Chapter 1
Executive Summary

1.1 Introduction

The State Water Resource Control Board's (State Water Board or Board) mission is to preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use for the benefit of present and future generations. The State Water Board and Regional Water Quality Control Boards (collectively Water Boards) prepare water quality control plans, or basin plans, to protect beneficial uses of water in the state pursuant to state and federal law. The State Water Board is responsible for adopting and updating the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan or Plan) to protect beneficial uses of water in the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) watershed related to water diversions and operations. The Bay-Delta Plan identifies beneficial uses of water to be protected in the Bay-Delta watershed; narrative and numeric, including flow and salinity, water quality objectives for the reasonable protection of those beneficial uses; a program of implementation to achieve the objectives; and monitoring, evaluation, and special study provisions to evaluate and inform planning and implementation.

The Bay-Delta watershed[1] is an integral part of California's environment, economy, and way of life. Protecting the Bay-Delta watershed and its many beneficial uses of water is one of the State Water Board's primary responsibilities and top priorities. In response to declines of several native aquatic species since the Bay-Delta Plan was last comprehensively updated, the State Water Board is in the process of updating and implementing the Bay-Delta Plan to provide for the reasonable protection of native fish and wildlife. In response to comments from California Native American tribes within the watershed, the State Water Board is considering incorporation of tribal and subsistence beneficial uses of water that are related to the existing fish and wildlife beneficial uses.

In December 2018, the State Water Board adopted Bay-Delta Plan amendments focused on flows in the Lower San Joaquin River and its three major tributaries (the Stanislaus, Tuolumne, and Merced Rivers) for the protection of fish and wildlife. In addition, the 2018 Bay-Delta Plan amendments included a new salinity objective for the reasonable protection of agricultural uses in the southern Delta. In 2022, the State Water Board issued a Notice of Preparation (NOP) for a proposed regulation to implement the Lower San Joaquin River/Southern Delta updates to the Bay-Delta Plan. Separately, the State Water Board is also considering possible updates that would be needed for a proposed Voluntary Agreement (VA) for the Tuolumne River. In April 2023, an NOP was issued for preparation of a draft Staff Report/Substitute Environmental Document needed to support possible amendments to the Bay-Delta Plan to incorporate the proposed Tuolumne River VA.

[1] A watershed, also called a *drainage basin* or *catchment*, is a land area that channels rainfall and snowmelt to creeks, streams, and rivers and eventually to outflow points such as reservoirs, bays, and the ocean. The size of a watershed can be appropriately defined on several scales (NOAA 2023). For example, the Delta watershed is fed by both the Sacramento and San Joaquin Rivers, two watersheds that are highly distinct in terms of precipitation, sources of snowmelt, and other features.

This draft Staff Report/Substitute Environmental Document (draft Staff Report) was prepared in support of consideration of updates to the Bay-Delta Plan focused on the reasonable protection of fish and wildlife in the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne Rivers), and Delta (referred to as the *Sacramento/Delta watershed*). This effort is referred to as the *Sacramento/Delta update to the Bay-Delta Plan*. This draft Staff Report provides scientific information to support possible updates and information on the potential benefits and environmental, economic, and other impacts and associated mitigation measures for possible alternatives for updating the Sacramento/Delta portions of the Bay-Delta Plan. The draft Staff Report assesses a range of alternatives that may be considered for adoption by the State Water Board. Alternatives include several stand-alone alternatives that are based on flow scenarios evaluated in the State Water Board's 2017 Scientific Basis Report for potential Sacramento/Delta updates to the Bay-Delta Plan (*Scientific Basis Report in Support of New and Modified Requirements for Inflows from the Sacramento River and Its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows* (Scientific Basis Report) (Appendix B), as well as a proposed stand-alone voluntary agreements alternative, and several modular alternatives that would add to or modify the stand-alone alternatives. The draft Staff Report includes an alternative that is referred to as the proposed Plan amendments that is based on the State Water Board's 2018 Framework for a possible Sacramento/Delta Update to the Bay-Delta Plan (2018 Framework) (^SWRCB 2018) that was identified prior to the VAs proposal. While the draft Staff Report identifies proposed Plan amendments, the State Water Board has not yet made a decision on how to move forward with the Sacramento/Delta update to the Bay-Delta Plan, and all alternatives described in the draft Staff Report are available for consideration and adoption during the public planning process.

This draft Staff Report provides a description of the possible changes to the Bay-Delta Plan for each alternative. However, the specific changes to the Bay-Delta Plan, and specifically the program of implementation, have not been developed yet. Those changes will be developed based on public comments on this draft Staff Report and other information, and the draft changes will be subject to public review and comment, anticipated to occur in early to mid-2024.

The 2018 Framework identified the following possible changes to the Bay-Delta Plan that are reflected in the proposed Plan amendments.

(1) Narrative and numeric inflows from the Sacramento River, its tributaries, and Delta eastside tributaries (the Cosumnes, Mokelumne, and Calaveras Rivers) that would require 55 percent unimpaired flow, with an adaptive range from 45 percent to 65 percent unimpaired flow to support salmonids and other native species within streams and contribute to Delta outflows (see below). Unimpaired flow is the flow that would occur without water diversions with existing channel configurations and is an indication of the amount of water available within a stream system to support all the uses for water within that system, including water diversions for agricultural, municipal, and other uses, and instream flow purposes.

(2) Narrative and numeric inflow-based Delta outflows that would require inflows required as part of the Bay-Delta Plan, including from the Sacramento/Delta tributaries and San Joaquin River and tributaries, to be provided as Delta outflow to support species migrating through and residing in the Delta. Delta outflows also support salinity control for agricultural and municipal uses.

(3) Narrative cold water habitat provisions that would require reservoirs to be operated in a manner that provides needed cold water habitat for salmonids or other measures to provide cold water habitat.

(4) Narrative and numeric interior Delta flows to reasonably protect native fish populations migrating through and rearing in the Delta from impacts related to Delta water export facilities, including exports constraints, Old and Middle River reverse flow constraints, and additional Delta Cross Channel gate closure requirements.

(5) Monitoring, reporting, and evaluation measures and other provisions.

Additional details and discussion of the proposed Plan amendments are provided in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*. The narrative and numeric objectives would apply to surface waterbodies in the Sacramento/Delta watershed (Figure 1-1a). Major tributaries in the Sacramento/Delta are labeled on Figure 1-1a and are described in detail in Chapter 2, *Hydrology and Water Supply*.

In addition to the proposed Plan amendments, as discussed above, the State Water Board is considering the proposed VAs as another possible pathway for updating and implementing the Bay-Delta Plan. On March 29, 2022, the State Water Board received *a Memorandum of Understanding Advancing a Term Sheet for the Voluntary Agreements to Update and Implement the Bay-Delta Water Quality Control Plan, and Other Related Actions* (MOU; hereafter referred to as the *VA Term Sheet*) (^Voluntary Agreements Parties 2022). The VA Term Sheet included signatories from state and federal agencies, local water agencies, private companies, and a non-profit mutual benefit corporation (collectively referred to in the VA documents as *Parties*, *public water agencies*, or *PWAs*). The Parties submitted the VAs as a proposed alternative for updating the Bay-Delta Plan to achieve reasonable protection of fish and wildlife beneficial uses in the tributaries covered by the VAs (VA tributaries). The State Water Board received updates to the VA Term Sheet in August 2022 and in November 2022 to include additional parties.

The proposed VAs include a combination of proposed habitat restoration through flow and non-flow measures on a portion of the Sacramento/Delta tributaries over 8 years (with the intent to extend the term), including varying amounts of increased flows, depending on water year type, and non-flow habitat restoration actions targeted at improving spawning and rearing capacity for juvenile salmonids, estuarine species, and other native fish and wildlife. The flow and non-flow habitat actions are proposed as implementation measures for an existing and proposed new water quality objective in the Bay-Delta Plan. Specifically, the VAs propose (1) a new narrative objective to achieve the viability of native fish populations; and (2) to provide the participating parties' share, during implementation of the VAs, to contribute to achieving the existing Narrative Salmon Protection Objective by 2050. The proposed VAs also identify the development of governance and science programs to direct flows and habitat restoration, conduct assessments, and develop strategic plans and annual reports.

