Water quality is an issue of concern because of uncertainties regarding activities associated with conveyance facilities and restored habitat that could lead to discharge of sediment, possible

changes in salinity patterns, and water quality changes that could result from modifications to existing flow regimes.

- **Flood Management.** Flood management is a potentially controversial issue because implementation of the BDCP would entail modification of some existing levees as well as changes in flow regimes and other changes, including habitat restoration in the Yolo Bypass.
- **Agricultural Resources.** Because the Plan Area is largely devoted to agricultural uses, the effects of the BDCP on existing agricultural activities constitute an issue of known controversy. In addition to conversion of agricultural lands to other uses (i.e., water conveyance facilities and restored/enhanced natural habitat areas), there are concerns that conflicts could arise between continuing agricultural operations and management requirements in areas targeted for conservation actions (e.g., changes in cultivation or pest management practices).
- **Socioeconomics.** The key socioeconomic concerns involve the potential for loss of revenue and employment associated with the decrease in agricultural production stemming from conversion of agricultural land to other uses, as well as the potential decrease in tax revenues due to such a decline in agricultural activities.
- **Regional Economic Resources.** Like socioeconomic concerns, regional economic issues are controversial. In addition to the concerns discussed above, these concerns address a wider geographic scope and involve such issues as the preclusion of future development in areas of the Delta that are protected in ROAs associated with implementation of the BDCP, as well as the costs of implementation and the potential loss of revenues to local jurisdictions. The potential for operable barriers and gates to divert recreation away from the Delta and affect businesses related to recreational boating and fishing marinas is an issue of concern.
- **Recreation.** Concerns relating to recreation include potential conflicts between construction and operation of facilities associated with the BDCP and ongoing Delta recreational activities (e.g., boating, fishing, hunting, enjoyment of marinas). In addition, there are concerns about possible conflicts between operable barriers and gates in Delta waterways and recreational boating corridors.
- **Mosquitoes and Other Hazards.** Public health hazards—particularly those associated with mosquitoes—must be addressed because of concerns that increased areas of natural habitat, especially those associated with periodic inundation, could lead to an increase in breeding habitat for mosquitoes as well as habitat for rodents and other wildlife species and, consequently, to an increase in potential disease vectors.
- **Aesthetics/Visual Resources.** Potential effects on aesthetics/visual resources are controversial to area residents; these concerns focus largely on the proposed intake facilities and the power transmission facilities necessary to support them and, to a lesser degree, on new canals that are proposed under some of the alternatives.
- **Growth.** One of the BDCP objectives is to increase water supply reliability to SWP and CVP contractors south of the Delta. Increasing the reliability of water may allow additional growth south of the Delta or in export service areas. Concerns regarding the growth-inducing consequences of the BDCP generally focus on the potential effects of increased water supply to the southern part of the state.
- **Community Issues.** Community issues, such as construction noise, air quality, and traffic circulation effects; conversion of existing land uses; and access to private lands have been

controversial topics. Plans by DWR to conduct geotechnical drilling surveys were opposed by the local Farm Bureaus because of concerns over confidentiality of the survey results, and the eminent domain process is currently underway to allow acquisition of temporary entry rights on private land for survey work. Although population densities in the Plan Area are relatively low, existing farms and agricultural enterprises could be permanently divided, jeopardizing the ability of that land to continue serving productive agricultural uses. Residences, schools, religious institutions, and other sensitive community land uses could be disrupted by the BDCP during the 9-year-long construction period.

ES.8 Effects of the Alternatives

The EIR/EIS describes the potential temporary and permanent direct and reasonably foreseeable indirect effects of implementing the 16 alternatives, including the No Action Alternative, on human, physical, and biological resources in the project area. This section identifies those resource areas that were determined relevant for evaluation of the alternatives; describes the CEQA and NEPA baselines; and explains the impact analysis, mitigation measures, and CEQA and NEPA analysis conclusions.

ES.8.1 Resource Areas

Individual chapters of the EIR/EIS provide the results of the evaluations of the effects of implementing the BDCP conservation measures on 25 resource areas under all alternatives. Topics addressed are those determined to be relevant to the evaluation of the alternatives under CEQA and/or NEPA because implementing one of the alternatives would result in one or more effects on that resource. The resource areas are listed below in the order in which they appear in the document.

- Water Supply
- Surface Water
- Groundwater
- Water Quality
- Geology and Seismicity
- Soils
- Fish and Aquatic Resources
- Terrestrial Biological Resources
- Land Use
- Agricultural Resources
- Recreation
- Socioeconomics
- Aesthetic and Visual Resources
- Cultural and Historic Resources

- Transportation
- Public Services and Utilities
- Energy
- Air Quality and Greenhouse Gas Emissions
- Noise
- Hazards and Hazardous Materials
- Public Health
- Mineral Resources
- Paleontological Resources
- Environmental Justice (NEPA only)
- Climate Change
- Growth Inducement and Other Indirect Effects

For some resource topics, the types of changes anticipated as a result of implementing one of the alternatives would occur only in one of the defined geographic regions that make up the overall project area; for other resource topics, changes would take place in more than one region (i.e., Upstream of the Delta, Delta [corresponding to the Plan Area and Areas of Additional Analysis], or SWP and CVP Export Service Areas) (see ES.3, *Project Location*). The rationale for evaluating specific geographic regions is based on the extent to which the alternatives would affect the specific resource topic and are discussed in the introductory Environmental Setting section of each resource chapter. The study area defined in the setting for each resource considers the geographic areas that could be affected by implementation of all the alternatives.

ES.8.2 CEQA and NEPA Baselines

Because CEQA and NEPA have different directives related to using a baseline for determining the impacts of the action, two baselines have been established for the impact analyses: one for determining the impacts of state and local agency actions under CEQA and one for determining the impacts of federal actions under NEPA. The CEQA baseline for assessing the significance of impacts of any proposed project is normally the environmental setting, or existing conditions, at the time an NOP is issued (State CEQA Guidelines Section 15125[a]). This directive was recently interpreted and applied by the California Supreme Court[16]. According to the court, "[t]he CEQA Guidelines establish the default of an existing conditions baseline even for projects expected to be in operation for many years or decades." (Id. at p. 16.) "[E]xisting conditions constitute the norm from which a departure must be justified—not only because the CEQA Guidelines so state, but because using existing conditions serves CEQA's goals in important ways."

The CEQA baseline employed in this EIR/EIS is consistent with the principles outlined above. Following CEQA Guidelines section 15125(a), the CEQA baseline is developed to assess the significance of impacts of the alternatives in relation to the existing conditions at the time of the NOP. The Existing Conditions assumptions for the BDCP EIR/EIS include facilities and ongoing programs that existed as of February 13, 2009 (publication date of the most recent NOP and NOI to

[16] Neighbors for Smart Rail v. Exposition Metro Line Construction Authority (2013) 57 Cal.4th_439.

prepare an EIR/EIS), that could affect or could be affected by implementation of the BDCP alternatives.

Certain baseline assumptions were updated within the CEQA lead agency's reasonable discretion. For example, the June 2009 BiOp for salmonid species from NMFS was included within the CEQA baseline even though it had not been issued in its final form as of February 2009. Because the December 2008 BiOp for the delta smelt from the USFWS was in place as of February 2009, it made sense to also include the NMFS BiOp, which had been released in draft form prior to February 2009. DWR decided that it would have been anomalous to rely on the most current USFWS BiOp with respect to delta smelt issues, but to ignore the soon-to-be-adopted NMFS BiOp with respect to salmonid issues.

Even so, because of the importance of focusing on existing conditions, DWR as CEQA lead agency did not assume full implementation of *all* aspects of either BiOp. In particular, DWR did not assume full implementation of a particular requirement of the delta smelt BiOp, known as the *Fall X2* salinity standard, which in certain water year types can require large upstream reservoir releases in fall months of wet and above normal years to maintain the location of Fall X2 at approximately 74 or 81 river kilometers inland from the Golden Gate Bridge. As of spring 2011, when a lead agency technical team began a new set of complex computer model runs in support of the EIR/EIS, DWR determined that full implementation of the Fall X2 salinity standard as described in the 2008 USFWS BiOp was not certain to occur within a reasonable near-term timeframe because of a recent court decision and reasonably foreseeable near-term hydrological conditions. As of that date, the United States District Court in litigation filed by various water users over the delta smelt BiOp determined that it had failed to sufficiently explain the basis for Fall X2, and its implementation was uncertain in the foreseeable future. This uncertainty, together with CEQA's focus on existing conditions, led to the decision to use a CEQA baseline without the implementation of the Fall X2 action in CEQA assumptions and analyses in the draft EIR/EIS. However, for NEPA purposes, which uses a different method for assessing environmental effects of the action alternatives, the Fall X2 action is included in the NEPA point of comparison.

Consistent with the considerations of the CEQA baseline, Existing Conditions for the BDCP EIR/EIS include continuation of operations of the SWP and CVP by DWR and Reclamation, respectively. Assumptions for the Existing Conditions related to operations of the SWP and CVP are described in the *Biological Assessment on the Continued Long-term Operations of the Central Valley Project and the State Water Project* (August 2008) prepared by Reclamation (2008) as modified by certain elements of the June 2009 NMFS BiOp and the December 2008 USFWS BiOp that would be expected to occur even in the absence of the proposed project.

Neither NEPA nor the CEQ Regulations for implementing NEPA contain a specific directive for using a baseline for determining an action's significant effects on the quality of the human environment. CEQ's *Forty Most Asked Questions Concerning CEQ's NEPA Regulations* provides that the no action alternative may be used as a "benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives." Under NEPA, federal agencies have the discretion to define the point of comparison for assessing environmental effects of the alternatives as the no action alternative. Accordingly, the NEPA portion of this EIR/EIS uses the No Action Alternative as the point of measurement for determining impacts of the federal action under NEPA. The No Action Alternative, sometimes referred to as the *future no action condition*, considers No Action to include continuation of operations of the SWP and CVP as described in the 2008 USFWS and 2009 NMFS BiOps and other relevant plans and projects that would likely occur in the absence of BDCP actions.

NEPA requires the evaluation of the potential effects of alternatives in comparison with the likely future No Action condition from the time that proposed actions are implemented and/or become operational. Because nothing in NEPA or NEPA case law precludes NEPA lead agencies when using No Action scenarios as the point of comparison from including anticipated future conditions in the impact assessment, the No Action Alternative, unlike the CEQA baseline, assumes implementation of the Fall X2 salinity standard as described in the 2008 USFWS BiOp, as well as changes due to climate change that would occur with or without the proposed action or alternatives.

ES.8.3 Impacts, Mitigation Measures, Conclusions

The Environmental Consequences section of each resource chapter presents the impacts, mitigation measures, and conclusions of the NEPA and CEQA analyses. The overall framework common to the Environmental Consequences section of each resource chapter is organized to describe the methods of analysis, determination of effects, the effects and mitigation approaches, and cumulative effects.

- *Methods of Analysis* explains the specific analytical approaches or variations used, including modeling, simulations, or other analytical tools, to perform the evaluation of the specific resource topic. It describes how the potential effects associated with construction and operation of the alternatives are determined.
- *Determination of Effects* describes the criteria for determining whether an impact is beneficial, adverse, or not adverse under NEPA and significant under CEQA. For purposes of the CEQA impact analysis, these sections primarily incorporate the State CEQA Guidelines Appendix G criteria or other established thresholds and provide further explanation of how the analyses use these criteria to make a determination with regard to whether an effect is significant. For NEPA, these criteria are used to provide general guidance on determining if NEPA effects are beneficial, adverse, or not adverse.
- *Effects and Mitigation Approaches* presents each alternative and provides a discussion of potential temporary, permanent, direct, and indirect effects of implementing the BDCP conservation measures on the resource and identifies any environmental commitments that would reduce the level of the effect. The section also identifies mitigation approaches to further avoid, reduce, or compensate for adverse effects that remain after implementation of relevant environmental commitments. Pursuant to CEQA requirements, each impact discussion includes a *CEQA Conclusion* that states the significance of the impact prior to mitigation, identifies mitigation if a significant impact would occur, and states the residual level of impact after incorporation of the identified mitigation measure(s). Refer to Sections ES.8.3.1, *Impacts*, ES.8.3.2, *Mitigation Measures*, and ES.8.3.3, *Conclusions*, for additional discussion on these topics.
- *Cumulative Effects*, addresses the potential for the alternatives to act in combination with other past, present, and probable future projects or programs to create a cumulatively significant adverse impact.

ES.8.3.1 Impacts

Under NEPA, the purpose of an EIS is to describe and disclose the effects of the alternatives and determine whether the project "as a whole" would have an adverse effect on the environment. Under CEQA, the significance of each individual impact must be described. A "significant effect on the environment" is defined as a substantial, or potentially substantial, adverse change in the environment (CEQA Public Resources Code Section 21068). Therefore, to facilitate both CEQA and

NEPA reviews, the Environmental Consequences sections analyze each action alternative and compares it against both the No Action Alternative (for NEPA purposes—the NEPA baseline) and the Existing Conditions (for CEQA purposes—the CEQA baseline) and describe potential resource-specific impacts and whether those effects would be adverse (see Section ES.8.2, *CEQA and NEPA Baselines*). In addition, for CEQA adequacy, the resource analyses indicate a threshold of significance; identify mitigation that would reduce significant impacts, when available and feasible; and provide a statement of each impact's significance before and after mitigation (conclusion).

The No Action Alternative is presented first and is followed by the analyses of the action alternatives. Many of the action alternatives have identical or very similar effects on the resources. Accordingly, the Environmental Consequences sections present detailed analyses of certain alternatives that have varying effects due to substantial differences between the alternatives (e.g. water conveyance footprints, operational rules). Then, where appropriate, discussions of other alternatives reference these analyses and conclusions where the effects are the same as or similar to those previously assessed alternatives. This approach allows the presentation of effects to minimize redundancy to the extent possible and emphasize aspects of the alternatives that differ from the effects of the alternatives described in greater detail. Therefore, it is recommended that to gain a better understanding of the impacts and mitigation for the alternatives described in lesser detail, readers should first become familiar with the presentation of impacts and mitigation for the alternatives described in greater detail.

Impacts are numbered consecutively beginning with Impact TOPIC-1 for each alternative. The impact identification is composed of an abbreviation specific to the resource topic and the corresponding number; for example, the discussion of the first land use impact under each alternative would be "Impact LU-1" with a title defining the general nature of the impact being addressed. In most resource chapters, the same impacts are evaluated for all alternatives. The discussion of cumulative effects is presented in a separate standalone section following Alternative 9 and has separate impact numbers continuing the sequence from the last impact evaluated under the alternatives.

The analysis of each impact follows the same basic structure; lengthier discussions may be further divided with subheadings. Each impact discussion first addresses the NEPA analysis, using the appropriate terminology for presence or absence of adverse effects. This analysis is followed by a CEQA conclusion, which is identified as such. The CEQA conclusion typically relies on the NEPA analysis and provides additional discussion if appropriate to further explain the CEQA conclusion. The CEQA conclusion uses the terminology appropriate to describing the presence or absence of significant impacts, identifies mitigation measures, and makes a statement regarding the level of significance of the impact after mitigation is incorporated.

For some resource areas, certain impacts may be further divided into two timeframes for analysis—near-term and late long-term; these subheadings then appear in both the NEPA and the CEQA analyses. The near-term effects, which would occur over the first 10 years of BDCP implementation, are addressed separately because they relate primarily to construction of the BDCP water conveyance facilities. The late long-term effects are those associated with all actions that would occur over the 50-year timeframe of the BDCP; these effects are analyzed at a program level.

The basic structure of the individual impact is as follows.

Impact TOPIC-1: Effects of water operations on component of resource topic

General statement about the effect of the alternative on the resource topic relative to the NEPA baseline followed by the detailed analysis of the impact on the resource topic.

NEPA Effects: Summary of analysis and NEPA determination regarding whether the effect would be beneficial, adverse, or not adverse.

***CEQA Conclusion*:** Statement about the significance of the impact of the alternative relative to the CEQA baseline.

Summary of analysis and CEQA conclusion before mitigation; identification of mitigation when the impact is significant; and conclusion regarding impact significance after mitigation.

This discussion is followed by a list of mitigation measures for any significant impacts identified in the analysis.

ES.8.3.2 Mitigation Measures

Specific mitigation measures are proposed when necessary to avoid, minimize, rectify, reduce or eliminate, or compensate for impacts of the alternatives on the environmental resource areas. Mitigation is presented to meet CEQA's specific requirement that whenever possible, agency decisionmakers adopt feasible mitigation available to reduce a project's significant impacts to a less-than-significant level. Although NEPA does not impose a similar procedural obligation on federal agencies, this practice is consistent with NEPA's intent that mitigation be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated.

Frequently, a mitigation measure developed for one resource would also reduce the level of impact on another resource. Instead of developing redundant measures, the resource chapters provide cross-references to specific mitigation measures that have been developed for another resource area but that would also serve to address the impact identified. For example, the Transportation analysis identifies a specific mitigation measure that requires preparation of site-specific traffic management plans to be implemented to reduce potential significant impacts caused by construction-related traffic. This measure serves to mitigate effects on a number of additional resource topics such as land use, recreation, public services and utilities, and hazards and hazardous materials, and is identified as such in those individual chapters.

The discussion of mitigation measures includes identification of the entity or entities responsible for ensuring that the measure is carried out as specified. Typically, this responsibility is assigned to "BDCP proponents." This term should be understood to mean different entities in different contexts. All construction activities associated with CM1 will be the responsibility of DWR. With respect to water operations–related conservation measures, DWR and Reclamation will implement all actions associated with CM1 and water operations aspects of CM2, consistent with their existing responsibilities and authorities. In general, mitigation related to restoration and other activities in CM3–CM22 will be the responsibility of a larger group of agencies as set forth in relevant portions of the BDCP. Responsibilities for particular measures will be described in the Mitigation Monitoring and Reporting Program to be issued in connection with the Final EIR/EIS.

ES.8.3.3 Conclusions

The requirements for the discussion of impacts and identification of mitigation measures differs between NEPA and CEQA. In some instances, the NEPA analyses and CEQA conclusions differ for a particular impact discussion because the NEPA and CEQA baselines or points of comparison for the impact analyses use different timeframes (see Section ES.8.2, *CEQA and NEPA Baselines*). Additionally, the requirements for a final statement or conclusion regarding the level of effect (under NEPA) or significance of an impact (under CEQA) are different. The NEPA analyses include a statement regarding whether the effect being discussed would be adverse, not adverse, or beneficial. If an effect is identified as adverse, the discussion identifies any mitigation measures that are available to reduce the severity of the effect and provides a discussion of each of the mitigation measures. In some instances, these mitigation measures are specific to another resource topic and a summary of the measure is provided with a cross-reference to the appropriate resource chapter for the full description. NEPA also requires the identification of any adverse environmental effects that would still occur despite mitigation. As discussed below, the CEQA discussion identifies impacts that cannot be fully mitigated and concludes that the residual impact is significant and unavoidable.