The proposed VAs identify that there will be a regulatory pathway that would exist in parallel with the VA implementation pathway. The regulatory pathway proposed as part of the VA alternative would apply to non-VA Parties and could apply to VA Parties in the event that the VAs are discontinued. The proposed regulatory pathway is largely consistent with the proposed Plan amendments except that instead of being included in the water quality objectives, the inflow, inflow-based Delta outflow, and cold water habitat provisions of the proposed Plan amendments would be

included in the program of implementation and could become applicable in the future if the VAs are not continued.

Other alternatives are described below under Section 1.4.4, *Alternatives Considered*. The proposed Plan amendments, proposed VAs, and additional alternatives are intended to inform the State Water Board and the public on a range of possible actions and approaches that could be adopted to update the Bay-Delta Plan. The State Water Board is considering the proposed VAs as a possible path forward for updating the Bay-Delta Plan upon finalization of additional components of the proposed VAs, including proposed program of implementation language for the Bay-Delta Plan, that are currently under development. Public input on the draft Staff Report and peer review of the *Final Draft Scientific Basis Report Supplement in Support of Proposed Voluntary Agreements for the Sacramento River, Delta, and Tributaries Update to the San Francisco Bay/Sacramento-San Joaquin Delta Water Quality Control Plan* (Final Draft Scientific Basis Report Supplement) (Appendix G2) will also inform the Board's consideration of the proposed VAs. The Board will conduct a full public review process before considering whether to incorporate any VAs into the Bay-Delta Plan update.

In addition to the potential changes to the objectives and implementation measures discussed elsewhere in this draft Staff Report, the State Water Board is considering incorporation of tribal and subsistence beneficial uses (TBUs)[2] to the Bay-Delta Plan in the context of its Plan update for the reasonable protection of fish and wildlife. The State Water Board adopted definitions in 2017, which are Tribal Subsistence Fishing (T-SUB), Tribal Tradition and Culture (CUL), and Subsistence Fishing (SUB).

As discussed above, after considering the comments received on this draft Staff Report, State Water Board staff will develop and circulate draft regulatory text proposed Sacramento/Delta changes to the Bay-Delta Plan, including the program of implementation. The input received on this draft Staff Report and the draft Bay-Delta Plan amendments will inform the final Staff Report and final proposed Bay-Delta Plan amendments, which will be brought before the State Water Board for consideration at a future meeting.

1.2 Organization of the Staff Report

This draft Staff Report includes information and analyses to support the State Water Board's planning and decision making on possible Sacramento/Delta updates to the Bay-Delta Plan, including scientific, hydrologic, modeling, environmental, and economic analyses and other information and analyses, including requirements of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (Wat. Code, § 13000 et seq.). This draft Staff Report incorporates portions of the 2017 Scientific Basis Report and the 2023 Final Draft Scientific Basis Report Supplement in various chapters. The full reports are also appendices to this draft Staff Report.

[2] The SUB beneficial use does not explicitly pertain to "California Native American tribes," as that phrase is defined but may, nevertheless, reflect activities of tribal governments as well as tribal members, tribal-focused organizations, and the public. As a result, this document collectively refers to the three beneficial uses as the "Tribal Beneficial Uses (TBUs)."

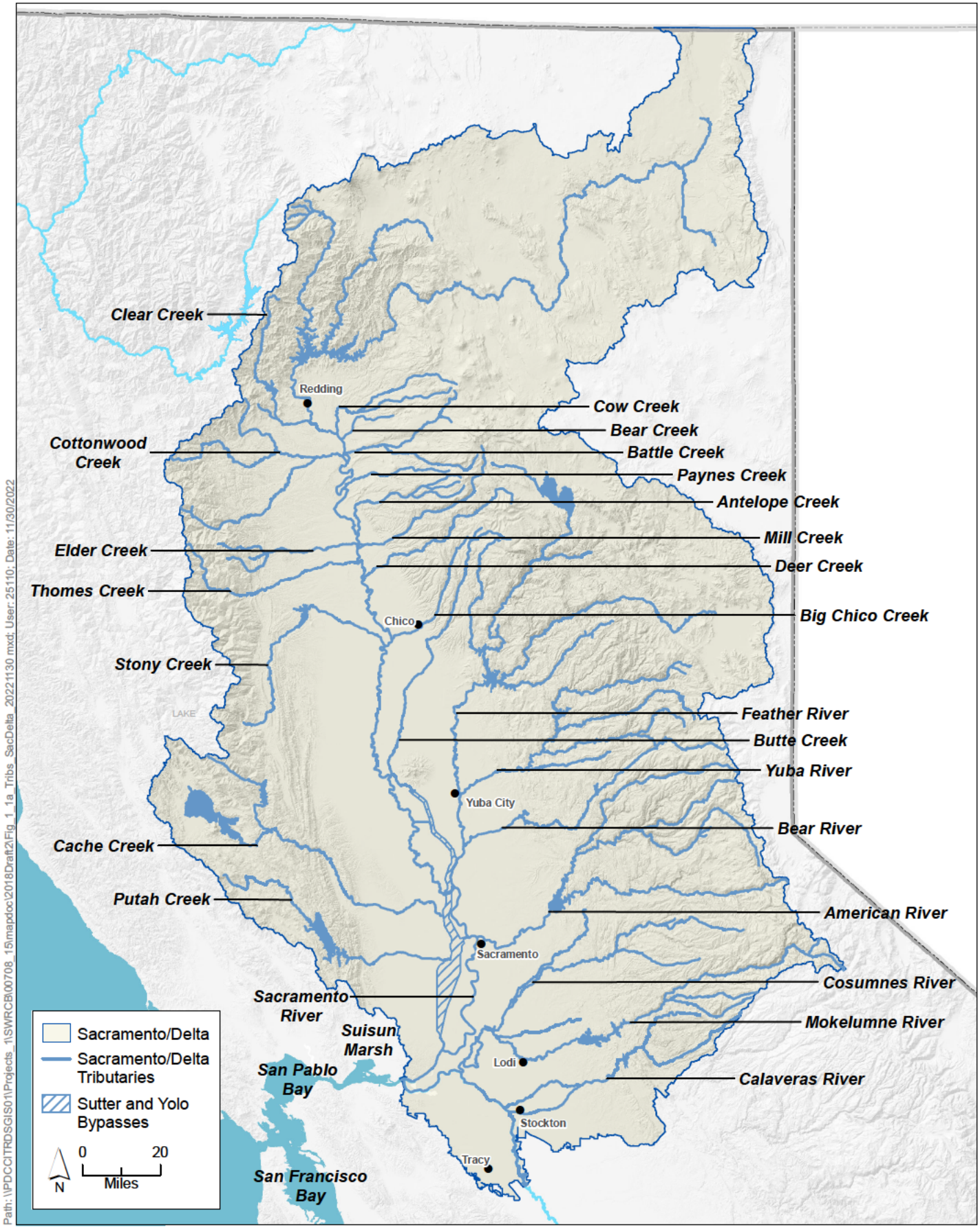

Figure 1-1a
Sacramento/Delta Tributaries

Chapters included in this draft Staff Report are summarized below.