Following the NEPA analysis, a *CEQA Conclusion* is provided. This section summarizes the key impact mechanisms discussed in the preceding NEPA analysis and identifies the level of significance of the impact related to the specific impact criteria or thresholds of significance identified in the *Determination of Effects*. This determination of significance considers full implementation of relevant Environmental Commitments as part of implementing the alternative. If the impact is less than significant, the analysis makes this conclusion and states that no mitigation is required. If the identified impact is significant, then the CEQA discussion identifies the specific mitigation measures that should be implemented to reduce the impact to a less-than-significant level. These mitigation measures may be specific to an individual resource chapter or, as discussed above, may be in the form of a cross-reference to mitigation measures developed in another chapter. If the mitigation measures would fully mitigate the identified impact, the conclusion states that the residual impact (the impact remaining after mitigation) would be less than significant. In instances where the impact cannot be fully mitigated, the discussion explains this and concludes that the residual impact is significant and unavoidable. The full list of mitigation measures relevant to a specific impact are provided following the discussion of the *CEQA Conclusion*.

ES.9 Comparisons of the Alternatives

This section provides a general overview of the key differences in the types and degree of potential effects between the BDCP alternatives, including the No Action Alternative, by general resource area types or categories (i.e., water-, land-, and air-based). In addition, Table ES-9 summarizes, by resource area, the environmental impacts/effects of implementing the BDCP alternatives, any mitigation to reduce significant impacts, and their level of significance after mitigation.

ES.9.1 Water-Based Resources and Impact Mechanisms

ES.9.1.1 Comparison of Water Flow Differences for BDCP Alternatives

Each of the BDCP action alternatives includes assumed changes in the existing operation of the CVP and SWP in the Delta to further protect fish populations and to accommodate new Delta facilities and proposed habitat restoration. The existing operation of the CVP and SWP in the Delta is

determined by rules and objectives that guide daily Delta operational activities. Many of these rules are included in D-1641 (which implemented the 1995 Bay-Delta Water Quality Control Plan [WQCP] objectives). Several additional rules have been added by the 2008 USFWS BiOp and the 2009 NMFS BiOp for long-term operation of the CVP and SWP. The existing operation of the CVP and SWP in the Delta is briefly summarized here, so that the modifications to these existing (and Future No Action) operations (rules) can be identified for the BDCP action alternatives.

Currently, several different operational criteria influence exports and Delta outflow. The proposed BDCP north Delta intake operations would include additional rules governing allowable north Delta diversions. The BDCP alternatives would require additions to, modification of, or elimination of some of the existing Delta operational rules, as described in further detail below. Changes in the operational rules may cause changes in the Delta channel flows, outflows and exports, and may require changes in the SWP upstream reservoir releases and reservoir storage. Because each alternative has a slightly different set of applicable rules (Table ES-10) and varying north Delta intake capacities, each BDCP alternative would have slightly different Delta operations in many months. Although the monthly Delta inflows, Delta channel flows, Delta outflow, and Delta exports may be slightly different for each BDCP alternative (as simulated using the CALSIM model), the basic changes in flow (patterns) that would likely cause differences in the aquatic habitat conditions for covered species are briefly previewed in this section.

ES.9.1.2 Changes in Minimum Required Delta Outflow

There are several rules governing Delta outflow. These include the minimum monthly outflows specified in D-1641 for each month, which often depend on the water year type (i.e., runoff conditions). These flow objectives were set to protect beneficial uses of Delta water for fish habitat. Delta outflow is also controlled by the maximum salinity objectives specified in D-1641 for each month or period. For example, salinity objectives are specified at certain Delta locations to protect agricultural diversions and drinking water supplies. Because Delta outflow is the major factor determining salinity within the Delta channels, these salinity objectives are satisfied by increasing Delta outflow. The Delta outflow required to meet these salinity objectives is included in the CALSIM model, so that all BDCP alternatives would meet these outflow and salinity objectives.

The spring X2 objectives introduced in the 1995 WQCP control Delta outflow in the months of February–June. *X2*, the location of the 2 parts per thousand (ppt) salinity isohaline (i.e., the upstream edge of the low salinity habitat zone), is specified on the basis of the (unimpaired) runoff in the previous month. This objective supports several estuarine species whose abundance has been correlated with X2. This was formulated as an adaptive objective; the required outflow increases with higher runoff conditions. All the BDCP alternatives include these same D-1641 outflow rules.

The 2008 USFWS BiOp included an outflow requirement for September, October, and November in wet (30% of years) and above normal (15% of years) water year types. The *Fall X2* rule requires X2 (2 ppt salinity) to be at or downstream of Collinsville in above normal years and downstream of Chipps Island in wet years. The outflow would be greater and the exports would be less in these months with the Fall X2 requirement. The Fall X2 rule applies to the No Action Alternative and most of the BDCP alternatives. The Fall X2 rule was not included in the Existing Conditions and was not included in BDCP Alternatives 1A-C and 3.

Table ES-10. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives

Operational Scenario Alternative	Applicable Months	Existing and No Action	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 8	Alt 9
Delta Operational Rules for Maximum Allowable CVP and SWP South Delta Exports											
Limit for CVP (cfs)	Jan–Dec	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
Limit for SWP (10,300 cfs or 6,680 cfs plus 1/3 of SJR Dec 15–March 15)	Jan–Dec	6,680+	10,300	10,300	10,300	10,300	10,300	10,300	10,300	10,300	6,680+
Export/Inflow or Export/(Inflow-ND Intake)	Jan–Dec	Inflow	Inflow – ND Intake	Inflow – ND Intake	Inflow – ND Intake	Inflow – ND Intake	Inflow – ND Intake	O	Inflow – ND Intake	Inflow – ND Intake	Inflow
SJR Inflow/Export Ratio	Apr–May	X	O	O	O	O	X	O	X	X	O
Reverse Old and Middle River Flows	Dec–Jun	X	X	X	X	X	X	O	X	X	O
Delta Operational Rules for Minimum Required Delta Outflow											
D-1641 Objectives for Minimum Monthly Outflow, Maximum EC, and Feb-Jun X2	Jan–Dec	X	X	X	X	X	X	X	X	X	X
55% of unimpaired Runoff Objective	Feb–Jun	O	O	O	O	O	O	O	O	X	O
Maximum Fall X2 Location	Sep–Oct	X	O	X	O	X	X	X	X	X	X
New Operational Rules for Maximum North Delta Intake Diversions											
Maximum Capacity of North Delta Intakes (cfs)	Jan-Dec	None	15,000	15,000	6,000	9,000	3,000	15,000	9,000	9,000	None
Bypass Flows (% of Sacramento River at Freeport)	Jan–Dec	O	X	X	X	X	X	X	X	X	O

Note:
"X" indicates that a BDCP alternative incorporates an operational rule.
"O" indicates that a BDCP alternative does not incorporate that operational rule.

The State Water Board has recently explored additional operational rules that would require Delta outflow to be a specified percentage of monthly unimpaired flow (California State Water Resources Control Board 2010). This rule would reduce the amount of runoff that could be stored in upstream reservoirs and would increase Delta outflow and reduce Delta exports in these months. BDCP Alternative 8 includes a monthly outflow of 55% of unimpaired runoff from February through June.

ES.9.1.3 Changes in Maximum Allowable Exports

Each alternative includes the CVP capacity of 4,600 cfs and assumes the existing south Delta SWP diversion capacity of 6,680 cfs plus 1/3 of the SJR flow from December 15 to March 15. SWP pumping to the maximum physical capacity of 10,300 cfs was assumed for BDCP alternatives that include north Delta intakes, but not for Alternative 9, which relies on south Delta pumping. The south Delta exports are limited to 35% of the Delta inflow in February–June and 65% of the Delta inflow in July–January. Delta inflow for the BDCP alternatives was assumed to be reduced by the north Delta diversions. However, the outflow requirements and the north Delta bypass flow rules generally prevent the basic E/I ratio from being exceeded for any of the BDCP alternatives. The 2009 NMFS BiOp SJR inflow/export ratio in April and May was applied to the south Delta exports for all BDCP alternatives except Alternative 9, which provides a separate corridor for the SJR flow that eliminates the entrainment of SJR fish in the CVP or SWP exports.

The limits on reverse OMR flows were applied to all BDCP alternatives except Alternative 6, which is an isolated facility that would divert all exports from the north Delta intakes. The limits on reverse OMR flow would also not apply to Alternative 9, because the SJR fish would be separated from exports by the Old River "corridor," and Sacramento River water would be diverted through fish screens at DCC and Georgiana Slough to the Middle River "water supply corridor." Entrainment of estuarine fish at south Delta pumping facilities would be eliminated because there would be no upstream flow from the lower SJR. Tidal transport of salt and fish from the low salinity habitat zone would be greatly reduced under Alternative 9. The OMR limits would vary each year with fish monitoring and turbidity conditions, as determined by the smelt working group. The north Delta diversions that are proposed for all BDCP action alternatives except Alternative 9 would allow these reverse OMR limits to be satisfied while diverting additional water from the Sacramento River. This is the major water supply benefit that would be achieved with the BDCP north Delta intakes and conveyance facilities.

ES.9.1.4 New Rules for North Delta Diversions

Fish protection at the proposed BDCP north Delta intakes would be provided by operational parameters that are related to maintaining seaward flow in the river and to continue the variability in flow that accompanies flow pulses, especially in key migratory months. Daily bypass flow rules were incorporated into the CALSIM modeling of each BDCP alternative. The bypass flow rule for July–September was assumed to be 5,000 cfs in all years for all BDCP alternatives except Alternative 9. During these months, Sacramento River flow above 5,000 cfs could be diverted at the north Delta intakes, subject to the minimum required Delta outflow. The minimum bypass flow in October and November was assumed to be 7,000 cfs in all years for all BDCP alternatives except Alternative 9.

The assumed bypass flow rules in December–June increase with the river inflow. Low-level pumping of 6% of the river flow would be allowed most of the time, but major diversions could not begin until the Sacramento River flow was greater than a specified threshold. The same bypass rules were

assumed for most of the BDCP alternatives. Alternatives 7 and 8 used slightly different bypass flow rules, and none were needed for Alternative 9, because the DCC and Georgiana Slough diversions are already limited to about 25% of the Sacramento River flow at Freeport.

Delta exports are sometimes limited by the storage capacity of San Luis Reservoir and seasonal (monthly) water supply deliveries that are assumed for south of Delta CVP and SWP contractors. The San Luis Reservoir provides about 2 million acre-feet (MAF) of seasonal storage for meeting the peak summer water demands. The San Luis Reservoir storage allows exports to continue through the fall and winter period. The BDCP action alternatives use the same CVP and SWP demands, but BDCP alternatives that allow higher exports may fill San Luis Reservoir earlier in some years and allow greater SWP Article 21 (interruptible) deliveries.

ES.9.1.5 Comparison of Flow Patterns for the BDCP Alternatives

The seasonal flow patterns calculated with the CALSIM monthly model for the BDCP alternatives are generally quite similar, because the inflow hydrology for the 82-year sequence (WY 1922–2003) are the same for each action alternative. Because there are no BDCP changes in the operation of the Trinity River Division, Trinity River diversions to the Sacramento River are identical for all the action alternatives. Similarly, because there are no BDCP-related changes in the San Joaquin River watershed, the SJR operations at Friant Dam and the reservoir operations on the SJR tributaries (i.e., Stanislaus, Tuolumne, and Merced Rivers) are identical for each of the BDCP alternatives. Finally, reservoir operations for each of the other tributaries (i.e., Yuba River, Mokelumne River, Cosumnes River, Calaveras River, Putah Creek, and Cache Creek) are unchanged for any of the BDCP alternatives. Therefore, the only flow changes are on the Sacramento, Feather, and American Rivers and in the Delta exports (north and south) and the Delta outflow.

All the BDCP alternatives include operable gates at the Fremont Weir to allow diversions into Yolo Bypass for floodplain inundation to provide improved rearing habitat for juvenile salmonids during November–May. Fremont Weir overtops when the combined flow of Sutter Bypass and the Sacramento and Feather Rivers surpasses 55,000 cfs as measured at Verona; flows through an operable gate could begin when Sacramento River flow at Verona is more than 23,100 cfs. The additional flows to the Yolo Bypass would be limited to 6,000 cfs and would reduce the Sacramento River flow at Freeport by this same amount. This shifting of Sacramento River flows into the Yolo Bypass was assumed for all the BDCP alternatives.

The north Delta intake diversions (Alternatives 1A through 8) would change the south Delta exports and the Delta outflows. Alternative 5 with a 3,000 cfs intake capacity would have the smallest effect on south Delta exports and would not substantially change outflow. Alternative 3 with a 6,000 cfs intake capacity would have a larger effect on reduced south Delta exports, and because Alternative 3 would not include the Fall X2 requirements, outflow would be reduced considerably from the No Action Alternative condition (which includes the Fall X2 requirements). Alternatives 4 (Scenario H1) and 7, both with a 9,000 cfs intake capacity, would shift about half the exports to the north Delta without changing the Delta outflow substantially. Under Alternative 4, CM1 includes two decision trees—one for fall outflow and one for spring outflow—that specify potential alternative outcomes for each criterion. Because each decision tree identifies two possible outcomes, the decision trees lay out four potential outcomes in initial outflow criteria when the spring and fall outflow components are combined. These four outcomes will be aggressively investigated through the decision tree process. Project operating criteria will be subject to a new determination by the permitting agencies, consistent with the adaptive management process for the BDCP, based on best

available science, specifying what the spring and fall outflow criteria will be at the time CM1 operations begin[17]. The lower outflow scenario (H1) would allow 820 thousand acre-feet (TAF)/yr more exports than the No Action conditions, while the higher outflow scenario (H4) would allow about 25 TAF/yr less exports than the No Action conditions. Alternative 8, with 55% of unimpaired runoff required as outflow in February–June, would greatly increase outflow and reduce exports because the 9,000 cfs intake capacity would not be used as much as for Alternatives 4 and 7. Alternatives 1A–C and 2A–C each have a 15,000 cfs intake capacity but only about half the exports would be shifted from the south Delta. Delta outflow was reduced substantially for Alternatives 1A–C because the Fall X2 requirements were not included. Delta outflow was reduced slightly for Alternatives 2A–C in some months when the total exports were increased compared to the No Action Alternative condition. Alternatives 6A–C with a 15,000 cfs intake capacity would be operated as an isolated facility and would eliminate all pumping from the south Delta. However, because of the assumed bypass flow rules for the north Delta intakes, the total exports would be reduced.

Alternative 9 would fundamentally change the existing Delta channel flows. The SJR flow would be diverted into Old River (unless SJR flow is more than 10,000 cfs), would bypass the CVP and SWP south Delta pumping facilities, and would flow down the Old River channel to enter the estuary at the confluence near Collinsville. Estuarine fish from the low salinity zone would no longer be vulnerable to entrainment. Fish screens would be constructed at DCC and Georgiana Slough, so that DCC could be opened all the time to provide greater diversions from the Sacramento River to the Middle River water supply channel and the south Delta pumping facilities. The existing south Delta diversion capacity of 11,280 cfs was assumed for Alternative 9. The Delta outflow and exports were not substantially different from the No Action conditions.

The Delta water operations for the BDCP alternatives are compared on the basis of the change in Delta outflow (or the corresponding change in total exports) and by the fraction of the exports that are shifted to the north Delta intakes (to reduce entrainment of Sacramento River, San Joaquin River, and estuarine fish). Table ES-11 provides a summary for the No Action Alternative and nine BDCP alternative operational scenarios. Although there were some larger changes in monthly reservoir release flows or Delta outflows and exports, these annual average values show that the BDCP alternatives would result in only moderate changes in Delta outflow or south Delta exports.

[17] This refers to the beginning of operations for the new north Delta facilities.

Table ES-11. Changes in Average Delta Outflow, Total Exports, and South Delta Pumping for the BDCP Alternatives for the Late Long-Term (2060)

Alternative	North Delta Intake Capacity (cfs)	Major Feature(s)	Outflow (TAF/yr)	Delta Outflow Change (TAF/yr)	Total Exports (TAF/yr)	Total Exports Change (TAF/yr)	South Delta Exports (TAF/yr)	South Delta Exports Change (TAF/yr)
No Action	0		16,400		4,441		4,441	
Alt 1	15,000	Five Intakes, No Fall X2	15,319	-1,081 (-7%)	5,459	1,025 (23%)	2,742	-1,692 (-38%)
Alt 2	15,000	Five Intakes	15,753	-647 (-4%)	5,070	636 (14%)	2,126	-2,308 (-52%)
Alt 3	6,000	Two Intakes, No Fall X2	15,415	-985 (-6%)	5,372	938 (21%)	3,501	-933 (-21%)
Alt 4-H3	9,000	Three Intakes, D-1641 Spring X2 and Fall X2	15,884	-516 (-3%)	4,946	505 (11%)	2,510	-1,931 (-44%)
Alt 4-H1	9,000	D-1641 Spring X2 and D-1641 Fall Outflow	15,418	-982 (-6%)	5,255	821 (18%)	2,792	-1,649 (-37%)
Alt 4-H2	9,000	Higher Spring Outflow and D-1641 Fall outflow	15,937	-463 (-3%)	4,710	269 (6%)	2,561	-1,880 (-42%)
Alt 4-H4	9,000	Higher Spring Outflow and Fall X2	16,277	-123 (-<1%)	4,414	-27 (-<1%)	2,270	-2,171 (-49%)
Alt 5	3,000	One Intake	16,053	-347 (-2%)	4,780	346 (8%)	3,588	-846 (-19%)
Alt 6	15,000	Five Intakes, Isolated-No SD Pumping	17,025	625 (4%)	3,763	-671 (-15%)	0	-4,434 (-100%)
Alt 7	9,000	Three Intakes, More restrictive OMR and SJR/Export Limits	17,083	683 (4%)	3,752	-682 (-15%)	1,404	-3,030 (-68%)
Alt 8	9,000	Three Intakes, February-June Outflow >55% Unimpaired Runoff	17,847	1,447 (9%)	3,105	-1,329 (-30%)	912	-3,522 (-79%)
Alt 9	0	SJR Separated, Fish Screens on DCC and Georgiana Slough	16,464	64 (<1%)	4,365	-69 (-<1%)	4,365	-69 (-<1%)

ES.9.2 Land-Based Resources and Impact Mechanisms

As described in Section ES.5, *Alternatives Considered in the EIR/EIS*, the alternatives differ primarily in their physical conveyance facility infrastructure and alignments, the locations of facilities, and diversion capacities (ranging from 3,000 to 15,000 cfs). Other differences between alternatives are associated with operational criteria for water supply facilities and the amounts and types of habitat restoration and enhancement proposed. These basic differences between alternatives would generally influence the extent or degree of impacts on land-based resources. Under the No Action Alternative, there would be no BDCP-related impacts on land-based resources.

For land-based resources (e.g., agricultural resources, terrestrial biological resources, cultural resources, hazards and hazardous materials, public services and utilities), those alternatives that would result in the greatest land disturbances would also result in more extensive or greater impacts, in general. Those BDCP action alternatives that include the construction of large canals for water conveyance under CM1 (Alternatives 1B, 1C, 2B, 2C, 6B, and 6C) would have greater impacts on land-based resources due to the potential loss of habitat; disturbance/destruction of cultural resources; interference with or loss of recreational opportunities; loss of agricultural resources; and impairment of public services and utilities, for example, compared with alternatives that would rely on pipelines/tunnels to convey water underground (Alternatives 1A, 2A, 3, 4, 5, 7, and 8). The canal alignment alternatives would also bisect existing floodplains, agricultural drainage systems, surface irrigation systems, and underground utilities. Although the construction of north Delta intakes, an intermediate forebay, and tunnel facilities would likely result in some of these types of land-based impacts, the extent of the disturbed acreage would be only a fraction of what would occur with the construction of surface conveyance canals.

Further, alternatives with fewer intakes (Alternatives 3, 4, 5, 7, and 8 contrasted with Alternatives 1A–1C, 2A–2C, and 6A–6C) would result decreases in some kinds of impacts: for example, less land disturbance and thus potentially less noise and visual disturbances for recreationists; fewer incompatibilities with existing land uses; and fewer vehicles associated with construction activities on existing roadways. Additionally, alternatives with a westside canal alignment (1C, 2C, and 6C) would be more susceptible to earthquake damage and would be more difficult to construct than the eastside canals (1B, 2B, and 6B) due to geologic conditions. Alternatives with tunnels would also be less susceptible than alternatives with canals to liquefaction, seepage, settlement, and damage resulting from seismic events, wave run-up, and erosion during a flood event. Although the construction and operation of a large-scale water conveyance facility would not occur under the No Action Alternative, projects would be constructed and operated that would result in temporary and permanent impacts on land-based resources such as agriculture, aesthetics, recreation, and terrestrial habitat and species. However, it is unlikely that any single project under this alternative would result in impacts on land-based resources that are similar in magnitude and geographical extent to those of any BDCP action alternative.

Alternative 9, a "through-Delta" proposal, which would provide an isolated corridor for fish passage through the San Joaquin River system in lieu of new north Delta intakes, presents a unique set of environmental issues. Alternative 9 would use sensitive natural channels in the Delta to transport water and would require increased construction in riparian areas along the banks of the Mokelumne and San Joaquin Rivers, compared to the other alternatives that would require construction primarily along the Sacramento River, which is already heavily riprapped. Alternative 9 would result in increased visual and recreation impacts in certain areas compared to other alternatives associated with the construction of 14 operable barriers, necessary for fish and water quality

protection purposes; these barriers would substantially change the visual character of the Mokelumne and San Joaquin Rivers and would adversely affect recreational boating opportunities. This alternative combines various in-Delta improvements compared to the No Action Alternative.

As described in Section ES.5, *Alternatives Considered in the EIR/EIS*, CM2–CM22 are the same for all action alternatives with the exception of Alternatives 5 and 7. Relative to the other action alternatives, Alternative 5 would restore 40,000 fewer acres of tidal habitat, and Alternative 7 would restore an additional 10,000 acres of seasonally inundated floodplain, and would enhance 20 additional linear miles of channel margin habitat. Therefore, under Alternative 7, there would be potentially more or greater temporary (construction-related) and/or permanent impacts on many land-based resources, such as aesthetics, public services and utilities, land use, and public health, depending on the locations chosen to implement these restoration/enhancement actions. Because Alternative 5 would restore substantially fewer acres of tidal habitat, temporary and/or permanent impacts on land-based resources such as agriculture, land use, terrestrial biological resources would generally be less than those under the other action alternatives. For example, under Alternative 5, there would be reduced conversion of managed wetlands and cultivated lands. However, Alternative 5 would also offer fewer benefits to those terrestrial species that are restricted to tidal wetlands. Under the No Action Alternative, although some future projects and programs would implement habitat restoration in the Plan Area, such as implementation of certain reasonable and prudent alternatives (RPAs) as required by the 2008 and 2009 BiOps issued by NMFS and USFWS, it is unlikely that the magnitude of habitat restoration, creation, and enhancement would exceed that implemented under any of the action alternatives. Consequently, temporary and/or permanent impacts on land-based resources due to these activities would likely be less under the No Action Alternative. However, for this same reason, the extent of potential benefits to certain land-based resources, such as certain terrestrial species, would also likely be less under the No Action Alternative than under the action alternatives because there would likely be less riparian and grassland natural community restoration, for example.

ES.9.3 Air-Based Resources and Impact Mechanisms

Air-based resources (e.g., criteria pollutants, toxic air containments [TACs], and greenhouse gases [GHG]) are primarily influenced by construction and operational activities associated with CM1. Pollutant emissions generated by construction of the BDCP action alternatives would vary depending on the total amount of disturbed area, the duration and location of construction, and the intensity of construction activities. Criteria pollutants and TACs generated by long-term operation of the water conveyance facility would be similar among all alternatives, whereas GHG emissions generated by electricity generation would differ based on water supply criteria of the specific alternatives.

Those alternatives that would require the most construction activities would result in more extensive air quality impacts. With respect to criteria pollutants and TACs, the pipeline/tunnel alternatives (1A, 2A, 3, 5, 6A, 7, and 8) and modified pipeline/tunnel alternative (4) have the greatest potential to result in short-term effects on ambient air quality in Sacramento County. Alternatives 1A, 2A, and 6A, which would construct five intakes and pumping plants, would generate the highest emissions of the pipeline/tunnel alternatives. While the pipeline/tunnel alternatives would generate substantial criteria pollutants and TACs in Sacramento County, emissions generated in San Joaquin and Contra Costa Counties would be minimized by use of electric tunnel boring machines.

The east alignment alternatives (1B, 2C, 6C) that include the construction of large canals for water conveyance would have the greatest potential to result in short-term effects on ambient air quality in San Joaquin County. These alternatives would also generate TAC concentrations that would exceed local air district thresholds and potentially expose sensitive receptors to substantial pollutant concentrations. The west alignment alternatives (1C, 2C, 6C) do not include any construction activity in San Joaquin County, but would generate the highest emissions levels of all BDCP action alternatives within Yolo and Contra Costa Counties. Construction activities associated with Alternative 9 are spatially diverse and spread throughout Sacramento, San Joaquin, and Contra Costa Counties.

The BDCP action alternatives that require extensive tunnel boring and concrete batching activities have the greatest potential to adversely affect climate change (i.e., contribute to elevated GHG concentrations in the atmosphere). Accordingly, the pipeline/tunnel and modified pipeline/tunnel alternatives would generate the most GHG emissions of the four alignments. The west alignment alternatives, followed by the east alignment alternatives and Alternative 9, would generate the next highest emissions, respectively.

Facilities under construction as of February 13, 2009, would result in short-term criteria pollutant, TAC, and GHG emissions from land disturbance and the use of heavy-duty equipment under the No Action Alternative. Construction emissions associated with these projects would result in an adverse effect if the incremental difference, or increase, relative to Existing Conditions exceeds applicable air district or federal de minimis thresholds. However, it is unlikely that any single project under the No Action Alternative would result in impacts on air quality that are similar in magnitude and geographical extent to those of any BDCP action alternatives. Moreover, all projects would be required to comply with air district rules and regulations governing construction-related criteria pollutant and GHG emissions.

None of the BDCP action alternatives would result in adverse effects on air quality from long-term operation of the water conveyance facility. Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 3 would result in a net increase in GHG emissions relative to Existing Conditions and the No Action Alternative. Alternatives 4 and 5 could result in a net increase or decrease in GHG emissions, depending on the analysis condition (2025 or 2060) and pumping scenario. GHG emissions generated by increased electricity consumption for pumping would be addressed through modifications to DWR's Renewable Energy Procurement Plan (REPP). Alternatives 6A through 9 would result in a net reduction in electricity demand and associated GHG emissions.

Habitat restoration and enhancement conservation measures (CM2–CM22) are anticipated to include a number of activities that could generate traffic and require earthmoving equipment. Criteria pollutant, TAC, and GHG emissions generated by implementation of CM2–CM22 would be the same for all BDCP action alternatives. Emissions could result in adverse impacts on air quality if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds. Changes in carbon flux associated with restoration and enhancement activities are expected to result in a beneficial impact on GHG emissions. However, without information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible.

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Table ES-9. Summary of BDCP EIR/EIS Impacts and Mitigation Measures

Notes:

1. These conclusions reflect implementation of Environmental Commitments (described in detail in Appendix 3B), as well as Conservation Measures (particularly CMs 2–22) and Avoidance and Minimization Measures (described in detail in Chapter 3, *Description of Alternatives*, Section 3.3.2), which are considered a part of each action alternative.
2. In some cases, mitigation measures proposed under one resource section (e.g., terrestrial biological resources) are also proposed to reduce effects on another resource topic (e.g., recreation). These mitigation measures are cross-referenced wherever they may reduce effects. Additional discussion of each effect and mitigation measure can be found under the referenced resource-specific chapter(s).
3. While many impact headers (see "Potential Impact" column) describe specific effects associated with BDCP action alternatives (e.g., the effects of implementing one or more conservation measures proposed as part of the BDCP), the conclusions provided for No Action Alternative (NAA) represent the anticipated effects on a resource as a result of future conditions in the absence of BDCP implementation. For the EIR/EIS analysis, the No Action Alternative assumptions are described in Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative, and Cumulative Impact Conditions*.

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Water Supply					
WS-1: Changes in SWP/CVP water deliveries during construction	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
WS-2: Change in SWP and CVP deliveries	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	ND		ND	ND
WS-3: Effects of water transfers on water supply	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
Surface Water					
SW-1: Changes in SWP or CVP reservoir flood storage capacity	NAA	LTS		LTS	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SW-2: Changes in Sacramento and San Joaquin River flood flows	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SW-3: Change in reverse flow conditions in Old and Middle Rivers	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	ND		ND	ND
SW-4: Substantially alter the existing drainage pattern or substantially increase the rate or amount of surface runoff in a manner that would result in flooding during construction of conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA
SW-5: Substantially alter the existing drainage pattern or substantially increase the rate or amount of surface runoff in a manner that would result in flooding during construction of habitat restoration area facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA
SW-6: Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
SW-7: Expose people or structures to a significant risk of loss, injury or death involving flooding due to the construction of new conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SW-8: Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding due to habitat restoration	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	SW-8: Implement measures to address potential wind fetch issues	LTS	NA
SW-9: Place within a 100-year flood hazard area structures which would impede or redirect flood flows, or be subject to inundation by mudflow	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA
Groundwater					
Changes in Central and South Delta flow	NAA	NI		NI	NE
Changes in Delta Groundwater Levels[1]		NI		NI	NE[2]
Changes in Delta Groundwater Quality[1]		NI		NI	NE
Changes in Delta Agricultural Drainage[1]		NI		NI	NE
San Joaquin Basin flow[3]		S		S	A
Tulare Basin Groundwater Levels[3]		S		S	A
Tulare Basin Groundwater Flow[3]		LTS		LTS	NA
Tulare Basin Land Subsidence[3]		LTS		LTS	NA
Other Portions of the Export Service Areas–Groundwater supplies, recharge, and local groundwater table levels		S		S	A
Ongoing Plans, Policies, and Programs		LTS		LTS	NA
GW-1: During construction, deplete groundwater supplies or interfere with groundwater recharge, alter local groundwater levels, or reduce the production capacity of preexisting nearby wells	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	GW-1: Maintain water supplies in areas affected by construction dewatering	SU	A
	9	S	GW-1: Maintain water supplies in areas affected by construction dewatering	LTS	NA
GW-2: During operations, deplete groundwater supplies or interfere with groundwater recharge, alter local groundwater levels, or reduce the production capacity of preexisting nearby wells	1A, 2A, 3, 4, 5, 6A, 7, 8, 9	LTS		LTS	NA
	1B, 1C, 2B, 2C, 6B, 6C	S	GW-2: Maintain water supplies in areas affected by changes in groundwater levels during operation of canals	SU	A
GW-3: Degrade groundwater quality during construction and operation of conveyance facilities	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

[1] Includes effects of climate change and sea level rise at 2060
[2] Increased groundwater level due to sea level rise in San Francisco Bay may result in a beneficial effect on shallow well yields
[3] SWP/CVP Export Service Areas

Level of Significance/Determination of Effects:

CEQA

SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)
S=significant
LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
GW-4: During construction of conveyance facilities, interfere with agricultural drainage in the Delta	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	LTS		LTS	NA
	9	S	GW-5: Agricultural lands seepage minimization	LTS	NA
GW-5: During operations of new facilities, interfere with agricultural drainage in the Delta	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	GW-5: Agricultural lands seepage minimization	SU	A
	9	LTS		LTS	NA
GW-6: Deplete groundwater supplies or interfere with groundwater recharge, alter local groundwater levels, reduce the production capacity of preexisting nearby wells, or interfere with agricultural drainage as a result of implementing CM2–CM22	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	GW-5: Agricultural lands seepage minimization	SU	A
GW-7: Degrade groundwater quality as a result of implementing CM2–CM22	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	GW-7: Provide an alternate source of water	SU	A
GW-8: During operations, deplete groundwater supplies or interfere with groundwater recharge, alter groundwater levels, or reduce the production capacity of preexisting nearby wells	1A, 1B, 1C	B		B	B
	3	LTS		LTS	B
	2A, 2B, 2C, 5	LTS		LTS	NA
	4 6A, 6B, 6C, 7, 8, 9	S	No feasible mitigation to address this impact	SU	A
GW-9: Degrade groundwater quality	1A, 1B, 1C, 2A, 2B, 2C, 3, 5	LTS		LTS	NA
	4, 6A, 6B, 6C, 7, 8, 9	S	No feasible mitigation to address this impact	SU	A
GW-10: Result in groundwater level-induced land subsidence	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
Water Quality					
WQ-1: Effects on ammonia concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-2: Effects on ammonia concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-3: Effects on boron concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-4: Effects on boron concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-5: Effects on bromide concentrations resulting from facilities operations and maintenance (CM1)	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	WQ-5: Avoid, minimize, or offset, as feasible, adverse water quality conditions	SU	A
WQ-6: Effects on bromide concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
WQ-7: Effects on chloride concentrations resulting from facilities operations and maintenance (CM1)	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	WQ-7: Following initial operations of CM1, conduct additional evaluation and modeling of chloride levels to determine feasibility of mitigation to reduce chloride levels WQ-7a: Conduct additional evaluation and modeling of increased chloride levels following initial operations of CM1. WQ-7b: Consult with Delta water purveyors to identify means to avoid, minimize, or offset for reduced seasonal availability of water that meets applicable water quality objectives WQ-7c: Consult with CDFW/USFWS, and Suisun Marsh stakeholders, to identify potential actions to avoid or minimize chloride level increases in the Marsh.	SU	A
WQ-8: Effects on chloride concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-9: Effects on dissolved oxygen resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-10: Effects on dissolved oxygen resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-11: Effects on electrical conductivity concentrations resulting from facilities operations and maintenance (CM1)	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	WQ-11: Avoid, minimize, or offset, as feasible, reduced water quality conditions WQ-11a: Conduct additional evaluation and modeling of increased EC levels following initial operations of CM1. WQ-11b: Consult with CDFW/USFWS, and Suisun Marsh stakeholders, to identify potential actions to avoid or minimize EC level increases in the Marsh.	SU	A
WQ-12: Effects on electrical conductivity concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-13: Effects on mercury concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5	LTS		LTS	NA
	6A, 6B, 6C, 7, 8, 9	S	No feasible mitigation to address this impact	SU	A
WQ-14: Effects on mercury concentrations resulting from implementation of CM2–CM22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	No available mitigation to address this impact	SU	A
WQ-15: Effects on nitrate concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-16: Effects on nitrate concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-17: Effects on organic carbon concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5	LTS		LTS	NA
	6A, 6B, 6C, 7, 8, 9	S	WQ-17: Consult with Delta water purveyors to identify means to avoid, minimize, or offset increases in long-term average DOC concentrations	SU	A

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
WQ-18: Effects on organic carbon concentrations resulting from implementation of CM2–CM22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	WQ-18: Design wetland and riparian habitat features to minimize effects on municipal intakes	SU	A
WQ-19: Effects on pathogens resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-20: Effects on pathogens resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-21: Effects on pesticide concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5	LTS		LTS	NA
	6A, 6B, 6C, 7, 8, 9	S	No feasible mitigation to address this impact	SU	A
WQ-22: Effects on pesticide concentrations resulting from implementation of CM2–CM22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	WQ-22: Implement principals of integrated pest management	SU	A
WQ-23: Effects on phosphorus concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-24: Effects on phosphorus concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-25: Effects on selenium concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5,	LTS		LTS	NA
	6A, 6B, 6C, 7, 8, 9	S	Determine the reliability of the model in predicting biota selenium accumulation concentrations in the environment where effects are predicted by selenium data are lacking. Validate the model with site-specific sampling before extensive mitigation measures relative to CM1 operations are developed and evaluated for feasibility.	SU	A
WQ-26: Effects on selenium concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-27: Effects on trace metal concentrations resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-28: Effects on trace metal concentrations resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-29: Effects on TSS and turbidity resulting from facilities operations and maintenance (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-30: Effects on TSS and turbidity resulting from implementation of CM2–CM22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
WQ-31: Water quality impacts resulting from construction-related activities (CM1–CM22)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA

SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)
S=significant
LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Geology and Seismicity					
GEO-1: Loss of property, personal injury, or death from structural failure resulting from strong seismic shaking of water conveyance features during construction	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-2: Loss of property, personal injury, or death from settlement or collapse caused by dewatering during construction of water conveyance features	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-3: Loss of property, personal injury, or death from ground settlement during construction of water conveyance features	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-4: Loss of property, personal injury, or death from slope failure during construction of water conveyance features	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-5: Loss of property, personal injury, or death from structural failure resulting from construction-related ground motions during construction of water conveyance features	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-6: Loss of property, personal injury, or death from structural failure resulting from rupture of a known earthquake fault during operation of water conveyance features	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-7: Loss of property, personal injury, or death from structural failure resulting from strong seismic shaking during operation of water conveyance features	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-8: Loss of property, personal injury, or death from structural failure resulting from seismic-related ground failure (including liquefaction) during operation of water conveyance features	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-9: Loss of property, personal injury, or death from landslides and other slope instability during operation of water conveyance features	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-10: Loss of property, personal injury, or death from seiche or tsunami during operation of water conveyance features	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA			**NEPA**		
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
GEO-11: Ground failure caused by increased groundwater surface elevations from unlined canal seepage as a result of operating the water conveyance facilities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-12: Loss of property, personal injury, or death resulting from structural failure caused by rupture of a known earthquake fault at Restoration Opportunity Areas	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-13: Loss of property, personal injury, or death from structural failure resulting from strong seismic shaking at Restoration Opportunity Areas	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-14: Loss of property, personal injury, or death from structural failure resulting from seismic-related ground failure (including liquefaction) beneath Restoration Opportunity Areas	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-15: Loss of property, personal injury, or death from landslides and other slope instability at Restoration Opportunity Areas	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
GEO-16: Loss of property, personal injury, or death from seiche or tsunami at Restoration Opportunity Areas as a result of implementing the conservation actions	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
Soils					
SOILS-1: Accelerated erosion caused by vegetation removal and other soil disturbances as a result of constructing the proposed water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SOILS-2: Loss of topsoil from excavation, overcovering, and inundation as a result of constructing the proposed water conveyance facilities	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	SOILS-2a: Minimize extent of excavation and soil disturbance SOILS-2b: Salvage, stockpile, and replace topsoil and prepare a topsoil storage and handling plan	SU	A
SOILS-3: Property loss, personal injury, or death from instability, failure, and damage from construction on or in soils subject to subsidence as a result of constructing the proposed water conveyance facilities	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SOILS-4: Risk to life and property as a result of constructing the proposed water conveyance facilities in areas of expansive, corrosive, and compressible soils	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SOILS-5: Accelerated bank erosion from increased channel flow rates as a result of operations	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
SOILS-6: Accelerated erosion caused by clearing, grubbing, grading, and other disturbances associated with implementation of proposed conservation measures CM2–CM11, CM18 and CM19	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SOILS-7: Loss of topsoil from excavation, overcovering, and inundation associated with restoration activities as a result of implementing the proposed conservation measures CM2–CM11	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	SOILS-2a: Minimize extent of excavation and soil disturbance SOILS-2b: Salvage, stockpile, and replace topsoil and prepare a topsoil storage and handling plan	SU	A
SOILS-8: Property loss, personal injury, or death from instability, failure, and damage from construction on soils subject to subsidence as a result of implementing the proposed conservation measures CM2–CM11	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
SOILS-9: Risk to life and property from construction in areas of expansive, corrosive, and compressible soils as a result of implementing the proposed conservation measures CM2–CM11	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
Fish and Aquatic Resources					
AQUA-NAA1: Effects of construction of facilities on covered fish species	NAA	LTS		LTS	NA
AQUA-NAA2: Effects of maintenance of facilities on covered fish species	NAA	LTS		LTS	NA
AQUA-NAA3: Effects of water operations on entrainment of covered fish species	NAA	LTS		LTS	NA
AQUA-NAA4: Effects of water operations on spawning and egg incubation habitat for covered fish species	NAA	LTS S (winter-run Chinook salmon and green sturgeon)	No feasible mitigation to address this impact on Chinook salmon	SU	NA A (winter-run Chinook salmon and green sturgeon)
AQUA-NAA5: effects of water operations on rearing habitat for covered fish species	NAA	S[4]		S	NA
AQUA-NAA6: Effects of water operations on migration habitat for covered fish species	NAA	LTS		LTS	NA
AQUA-NAA7: Effects of habitat restoration on covered fish species	NAA	LTS		LTS	NA
AQUA-NAA8: Effects of other Conservation Measures on covered fish species	NAA	LTS		LTS	B
AQUA-NAA9: Effects of construction of facilities on non-covered fish species	NAA	LTS		LTS	NA