- Chapter 1, *Executive Summary,* explains the Staff Report purpose and organization, and provides a summary of its major findings. Other chapters of the draft Staff Report inform the environmental analyses and contain additional details on specific topics.
- Chapter 2, *Hydrology and Water Supply,* describes the flow regime within the Sacramento/Delta watershed, including how the magnitude, frequency, duration, timing, and rate of change of flows have been altered, and presents an overview of California's water rights system and water supply portfolios.
- Chapter 3, *Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations*, provides a review and summary of the best available science on flow needs for the protection of fish and wildlife beneficial uses.
- Chapter 4, *Other Aquatic Ecosystem Stressors*, summarizes other aquatic ecosystem stressors (e.g., loss of habitat, invasive species, and water quality pollutants) in the Bay-Delta watershed and how those stressors interact in the ecosystem.
- Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, includes a description and discussion of the proposed Plan amendments, including water quality objectives and a description of program of implementation provisions designed to meet the objectives. This chapter is informed by Chapters 2 through 4, the model outputs in Chapter 6, environmental analyses in Chapter 7, and economic evaluation in Chapter 8.
- Chapter 6, *Changes in Hydrology and Water Supply*, presents Sacramento Water Allocation Model (SacWAM) output in a range of potential instream flow changes in increments of 10 percent, from 35 percent up to 75 percent unimpaired flow (referred to as *scenarios*), and describes other water management actions, including groundwater storage and recovery, water transfers, water recycling, and conservation measures.
- Chapter 7, *Environmental Analysis,* presents the approach to the environmental analysis; a description of alternatives and alternatives analysis; environmental analyses of proposed Plan amendments for all resource topics; an evaluation of habitat restoration and other ecosystem projects, as well as new or modified facilities; and an analysis of cumulative impacts, growth-inducing impacts, and significant irreversible environmental changes.
- Chapter 8, *Economic Analysis and Other Considerations*, evaluates economics effects associated with the proposed Plan amendments.
- Chapter 9, *Proposed Voluntary Agreements*, includes analyses of the proposed VAs. These analyses are combined in Chapter 9 because the VAs were received after much of this draft Staff Report was prepared. Chapter 9 provides model results and an evaluation of potential environmental impacts of the proposed VA alternative for all resource topics. This chapter relies on the environmental analyses presented in Chapter 7 where possible for efficiency and to avoid redundancy. The economic effects of the proposed VAs are also evaluated in this chapter.
- Chapter 10, *Economically Disadvantaged Communities*, provides an overview of economically disadvantaged communities (DAC) and their water supplies, discusses potential effects of the project on DACs and small public water systems and incorporates information from several other sections and chapters to identify potential effects on DACs. This chapter also discusses relevant State Water Board financial and technical assistance programs to provide safe, clean, and reliable water supplies to DACs.

- Chapter 11, *Tribal Engagement,* summarizes tribal engagement activities and input received related to the Sacramento/Delta update to the Bay-Delta Plan, including tribal input requesting the incorporation of traditional ecological knowledge (TEK) and addition of TBUs to the Bay-Delta Plan. Chapter 11 also provides a summary of TEK from tribes in the Bay-Delta watershed. The State Water Board plans to continue to work with California Native American Tribes to incorporate their further input on this draft Staff Report.
- Chapter 12, *Public Participation*, summarizes the public participation activities that were held throughout the pre-scoping and scoping phase of the environmental review process for the Sacramento/Delta update to the Bay-Delta Plan.

The State Water Board adopts water quality control plans as part of a certified regulatory program under the California Environmental Quality Act (CEQA). (Pub. Resources Code, § 21080.5, subd. (b)(2); Cal. Code Regs., tit. 23, § 3775 et seq.) Certified regulatory programs are exempt from CEQA's requirements for preparing an environmental impact report, negative declaration, and/or initial study. (Pub. Resources Code, § 21080.5; Cal. Code Regs., tit. 14, § 15251, subd, (g).) Accordingly, the State Water Board may prepare a substitute environmental document (SED) that meets the requirements of CEQA. (Cal. Code Regs., tit. 14, § 15252, subd, (a).)

This entire Staff Report can be considered the SED that fulfills the requirements of CEQA and the State Water Board's CEQA regulations (Cal. Code Regs., tit. 23, § 3775 et seq.) to analyze the environmental effects of the proposed regulatory activity. The majority of the environmental analyses and conclusions are presented in Chapters 7 and 9. The draft Staff Report will inform the State Water Board's consideration of the Sacramento/Delta updates to the Bay-Delta Plan described within this document.

In addition to CEQA's requirements, the State Water Board's amendments to the Bay-Delta Plan must be prepared in accordance with applicable water quality planning provisions of the Porter-Cologne Act, Water Code Section 13000 et seq., and other applicable laws. Section 13241 of the Porter-Cologne Act identifies certain factors that must be evaluated when establishing water quality objectives. These factors include: (1) past, present, and probable future beneficial uses of water; (2) environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto; (3) water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area; (4) economic considerations; (5) the need for developing housing within the region; and (6) the need to develop and use recycled water. This draft Staff Report discusses these factors with respect to the Sacramento/Delta updates to the Bay-Delta Plan, including the proposed objectives under the proposed Plan amendments, proposed VAs, and other project alternatives. The factors are an inherent part of the analyses presented for decision makers to understand the impacts not only on the environment but also on other beneficial uses, economics, and other important considerations like the human right to water.

The primary locations where this information can be found in the draft Staff Report are listed below.

1. **Past, present, and probable future beneficial uses of water:** Table 7.12.1-1a in Section 7.12.1, *Hydrology and Water Quality – Surface Water*, lists the designated beneficial uses of water currently identified in the Bay-Delta, which includes past, present, and future beneficial uses of water. Chapter 3, *Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations*, and Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, present and evaluate information relevant to the reasonable protection of fish and wildlife beneficial uses.

Chapter 7 and Chapter 9 include impact analyses for agriculture, municipal, wildlife refuges, and hydropower beneficial uses. Chapter 11, *Tribal Engagement,* identifies TBUs that the State Water Board is considering adding to the Bay-Delta Plan.

2. **Environmental characteristics of the hydrographic unit:** Discussion is included in Chapter 2, *Hydrology and Water Supply,* and in the environmental setting section of each Chapter 7 resource section (Sections 7.3 through 7.20).

3. **Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality:** Analysis of surface water conditions related to streamflow, water temperature, and salinity is included in Chapter 2, *Hydrology and Water Supply;* Chapter 6, *Changes in Hydrology and Water Supply*; Section 7.6.2, *Aquatic Biological Resources*; Section 7.12.1, *Hydrology and Water Quality – Surface Water*; Section 9.5, *Changes in Hydrology and Water Supply*; Section 9.7.6.1, *Aquatic Biological Resources*; and Section 9.7.12.1, *Hydrology and Water Quality – Surface Water*. Modeling results of surface water conditions related to streamflow are provided in Appendix A1*, Sacramento Water Allocation Model Methods and Results*, and Appendix G3a, *Sacramento Water Allocation Model Methods and Results for the Proposed Voluntary Agreements*. Modeling results of water temperatures in several tributaries are provided in Appendix A6, *Water Temperature Modeling and Fish Assessment for the Sacramento, Feather, and American Rivers*; and Appendix G3e, *Water Temperature Modeling and Fish Assessment for the Sacramento, Feather, and American Rivers for the Proposed Voluntary Agreements*. Modeling results for salinity conditions in the Delta are provided in Appendix A2, *Delta Simulation Model II (DSM2) Methods and Results*, and Appendix G3b, *Delta Simulation Model II (DSM2) Methods and Results for the Proposed Voluntary Agreements*. Modeling results for floodplain habitat are provided in Appendix A8, *Salmonid Tributary Habitat Analysis*, and Appendix G2, *Final Draft Scientific Basis Report Supplement in Support of Proposed Voluntary Agreements for the Sacramento River, Delta, and Tributaries Update to the San Francisco Bay/Sacramento-San Joaquin Delta Water Quality Control Plan*.

4. **Economic considerations:** Section 7.4, *Agriculture and Forest Resources*; Section 9.7.4, *Agriculture and Forest Resources*; Chapter 8, *Economic Analysis and Other Considerations*; and Section 9.8, *Economic Analysis and Other Considerations* address economic considerations. Economic modeling results are provided in Appendix A3, *Agricultural Economic Analysis: SWAP Methodology and Modeling Results*; Appendix A4, *Regional Economic Analysis Modeling Procedure*; and Appendix G3c, *Economic Considerations for the Proposed Voluntary Agreements*.

5. **Need for developing housing within the region:** The project would not directly restrict development of housing. As explained in Section 7.16, *Population and Housing*; Section 9.7.16, *Population and Housing*; Section 7.23, *Cumulative Impact Analysis, Growth-Inducing Impacts, and Significant Irreversible Environmental Resources*; and Section 9.7.22, *Cumulative Impact Analysis, Growth-Inducing Impacts, and Significant Irreversible Environmental Resources*, the project would not induce substantial population growth either directly or indirectly.