[4] Reduced summer flows would affect rearing habitat conditions for winter-run Chinook salmon and green and white sturgeon, which would include increased water temperatures, and could result in decreased survival over the NAA period. The effect could be adverse for these covered species over the NAA period. The overall effects of the No Action Alternative would be less than significant for the other covered fish species.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-NAA10: Effects of maintenance of facilities on non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA11: Effects of water operations on entrainment of non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA12: Effects of water operations on spawning and egg incubation habitat for non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA13: Effects of water operations on rearing habitat for non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA14: Effects of water operations on migration habitat for non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA15: Effects of habitat restoration on non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA16: Effects of other Conservation Measures on non-covered fish species	NAA	LTS		LTS	B
AQUA-1: Effects of construction of water conveyance facilities on delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-2: Effects of maintenance of water conveyance facilities on delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-3: Effects of water operations on entrainment of delta smelt	2A, 2B, 2C, 3, 5	LTS		LTS	NA
	1A, 1B, 1C, 4	LTS		LTS	B
	6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-4: Effects of water operations on spawning and egg incubation habitat for delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-5: Effects of water operations on rearing habitat for delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 7, 8, 9	LTS		LTS	ND
	6A, 6B, 6C	B		B	ND
AQUA-6: Effects of water operations on migration conditions for delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	ND
AQUA-7: Effects of construction of restoration measures on delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-8: Effects of contaminants associated with restoration measures on delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA/ND
AQUA-9: Effects of restored habitat conditions on delta smelt	2A, 3	LTS		LTS	NA
	1A, 1B, 1C, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-10: Effects of methylmercury management on delta smelt (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-11: Effects of invasive aquatic vegetation management on delta smelt (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 4, 6A, 6B, 6C, 7, 8, 9	B		B	B
	3, 5	LTS		LTS	NA
AQUA-12: Effects of dissolved oxygen level management on delta smelt (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-13: Effects of localized reduction of predatory fish on delta smelt (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
	3	LTS		LTS	NA
AQUA-14: Effects of nonphysical fish barriers on delta smelt (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 4, 5, 6A, 6B, 6C, 8, 9	NI		NI	NE
	3	LTS		LTS	NA
	7	B		B	B
AQUA-15: Effects of illegal harvest reduction on delta smelt (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-16: Effects of conservation hatcheries on delta smelt (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
	3	LTS		LTS	NA
AQUA-17: Effects of urban stormwater treatment on delta smelt (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
	3	LTS		LTS	NA
AQUA-18: Effects of removal/relocation of nonproject diversions on delta smelt (CM21)	1A, 1B, 1C, 2B, 2C, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
	2A, 3	LTS		LTS	NA
AQUA-19: Effects of construction of water conveyance facilities on longfin smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-20: Effects of maintenance of water conveyance facilities on longfin smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-21: Effects of water operations on entrainment of longfin smelt	1A, 1B, 1C, 5	LTS		LTS	NA
	2A, 2B, 2C	B		B	B
	3	S	AQUA-21a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to longfin smelt to determine feasibility of mitigation to reduce entrainment impacts AQUA-21b: Conduct additional evaluation and modeling of impacts on longfin smelt entrainment following initial operations of CM1 AQUA-21c: Consult with USFWS and CDFW to identify and implement potentially feasible means to minimize effects on longfin smelt entrainment consistent with CM1	SU	A
	4, 6B, 6C	B		B	NA
	6A, 7, 9	B		B	B
	8	LTS		LTS	B
AQUA-22: Effects of water operations on spawning, egg incubation, and rearing habitat for longfin smelt	1A, 1B, 1C, 3, 5, 6A, 6B, 6C, 7	S	AQUA-22a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to longfin smelt to determine feasibility of mitigation to reduce impacts to spawning and rearing habitat AQUA-22b: Conduct additional evaluation and modeling of impacts on longfin smelt rearing habitat following initial operations of CM1 AQUA-22c: Consult with USFWS and CDFW to identify and implement feasible means to minimize effects on longfin smelt rearing habitat consistent with CM1	LTS	ND
	2A, 2B, 2C, 4, 8, 9	LTS		LTS	ND
AQUA-23: Effects of water operations on rearing habitat for longfin smelt	1A, 1B, 1C, 3, 5, 6A, 6B, 6C, 7	S	AQUA-22a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to longfin smelt to determine feasibility of mitigation to reduce impacts to spawning and rearing habitat AQUA-22b: Conduct additional evaluation and modeling of impacts on longfin smelt rearing habitat following initial operations of CM1 AQUA-22c: Consult with USFWS and CDFW to identify and implement feasible means to minimize effects on longfin smelt rearing habitat consistent with CM1	LTS	ND
	2A, 2B, 2C, 4, 8, 9	LTS		LTS	ND
AQUA-24: Effects of water operations on migration conditions for longfin smelt	1A, 1B, 1C, 3, 5, 6A, 6B, 6C, 7	S	AQUA-22a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to longfin smelt to determine feasibility of mitigation to reduce impacts to spawning and rearing habitat AQUA-22b: Conduct additional evaluation and modeling of impacts on longfin smelt rearing habitat following initial operations of CM1 AQUA-22c: Consult with USFWS and CDFW to identify and implement feasible means to minimize effects on longfin smelt rearing habitat consistent with CM1	LTS	ND
	2A, 2B, 2C, 4, 8, 9	LTS		LTS	ND
AQUA-25: Effects of construction of restoration measures on longfin smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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NEPA

A=adverse
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-26: Effects of contaminants associated with restoration measures on longfin smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA/ND
AQUA-27: Effects of restored habitat conditions on longfin smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, 8, 9	LTS		LTS	NA
	5, 7	B		B	B
AQUA-28: Effects of methylmercury management on longfin smelt (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-29: Effects of invasive aquatic vegetation management on longfin smelt (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-30: Effects of dissolved oxygen level management on longfin smelt (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-31: Effects of localized reduction of predatory fish on longfin smelt (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-32: Effects of nonphysical fish barriers on longfin smelt (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-33: Effects of illegal harvest reduction on longfin smelt (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-34: Effects of conservation hatcheries on longfin smelt (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-35: Effects of urban stormwater treatment on longfin smelt (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
	3	LTS		LTS	NA
AQUA-36: Effects of removal/relocation of nonproject diversions on longfin smelt (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-37: Effects of construction of water conveyance facilities on Chinook salmon (winter-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-38: Effects of maintenance of water conveyance facilities on Chinook salmon (winter-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-39: Effects of water operations on entrainment of Chinook salmon (winter-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 6A, 6B, 6C, 9	B		B	B
	4, 5, 7	LTS		LTS	NA
	8	B		B	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-40: Effects of water operations on spawning and egg incubation habitat for Chinook salmon (winter-run ESU)	5, 6A, 6B, 6C, 9	LTS		LTS	NA
	3, 4, 7	LTS		LTS	ND
	1A, 1B, 1C, 2A, 2B, 2C, 8	S	AQUA-40a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to winter-run Chinook salmon to determine feasibility of mitigation to reduce impacts to spawning habitat AQUA-40b: Conduct additional evaluation and modeling of impacts on winter-run Chinook salmon spawning habitat following initial operations of CM1 AQUA-40c: Consult with USFWS and CDFW to identify and implement potentially feasible means to minimize effects on winter-run Chinook salmon spawning habitat consistent with CM1	SU	A
AQUA-41: Effects of water operations on rearing habitat for Chinook salmon (winter-run ESU)	4, 5, 6A, 6B, 6C, 7, 9	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 8	S	AQUA-41a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to winter-run Chinook salmon to determine feasibility of mitigation to reduce impacts to rearing habitat AQUA-41b: Conduct additional evaluation and modeling of impacts on winter-run Chinook salmon rearing habitat following initial operations of CM1 AQUA-41c: Consult with NMFS, USFWS and CDFW to identify and implement potentially feasible means to minimize effects on winter-run Chinook salmon rearing habitat consistent with CM1	SU	A
AQUA-42: Effects of water operations on migration conditions for Chinook salmon (winter-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 6A, 6B, 6C, 8	S	AQUA-42a: Following Initial Operations of CM1, Conduct Additional Evaluation and Modeling of Impacts to Winter-Run Chinook Salmon to Determine Feasibility of Mitigation to Reduce Impacts to Migration Conditions AQUA-42b: Conduct Additional Evaluation and Modeling of Impacts on Winter-Run Chinook Salmon Migration Conditions Following Initial Operations of CM1 AQUA-42c: Consult with USFWS, and CDFW to Identify and Implement Potentially Feasible Means to Minimize Effects on Winter-Run Chinook Salmon Migration Conditions Consistent with CM1	SU	A
	3	LTS		LTS	A
	4, 5, 7	LTS		LTS	ND
	9	LTS		LTS	NA
AQUA-43: Effects of construction of restoration measures on Chinook salmon (winter-run ESU)	7	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 8, 9	LTS		LTS	NA/B[5]
AQUA-44: Effects of contaminants associated with restoration measures on Chinook salmon (winter-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-45: Effects of restored habitat conditions on Chinook salmon (winter-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B

[5] The effects of short-term restoration construction activities would not be adverse; the overall long-term effects of habitat restoration are expected to be beneficial to winter-run Chinook salmon and other covered species by providing additional or improved habitat.

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-46: Effects of methylmercury management on Chinook salmon (winter-run ESU) (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-47: Effects of invasive aquatic vegetation management on Chinook salmon (winter-run ESU) (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-48: Effects of dissolved oxygen level management on Chinook salmon (winter-run ESU) (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 7, 6A, 6B, 6C, 8, 9	NI		NI	NE
AQUA-49: Effects of localized reduction of predatory fish on Chinook salmon (winter-run ESU) (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-50: Effects of nonphysical fish barriers on Chinook salmon (winter-run ESU) (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-51: Effects of illegal harvest reduction on Chinook salmon (winter-run ESU) (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-52: Effects of conservation hatcheries on Chinook salmon (winter-run ESU) (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-53: Effects of urban stormwater treatment on Chinook salmon (winter-run ESU) (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-54: Effects of removal/relocation of nonproject diversions on Chinook salmon (winter-run ESU) (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-55: Effects of construction of water conveyance facilities on Chinook salmon (spring-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-56: Effects of maintenance of water conveyance facilities on Chinook salmon (spring-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-57: Effects of water operations on entrainment of Chinook salmon (spring-run ESU)	1A, 1B, 1C, 3	S		S	A
	4, 7, 8	B		B	NA
	2A, 2B, 2C	LTS		LTS	NA
	5	LTS		LTS	B
	6A, 6B, 6C, 9	B		B	B

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-58: Effects of water operations on spawning and egg incubation habitat for Chinook salmon (spring-run ESU)	1A, 1B, 1C, 3	S	AQUA-58a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to spring-run Chinook salmon to determine feasibility of mitigation to reduce impacts to spawning habitat AQUA-58b: Conduct additional evaluation and modeling of impacts on spring-run Chinook salmon spawning habitat consistent with CM1 AQUA-58c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on spring-run Chinook salmon spawning habitat consistent with CM1	SU	A
	2A, 2B, 2C, 4, 5, 7	LTS		LTS	ND
	6A, 6B, 6C, 8, 9	LTS		LTS	NA
AQUA-59: Effects of water operations on rearing habitat for Chinook salmon (spring-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 9	LTS		LTS	NA
	8	S	AQUA-59a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to spring-run Chinook salmon to determine feasibility of mitigation to reduce impacts to rearing habitat AQUA-59b: Conduct additional evaluation and modeling of impacts on spring-run Chinook salmon rearing habitat following initial operations of CM1 AQUA-59c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on spring-run Chinook salmon rearing habitat consistent with CM1	SU	A
AQUA-60: Effects of water operations on migration conditions for Chinook salmon (spring-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 6A, 6B, 6C, 8	S	AQUA-60a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to spring-run Chinook salmon to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-60b: Conduct additional evaluation and modeling of impacts on spring-run Chinook salmon migration conditions following initial operations of CM1 AQUA-60c: Consult with NMFS, USFWS and CDFW to identify and implement potentially feasible means to minimize effects on spring-run Chinook salmon migration conditions consistent with CM1	SU	A
	3, 4, 5, 7	LTS		LTS	ND
	9	LTS		LTS	NA
AQUA-61: Effects of construction of restoration measures on Chinook salmon (spring-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 8, 9	LTS		LTS	NA/B[6]
	7	LTS		LTS	NA
AQUA-62: Effects of contaminants associated with restoration measures on Chinook salmon (spring-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-63: Effects of restored habitat conditions on Chinook salmon (spring-run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B

[6] The effects of short-term restoration construction activities would not be adverse; the overall long-term effects of habitiat restoration are expected to be beneficial to spring-run ESU Chinook salmon and other covered species by providing additional or improved habitat.

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-64: Effects of methylmercury management on Chinook salmon (spring-run ESU) (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-65: Effects of invasive aquatic vegetation management on Chinook salmon (spring-run ESU) (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-66: Effects of dissolved oxygen level management on Chinook salmon (spring-run ESU) (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 7, 6A, 6B, 6C, 8, 9	B		B	NE
AQUA-67: Effects of localized reduction of predatory fish on Chinook salmon (spring-run ESU) (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-68: Effects of nonphysical fish barriers on Chinook salmon (spring-run ESU) (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-69: Effects of illegal harvest reduction on Chinook salmon (spring-run ESU) (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-70: Effects of conservation hatcheries on Chinook salmon (spring-run ESU) (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-71: Effects of urban stormwater treatment on Chinook salmon (spring-run ESU) (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-72: Effects of removal/relocation of nonproject diversions on Chinook salmon (spring-run ESU) (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-73: Effects of construction of water conveyance facilities on Chinook salmon (fall- and late fall–run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-74: Effects of maintenance of water conveyance facilities on Chinook salmon (fall- and late fall–run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-75: Effects of water operations on entrainment of Chinook salmon (fall-/late fall–run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 7, 8	B		B	NA
	3	S		S	A
	4	LTS		LTS	NA
	5	LTS		LTS	B
	6A, 6B, 6C, 9	B		B	B
AQUA-76: Effects of water operations on spawning and egg incubation habitat for Chinook salmon (fall- and late fall–run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-77: Effects of water operations on rearing habitat for Chinook salmon (fall-/late fall–run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 8, 9	LTS		LTS	NA
	7	S	AQUA-77a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to fall-/late fall–run Chinook salmon to determine feasibility of mitigation to reduce impacts to rearing habitat AQUA-77b: Conduct additional evaluation and modeling of impacts on fall-/late fall–run Chinook salmon rearing habitat following initial operations of CM1 AQUA-77c: Consult with NMFS, USFWS and CDFW to identify and implement potentially feasible means to minimize effects on fall-/late fall–run Chinook salmon rearing habitat consistent with CM1	SU	A
AQUA-78: Effects of water operations on migration conditions for Chinook salmon (fall-/late fall–run ESU)	4, 7	LTS		LTS	ND
	9	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 8	S	AQUA-78a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to fall-/late fall–run Chinook salmon to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-78b: Conduct additional evaluation and modeling of impacts on fall-/late fall–run Chinook salmon migration conditions following initial operations of CM1 AQUA-78c: Consult with NMFS, USFWS and CDFW to identify and implement potentially feasible means to minimize effects on fall-/late fall–run Chinook salmon migration conditions consistent with CM1	SU	A
AQUA-79: Effects of construction of restoration measures on Chinook salmon (fall-/late fall–run ESU)	7	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 8, 9	LTS		LTS	NA/B[7]
AQUA-80: Effects of contaminants associated with restoration measures on Chinook salmon (fall-/late fall–run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-81: Effects of restored habitat conditions on Chinook salmon (fall-/late fall–run ESU)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-82: Effects of methylmercury management on Chinook salmon (fall-/late fall–run ESU) (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-83: Effects of invasive aquatic vegetation management on Chinook salmon (fall-/late fall–run ESU) (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-84: Effects of dissolved oxygen level management on Chinook salmon (fall-/late fall–run ESU) (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	NE

[7] The effects of short-term restoration construction activities would not be adverse; the overall long-term effects of habitiat restoration are expected to be beneficial to fall-/late fall-run ESU Chinook salmon and other covered species by providing additional or improved habitat.