6. **Need to develop and use recycled water:** Other water management actions, including water recycling, are discussed in Section 6.6, *Other Water Management Actions*, and Section 7.1, *Approach to Analysis*. The evaluation of actions that may be taken in response to changes in water supply presented in Sections 7.3 through 7.20 address other water management actions, including water recycling. While the project cannot be considered the driving impetus for sustainable management and water supply diversification efforts, including the need to develop

and use recycled water, the project may accelerate and increase the need for such efforts to manage water sustainably and may promote development of recycled water.

In addition, while not listed in Water Code section 13241, climate change is a relevant factor that also merits consideration. It is likely that increased flow variability and shifts in timing of high flows would occur in the future. Climate change is discussed throughout the Staff Report, including but not limited to, Section 2.6, *Climate Change and Drought*; Chapter 4, *Other Aquatic Ecosystem Stressors*; Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*; Chapter 6, *Changes in Hydrology and Water Supply*; Section 7.10, *Greenhouse Gas Emissions*; and Section 9.7.10, *Greenhouse Gas Emissions*.

1.3 Background

The Bay-Delta watershed encompasses California's two major river systems, the Sacramento and San Joaquin Rivers, as well as numerous other tributaries to those rivers, the Delta and tributaries, Suisun Marsh, and San Francisco Bay. The Bay-Delta watershed drains water from about 40 percent of California's land area and supports a variety of beneficial uses of water, including a portion of the drinking water for more than two-thirds of Californians; irrigation to the largest agricultural economy in the United States; various industrial purposes within the Bay-Delta watershed and in areas outside of the watershed; and numerous recreational purposes from upper watersheds, the valley, Delta, and Bay. The Bay-Delta watershed is also home to numerous California Native American tribes and small and large communities, including economically disadvantaged communities and black, Indigenous, and people of color communities. The Delta is the hub of California's water supply system, serving as the source of water for the state's two largest water supply projects—the California Department of Water Resources' (DWR) State Water Project (SWP) and the U.S. Bureau of Reclamation's (Reclamation) Central Valley Project (CVP) (collectively, the Projects)—as well as many other large and small diverters.

The Bay-Delta watershed includes the largest estuarine ecosystem on the West Coast of the Americas. The Delta is about 738,000 acres, of which about 48,000 acres are now open fresh water and the remainder is agricultural or urban, reflecting an almost complete loss of wetland habitats since California became a state (^Whipple et al. 2012). Suisun Marsh comprises approximately 85,000 acres of duck clubs, game refuges, and sloughs. Landforms in Suisun Marsh have changed little from natural conditions, but salinities have generally risen (^Whipple et al. 2012). San Francisco Bay includes about 306,400 acres of open water, with almost half of its wetland habitats having been restored in the last 20 years (SFEP 2015).

The Bay-Delta watershed supports an exceptionally diverse array of migratory and resident fish, birds, and other valued wildlife and plants. The watershed is a crucial part of the Pacific Flyway. Some birds, including sandhill cranes, Canada geese, and snow geese, over-winter on flooded fields in the Delta and Sacramento Valley, while many other waterfowl rely on habitats in Suisun Marsh and San Francisco Bay. Migratory fish include green and white sturgeon; spring-run, winter-run, fall-run, and late fall-run Chinook salmon; and steelhead. These native species include ecologically, culturally, recreationally, and commercially important fisheries as well as fish that are relied upon for subsistence by tribes and local communities, as well as taxa listed under the California and federal Endangered Species Acts (CESA and ESA, respectively). Migratory fish must travel through large portions of the watershed to get to and from their spawning habitats, including salmon and steelhead that must travel from the ocean to the upper watershed. To migrate successfully, fish must

find suitable habitats and withstand multiple stressors throughout the watershed. Almost all resident native fish species in the Bay-Delta have declined in abundance, particularly longfin smelt (listed under CESA) and Delta smelt (listed under both ESA and CESA). Two resident species have been extirpated: Sacramento perch and thicktail chub, primarily due to loss of suitable habitat. The most abundant fishes of the upper estuary are now introduced and do not rely on the habitats and conditions historically found in California. These nonnatives include striped bass, largemouth bass, and carp that were introduced for harvest and other species that invaded by various pathways. Habitat restoration and the effects of climate change are likely to further shift the abundance and distributions of species throughout the estuary (Goals Project 2015).

1.3.1 Purpose and Need for Bay-Delta Update

As described in Chapter 3, *Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations*, and Chapter 4, *Other Aquatic Ecosystem Stressors*, since the Bay-Delta Plan was last updated and implemented, populations of native aquatic species in the Bay-Delta watershed have shown significant signs of decline due to a combination of factors, including hydrologic modifications, non-flow physical habitat degradation, water quality impairments, and climate change.

Scientific information indicates that restorations of flows and the functions that flow provides in an integrated fashion with physical habitat improvements is needed to address the declines. Though various state and federal agencies have adopted requirements to protect the Bay-Delta ecosystem, the best available science supports a more comprehensive strategy. The current Bay-Delta Plan objectives and implementation measures are minimal and focused on the Delta without considering instream flow needs within the tributaries and connecting those flows with the downstream watershed and Delta outflows. Most tributaries do not have instream flow requirements in the Bay-Delta Plan. Current conditions may be protective of fish and wildlife in some locations, but action is needed to ensure that conditions are not degraded in the future and that conditions in the Bay-Delta improve based on more complete and coordinated watershed management.

As described in Chapter 2, *Hydrology and Water Supply*, under current requirements, flows can be significantly reduced at certain times in some streams in the Sacramento/Delta watershed, along with significant reductions in Delta outflows, particularly in the winter and spring. At the same time, dams in the watershed disconnect migratory corridors for native aquatic species, blocking access to significant portions of historical habitat. Total average annual unimpaired (without diversions and dams under current channel and infrastructure conditions) outflows from the Bay-Delta watershed are about 28.5 million acre-feet (MAF). Annual average outflows with diversions are a little more than half this amount at about 15.5 MAF, and outflows during the winter and spring from January through June are less than half. However, average regulatory minimum Delta outflows are only about 5 MAF, or about a third of current average outflows and less than 20 percent of average unimpaired outflows. Existing regulatory minimum Delta outflows would not be protective of the ecosystem, and without additional instream flow protections, existing flows may be reduced in the future, particularly with climate change and additional water development absent additional minimum instream flow requirements that ensure flows are preserved in stream when needed for the reasonable protection of fish and wildlife. In addition to instream flows, complementary habitat restoration can improve the effectiveness of instream flow measures at providing habitat conditions that support and promote recovery of native species populations.

1.3.2 Bay-Delta Water Quality Control Planning Background

The State Water Board has authority to adopt statewide water quality control plans and adopts the Bay-Delta Plan because of its ecological and water supply importance to the state. The Bay-Delta Plan largely addresses water diversions and use in the water quality control planning context, in accordance with the Porter-Cologne Act and other laws. The current Bay-Delta Plan flow-based water quality objectives that apply to the Sacramento/Delta watershed were established in 1995, based in part on an agreement between state and federal agencies regarding measures for ecosystem protection in the Bay-Delta estuary. The State Water Board updated the 1995 Bay-Delta Plan in 2006 with minor modifications and as discussed above, updated the San Joaquin River flow and southern Delta salinity portions of the Plan in 2018.

The Bay-Delta Plan identifies various beneficial uses of water, including agricultural, municipal and industrial, and fish and wildlife, and water quality objectives designed to reasonably protect those uses. Certain objectives are expressed as flows and others as salinity (electrical conductivity [EC] or chloride) and dissolved oxygen levels that are largely achieved through flows and Project operations. The Bay-Delta Plan also includes narrative fish and wildlife protection objectives for salmon and the Suisun Marsh. The Bay-Delta Plan includes a program of implementation identifying how the objectives will be achieved, including a description of actions necessary to achieve the objectives; a time schedule for taking the actions; and monitoring, evaluation, and reporting measures to determine compliance with the objectives and evaluate the effectiveness of implementation measures.

Currently, the Projects have primary responsibility for meeting Bay-Delta Plan objectives that apply to the Sacramento/Delta watershed, including existing Sacramento River inflow, Delta outflow, salinity, Project operational constraints, and other requirements. Under State Water Board Water Right Decision 1641 (D-1641), the State Water Board accepted various agreements between DWR and Reclamation and other water users to assume responsibility for meeting specified Bay-Delta Plan objectives for a period of time through conditions on DWR's and Reclamation's water rights for the SWP and CVP, respectively.

1.3.3 The Delta Reform Act and Delta Flow Criteria Report

The Sacramento-San Joaquin Delta Reform Act was adopted in 2009 (Delta Reform Act) (Wat. Code, § 85000 et seq.). The Delta Reform Act codified two coequal goals for the Delta of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem—both of which are to be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. To achieve this, the Delta Reform Act established the Delta Stewardship Council (DSC) and tasked the DSC with developing, adopting, and implementing an enforceable long-term plan for the Delta. DSC's Delta Plan (^DSC 2013) includes policies that are legally binding on covered activities as well as advisory recommendations.[3]

[3] The DSC has authority to ensure that covered actions – projects, plans, or programs that occur in the Delta and have a significant impact on achievement of the coequal goals – are consistent with the Delta Plan. (Wat. Code, §§ 85225, 85057.5.) The State Water Board's regulatory actions, including its water quality and water right proceedings, are exempt from the definition of covered actions and the DSC's consistency determinations. (*Id*., § 85057.5, subd. (b)(1).)

To inform planning decisions for the Delta Plan and other efforts, the Delta Reform Act required the State Water Board to develop flow criteria for the Delta ecosystem for the protection of public trust resources without considering other needs for water. In August 2010, the State Water Board completed a technical report on the *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem* (Delta Flow Criteria Report). The Delta Flow Criteria Report made a number of findings and identified specific criteria for inflows, outflows, and interior Delta flows if fishery protection was the sole purpose for which waters were put to beneficial use without considering the need for cold water reserves and balancing of supplies for other beneficial uses of water. The report noted that Delta waters support many other important beneficial uses, such as municipal, industrial, agricultural, hydropower, recreation, and other environmental uses such as wetlands and refuge water supplies that must be considered when determining regulatory flow requirements. The report noted that the State Water Board is required by law to establish flow and other requirements that ensure the reasonable protection of beneficial uses and that for any flow requirements to be reasonable, the State Water Board will consider and balance competing uses of water in its decision-making.

1.3.4 Input on Sacramento/Delta Update to the Bay-Delta Plan

Through the public comment process and other outreach, State Water Board staff has received valuable input from many interested parties related to the Sacramento/Delta update to the Bay-Delta Plan that has and will continue to be further considered through the planning process. This section describes prior public comment processes and outreach activities that have occurred. Chapter 12, *Public Participation*, provides a complete summary of the public participation activities that have occurred to date. Chapter 11, *Tribal Engagement*, summarizes outreach and participation with California Native American tribes related to the update to the Bay-Delta Plan, including information responsive to recent requests from California Native American tribes to incorporate TEK and consider the addition of TBUs to the Bay-Delta Plan.

Section 1.5, *Staff Report Public Process and Next Steps*, provides more information on next steps related to the Sacramento/Delta update to the Bay-Delta Plan, including public review of the draft Staff Report. The State Water Board will consider all input provided by stakeholders and will provide additional opportunities for public participation as the planning process moves forward. The final Staff Report and proposed changes to the Sacramento/Delta update to the Bay-Delta Plan will be considered by the State Water Board at a public Board meeting. The public will also have the opportunity to participate in that process.

1.3.4.1 2017 Scientific Basis Report and 2023 Final Draft Scientific Basis Report Supplement

In October 2017, the State Water Board finalized a Scientific Basis Report in support of the Sacramento/Delta update to the Bay-Delta Plan. The Scientific Basis Report describes the science supporting the primary non-VA alternatives evaluated in this draft Staff Report.

A working draft version of the Scientific Basis Report was released in 2016, to receive public input on the science related to the Sacramento/Delta update to the Bay-Delta Plan prior to submittal of the Scientific Basis Report for external peer review. The State Water Board received input on the working draft Scientific Basis Report from a number of interested parties, including water users;

environmental groups; and local, state, and federal agencies. In addition, the Delta Independent Science Board (ISB) conducted a review of the working draft Scientific Basis Report. Based on public and agency input, the working draft Scientific Basis Report was refined, and a final draft Scientific Basis Report was submitted for independent peer review pursuant to the requirements of California Public Health and Safety Code section 57004. The final Scientific Basis Report, which consists of the final draft Scientific Basis Report submitted for external peer review and an attached errata sheet, was finalized in 2017 and is included as Appendix B.

A 2023 Final Draft Scientific Basis Report Supplement has been prepared to document the science supporting the proposed provisions included in the proposed VAs and serves as a supplement to the 2017 Scientific Basis Report. The Final Draft Scientific Basis Report Supplement was developed by State Water Board staff in collaboration with staff from the California Department of Fish and Wildlife and DWR. As discussed in Chapter 12, *Public Participation*, the State Water Board made the draft Scientific Basis Report Supplement available for public comment and held a public workshop in January2023. The Final Draft Scientific Basis Report Supplement has been revised in response to public comments and will be submitted for peer review pursuant to the requirements of California Public Health and Safety Code (§ 57004). The Final Draft Scientific Basis Report Supplement is included in Appendix G.

1.3.4.2 SacWAM Development

The Sacramento Water Allocation Model (SacWAM) is a hydrologic and system operations model developed by the Stockholm Environmental Institute and State Water Board to assess potential revisions to instream flow and other requirements in the Bay-Delta watershed, including the current Sacramento/Delta update of the Bay-Delta Plan.

In fall 2016, the State Water Board released an early version of SacWAM for public review and for review by an independent science review (ISR) panel convened by DSC's Delta Science Program to assure transparency and confirm the adequacy of SacWAM to simulate flows to inform the Sacramento/Delta update of the Bay-Delta Plan. On October 4, 2016, State Water Board staff held a public workshop that provided a general and technical overview of SacWAM (version 0.20) and hands-on instruction on how to navigate the model and the model documentation. Video recordings and presentation slides from the public workshop are available on the State Water Board's website. On October 19, 2016, a public meeting was held in which the ISR panel presented initial findings, asked additional questions, and engaged in a dialogue with the model development team and State Water Board staff and interested persons. The ISR panel provided a review report to the State Water Board on December 19, 2016, that contained detailed recommendations for model improvements and suggestions for meeting with other agencies to obtain information to improve SacWAM's representation of the system. In response to the panel's observations and recommendations, the SacWAM development team met with several agencies and undertook additional model refinement to improve the representation of hydrology, water control facilities, and water management in SacWAM.

SacWAM development continuing into 2018 and 2019 incorporated updates to upper watershed hydrology and operations, and CVP and SWP operations based on updates related to development of the CalSim 3 model by DWR, Reclamation, and their consultants. SacWAM version 1.2 was released in April 2019 and incorporated these updates. In November 2019, SacWAM version 2019.11.22 was released, followed by a public presentation in December 2019. Since 2019, additional SacWAM updates have occurred to reflect changes to regulations that affect reservoir operations, streamflow

requirements, and Delta operations, and refining model logic to support simulation of the proposed VAs. More information on these assumptions can be found in Chapter 6, *Changes in Hydrology and Water Supply*.

1.4 Environmental Analysis

State Water Board regulations (Cal. Code. Regs., tit. 23, § 3777) require that any water quality control plan proposed for approval or adoption be accompanied by environmental documentation. The State Water Board's water quality control planning program is certified by the Secretary of the California Resources Agency as exempt from CEQA's requirements for the preparation of environmental impact reports, negative declarations, and initial studies (Pub. Resources Code, § 21080.5; Cal. Code Regs., tit. 14, § 15251, subd. (g)). Agencies qualifying for such exemptions must still comply with CEQA's goals and policies, including the policy of avoiding significant adverse effects on the environment where feasible.