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-85: Effects of localized reduction of predatory fish on Chinook salmon (fall-/late fall–run ESU) (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-86: Effects of nonphysical fish barriers on Chinook salmon (fall-/late fall–run ESU) (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-87: Effects of illegal harvest reduction on Chinook salmon (fall-/late fall–run ESU) (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-88: Effects of conservation hatcheries on Chinook salmon (fall-/late fall–run ESU) (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-89: Effects of urban stormwater treatment on Chinook salmon (fall-/late fall–run ESU) (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-90: Effects of removal/relocation of nonproject diversions on Chinook salmon (fall-/late fall–run ESU) (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-91: Effects of construction of water conveyance facilities on steelhead	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-92: Effects of maintenance of water conveyance facilities on steelhead	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-93: Effects of water operations on entrainment of steelhead	2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7	LTS		LTS	NA
	1A, 1B, 1C, 9	B		B	B
	8	B		B	NA
AQUA-94: Effects of water operations on spawning and egg incubation habitat for steelhead	1A, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-95: Effects of water operations on rearing habitat for steelhead	1A, 1B, 1C, 4, 6A, 6B, 6C, 7, 9	LTS		LTS	NA
	2A, 2B, 2C, 3, 5, 8	S	AQUA-95a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to steelhead to determine feasibility of mitigation to reduce impacts to rearing habitat AQUA-95b: Conduct additional evaluation and modeling of impacts on steelhead rearing habitat following initial operations of CM1 AQUA-95c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on steelhead rearing habitat consistent with CM1	SU	A

Level of Significance/Determination of Effects:

CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-96: Effects of water operations on migration conditions for steelhead	3, 4, 5, 7	LTS		LTS	ND
	1A, 1B, 1C, 2A, 2B, 2C, 6A, 6B, 6C, 8	S	AQUA-96a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to steelhead to determine feasibility of mitigation to reduce impact to migration conditions AQUA-96b: Conduct additional evaluation and modeling of impacts on steelhead migration conditions following initial operations of CM1 AQUA-96c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on steelhead migration conditions consistent with CM1	SU	A
	9	LTS		LTS	NA
AQUA-97: Effects of construction of restoration measures on steelhead	5, 7	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, 8, 9	LTS		LTS	B
AQUA-98: Effects of contaminants associated with restoration measures on steelhead	5, 7	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, 8, 9	LTS/B[8]		LTS/B[9]	B
AQUA-99: Effects of restored habitat conditions on steelhead	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B[9]
AQUA-100: Effects of methylmercury management on steelhead (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-101: Effects of invasive aquatic vegetation management on steelhead (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-102: Effects of dissolved oxygen level management on steelhead (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-103: Effects of localized reduction of predatory fish on steelhead (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-104: Effects of nonphysical fish barriers on steelhead (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-105: Effects of illegal harvest reduction on steelhead (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-106: Effects of conservation hatcheries on steelhead (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NA
AQUA-107: Effects of urban stormwater treatment on steelhead (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B

[8] The impact of contaminants would be less than significant and with restoration and would be beneficial in the long term.
[9] The effect would be generally beneficial, but benefits would not be derived in all years, and an adaptive management plan would be needed to determine an operational protocol that optimizes benefits both locally and in adjacent habitats.

Level of Significance/Determination of Effects:

CEQA

SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial
S=significant	NI=no impact	ND=no determination

NEPA

A=adverse	NE=no effect	ND=no determination
NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-108: Effects of removal/relocation of nonproject diversions on steelhead (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-109: Effects of construction of water conveyance facilities on Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-110: Effects of maintenance of water conveyance facilities on Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-111: Effects of water operations on entrainment of Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 5, 6A, 6B, 6C, 7, 8	LTS		LTS	NA
	3, 4	B		B	NA
	9	B		B	B
AQUA-112: Effects of water operations on spawning and egg incubation habitat for Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-113: Effects of water operations on rearing habitat for Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 3, 6C	B		B	B
	4, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
	5	B		B	B
AQUA-114: Effects of water operations on migration conditions for Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
	5	B		B	B
AQUA-115: Effects of construction of restoration measures on Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-116: Effects of contaminants associated with restoration measures on Sacramento splittail	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-117: Effects of restored habitat conditions on Sacramento splittail	1A, 1B, 1C, 2B, 2C, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B[9]
AQUA-118: Effects of methylmercury management on Sacramento splittail (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-119: Effects of invasive aquatic vegetation management on Sacramento splittail (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-120: Effects of dissolved oxygen level management on Sacramento splittail (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-121: Effects of localized reduction of predatory fish on Sacramento splittail (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-122: Effects of nonphysical fish barriers on Sacramento splittail (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-123: Effects of illegal harvest reduction on Sacramento splittail (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-124: Effects of conservation hatcheries on Sacramento splittail (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-125: Effects of urban stormwater treatment on Sacramento splittail (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 8, 9	B		B	B
AQUA-126: Effects of removal/relocation of nonproject diversions on Sacramento splittail (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-127: Effects of construction of water conveyance facilities on green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-128: Effects of maintenance of water conveyance facilities on green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-129: Effects of water operations on entrainment of green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 7	LTS		LTS	NA
	6A, 6B, 6C	LTS		LTS	B
	8	B		B	NA
	9	B		B	B
AQUA-130: Effects of water operations on spawning and egg incubation habitat for green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-131: Effects of water operation on rearing habitat for green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-132: Effects of water operations on migration conditions for green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 7, 8	S	AQUA-132a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to green sturgeon to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-132b: Conduct additional evaluation and modeling of impacts on green sturgeon migration conditions following initial operations of CM1 AQUA-132c: Consult with NMFS, USFWS and CDFW to identify and implement potentially feasible means to minimize effects on green sturgeon migration conditions consistent with CM1	SU	A
	4, 5, 6A, 6B, 6C, 9	LTS		LTS	ND
AQUA-133: Effects of construction of restoration measures on green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-134: Effects of contaminants associated with	1A, 1B, 1C, 2A, 2B, 2C, 3, 4,	LTS/B[8]		LTS/B[8]	B

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
restoration measures on green sturgeon	5, 6A, 6B, 6C, 7, 8, 9				
AQUA-135: Effects of restored habitat conditions on green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B[9]
AQUA-136: Effects of methylmercury management on green sturgeon (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-137: Effects of invasive aquatic vegetation management on green sturgeon (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 8, 9	B		B	B
AQUA-138: Effects of dissolved oxygen level management on green sturgeon (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-139: Effects of localized reduction of predatory fish on green sturgeon (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-140: Effects of nonphysical fish barriers on green sturgeon (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-141 Effects of illegal harvest reduction on green sturgeon (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-142: Effects of conservation hatcheries on green sturgeon (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-143: Effects of urban stormwater treatment on green sturgeon (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-144: Effects of removal/relocation of nonproject diversions on green sturgeon (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	NA
AQUA-145: Effects of construction of water conveyance facilities on white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-146: Effects of maintenance of water conveyance facilities on white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-147: Effects of water operations on entrainment of white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 7	LTS		LTS	NA
	6A, 6B, 6C	LTS		LTS	B
	8	B		B	NA
	9	B		B	B
AQUA-148: Effects of water operations on spawning and egg incubation habitat for white sturgeon	1A, 1B, 1C, 2A. 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-149: Effects of water operations on rearing habitat for white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA

SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)
S=significant
LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-150: Effects of water operations on migration conditions for white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 9	LTS		LTS	ND
	8	S	AQUA-150a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to shite sturgeon to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-150b: Conduct additional evaluation and modeling of impacts on white sturgeon migration conditions following initial operations of CM1 AQUA-150c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on white sturgeon migration conditions consistent with CM1	SU	A
AQUA-151: Effects of construction of restoration measures on white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-152: Effects of contaminants associated with restoration measures on white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-153: Effects of restored habitat conditions on white sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B[9]
AQUA-154: Effects of methylmercury management on white sturgeon (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-155: Effects of invasive aquatic vegetation management on white sturgeon (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-156: Effects of dissolved oxygen level management on white sturgeon (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	NA
AQUA-157: Effects of localized reduction of predatory fish on white sturgeon (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-158: Effects of nonphysical fish barriers on white sturgeon (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 7, 6A, 6B, 6C, 8, 9	LTS		LTS	NA
AQUA-159: Effects of illegal harvest reduction on white sturgeon (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-160: Effects of conservation hatcheries on white sturgeon (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE

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CEQA			NEPA		
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-162: Effects of removal/relocation of nonproject diversions on white sturgeon (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, 5, 7, 8, 9	B		B	NA
AQUA-163: Effects of construction of water conveyance facilities on Pacific lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-164: Effects of maintenance of water conveyance facilities on Pacific lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-165: Effects of water operations on entrainment of Pacific lamprey	1A, 1B, 1C, 4, 5, 6A, 6B, 6C, 7, 8	LTS		LTS	NA
	9	B		B	B
AQUA-166: Effects of water operations on spawning and egg incubation habitat for Pacific lamprey	2A, 2B, 2C, 4, 6A, 6B, 6C, 7, 9	LTS		LTS	NA
	1A, 1B, 1C, 3, 5, 8	S	AQUA-166a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to Pacific lamprey to determine feasibility of mitigation to reduce impacts to spawning habitat AQUA-166b: Conduct additional evaluation and modeling of impacts on Pacific lamprey spawning habitat following initial operations of CM1 AQUA-166c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on Pacific lamprey spawning habitat consistent with CM1	SU	A
AQUA-167: Effects of water operations on rearing habitat for Pacific lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 9	LTS		LTS	NA
	8	S		SU	A
AQUA-168: Effects of water operations on migration conditions for Pacific lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-169: Effects of construction of restoration measures on Pacific lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-170: Effects of contaminants associated with restoration measures on Pacific lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-171: Effects of restored habitat conditions on Pacific lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-172: Effects of methylmercury management on Pacific lamprey (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-173: Effects of invasive aquatic vegetation management on Pacific lamprey (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-174: Effects of dissolved oxygen level management on Pacific lamprey (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA

SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)
S=significant
LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
AQUA-175: Effects of localized reduction of predatory fish on Pacific lamprey (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-176: Effects of nonphysical fish barriers on Pacific lamprey (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-177: Effects of illegal harvest reduction on Pacific lamprey (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-178: Effects of conservation hatcheries on Pacific lamprey (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-179: Effects of urban stormwater treatment on Pacific lamprey (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-180: Effects of removal/relocation of nonproject diversions on Pacific lamprey (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-181: Effects of construction of water conveyance facilities on river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-182: Effects of maintenance of water conveyance facilities on river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-183: Effects of water operations on entrainment of river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	LTS		LTS	NA
	9	B		B	B
AQUA-184: Effects of water operations on spawning and egg incubation habitat for river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 9	LTS		LTS	NA
	8	S	AQUA-184a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to river lamprey to determine feasibility of mitigation to reduce impacts to spawning habitat AQUA-184b: Conduct additional evaluation and modeling of impacts on river lamprey spawning habitat following initial operations of CM1 AQUA-184c: Consult with USFWS and CDFW to identify and implement potentially feasible means to minimize effects on river lamprey spawning habitat consistent with CM1	SU	A
AQUA-185: Effects of water operations on rearing habitat for river lamprey	1A, 1B, 1C, 8	S	AQUA-185a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to river lamprey to determine feasibility of mitigation to reduce impacts to rearing habitat AQUA-185b: Conduct additional evaluation and modeling of impacts on river lamprey rearing habitat following initial operations of CM1 AQUA-185c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on river lamprey rearing habitat consistent with CM1	SU	A
	2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-186: Effects of water operations-related decline on migration conditions for river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 9	LTS		LTS	NA
	8	S	AQUA-186a: Following initial operations of CM1, conduct additional evaluation and modeling of impacts to river lamprey to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-186b: Conduct additional evaluation and modeling of impacts on river lamprey migration conditions following initial operations of CM1 AQUA-186c: Consult with USFWS and CDFW to identify and implement potentially feasible means to minimize effects on river lamprey migration conditions consistent with CM1	SU	A
AQUA-187: Effects of construction of restoration measures on river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-188: Effects of contaminants associated with restoration measures on river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS/B[11]		LTS/B[11]	NA/B[11]
AQUA-189: Effects of restored habitat conditions on river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-190: Effects of methylmercury management on river lamprey (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-191: Effects of invasive aquatic vegetation management on river lamprey (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-192: Effects of dissolved oxygen level management on river lamprey (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-193: Effects of localized reduction of predatory fish on river lamprey (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-194: Effects of nonphysical fish barriers on river lamprey (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-195: Effects of illegal harvest reduction on river lamprey (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-196: Effects of conservation hatcheries on river lamprey (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-197: Effects of urban stormwater treatment on river lamprey (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-198: Effects of removal/relocation of nonproject diversions on river lamprey (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B

[11] The effects of contaminants on river lamprey associated with restoration measures would not be adverse (NEPA) and would be less than significant (CEQA), while the overall effects of the restored habitat are expected to be beneficial in the long-term.

Level of Significance/Determination of Effects:

CEQA

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LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation CEQA	 NEPA
AQUA-199: Effects of construction of water conveyance facilities on non-covered aquatic species of primary management concern	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise. AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-200: Effects of maintenance of water conveyance facilities on non-covered aquatic species of primary management concern	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-201: Effects of water operations on entrainment of non-covered aquatic species of primary management concern	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6B, 6C, 7, 8, 9	LTS NI (California bay shrimp)		LTS NI (California bay shrimp)	NA NE (California bay shrimp) B (Alternative 9 for largemouth bass)
	6A	LTS B (largemouth bass) NI (California bay shrimp)		LTS B (largemouth bass) NI (California bay shrimp)	LTS NE (California bay shrimp)
AQUA-202: Effects of water operations on spawning and egg incubation habitat for non-covered aquatic species of primary management concern	1A, 1B, 1C, 2B, 2C, 4, 6B, 6C	NI (striped bass, largemouth bass, threadfin shad, hardhead) LTS (American shad, Sacramento tule perch, Sacramento–San Joaquin roach)		NI (striped bass, largemouth bass, threadfin shad, hardhead) LTS (American shad, Sacramento tule perch, Sacramento–San Joaquin roach)	NA
	2A, 2B, 2C, 3	NI (largemouth bass, Sacramento–San Joaquin roach, hardhead)		NI (largemouth bass, Sacramento–San Joaquin roach, hardhead)	NE
		LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, California bay shrimp)		LTS (striped bass, American shad, threadfin shad, largemouth bass, tule perch, bay shrimp)	NA
	5	NI (largemouth bass, Sacramento–San Joaquin roach, hardhead)		NI (largemouth bass, Sacramento–San Joaquin roach, hardhead)	NE
		LTS		LTS	NA
	6A, 6B, 6C	LTS	No feasible mitigation to address this impact	LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
		S (threadfin shad)		SU (threadfin shad)	
	7, 8, 9	LTS		LTS	NA
AQUA-203: Effects of water operations on rearing habitat for non-covered aquatic species of primary management concern	1A, 1B, 1C	LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, California bay shrimp)		LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, California bay shrimp)	NA
		S[12] (Sacramento–San Joaquin roach, hardhead)	No feasible mitigation to address this impact	SU (Sacramento–San Joaquin roach, hardhead)	NA[12]
	4, 5	LTS		LTS	NA
	2A, 2B, 2C, 6A, 6B, 6C, 7, 9	LTS (striped bass, American shad, threadfin shad, California bay shrimp)		LTS (striped bass, American shad, threadfin shad, California bay shrimp)	NA
		S[12] (largemouth bass, Sacramento tule perch, Sacramento–San Joaquin roach, hardhead)	No feasible mitigation to address this impact	SU (largemouth bass, Sacramento tule perch, Sacramento–San Joaquin roach, hardhead)	NA[12]
	3	LTS S (hardhead)	No feasible mitigation to address this impact	LTS SU (hardhead)	NA
	8	LTS (striped bass, American shad, threadfin shad, largemouth bass, California bay shrimp)		LTS (striped bass, American shad, threadfin shad, largemouth bass, California bay shrimp)	NA
		S (Sacramento tule perch, Sacramento–San Joaquin roach, hardhead)	No feasible mitigation to address this impact	SU (tule perch, Sacramento-San Joaquin roach, hardhead)	

[12] CEQA and NEPA conclusions differ because they were determined using two unique baselines. The NEPA conclusion was based on the comparison of A2A_LLT with NAA and the CEQA conclusion was based on the comparison of A2A_LLT with existing conditions. The NAA includes the Fall X2 standard in wet above normal water years whereas the CEQA existing conditions do not. Further, the NAA is assumed to occur during the late long-term implementation period whereas the CEQA conclusion assumes existing climate conditions. Thus differences are due to both the alternative and climate change.

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-204: Effects of water operations on migration conditions for non-covered aquatic species of primary management concern	1A, 1B, 1C, 2A, 2B, 2C, 3, 4	LTS NI (largemouth bass, Sacramento tule perch)		LTS NI (largemouth bass, Sacramento tule perch)	NA NE (threadfin shad, largemouth bass, Sacramento tule perch)
	5	LTS NI (largemouth bass, Sacramento–San Joaquin roach, hardhead)		LTS NI (largemouth bass, Sacramento–San Joaquin roach, hardhead)	NA NE (largemouth bass, Sacramento–San Joaquin roach, hardhead, threadfin shad)
	6A, 6B, 6C, 7	LTS (striped bass, American shad, Sacramento–San Joaquin roach, hardhead, California bay shrimp)		LTS (striped bass, American shad, Sacramento–San Joaquin roach, hardhead, California bay shrimp)	NA (striped bass, American shad, Sacramento–San Joaquin roach, hardhead, California bay shrimp)
		NI (threadfin shad, largemouth bass, Sacramento tule perch)		NI (threadfin shad, largemouth bass, Sacramento tule perch)	NE (threadfin shad, largemouth bass, Sacramento tule perch)
	8, 9	LTS (striped bass, American shad, threadfin shad, Sacramento–San Joaquin roach, hardhead) NI (largemouth bass, Sacramento tule perch)		LTS (striped bass, American shad, threadfin shad, Sacramento–San Joaquin roach, hardhead) NI (largemouth bass, Sacramento tule perch)	NA (striped bass, American shad, threadfin shad, Sacramento–San Joaquin roach, hardhead) NE (largemouth bass, Sacramento tule perch)
AQUA-205: Effects of construction of restoration measures on non-covered aquatic species of primary management concern	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-206: Effects of contaminants associated with restoration measures on non-covered aquatic species of primary management concern	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-207: Effects of restored habitat conditions on non-covered aquatic species of primary management concern	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-208: Effects of methylmercury management on non-covered aquatic species of primary management concern (CM12)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA

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NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-209: Effects of invasive aquatic vegetation management on non-covered aquatic species of primary management concern (CM13)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS NI (California bay shrimp)		LTS NI (California bay shrimp)	NA NE (California bay shrimp)
AQUA-210: Effects of dissolved oxygen level management on non-covered aquatic species of primary management concern (CM14)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B NI (California bay shrimp)		B NI (California bay shrimp)	B NE (California bay shrimp)
AQUA-211: Effects of localized reduction of predatory fish on non-covered aquatic species of primary management concern (CM15)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 9, 9	LTS NI (California bay shrimp)		LTS NI (California bay shrimp)	NA NE (California bay shrimp)
AQUA-212: Effects of nonphysical fish barriers on non-covered aquatic species of primary management concern (CM16)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B. 6C, 7, 8, 9	LTS NI (California bay shrimp)		LTS NI (California bay shrimp)	NA NE (California bay shrimp)
AQUA-213: Effects of illegal harvest reduction on non-covered aquatic species of primary management concern (CM17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS NI (California bay shrimp)		LTS NI (California bay shrimp)	NA NE (California bay shrimp)
AQUA-214: Effects of conservation hatcheries on non-covered aquatic species of primary management concern (CM18)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
AQUA-215: Effects of urban stormwater treatment on non-covered aquatic species of primary management concern (CM19)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
AQUA-216: Effects of removal/relocation of nonproject diversions on non-covered aquatic species of primary management concern (CM21)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS NI (California bay shrimp)		LTS NI (California bay shrimp)	NA NE (California bay shrimp)
AQUA-217: Effects of water operations on reservoir coldwater fish habitat	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
Terrestrial Biological Resources					
BIO-1: Changes in tidal perennial aquatic natural community as a result of implementing BDCP conservation measures	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-2: Increased frequency, magnitude and duration of periodic inundation of tidal perennial aquatic natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-3: Modification of tidal perennial aquatic natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-4: Changes in tidal brackish emergent wetland natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-5: Modification of tidal brackish emergent wetland natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-6: Changes in tidal freshwater emergent wetland natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-7: Increased frequency, magnitude and duration of periodic inundation of tidal freshwater emergent wetland natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-8: Modification of tidal freshwater emergent wetland natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-9: Changes in valley/foothill riparian natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	B		B	B
	9	S	BIO-9: Compensate for loss of valley/foothill riparian natural community	B	B
BIO-10: Increased frequency, magnitude and duration of periodic inundation of valley/foothill riparian natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-11: Modification of valley/foothill riparian natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-12: Changes in nontidal perennial aquatic natural community as a result of implementing BDCP conservation measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-13: Increased frequency, magnitude and duration of periodic inundation of nontidal perennial aquatic natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
BIO-14: Modification of nontidal perennial aquatic natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-15: Changes in nontidal freshwater perennial emergent wetland natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-16: Increased frequency, magnitude and duration of periodic inundation of nontidal freshwater perennial emergent wetland natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-17: Modification of nontidal freshwater perennial emergent wetland natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-18: Changes in alkali seasonal wetland complex natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-18: Compensate for loss of alkali seasonal wetland complex	LTS	NA
BIO-19: Increased frequency, magnitude and duration of periodic inundation of alkali seasonal wetland complex natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-20: Modification of alkali seasonal wetland complex natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-18: Compensate for loss of alkali seasonal wetland complex	LTS	NA
BIO-21: Changes in vernal pool complex natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-21: Compensate for loss of vernal pool complex	LTS	NA
BIO-22: Increased frequency, magnitude and duration of periodic inundation of vernal pool complex natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-23: Modification of vernal pool complex natural community from ongoing operation, maintenance and	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4,	LTS		LTS	NA

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NEPA

A=adverse
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
management activities	5, 6A, 6B, 6C, 7, 8, 9				
BIO-24: Changes in managed wetland natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-25: Increased frequency, magnitude and duration of periodic inundation of managed wetland natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-26: Modification of managed wetland natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-27: Modification of other natural seasonal wetland natural community as a result of implementing BDCP Conservation Measures	NAA	LTS		LTS	NA
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-27: Compensate for loss of other natural seasonal wetland	LTS	NA
BIO-28: Modification of other natural seasonal wetland natural community from ongoing operation, maintenance and management activities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-29: Changes in grassland natural community as a result of implementing BDCP Conservation Measures	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-30: Increased frequency, magnitude and duration of periodic inundation of grassland natural community	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-31: Modification of grassland natural community from ongoing operation, maintenance and management activities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-32: Loss or conversion of habitat for and direct mortality of vernal pool crustaceans	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-32: Restore and protect vernal pool crustacean habitat	LTS	NA

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NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
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ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-33: Indirect effects of Plan implementation on vernal pool crustaceans	NI		NI	NE	NI
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-34: Periodic effects of inundation of vernal pool crustacean habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-35: Loss of valley elderberry longhorn beetle habitat	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term) /A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-36: Indirect effects on valley elderberry longhorn beetle and its habitat	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-37: Periodic effects of inundation of valley elderberry longhorn beetle habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-38: Loss or conversion of habitat for and direct mortality of nonlisted vernal pool invertebrates	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-32: Restore and protect vernal pool crustacean habitat	LTS	NA
BIO-39: Indirect effects of Plan implementation on nonlisted vernal pool invertebrates	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-40: Periodic effects of inundation of nonlisted vernal pool invertebrates' habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-41: Loss or conversion of habitat for and direct mortality of Sacramento and Antioch Dunes anthicid beetles	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-42: Loss or conversion of habitat for and direct mortality of delta green ground beetle	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-42: Avoid impacts on delta green ground beetle and its habitat	LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-43: Loss or conversion of habitat for and direct mortality of Callippe silverspot butterfly	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-43: Avoid and minimize loss of Callippe silverspot butterfly habitat	LTS	NA
BIO-44: Loss or conversion of habitat for and direct mortality of California red-legged frog	NAA	LTS		LTS	NA (
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-45: Indirect effects of Plan implementation on California red-legged frog	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-46: Loss or conversion of habitat for and direct mortality of California tiger salamander	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-47: Indirect effects of Plan implementation on California tiger salamander	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-48: Periodic effects of inundation of California tiger salamander habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-49: Loss or conversion of habitat for and direct mortality of giant garter snake	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-50: Indirect effects of Plan implementation on giant garter snake	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-50a: Loss of connectivity among giant garter snakes in the Coldani Marsh/White Slough subpopulation, Stone Lakes National Wildlife Refuge, and the Delta	NAA	LTS		LTS	NA
	1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7, 8, 9	LTS		LTS	NA
	1B, 2B, 6B	S	BIO-50a: Provide connectivity among Coldani Marsh/White Slough, Stone Lakes National Wildlife Refuge, and the Delta	LTS	NA
BIO-51: Periodic effects of inundation of giant garter snake habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
BIO-52: Loss or conversion of habitat for and direct mortality of western pond turtle	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-53: Indirect effects of Plan implementation on western pond turtle	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-54: Periodic effects of inundation of western pond turtle habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-55: Loss or conversion of habitat for and direct mortality of special-status reptiles	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-55: Conduct preconstruction surveys for noncovered special-status reptiles and implement applicable CM22 measures	LTS	NA
BIO-56: Indirect effects of Plan implementation on special-status reptile species	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-55: Conduct preconstruction surveys for noncovered special-status reptiles and implement applicable CM22 measures	LTS	NA
BIO-57: Loss or conversion of habitat for and direct mortality of California black rail	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-58: Effects on California black rail associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-59: Indirect effects of Plan implementation on California black rail	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-60: Fragmentation of California black rail habitat as a result of conservation component implementation	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-61: Periodic effects of inundation of California black rail habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-62: Loss or conversion of habitat for and direct mortality of California clapper rail	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-63: Indirect effects of Plan implementation on California clapper rail	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-64: Effects on California clapper rail associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-65: Fragmentation of California clapper rail habitat as a result of conservation component implementation	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-66: Loss or conversion of habitat for and direct mortality of California least tern	NAA	B		B	B
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-66: California least tern nesting colonies shall be avoided and indirect effects on colonies will be minimized	LTS	NA
BIO-67: Indirect effects of Plan implementation on California least tern	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-66: California least tern nesting colonies shall be avoided and indirect effects on colonies will be minimized	LTS	NA
BIO-68: Effects on California least tern associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-69: Loss or conversion of habitat for and direct mortality of greater sandhill crane	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7, 8, 9	S	BIO-69a: Compensate for the loss of Medium to Very High-Value Greater Sandhill Crane Foraging Habitat	LTS	ND
	1B, 2B, 6B	S	BIO-69a: Compensate for the loss of Medium to Very High-Value Greater Sandhill Crane Foraging Habitat BIO-69b: BDCP-related construction will not result in a net decrease in crane use days on Bract Tract	LTS	ND
BIO-70: Effects on greater sandhill crane associated with electrical transmission facilities	NAA	LTS (short-term)/		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	ND

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
BIO-71: Indirect effects of Plan implementation on greater sandhill crane	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	ND
BIO-72: Loss or conversion of habitat for and direct mortality of lesser sandhill crane	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7, 8, 9	S	BIO-72: Compensate for the loss of medium- to very high-value lesser sandhill crane foraging habitat	LTS	NA
	1B, 2B, 6B	S	BIO-72: Compensate for the loss of medium- to very high-value lesser sandhill crane foraging habitat BIO-69b: BDCP-related construction will not result in a net decrease in crane use days on Bract Tract	LTS	NA
BIO-73: Effects on lesser sandhill crane associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-74: Indirect effects of Plan implementation on lesser sandhill crane	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-75: Loss or conversion of habitat for and direct mortality of least Bell's vireo and yellow warbler	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-76: Fragmentation of least Bell's vireo and yellow warbler habitat	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-77: Effects on least Bell's vireo and yellow warbler associated with electrical transmission facilities	NAA	LTS		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-78: Indirect effects of Plan implementation on least Bell's vireo and yellow warbler	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-79: Periodic effects of inundation of least Bell's vireo and yellow warbler habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-80: Loss or conversion of habitat for and direct mortality of Suisun song sparrow and saltmarsh common yellowthroat	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-81: Indirect effects of Plan implementation on Suisun song sparrow and saltmarsh common yellowthroat	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-82: Effects on Suisun song sparrow and saltmarsh common yellowthroat associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-83: Loss or conversion of habitat for and direct mortality of Swainson's hawk	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-84: Effects on Swainson's hawk associated with electrical transmission facilities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-85: Indirect effects of Plan implementation on Swainson's hawk	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-86: Periodic effects of inundation of Swainson's hawk nesting and foraging habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-87: Loss or conversion of habitat for and direct mortality of tricolored blackbird	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-88: Effects on tricolored blackbird associated with electrical transmission facilities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-89: Indirect effects of Plan implementation on tricolored blackbird	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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BIO-90: Periodic effects of inundation of tricolored blackbird habitat as a result of implementation of conservation components	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-91: Loss or conversion of habitat for and direct mortality of western burrowing owl	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-91: Compensate for near-term loss of high-value western burrowing owl habitat	LTS	NA
BIO-92: Effects on western burrowing owl associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-93: Indirect effects of Plan implementation on western burrowing owl	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-94: Periodic effects of inundation on western burrowing owl habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-95: Loss or conversion of habitat for and direct mortality of western yellow-billed cuckoo	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-96: Fragmentation of western yellow-billed cuckoo habitat as a result of constructing the water conveyance facilities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-97: Effects on western yellow-billed cuckoo associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-98: Indirect effects of Plan implementation on western yellow-billed cuckoo	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-99: Periodic effects of inundation of western yellow-billed cuckoo habitat as a result of implementation of conservation components	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NI
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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BIO-100: Loss or conversion of habitat for and direct mortality of white-tailed kite	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-101: Effects on white-tailed kite associated with electrical transmission facilities	NAA	LTS		LTS	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-102: Indirect effects of Plan implementation on white-tailed kite	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-103: Periodic effects of inundation of white-tailed kite habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-104: Loss or conversion of habitat for and direct mortality of yellow-breasted chat	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-105: Fragmentation of yellow-breasted chat habitat as a result of constructing the water conveyance facilities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-106: Effects on yellow-breasted chat associated with electrical transmission facilities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-107: Indirect effects of Plan implementation on yellow-breasted chat	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-108: Periodic effects of inundation of yellow-breasted chat habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-109: Loss or conversion of habitat for and direct mortality of Cooper's hawk and osprey	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA

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BIO-110: Effects on Cooper's hawk and osprey associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-111: Indirect effects of Plan implementation on Cooper's hawk and osprey	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-112: Periodic effects of inundation of Cooper's hawk and osprey nesting habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-113: Loss or conversion of habitat for and direct mortality of golden eagle and ferruginous hawk	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-113: Compensate for the near-term loss of golden eagle and ferruginous hawk foraging habitat	LTS	NA
BIO-114: Effects on golden eagle and ferruginous hawk associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-115: Indirect effects of Plan implementation on golden eagle and ferruginous hawk	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-116: Periodic effects of inundation on golden eagle and ferruginous hawk habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-117: Loss or conversion of nesting habitat for and direct mortality of cormorants, herons and egrets	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-117: Avoid impacts on rookeries	LTS	NA
BIO-118: Effects associated with electrical transmission facilities on cormorants, herons and egrets	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-119: Indirect effects of Plan implementation on cormorants, herons and egrets	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-120: Periodic effects of inundation on cormorants, herons and egrets as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA

SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)
S=significant
LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
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ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-121: Loss or conversion of habitat for short-eared owl and northern harrier	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 2A, 3, 4, 5, 6A, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
	1B, 1C, 2B, 2C, 6B, 6C	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-121: Compensate for loss of short-eared owl and northern harrier nesting habitat	LTS	NA
BIO-122: Effects on short-eared owl and northern harrier associated with electrical transmission facilities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-123: Indirect effects of Plan implementation on short-eared owl and northern harrier	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-124: Periodic effects of inundation on short-eared owl and northern harrier as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-125: Loss or conversion of habitat for and direct mortality of mountain plover	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-125: Compensate for the near-term loss of mountain plover wintering habitat	LTS	NA
BIO-126: Effects on mountain plover associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-127: Indirect effects of Plan implementation on mountain plover	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-128: Periodic effects of inundation on mountain plover as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-129a: Loss or conversion of habitat for and direct mortality of black tern	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-129a: Compensate for loss of black tern nesting habitat	LTS	NA
BIO-129b: Indirect effects of Plan implementation on black tern	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA

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CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-129c: Periodic effects of inundation on black tern nesting habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-130: Loss or conversion of habitat for and direct mortality of California horned lark and grasshopper sparrow	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-130: Compensate for near-term loss of California horned lark and grasshopper sparrow habitat	LTS	NA
BIO-131: Effects on California horned lark and grasshopper sparrow and associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-132: Indirect effects of Plan implementation on grasshopper sparrow and California horned lark	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-133: Periodic effects of inundation on California horned lark and grasshopper sparrow as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-134: Loss or conversion of habitat for and direct mortality of least bittern and white-faced ibis	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-135: Effects on least bittern and white-faced ibis associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-136: Indirect effects of Plan implementation on least bittern and white-faced ibis	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-137: Periodic effects of inundation on least bittern and white-faced ibis as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-138: Loss or conversion of modeled habitat for and direct mortality of loggerhead shrike	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-138: Compensate for the near-term loss of high-value loggerhead shrike habitat	LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-139: Effects on loggerhead shrike associated with electrical transmission facilities	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-140: Indirect effects of Plan implementation on loggerhead shrike	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-141: Periodic effects of inundation on loggerhead shrike as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-142: Loss or conversion of habitat for and direct mortality of Modesto song sparrow	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-143: Effects on Modesto song sparrow associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-144: Indirect effects of Plan implementation on Modesto song sparrow	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-145: Periodic effects of inundation on Modesto song sparrow as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-146: Indirect effects of implementation of conservation components on bank swallow	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-146: Active bank swallow colonies shall be avoided and indirect effects on bank swallow will be minimized	LTS	NA
BIO-147: Effects of upstream reservoir and water conveyance facility operations on bank swallow	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-147: Monitor bank swallow colonies and evaluate winter and spring flows upstream of the study area	LTS	NA
BIO-148: Loss of habitat for and direct mortality of yellow-headed blackbird	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-149: Effects on yellow-headed blackbird associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-150: Indirect effects of Plan implementation on yellow-headed blackbird	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-151: Periodic effects of inundation of yellow-headed blackbird nesting habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-152: Loss or conversion of habitat for and direct mortality of riparian brush rabbit	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-153: Indirect effects of Plan implementation on riparian brush rabbit	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-154: Periodic effects of inundation of riparian brush rabbit habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-155: Loss or conversion of habitat for and direct mortality of riparian woodrat	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-156: Indirect effects of Plan implementation on riparian woodrat	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-157: Periodic effects of inundation of riparian woodrat habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-158: Loss or conversion of habitat for and direct mortality of salt marsh harvest mouse	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-159: Indirect effects of Plan implementation on salt marsh harvest mouse	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-160: Loss or conversion of habitat for and direct mortality of Suisun shrew	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-161: Indirect effects of Plan implementation on Suisun shrew	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-162: Loss or conversion of habitat for and direct mortality of San Joaquin kit fox and American badger	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-162: Conduct preconstruction survey for American badger	LTS	NA
BIO-163: Indirect effects of Plan implementation on San Joaquin kit fox and American badger	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-162: Conduct preconstruction survey for American badger	LTS	NA
BIO-164: Loss or conversion of habitat for and direct mortality of San Joaquin pocket mouse	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-165: Indirect effects of Plan implementation on San Joaquin pocket mouse	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-166: Loss or conversion of habitat for and direct mortality of special-status bats	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-166: Conduct preconstruction surveys for roosting bats and implement protective measures	LTS	NA
BIO-167: Indirect effects of Plan implementation on special-status bats	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-166: Conduct preconstruction surveys for roosting bats and implement protective measures	LTS	NA
BIO-168: Periodic effects of inundation of special-status bat habitat as a result of implementation of conservation components	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-166: Conduct preconstruction surveys for roosting bats and implement protective measures	LTS	NA

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A=adverse
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
BIO-169: Effects on habitat and populations of vernal pool plants	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-32: Restore and protect vernal pool crustacean habitat	LTS	NA
BIO-170: Effects on habitat and populations of alkali seasonal wetland plants	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	BIO-170: Avoid, minimize, or compensate for impacts on noncovered special-status plant species	LTS	NA
	9	LTS		LTS	NA
BIO-171: Effects on habitat and populations of grassland plant species	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S	BIO-170: Avoid, minimize, or compensate for impacts on noncovered special-status plant species	LTS	NA
BIO-172: Effects on habitat and populations of valley/foothill riparian plants	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-173: Effects on habitat and populations of tidal wetland plants	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-170: Avoid, minimize, or compensate for impacts on noncovered special-status plant species	LTS	NA
BIO-174: Effects on habitat and populations of inland dune plants	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-175: Effects on habitat and populations of nontidal wetland plants	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-170: Avoid, minimize, or compensate for impacts on noncovered special-status plant species	LTS	NA
BIO-176: Effects of constructing water conveyance facilities (CM1) on wetlands and other waters of the United States	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B

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CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-177: Effects of implementing other conservation measures (CM2–CM10) on wetlands and other waters of the United States	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	B		B	B
BIO-178: Loss or conversion of habitat for waterfowl and shorebirds as a result of water conveyance facilities construction	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-179: Loss or conversion of habitat for wintering waterfowl as a result of implementation of conservation components	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-179a: Conduct food studies and monitoring for wintering waterfowl in Suisun Marsh BIO-179b: Conduct food studies and monitoring to demonstrate food quality of palustrine tidal wetlands in the Yolo and Delta Basins	LTS	NA
BIO-180: Loss or conversion of habitat for breeding waterfowl from implementation of conservation components	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-180: Conduct food and monitoring studies of breeding waterfowl in Suisun Marsh	LTS	NA
BIO-181: Loss or conversion of habitat for shorebirds from implementation of conservation components	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-181: Conduct studies to quantify shorebird food resources and habitat value in tidal wetlands	LTS	NA
BIO-182: Effects on shorebirds and waterfowl associated with electrical transmission facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-183: Indirect effects of Plan implementation on shorebirds and waterfowl	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-184: Effects on habitat and populations of common wildlife and plants	NAA	LTS (short-term)/ S (long-term)		LTS (short-term)/ S (long-term)	NA (short-term)/ A (long-term)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-185: Effect of BDCP Conservation Measures on wildlife corridors	NAA	LTS		LTS	NA
	1A, 2A, 3, 4, 5, 6A, 7, 8, 9	LTS		LTS	NA
	1B, 1C, 2B, 2C, 6B, 6C	S	No mitigation is available to address this impact	SU	A