Pursuant to California Code of Regulations, title 23, section 3777, subdivision (b), the environmental documentation must include:

(1) A brief description of the proposed project;

(2) An identification of any significant or potentially significant adverse environmental impacts of the proposed project;

(3) An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and

(4) An environmental analysis of the reasonably foreseeable methods of compliance. The environmental analysis shall include, at a minimum, all of the following:

   (A) An identification of the reasonably foreseeable methods of compliance with the project;

   (B) An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;

   (C) An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and

   (D) An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance.

CEQA's basic purposes are to: (1) inform governmental decision makers and the public about the potential significant environmental effects of proposed activities; (2) identify ways that environmental damage can be avoided or significantly reduced; (3) prevent significant avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and (4) disclose to the public why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved. (Cal. Code Regs., tit. 14, § 15002, subd. (a).) To fulfill these functions, an evaluation of the environmental effects need not be exhaustive, but the sufficiency of an environmental analysis is to be reviewed in light of what is reasonably feasible and

CEQA documents need not be perfect. CEQA documents should be adequate, complete, and represent a good-faith effort at full disclosure. (*Id*., § 15151.)

This Staff Report was prepared to analyze the potential environmental impacts of adopting and implementing possible Sacramento/Delta updates to the Bay-Delta Plan. This Staff Report includes identification of significant or potentially significant adverse environmental impacts of the project alternatives, mitigation measures to avoid or reduce impacts, environmental analysis of the reasonably foreseeable methods of compliance, and other analyses and documents. This Staff Report identifies potentially significant environmental impacts of possible Sacramento/Delta updates to the Bay-Delta Plan in the watersheds in which Sacramento/Delta flows originate and in the areas in which Sacramento/Delta water is used or from which water is imported. This Staff Report also includes an analysis of the economic impacts that could result from possible Sacramento/Delta updates to the Bay-Delta Plan.

1.4.1 Sacramento/Delta Watershed, Plan Area, and Study Area

The State Water Board is considering amendments to the Bay-Delta Plan focused on the Sacramento River and its tributaries, Delta eastside tributaries (including the Cosumnes, Mokelumne, and Calaveras Rivers), Delta outflows, and interior Delta flows in order to reasonably protect fish and wildlife beneficial uses. This area is referred to as the *Sacramento/Delta watershed* or *Sacramento/Delta*. Tributaries in the Sacramento/Delta watershed are shown on Figure 1-1a and described in detail in Chapter 2, *Hydrology and Water Supply*.

The *plan area* includes the Sacramento/Delta and continues west as water flows through the Delta and downstream through Suisun Marsh and adjoining bays, marking the brackish transition from fresh water to salt water and out to the Pacific Ocean. The plan area encompasses the areas where possible Sacramento/Delta Plan amendments may apply and the ecosystem that the Plan is intended to protect. Figure 1-1b shows the plan area boundary.

Water from the Sacramento/Delta is delivered to and used in portions of the San Francisco Bay Area, San Joaquin Valley, Central Coast, and Southern California regions. Therefore, a larger *study area* is also defined to ensure that environmental and economic impacts are evaluated in all areas where impacts may occur. The study area is divided into seven regions based on geography and water supply (Figure 1-1c). The geographic regions in the study area include the Sacramento River watershed, Delta eastside tributaries, Delta, San Francisco Bay Area, San Joaquin Valley, Central Coast, and Southern California. The environmental analysis presented in Chapter 7, *Environmental Analysis*, and Chapter 9, *Proposed Voluntary Agreements*, describes and analyzes potential environmental impacts in these geographic regions as applicable.

1.4.2 Organization of the Analyses

To organize the environmental analysis of the proposed Plan amendments and the proposed VAs, the evaluation of reasonably foreseeable methods of compliance and response actions that may be taken in response to the project are organized into four main categories: (1) changes in hydrology; (2) changes in water supply; (3) habitat restoration and other ecosystems projects; and (4) new or modified facilities. The proposed Plan amendments and proposed VAs are analyzed broadly due to the size and complexity of Sacramento/Delta water supply and use. The environmental analyses use

Figure 1-1b
Plan Area

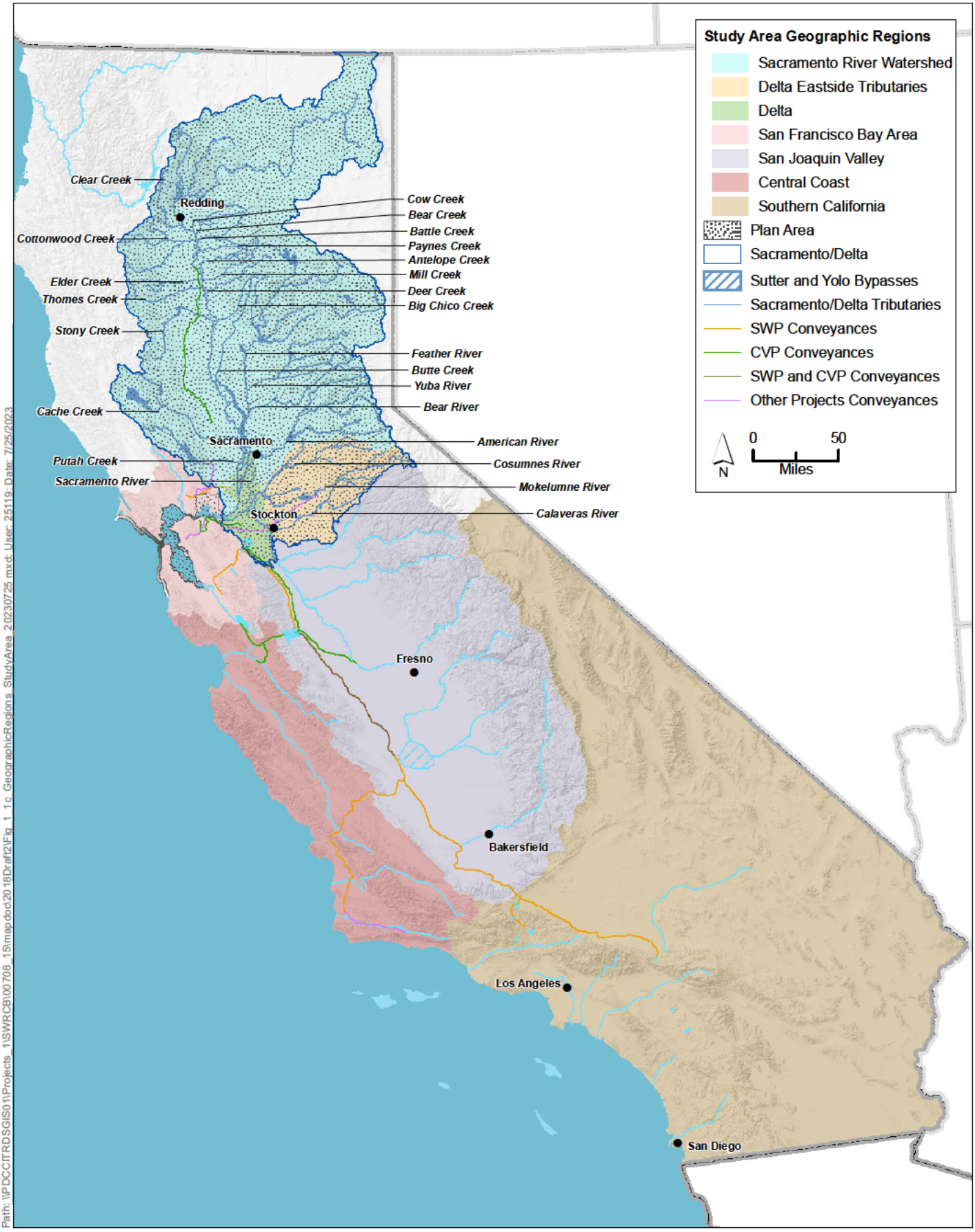

Figure 1-1c
Study Area Geographic Regions

the thresholds of significance that the State Water Board adopted in 2011 as Appendix A to the CEQA regulations. (Cal. Code. Regs., tit. 23, §§ 3720 et seq.)