Level of Significance/Determination of Effects:

CEQA

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S=significant
LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-186: Effects on natural communities resulting from the introduction and spread of invasive plant species	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
BIO-187: Compatibility of the proposed water conveyance facilities and other Conservation Measures with federal, state, or local laws, plans, policies, or executive orders addressing terrestrial biological resources in the study area	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
Land Use					
LU-1: Incompatibility with applicable land use designations, goals, and policies as a result of constructing the proposed water conveyance facility (CM1)	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
LU-2: Conflicts with existing land uses as a result of constructing the proposed water conveyance facility (CM1)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	A
LU-3: Create physical structures adjacent to and through a portion of an existing community as a result of constructing the proposed water conveyance facility (CM1)	1A, 1B, 1C, 2A, 2B, 2C, 4, 6A, 6B, 6C, 7, 8, 9	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments	SU	A
	NAA, 3, 5	LTS		LTS	NA
LU-4: Incompatibility with applicable land use designations, goals and policies as a result of implementing the proposed Conservation Measures 2–21	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
LU-5: Conflicts with existing land uses as a result of implementing the proposed Conservation Measures 2–21	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	A
LU-6: Create physical structures adjacent to and through a portion of an existing community as a result of implementing the proposed Conservation Measures 2–21	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE

Level of Significance/Determination of Effects:

CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Agricultural Resources					
AG-1: Temporary conversion, short-term conversion, and permanent conversion of Important Farmland or of farmland under Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility.	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones AG-1a: Promote agricultural productivity of Important Farmland to the extent feasible AG-1b: Minimize impacts on land subject to Williamson Act contracts or in Farmland Security Zones AG-1c: Consideration of an Optional Agricultural Land Stewardship Approach or Conventional Mitigation Approach	SU	A
AG-2: Other effects on agriculture as a result of constructing and operating the proposed water conveyance facility	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones GW-1: Maintain water supplies in areas affected by construction dewatering GW-5: Agricultural lands seepage minimization WQ-11: Avoid, minimize, or offset, as feasible, reduced water quality conditions	SU	A
AG-3: Temporary conversion, short-term conversion, and permanent conversion of Important Farmland or of land subject to Williamson Act contracts or in Farmland Security Zones as a result of implementing the proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	SU	A
AG-4: Other effects on agriculture as a result of implementing the proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones GW-5: Agricultural lands seepage minimization	SU	A
Recreation					
REC-1: Permanent displacement of existing well-established public use or private commercial recreation facility available for public access as a result of the location of the proposed water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	LTS		LTS	NA
	9	S	No mitigation available to address this impact	SU	A

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NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
REC-2: Result in long-term reduction of recreation opportunities and experiences as a result of constructing the proposed water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	REC-2: Provide alternative bank fishing access sites BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4a: Limit construction to daylight hours within 0.25 mile of residents AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program	SU/LTS[13]	A/NA[13]
REC-3: Result in long-term reduction of recreational navigation opportunities as a result of constructing the proposed water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	TRANS-1a: Implement site-specific construction traffic management plan	SU	A

[13] Impacts and effects on recreation from constructing the intakes would be LTS and NA, respectively, following mitigation.

Level of Significance/Determination of Effects:

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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
REC-4: Result in long-term reduction of recreational fishing opportunities as a result of constructing the proposed water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	REC-2: Provide alternative bank fishing access sites AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan	LTS	NA
REC-5: Result in long-term reduction of recreational fishing opportunities as a result of the operation of the proposed water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
REC-6: Cause a change in reservoir or lake elevations resulting in substantial reductions in water-based recreation opportunities and experiences at north- and south-of-Delta reservoirs	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
	4	LTS (for north-and south-of-Delta reservoirs for all operational scenarios except for San Luis Reservoir) S (for Scenarios H2 and H4 for San Luis Reservoir)	REC-6: Provide a temporary alternative boat launch to ensure access to San Luis Reservoir	LTS (for Scenarios H2 and H4 for San Luis Reservoir)	NA
REC-7: Result in long-term reduction in water-based recreation opportunities as a result of maintenance of the proposed water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
REC-8: Result in long-term reduction in land-based recreation opportunities as a result of maintenance of the proposed water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
REC-9: Result in long-term reduction in fishing opportunities as a result of implementing Conservation Measures 2–21	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
REC-10: Result in long-term reduction in boating-related recreation opportunities as a result of implementing Conservation Measures 2–21	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program	LTS	NA
REC-11: Result in long-term reduction in upland recreational opportunities as a result of implementing Conservation Measures 2–21	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
REC-12: Compatibility of the proposed water conveyance facilities and other conservation measures with federal, state, or local plans, policies, or regulations addressing recreation resources	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
Socioeconomics[14]					
ECON-1: Temporary effects on regional economics and employment in the Delta region during construction of the proposed water conveyance facilities.	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A

[14] Socioeconomic effects are not considered environmental impacts for the purposes of CEQA, but related physical impacts that could stem from such socioeconomic changes are addressed and evaluated throughout the BDCP EIR/EIS. As such, "NI" is indicated for each CEQA conclusion for this resource.

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CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
ECON-2: Effects on population and housing in the Delta region during construction of the proposed water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NA
ECON-3: Changes in community character as a result of constructing the proposed water conveyance facilities.	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	Various mitigation measures introduced in the following chapters: Chapter 14, *Agricultural* Resources; Chapter 15, *Recreation*; Chapter 17*, Aesthetics and Visual Resources*; Chapter 19. *Transportation*; and Chapter 23, *Noise*.	NI	A/B[15]
ECON-4: Changes in local government fiscal conditions as a result of constructing the proposed water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NA
ECON-5: Effects on recreational economics as a result of constructing the proposed water conveyance facilities.	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	Various mitigation measures introduced in the following chapters: Chapter 12, *Terrestrial Biological Resources;* Chapter 15, *Recreation*; Chapter 17*, Aesthetics and Visual Resources*; Chapter 19, *Transportation*; and Chapter 23, *Noise*.	NI	A
ECON-6: Effects on agricultural economics in the Delta region during construction of the proposed water conveyance facilities.	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-7: Permanent regional economic and employment effects in the Delta region during operation and maintenance of the proposed water conveyance facilities.	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-8: Permanent effects on population and housing in the Delta region during operation and maintenance of the proposed water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NA
ECON-9: Changes in community character during operation and maintenance of the proposed water conveyance facilities	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	Various mitigation measures introduced in the following chapters: Chapter 23, *Noise*; Chapter 17, *Aesthetics and Visual Resources*; Chapter 19, *Transportation*; Chapter 14, *Agricultural Resources*; Chapter 15, *Recreation*, and Chapter 30, *Growth Inducement and Other Indirect Effects.*	NI	A
ECON-10: Changes in local government fiscal conditions during operation and maintenance of the proposed water conveyance facilities.	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4,	NI		NI	A/B[16]

[15] While water conveyance construction could result in beneficial effects relating to the economic welfare of a community through additional regional employment and income, adverse social effects could also arise as a result of declining economic stability in communities closest to construction effects and in those most heavily influenced by agricultural and recreational activities.

[16] A decrease in revenue as a result property tax and assessment revenue forgone as a result of the proposed water conveyance facilities could result in the loss of a substantial share of some agencies' tax bases, which would be considered an adverse effect. However, the BDCP proponents would make arrangements to compensate local governments for the loss of property tax or assessment revenue for land used for constructing, locating, operating, or mitigating for new Delta water conveyance facilities. Additionally, operation and maintenance of the water conveyance facilities would be anticipated to result in a net increase of income and employment in the Delta region. This would also create an indirect beneficial effect through increased sales tax revenue for local government entities that rely on sales taxes.

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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
	5, 6A, 6B, 6C, 7, 8, 9				
ECON-11: Effects on recreational economics during operation and maintenance of the proposed water conveyance facilities	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	NI		NI	NA
	9	NI	REC-13a: Minimize congestion at passage facilities REC-13b: Implement boater information and education program on operation of barriers and boat passage facilities	NI	NA
ECON-12: Permanent effects on agricultural economics in the Delta region during operation and maintenance of the proposed water conveyance facilities.	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-13: Effects on the Delta region's economy and employment due to the implementation of the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones MIN-5: Design Conservation Measures 4, 5, and 10 to avoid displacement of active natural gas wells to the extent feasible	NI	A/B[17]
ECON-14: Effects on population and housing in the Delta region as a result of implementing the proposed Conservation Measures 2–22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NA
ECON-15: Changes in community character as a result of implementing the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	Various mitigation measures introduced in the following chapters: Chapter 14, *Agricultural Resources*; Chapter 15, Recreation; Chapter 17, *Aesthetics and Visual Resources*; Chapter 19, *Transportation*; and Chapter 23, *Noise.*	NI	A
ECON-16: Changes in local government fiscal conditions as a result of implementing the proposed Conservation Measures 2–22	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NA
ECON-17: Effects on recreational economics as a result of implementing the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	A/B[18]
ECON-18: Effects on agricultural economics in the Delta region as a result of implementing the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act	NI	A

[17] Implementation of CMs 2–22 would result in an increase in construction and operation and maintenance-related employment and labor income, which would be considered a beneficial effect. However, there may also be a resulting decrease in agricultural-related and natural gas production-related employment and labor income as a result of implementing these conservation measures, which would be considered an adverse effect.

[18] Adverse effects would be primarily limited to areas close to restoration areas and during site preparation and earthwork phases. These effects could result in a decline in visits to the Delta and reduction in recreation-related spending, creating an adverse economic effect throughout the Delta. Beneficial recreational effects would generally result during later stages of the BDCP permit period as CM2–CM22 are implemented and environmental conditions supporting recreational activities are enhanced. These effects could improve the quality of recreational experiences, leading to increased economic activities related to recreation, particularly in areas where conservation measure implementation would create new recreational opportunities.

Level of Significance/Determination of Effects:

CEQA			**NEPA**		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
			contracts or in Farmland Security Zones		
ECON-19: Socioeconomic effects in the south-of-Delta hydrologic regions	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 9	NI		NI	A/B[19]
	6A, 6B, 6C, 7, 8	NI		NI	A/B[20]
Aesthetics and Visual Resources					
AES-1: Substantial alteration in existing visual quality or character during construction of conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan	SU	A
	9	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible	SU	A

[19] In hydrologic regions where water deliveries are predicted to increase when compared with the No Action Alternative, more stable agricultural activities could support employment and economic production associated with agriculture. Where M&I deliveries increase, population growth could lead to general economic growth and support water-intensive industries. Such changes could also lead to shifts in the character of communities in the hydrologic regions with resultant beneficial or adverse effects. Likewise, growth associated with deliveries could require additional expenditures for local governments while also supporting increases in revenue.

[20] If operation of water conveyance facilities under Alternative 6A reduced M&I deliveries to the extent that it would, in the long run, constrain population growth, its implementation could reinforce a socioeconomic status quo or limit potential economic and employment growth in hydrologic regions. Such changes to agricultural production and population growth with its associated economic activity could also lead to shifts in the character of communities in the hydrologic regions with resultant beneficial or adverse effects. Likewise, limited growth associated with reduced deliveries could require lower expenditures for local governments while also leading to reduced revenue.

Level of Significance/Determination of Effects:

CEQA			**NEPA**		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AES-2: Permanent effects on a scenic vista from presence of conveyance facilities.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1e: Apply aesthetic design treatments to all structures to the extent feasible	SU	A
AES-3: Permanent damage to scenic resources along a state scenic highway from construction of conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1e: Apply aesthetic design treatments to all structures to the extent feasible	SU	A
	9	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-3: Design and implement an overlook with interpretative signage at the operable barrier on Threemile Slough Near Brannan Island State Recreation Area	SU	A
AES-4: Creation of a new source of light or glare that would adversely affect views in the area as a result of construction and operation of conveyance facilities.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AES-4a: Limit construction to daylight hours within 0.25 mile of residents AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences	SU	A
AES-5: Substantial alteration in existing visual quality or character during operation.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AES-6: Substantial alteration in existing visual quality or character during construction of CM2–CM22.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4a: Limit construction to daylight hours within 0.25 mile of residents AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences AES-6a: Underground new or relocated utility lines where feasible AES-6b: Develop and implement an afterhours low-intensity and lights off policy AES-6c: Implement a comprehensive visual resources management plan for the Delta and study area	SU	A
AES-7: Compatibility of the proposed water conveyance facilities and other conservation measures with federal, state, or local plans, policies, or regulations addressing aesthetics and visual resources	NAA	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
Cultural Resources					
CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities	NAA	S		SU	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites	SU	A
CUL-2: Effects on archaeological sites to be identified through future inventory efforts	NAA	S		SU	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources	SU	A
CUL-3: Effects on archaeological sites that may not be identified through inventory efforts	NAA	S		SU	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring	SU	A
CUL-4: Effects on buried human remains damaged during construction	NAA	S		SU	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction	SU	A

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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities	NAA	S		SU	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	CUL-5: Consult with relevant parties, prepare and implement a built environment treatment plan	SU	A
CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities	NAA	S		SU	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and develop treatment to resolve or mitigate adverse impacts	SU	A
CUL-7: Effects of other Conservation Measures on cultural resources	NAA	S		SU	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with implementation of Conservation Measures 2–22	SU	A
CUL-8: Compatibility of the proposed water conveyance facilities and other Conservation Measures with plans and policies	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
Transportation					
TRANS-1: Increased construction vehicle trips resulting in unacceptable LOS conditions	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments	SU[21]	A[21]
TRANS-2: Increased construction vehicle trips exacerbating unacceptable pavement conditions	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	TRANS-2a: Prohibit construction activity on physically deficient roadway segments TRANS-2b: Limit construction activity on physically deficient roadway segments TRANS-2c: Improve physical condition of affected roadway segments as stipulated in mitigation agreements or encroachment permits	SU[22]	A[22]
TRANS-3: Increase in safety hazards, including interference with emergency routes during	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4,	S	TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of	SU[23]	A[23]

[21] Although Mitigation MeasuresTRANS-1a through TRANS-1c would reduce the severity of this impact/effect, the BDCP proponents are not solely responsible for the timing, nature, or complete funding of required improvements. If an improvement that is identified in any mitigation agreement(s) contemplated by Mitigation Measure TRANS-1c is not fully funded and constructed before the project's contribution to the impact/effect is made, a significant impact, or an adverse effect, in the form of unacceptable LOS would occur. Therefore, this impact/effect would be significant and unavoidable and adverse, respectively. If, however, all improvements required to avoid significant impacts and adverse effects prove to be feasible and any necessary agreements are completed before the project's contribution to the effect is made, impacts would be less than significant and effects would not be adverse.

[22] Mitigation Measures TRANS-2a through TRANS-2c are available to reduce this effect/impact, but not necessarily to a level that would not be adverse/less than significant, as the BDCP proponents cannot ensure that the agreements or encroachment permits will be obtained from the relevant transportation agencies. If an agreement or encroachment permit is not obtained, an adverse/significant effect/impact in the form of deficient pavement conditions would occur. Accordingly, this effect/impact could remain adverse/significant. If, however, mitigation agreement(s) or encroachment permit(s) providing for the improvement or replacement of pavement are obtained and any other necessary agreements are completed, adverse/significant effects/impacts could be avoided.

[23] Mitigation Measure TRANS-1c will reduce the severity of this impact, the BDCP proponents cannot ensure that the improvements will be fully funded or constructed prior to the project's contribution to the impact. If an improvement identified in the mitigation agreement(s) is not fully funded and constructed before the project's contribution to the impact/effect is made, a significant impact or an adverse effect in the form of increased safety hazards would occur. Accordingly, this effect would be significant and unavoidable and adverse, respectively. If, however, all improvements required to avoid significant impacts prove to be feasible and any necessary agreements are completed before the project's contribution to the effect is made, impacts would be less than significant and effects would not be adverse.

Level of Significance/Determination of Effects:

CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
construction	5, 6A, 6B, 6C, 7, 8, 9		congested roadway segments		
TRANS-4: Disruption of marine traffic during construction	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
TRANS-5: Disruption of rail traffic during construction.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
TRANS-6: Disruption of transit service during construction.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments	SU	A
	9	S	TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
TRANS-7: Interference with bicycle routes during construction.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
TRANS-8: Increased traffic volumes and delays during operations and maintenance.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
TRANS-9: Permanent alteration of transportation patterns during operations and maintenance.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
TRANS-10: Increased traffic volumes during implementation of CM2–CM22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments	SU[24], [25]	A[24, 25]
TRANS-11: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE

[24] The impact and effect of increased traffic volumes during implementation of CM2–CM22 would be significant and adverse, respectively. Mitigation Measures TRANS-1a through TRANS-1c would reduce the severity of this effect/impact, but it would still remain adverse/significant and unavoidable. Therefore, the project's impacts to roadway segment LOS would be conservatively adverse/significant and unavoidable. If, however, all improvements required to avoid adverse/significant effects/impacts prove to be feasible and any necessary agreements are completed before the project's contribution to the effect/impact is made, effects/impacts would be not adverse/less than significant.

[25] Although TRANS-1a through TRANS-1c would reduce the severity of this impact and effect, the BDCP proponents are not solely responsible for the timing, nature, or complete funding of required improvements. If an improvement that is identified in any mitigation agreement(s) contemplated by Mitigation Measure TRANS-1c is not fully funded and constructed before the project's contribution to the impact and effect is made, a significant impact, or an adverse, in the form of unacceptable roadway segment LOS would occur. Therefore, this impact and effect would be significant and unavoidable and adverse, respectively. If, however, all improvements required to avoid significant impacts and adverse effects prove to be feasible and any necessary agreements are completed before the project's contribution to the effect is made, the impact would be less than significant and the effect would not be adverse.

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Public Services and Utilities					
UT-1: Increased demand on law enforcement, fire protection, and emergency response services from new workers in the Plan Area as a result of constructing the proposed water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
UT-2: Displacement of public service facilities as a result of constructing the proposed water conveyance facilities.	1A, 1B, 2A, 2B, 6A, 6B, 7, 8	S	UT-2: Ensure the continuation of fire protection services by the Courtland Fire Protection District	SU[26]	A[26]
	NAA, 1C, 2C, 3, 4, 5, 6C, 9	LTS		LTS	NA
UT-3: Effects on public schools as a result of constructing the proposed water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
UT-4: Effects on water or wastewater treatment services and facilities as a result of constructing the proposed water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
UT-5: Effects on landfills as a result of solid waste disposal needs during construction of the proposed water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
UT-6: Effects on regional or local utilities as a result of constructing the proposed water conveyance facilities.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	UT-6a: Verify locations of utility infrastructure UT-6b: Relocate utility infrastructure in a way that avoids or minimizes any effect on operational reliability UT-6c: Relocate utility infrastructure in a way that avoids or minimizes any effect on worker and public health and safety	SU[27]	A[27]
UT-7: Effects on public services and utilities as a result of operation and maintenance of the proposed water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
UT-8: Effects on public services and utilities as a result of implementing the proposed CM2–CM11	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	UT-6a: Verify locations of utility infrastructure UT-6b: Relocate utility infrastructure in a way that avoids or minimizes any effect on operational reliability UT-6c: Relocate utility infrastructure in a way that avoids or minimizes any effect on worker and public health and safety	SU	NA

[26] Implementation of these alternatives would conflict with the Courtland Fire Protection District's Hood Fire Station and could require relocation of Hood Fire Station, resulting in environmental impacts and effects. Mitigation Measure UT-2 would be available to lessen the severity of those impacts and effects. However, it would require the construction of a replacement facility, which could result in significant impacts and adverse effects. If coordination were successful, environmental commitments and mitigation measures would be adopted by the Courtland Fire District and Sacramento County, and the impact would be less than significant, and the effect would not be adverse.