The analyses in the resource sections of Chapter 7 (Sections 7.3 through 7.20) and Chapter 9 (Sections 9.7.3 through 9.7.20) largely focus on environmental impacts that may result from changes in hydrology and changes in water supply. Changes in hydrology include changes in streamflows and reservoir storage levels. Changes in water supply include reduced Sacramento/Delta supplies for agriculture, municipal, and wildlife refuge uses and changes in groundwater levels and use, including increased pumping from existing and new wells. Changes in water supply also include other water management actions: groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal water conservation using existing infrastructure and not involving construction.

The environmental impacts of physical habitat restoration and other ecosystem projects and new or modified facilities are evaluated in Sections 7.21, *Habitat Restoration and Other Ecosystem Projects*, and 7.22, *New or Modified Facilities*, respectively. Section 7.21 evaluates the environmental impacts of non-flow ecosystem projects, including physical habitat restoration, fish passage projects, predation, and aquatic invasive species control. Section 7.22 evaluates the environmental impacts of actions entities may take that would involve construction to modify or build new facilities and infrastructure to supplement or conserve surface water supplies and other construction projects that may result from implementation of possible Sacramento/Delta Plan amendments. Projects evaluated in Section 7.22 include new or modified dams/reservoirs and points of diversion; groundwater wells and groundwater storage and recovery projects; and new or modified drinking water treatment plants, including desalination plants and wastewater treatment plants. Section 7.22 also evaluates other construction actions that entities may take in response to changes in hydrology and water supply, including new or modified boat ramps, streamflow or temperature monitoring devices, and water conservation projects such as canal lining.

Many of the actions evaluated in Sections 7.21 and 7.22 would involve construction and, in some cases, large construction projects that would require site-specific environmental impact analyses. Because the potential combination of future actions such as restoration actions or development of new or modified water facilities is unknown, these actions are discussed generally and qualitative comparisons to baseline conditions are made.

The following resource topics are addressed in Chapter 7, *Environmental Analysis,* and Section 9.7*, Environmental Analysis,* for the proposed Plan amendments and proposed VAs, respectively: aesthetics; agriculture and forest resources; air quality; biological resources, including terrestrial biological resources and aquatic biological resources; cultural resources; energy; geology and soils; greenhouse gas emissions; hazards and hazardous materials; hydrology and water quality, including surface water and groundwater; land use and planning; mineral resources; noise; population and housing; public services; recreation; transportation/traffic; utilities and service systems. Chapter 7 includes an independent evaluation of habitat restoration and other ecosystem projects and new or modified facilities. Chapter 7 and Chapter 9 also include an evaluation of cumulative impacts, growth-inducing impacts, and significant irreversible environmental changes.

1.4.3 Baseline, Evaluation Approach, and Modeling Tools

CEQA requires a description of the physical environmental conditions in the vicinity of the project as they exist at the time the NOP is published (January 24, 2012 [supplemental NOP for the

Sacramento/Delta update to the Bay-Delta Plan]), or if no NOP is published, at the time environmental analysis is commenced. (Pub. Resources Code, § 15125.) This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. Where environmental conditions fluctuate over time, CEQA provides for comparing a project's impacts against a baseline derived from historical conditions.

The process for updating the Sacramento/Delta portions of the Bay-Delta Plan has been ongoing since 2012, when a supplemental NOP was issued for the Sacramento/Delta updates to the Bay-Delta Plan. Since that time, there have been changes to regulations that affect reservoir operations, streamflows, and Delta operations and related conditions. Most notably, updates to the Biological Opinions (BiOps) for the long-term operation of the CVP and SWP and Incidental Take Permit (ITP) for the SWP have changed since 2012. Many of the changes are not significant or are uncertain due to litigation and reconsultation, but other changes are expected to continue. The project baseline was updated to reflect conditions and operations as they have existed in recent years. The primary change is the modification of fall Delta outflow requirements that were included in the 2008 U.S. Fish and Wildlife Service (USFWS) BiOp that changed and for which those changes are expected to be durable. Updating these baseline assumptions avoids underestimating water supply impacts that may occur under some of the alternatives compared to baseline. The project baseline is described in more detail in Chapter 6, *Changes in Hydrology and Water Supply*.

In addition to the project baseline, other points of comparison are used in the draft Staff Report for describing and analyzing the effects of the proposed VAs. In addition to comparing the proposed VAs to baseline, the VA benefits are assessed in this draft Staff Report relative to the USFWS 2008/National Marine Fisheries Service (NMFS)2009 BiOps condition, which is the point of reference used for both the 2017 Scientific Basis Report and the 2023 Final Draft Scientific Basis Report Supplement. The difference between the baseline and the USFWS 2008/NMFS 2009 BiOps condition is described in detail in Chapter 6, *Changes in Hydrology and Water Supply*. The major difference is the change in fall Delta outflow discussed above. In addition, the proposed VAs rely on the USFWS and NMFS 2019 BiOps condition as the theoretical assumed starting point for VA accounting purposes. However, this condition is only used for VA accounting purposes and is not used for either impacts or benefits assessments, given that (1) the condition does not include the current ITP requirements that are being implemented; and (2)the USFWS and NMFS 2019 BiOps have not been fully implemented due to litigation, and those BiOps are currently under reconsultation due in part to the litigation.

The environmental analyses use both quantitative and qualitative approaches to compare the potential impacts to baseline conditions. For the quantitative evaluation, SacWAM was used to simulate changes in hydrology and water supply that could result from the proposed Plan amendments, proposed VAs, and other flow alternatives (including a Low Flow Alternative and a High Flow Alternative) discussed further below. The SacWAM documentation describes the methods and assumptions used to develop SacWAM (^SacWAM 2023). Chapter 6, *Changes in Hydrology and Water Supply*, summarizes the model results for the proposed Plan amendments. Appendix A1, *Sacramento Water Allocation Model Methods and Results,* presents additional information and provides detailed tables and figures of model results that are summarized in Chapter 6. Model results for the proposed VAs are summarized in Chapter 9, *Proposed Voluntary Agreements*, and detailed methods and results are presented in Appendix G3a, *Sacramento Water Allocation Model Methods and Results for the Proposed Voluntary Agreements.*

In addition to SacWAM, other modeling and technical analyses were utilized to evaluate the environmental impacts and economic effects of the project. Discussion of modeling and technical analyses used to evaluate the environmental impacts of the proposed Plan amendments and proposed VAs is presented in subsequent chapters and sections. Detailed model results are presented in Appendix A, *Modeling for the Unimpaired Flow Scenarios*, and Appendix G3*, Modeling Results for the Proposed Voluntary Agreements*, for the proposed Plan amendments and proposed VAs, respectively.

The Staff Report also contains various qualitative analyses to evaluate the potential environmental impacts of the alternatives. The evaluation approach and modeling tools used for the environmental analyses of the proposed Plan amendments are described in more detail in Section 7.1, *Introduction, Project Description, and Approach to Environmental Analysis*. The evaluation approach used for the proposed VAs is described in Section 9.7, *Environmental Analysis*.

1.4.4 Alternatives Considered

CEQA requires an environmental document to describe a range of reasonable alternatives to a project that "would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives." (State CEQA Guidelines § 15126.6, subd. (a); Cal. Code Regs., tit. 23, § 3777, subd. (b)(3).) It need not consider every conceivable alternative to a project, but instead, it "must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation." (State CEQA Guidelines § 15126.6, subd. (a).) A lead agency is not required to consider alternatives that are infeasible. (*Ibid.*)

This draft Staff Report evaluates the environmental impacts and economic effects of the proposed Plan amendments and proposed VAs, which are described above. This draft Staff Report also evaluates several additional alternatives for the Bay-Delta Plan update that may be considered for adoption by the State Water Board, including both stand-alone alternatives and modular alternatives that could be layered onto the stand-alone alternatives. The stand-alone alternatives include the proposed Plan amendments, a No Project Alternative (Alternative 1), a Low Flow Alternative (lower flows than the proposed Plan amendments) (Alternative 2), a High Flow Alternative (higher flows than the proposed Plan amendments) (Alternative 3), and the Proposed Voluntary Agreements Alternative (Alternative 6). The No Project Alternative is included to provide a comparison of the impacts of approving the project with the impacts of not approving the project. The Low Flow and High Flow Alternatives (referred to as *other flow alternatives*) would require lower or higher amounts of inflow to the Delta but otherwise would be consistent with the proposed Plan amendments.