[27] If coordination with all appropriate utility providers and local agencies to integrate with other construction projects and minimize disturbance to communities were successful under Mitigation Measure UT-6b, the impact would be less than significant (CEQA) and there would be no adverse effect (NEPA).

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
Energy					
ENG-1: Wasteful or inefficient energy use for temporary construction activities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
ENG-2: Wasteful or inefficient energy use for pumping and conveyance	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
ENG-3: Compatibility of the proposed water conveyance facilities and CM2–CM22 with plans and policies	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
Air Quality and Greenhouse Gases					
AQ-1: Generation of criteria pollutants in excess of the YSAQMD thresholds during construction of the proposed water conveyance facility.	NAA	S		S	A
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8, 9	LTS		LTS	NA
	1C, 2C, 6C	S (for ROG, NO_X, and PM10)	AQ-2a: Mitigate and offset construction-generated criteria pollutant emissions within the SMAQMD/SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where Applicable) and to quantities below applicable SMAQMD CEQA thresholds for other pollutants AQ-2b: Develop an alternative or complementary offsite mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SMAQMD/SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where applicable) and to quantities below applicable SMAQMD CEQA thresholds for other pollutants	SU (for ROG, NO_X, and PM10)	A (for ROG, NO_X, and PM10)
AQ-2: Generation of criteria pollutants in excess of the SMAQMD thresholds during construction of the proposed water conveyance facility.	NAA	S		S	A
	1A, 1B, 2A, 2B, 3, 5, 6A, 6B, 7, 8	S (for NO_X, PM10, and PM2.5)	No feasible measures beyond the identified environmental commitments would be available to reduce fugitive dust emissions for Alternatives 1A—3 and 5—9. AQ-2a: Mitigate and offset construction-generated criteria pollutant emissions within the SMAQMD/SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where Applicable) and to quantities below applicable SMAQMD CEQA thresholds for other pollutants AQ-2b: Develop an alternative or complementary offsite mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SMAQMD/SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where applicable) and to quantities below applicable SMAQMD CEQA thresholds for other pollutants AQ-2c: Relocate sensitive receptors to avoid excess health threats from exposure to particulate matter	LTS (NO_X) SU(PM10, PM2.5)	NA (NO_X) A (PM10, PM2.5)
	4	S (for NO_X, PM10, PM2.5)		LTS (for NO_X, PM10, PM2.5)	NA (for NO_X, PM10, PM2.5)
	1C, 2C, 6C, 9	S (for NO_X, PM10, and PM2.5)		SU (for NO_X, PM10, and PM2.5)[28]	A (for NO_X, PM10, and PM2.5)

[28] Mitigation Measure AQ-2c would be implemented for Alternative 4. However, the BDCP proponents cannot ensure that the affected landowners will accept DWR's offer for relocation assistance. If the landowners choose not to accept DWR's offer of relocation assistance, a significant impact in the form of exposure to substantial PM concentrations would occur at the two receptor locations near Twin Cities Road. Therefore, this impact would be significant and unavoidable. If, however, the landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Level of Significance/Determination of Effects:

CEQA			NEPA		
SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)	LTS=less than significant	B=beneficial	A=adverse	NE=no effect	ND=no determination
S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
AQ-3: Generation of criteria pollutants in excess of the BAAQMD thresholds during construction of the proposed water conveyance facility.	NAA	S		S	A
	1A, 2A, 3, 4, 5, 6A, 7, 8	S (for ROG and NO_X)	AQ-3a: Mitigate and offset construction-generated criteria pollutant emissions within BAAQMD/SFBAAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable BAAQMD CEQA thresholds for other pollutants AQ-3b: Develop an alternative or complementary off-site mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the BAAQMD/SFBAAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable BAAQMD CEQA thresholds for other pollutants	LTS (for ROG and NO_X)	NA (for ROG and NO_X)
	1B, 2B, 6B, 9	S (for NO_X)		LTS (for NO_X)	NA (for NO_X)
	1C, 2C, 6C	S (for ROG and NO_X)		SU (for ROG and NO_X)	A (for ROG and NO_X)
AQ-4: Generation of criteria pollutants in excess of the SJVAPCD thresholds during construction of the proposed water conveyance facility.	NAA	S		S	A
	1A, 2A, 3, 4, 5, 6A, 6B, 7, 8	S (for NO_X)	AQ-4a: Mitigate and offset construction-generated criteria pollutant emissions within SJVAPCD/SJVAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SJVAPCD CEQA thresholds for other pollutants AQ-4b: Develop an alternative or complementary off-site mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SJVAPCD/SJVAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SJVAPCD CEQA thresholds for other pollutants	LTS (for NO_X)	NA (for NO_X)
	9	S (for ROG and NO_X)		LTS (for ROG and NO_X)	NA (for ROG and NO_X)
	1B, 2B, 6B	S (for ROG, NO_X and PM10)		LTS (for ROG, NO_X and PM10)	NA (for ROG, NO_X and PM10)
	1C, 2C, 6C	LTS		LTS (for ROG, NO_X and PM10)	NA (for ROG, NO_X and PM10)
AQ-5: Generation of criteria pollutants in excess of the YSAQMD thresholds from operation and maintenance of the proposed water conveyance facility.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-6: Generation of criteria pollutants in excess of the SMAQMD thresholds from operation and maintenance of the proposed water conveyance facility.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-7: Generation of criteria pollutants in excess of the BAAQMD thresholds from operation and maintenance of the proposed water conveyance facility.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-8: Generation of criteria pollutants in excess of the SJVAPCD thresholds from operation and maintenance of the proposed water conveyance facility.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA

SU=significant and unavoidable (any mitigation not sufficient to render impact less than significant)
S=significant
LTS=less than significant
NI=no impact
B=beneficial
ND=no determination

NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
AQ-9: Generation of criteria pollutants in the excess of federal *de minimis* thresholds from construction and operation and maintenance of the proposed water conveyance facility.	NAA	S		S	A
	1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, 8	S (for NO_X)	AQ-2a: Mitigate and offset construction-generated criteria pollutant emissions within the SMAQMD/SFNA to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SMAQMD CEQA thresholds for other pollutants AQ-2b: Develop an alternative or complementary offsite mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SMAQMD/SFNA to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SMAQMD CEQA thresholds for other pollutants AQ-3a: Mitigate and offset construction-generated criteria pollutant emissions within BAAQMD/SFBAAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable BAAQMD CEQA thresholds for other pollutants AQ-3b: Develop an alternative or complementary off-site mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the BAAQMD/SFBAAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable BAAQMD CEQA thresholds for other pollutants AQ-4a: Mitigate and offset construction-generated criteria pollutant emissions within SJVAPCD/SJVAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SJVAPCD CEQA thresholds for other pollutants AQ-4b: Develop an alternative or complementary offsite mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SJVAPCD/SJVAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SJVAPCD CEQA thresholds for other pollutants	LTS (for NO_X)	NA (for NO_X)
	9	S (for NO_X)		SU (for NO_X)	A (for NO_X)
	1B, 2B, 6B	S (for ROG, NO_X, CO)		LTS (ROG and NO_X) SU (CO)	NA (ROG and NO_X) A (CO)
	1C, 2C, 6C	S (for ROG, NO_X, CO)		SU (for ROG, NO_X, CO)	A (for ROG, NO_X, CO)
AQ-10: Exposure of sensitive receptors to health threats in excess of YSAQMD's health-risk assessment thresholds	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-11: Exposure of sensitive receptors to health threats in excess of SMAQMD's health-risk assessment thresholds	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	LTS		LTS	NA
	9	S (cancer risk)	No feasible mitigation to address this impact	SU (cancer risk)	A (cancer risk)
AQ-12: Exposure of sensitive receptors to health threats in excess of SJVAPCD's health-risk assessment thresholds	NAA	S		S	A
	1A, 1C, 2A, 2C, 3, 5, 6A, 6C, 7, 8, 9	LTS		LTS	NA
	1B, 2B, 4, 6B	S (PM2.5)	AQ-12: Increase distance between batch plant and sensitive receptors	LTS (PM2.5)	NA (PM2.5)

Level of Significance/Determination of Effects:

CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQ-13: Exposure of sensitive receptors to health threats in excess of BAAQMD's health-risk assessment thresholds	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
	4	S (cancer risk)	AQ-13: Relocate sensitive receptors to avoid excess cancer risk from exposure to diesel particulate matter	SU[29] (cancer risk)	A (cancer risk)
AQ-14: Creation of potential odors affecting a substantial number of people during construction of the proposed water conveyance facility	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-15: Generation of cumulative greenhouse gas emissions during construction of the proposed water conveyance facility	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AQ-15: Develop and implement a GHG mitigation program to reduce construction related GHG emissions to net zero (0)	LTS	NA
AQ-16: Generation of cumulative greenhouse gas emissions from operation and maintenance of the proposed water conveyance facility and increased pumping	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-17: Generation of cumulative greenhouse gas emissions from increased CVP pumping as a result of implementation of CM1	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5	S	No feasible mitigation to address this impact	SU	A
	NAA, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-18: Generation of criteria pollutants from implementation of CM2–CM11	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to ensure air district regulations and recommended mitigation are incorporated into future conservation measures and associated project activities.	SU	A
AQ-19: Generation of cumulative greenhouse gas emissions from implementation of CM2–CM11	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to ensure air district regulations and recommended mitigation are incorporated into future conservation measures and associated project activities. AQ-19 Prepare a land use sequestration analysis to quantify and mitigate (as needed) GHG flux associated with conservation measures and associated project activities	SU	A
Noise					
NOI-1: Exposure of noise-sensitive land uses to noise from construction of water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	NOI-1a: Employ noise-reducing construction practices during construction, NOI-1b: Prior to construction, initiate a complaint/response tracking program	SU	A

[29] The BDCP proponents cannot ensure that the affected landowner will accept DWR's offer for relocation assistance. If the landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form of exposure to excess cancer risk would occur at the receptor location adjacent to Byron Highway. Therefore, this impact would be significant and unavoidable. If, however, the landowner accepts DWR's offer of relocation assistance, the impact would be less than significant.

Level of Significance/Determination of Effects:

CEQA			NEPA		
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
NOI-2: Exposure of sensitive receptors to vibration or groundborne noise from construction of water conveyance facilities	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	NOI-2: Employ vibration-reducing construction practices during construction of water conveyance facilities	SU	A
	NAA, 9	LTS		LTS	NA
NOI-3: Exposure of noise-sensitive land uses to noise from operation of water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	NOI-3: Design and construct intake facilities and other pump facilities such that operational noise does not exceed 50 dBA (one-hour L_{eq}) during daytime hours (7:00 a.m. to 10:00 p.m.) or 45 dBA (one-hour L_{eq}) during nighttime hours (10:00 p.m. to 7:00 a.m.) or the applicable local noise standard (whichever is less) at nearby noise sensitive land uses	LTS	NA
NOI-4: Exposure of noise-sensitive land uses to noise from implementation of proposed Conservation Measures 2–10	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program	SU	A
Hazards and Hazardous Materials					
HAZ-1: Create a substantial hazard to the public or the environment through the release of hazardous materials or by other means during construction of the water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	HAZ-1a: Perform preconstruction surveys, including soil and groundwater testing, at known or suspected contaminated areas within the construction footprint, and remediate and/or contain contamination HAZ-1b: Perform pre-demolition surveys for structures to be demolished within the construction footprint, characterize hazardous materials and dispose of them in accordance with applicable regulations UT-6a: Verify locations of utility infrastructure UT-6c: Relocate utility infrastructure in a way that avoids or minimizes any effect on worker and public health and safety TRANS-1a: Implement site-specific construction traffic management plan	LTS	NE
HAZ-2: Expose sensitive receptors located within 0.25 miles of a construction site to hazardous materials, substances, or waste during construction of the water conveyance facilities	1A, 2A, 3, 5, 6A, 7, 8	NI		NI	NE
	NAA, 1B, 1C, 2B, 2C, 4, 6B, 6C, 9	LTS		LTS	NA
HAZ-3: Potential to conflict with a known hazardous materials site and, as a result, create a significant hazard to the public or the environment	NAA, 1C, 2C, 6C	LTS		LTS	NA
	1A, 2A, 3, 4, 5, 6A, 7, 8	NI		NI	NE
	1B, 2B, 6B, 9	S	HAZ-1a: Perform preconstruction surveys, including soil and groundwater testing, at known or suspected contaminated areas within the construction footprint, and remediate and/or contain contamination	LTS	NA
HAZ-4: Result in a safety hazard associated with an airport or private airstrip within 2 miles of the water conveyance facilities footprint for people residing or working in the study area during construction of the water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
HAZ-5: Expose people or structures to a substantial risk of property loss, personal injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands, as a result of construction, and operation and maintenance of the water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
HAZ-6: Create a substantial hazard to the public or the environment through the release of hazardous materials or by other means during operation and maintenance of the water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	HAZ-6: Test dewatered solids from solids lagoons prior to reuse and/or disposal	LTS	NA
HAZ-7: Create a substantial hazard to the public or the environment through the release of hazardous materials or by other means as a result of implementing Conservation Measures CM2–CM11, CM13, CM14, CM16 and CM18	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	HAZ-1a: Perform preconstruction surveys, including soil and groundwater testing, at known or suspected contaminated areas within the construction footprint, and remediate and/or contain contamination HAZ-1b: Perform pre-demolition surveys for structures to be demolished within the construction footprint, characterize hazardous materials and dispose of them in accordance with applicable federal, state and local regulations UT-6a: Verify locations of utility infrastructure UT-6c: Relocate utility infrastructure in a way that avoids or minimizes any effect on worker and public health and safety TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
HAZ-8: Increased risk of bird – aircraft strikes during implementation of conservation components that create or improve wildlife habitat	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	HAZ-8: Consult with individual airports and USFWS, and relevant regulatory agencies	SU	A
Public Health					
PH-1: Increase in vector-borne diseases as a result of construction and operation of the intakes, solids lagoons, and/or sediment basins associated with the water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
PH-2: Exceedances of water quality criteria for constituents of concern such that there is an adverse effect on public health as a result of operation of the water conveyance facilities.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5	S	WQ-5: Avoid, minimize, or offset, as feasible, adverse water quality conditions	SU[30]	A[31]
	6A, 6B, 6C, 7, 8, 9	S	WQ-5: Avoid, minimize, or offset, as feasible, adverse water quality conditions WQ-17: Consult with Delta water purveyors to identify means to avoid, minimize, or offset increases in long-term average DOC concentrations	SU[31]	A[31]

[30] This impact/effect would be less than significant/not adverse if all financial contributions, technical contributions, or partnerships required to avoid significant impacts prove feasible and any necessary agreements are completed before the project's contribution to the effect.

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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
PH-3: Substantial mobilization or increase in constituents known to bioaccumulate as a result of construction, operation or maintenance of the water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
PH-4: Expose substantially more people to transmission lines generating new sources of EMFs as a result of the operation of the water conveyance facilities.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
PH-5: Increase in vector-borne diseases as a result of implementing CM2–CM7, CM10, and CM11	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
PH-6: Substantial increase in recreationists' exposure to pathogens as a result of implementing the restoration conservation measures	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
PH-7: Substantial mobilization of or increase in constituents known to bioaccumulate as a result of implementing CM2, CM4, CM5, and CM10	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
Mineral Resources					
MIN-1: Loss of availability of locally important natural gas wells as a result of constructing the water conveyance facilities	NAA	LTS		LTS	NA
	4, 9	NI		NI	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8	LTS		LTS	NA
MIN-2: Loss of availability of extraction potential from natural gas fields as a result of constructing the water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
MIN-3: Loss of availability of locally important natural gas wells as a result of operation and maintenance of the water conveyance facilities	1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7	NI		NI	NA
	NAA, 1B, 2B, 6B	LTS		LTS	NA
	8, 9	NI		NI	NE
MIN-4: Loss of availability of natural gas fields as a result of operation and maintenance of the water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	NI		NI	NA
	9	NI		NI	NE
MIN-5: Loss of availability of locally important natural gas wells as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	MIN-5: Design Conservation Measures 4, 5, and 10 to avoid displacement of active natural gas wells to the extent feasible	SU	A

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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	

Potential Impact	Alternatives	Impact Conclusions Before Mitigation: CEQA	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation: CEQA	Impact After Mitigation: NEPA
MIN-6: Loss of availability of extraction potential from natural gas fields as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	MIN-6: Design Conservation Measures 4, 5, and 10 to maintain drilling access to natural gas fields to the extent feasible	SU	A
MIN-7: Loss of availability of locally important aggregate resource sites (mines and MRZs) as a result of constructing the water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
MIN-8: Loss of availability of known aggregate resources as a result of constructing the proposed water conveyance facilities	NAA. 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
MIN-9: Loss of availability of locally important aggregate resource sites (mines and MRZs) as a result of operation and maintenance of the water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	NI		NI	NE
MIN-10: Loss of availability of known aggregate resources as a result of operation and maintenance of the water conveyance facilities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
MIN-11: Loss of availability of locally important aggregate resource sites (mines and MRZs) as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	MIN-11: Purchase affected aggregate materials for use in BDCP construction	LTS	A
MIN-12: Loss of availability of known aggregate resources as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
Paleontological Resources					
PALEO-1: Destruction of unique or significant paleontological resources as a result of construction of water conveyance facilities.	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8	S	PALEO-1a: Prepare a monitoring and mitigation plan for paleontological resources PALEO-1b: Review 90% design submittal and develop specific language identifying how the mitigation measures will be implemented along the alignment PALEO-1c: Educate construction personnel in recognizing fossil material PALEO-1d: Collect and preserve substantial potentially unique or significant fossil remains when encountered	SU	A
	9	S	PALEO-1a: Prepare a monitoring and mitigation plan for paleontological resources PALEO-1b: Review 90% design submittal and develop specific language identifying how the mitigation measures will be implemented along the alignment PALEO-1c: Educate construction personnel in recognizing fossil material PALEO-1d: Collect and preserve substantial potentially unique or significant fossil remains when encountered	LTS	NA

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NEPA

A=adverse
NA=not adverse
NE=no effect
B=beneficial
ND=no determination

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
PALEO-2: Destruction of unique or significant paleontological resources associated with the implementation of other conservation measures.	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	PALEO-1a: Prepare a monitoring and mitigation plan for paleontological resources PALEO-1b: Review 90% design submittal and develop specific language identifying how the mitigation measures will be implemented along the alignment PALEO-1c: Educate construction personnel in recognizing fossil material PALEO-1d: Collect and preserve substantial potentially unique or significant fossil remains when encountered	LTS	NA

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CEQA			NEPA		
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S=significant	NI=no impact	ND=no determination	NA=not adverse	B=beneficial	