The modular alternatives include modular alternatives for interior Delta flows and fall Delta outflow (Alternative 4), modular drought alternatives (Alternative 5), and a modular alternative for the Protection of Voluntary Agreements Flows (Alternative 6a). Alternative 4a (Exclusion of Interior Delta Flow and Fall Delta Outflow Related Amendments) excludes interior Delta flow and fall Delta outflow provisions included in the NMFS and USFWS BiOps for operation of the SWP and CVP and California Department of Fish and Wildlife ITP for operation of the SWP. Alternative 4b (Head of Old River Barrier Alternative) would require installation of a Head of Old River Barrier or alternative mechanisms to prevent San Joaquin River-origin anadromous fish from being drawn into the Delta export facilities. Alternative 4c (Extended Export Constraint Alternative) would require additional export constraints as a function of San Joaquin River flows (commonly referred to as the *San Joaquin*

River inflow to export ratio or I:E). A modular drought alternative (Alternative 5) includes two variations that could help to address limited water supplies during drought (Alternatives 5a and 5b). Alternative 5a (Instream Flow Protection Provision Alternative) would require water diverters (in addition to DWR and Reclamation) to bypass water needed to meet water quality objectives during drought circumstances similar to existing Standard Water Right Term 91. Alternative 5b (Shared Water Shortage Provision Alternative) would require all water users to reduce their use during drought conditions. Alternatives 4a, 4b, and 4c could be adopted in combination with the proposed Plan amendments or other flow alternatives. Alternatives 5a and 5b could be adopted in combination with the proposed Plan amendments, other flow alternatives, or the proposed VAs. Modular Alternative 6a (Protection of Voluntary Agreement Flows Alternative) would identify as part of the program of implementation additional measures to protect the base upon which the proposed VA flows are intended to be added from new or expanded water diversions and could be adopted in combination with the Proposed Voluntary Agreements Alternative.

For more information on the project alternatives evaluated in this document, see Section 7.2, *Description of Alternatives*. The environmental analysis and impact conclusions for Alternatives 1 through 5 are presented in Section 7.24, *Alternatives Analysis*. The Proposed Voluntary Agreements Alternative (Alternative 6) and modular Alternative 6a are evaluated in Chapter 9, *Proposed Voluntary Agreements*.

1.4.5 Environmental Analysis Results

The impacts of changes in hydrology and changes in water supply that could result from implementation of the proposed Plan amendments are presented in Chapter 7, *Environmental Analysis*, Sections 7.3 through 7.20. Sections 7.3 through 7.20 are organized by environmental resource category, following the State Water Board's environmental checklist (Cal. Code Regs, tit. 23, div. 3, ch. 27, §§ 3720–3781, Appendix A). For a summary of environmental impacts and mitigation measures identified for the proposed Plan amendments, see Table 1-1 at the end of this chapter. The CEQA environmental checklist questions are listed in the same order as they are addressed in Sections 7.3 through 7.20. Some impact questions are sufficiently related and are addressed together.

The impacts of changes in hydrology and changes in water supply that could result from implementation of the proposed VAs are presented in Chapter 9, *Proposed Voluntary Agreements*, Sections 9.7.3 through 9.7.20. Table 1-2 (at the end of this chapter) presents a summary of the impacts and mitigation measures identified for the proposed VAs.

Impact and mitigation measure summary tables have also been prepared for other project alternatives. For a summary of significant impacts and mitigation measures identified for habitat restoration and other ecosystem projects, see Table 7.21-1 in Section 7.21. For a summary of significant impacts and mitigation measures identified for new or modified facilities, see Table 7.22-1 in Section 7.22. For a summary of significant impacts and mitigation measures identified for the No Project Alternative (Alternative 1), Low Flow Alternative (Alternative 2), and High Flow Alternative (Alternative 3), see Appendix F, *Impact Summary Tables for Alternatives 1, 2, and 3*.

Tables 1-1 and 1-2 identify potentially significant impacts and less-than-significant impacts from changes in hydrology and supply under the proposed Plan amendments and proposed VAs, respectively. Some potentially significant impacts can be mitigated to less-than-significant levels.

Because the State Water Board has authority to ensure that mitigation is implemented for certain actions, these impacts could be reduced to less-than-significant levels with mitigation incorporated. These impacts are listed as potentially significant followed by an asterisk.

Many other identified potentially significant environmental impacts could be reduced to less-than-significant levels with mitigation incorporated; however, due to the large scope of the project and wide range of possible response actions, sufficient information is not available to conclude with certainty that the mitigation measures will reduce all impacts to less-than-significant levels in all circumstances. Some mitigation activities are within the State Water Board's jurisdiction. However, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the project. Accordingly, the State Water Board cannot guarantee that measures will always be adopted or applied fully to mitigate potentially significant impacts. Therefore, unless and until the mitigation is fully implemented, the impacts remain potentially significant.

In addition, the environmental analysis often considers a range of potential outcomes, including the most conservative for evaluating potentially significant effects on the physical environment. In many cases, there may be no impact. For each resource area, the analysis assumes a worst-case scenario. Some impacts are inversely proportional, and it is not possible for a worst-case scenario to occur for every environmental resource area.

It is important that the CEQA impact conclusions be understood in the context of the nature of the proposed project, which is intended to be a restoration action. The Porter-Cologne Act is California's comprehensive water quality control statute, which implements portions of the federal Clean Water Act. The primary purpose of the federal Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (Clean Water Act § 101(a).) Water quality objectives are established to ensure the reasonable protection of beneficial uses and the prevention of nuisance, in consideration of various factors, including past, present, and probable future beneficial uses of water (Wat. Code, § 13241.) The Bay-Delta Plan identifies various beneficial uses of water in the Bay-Delta watershed and establishes water quality objectives designed to reasonably protect those uses. The impacts that could potentially result from implementation occur in a system that has been highly altered, and the project would be expected to improve conditions for native fish and wildlife in the Sacramento/Delta watershed over time. However, changes in hydrology and changes in water supply could result in some environmental impacts at certain times and locations that must be analyzed under CEQA. These potential environmental impacts should be viewed in light of the overall purpose and goals of the Sacramento/Delta update to the Bay-Delta Plan.

1.5 Public Process and Next Steps

As discussed above, the State Water Board has received valuable input from many interested parties, which has informed the Sacramento/Delta update to the Bay-Delta Plan and will be further considered through the planning process.

The release of this draft Staff Report initiates a public comment period. During the public comment period, State Water Board staff will hold workshops to provide information on the contents of the draft Staff Report and provide an opportunity for the public to ask questions to facilitate their review of the report. These workshops will be followed by a multi-day public hearing before the State Water Board to receive oral comments. This public comment period is the public's opportunity

to review and comment on the analyses described in the draft Staff Report. Detailed information on how to submit written comments on this draft Staff Report and how to participate in the upcoming workshops and hearing is available on the State Water Board's website.

This draft Staff Report does not identify the preferred proposal for moving forward with the update to the Bay-Delta Plan, and all alternatives and variations described in this draft Staff Report are available for consideration and adoption during the public planning process. After public review of this draft Staff Report, certain alternatives may be rejected for not meeting the purposes and goals of the project or as not feasible. If so, written findings would explain the reasoning in a revised Staff Report.

The draft Staff Report is an environmental document that complies with CEQA and other laws and provides the public with an opportunity to review and comment on the analyses. After considering the comments received on the draft Staff Report, State Water Board staff will develop and circulate specific regulatory text for the proposed Sacramento/Delta changes to the Bay-Delta Plan, including the program of implementation (collectively referred to as *Plan amendments*). These draft Plan amendments will be the specific regulatory text for the Plan itself and will be part of a full public process. Draft language is anticipated to be released for public review and comment in 2024.

The input received on the draft Staff Report and the draft Plan amendments will inform the final Staff Report and final proposed Plan amendments, which will be brought before the State Water Board for consideration at a future meeting. Interested parties will also have the opportunity to review and comment on the final Staff Report and final proposed Plan amendments prior to Board consideration.

Table 1-1. Impact and Mitigation Measure Summary—Proposed Plan Amendments [1,2]

Impact	Impact Conclusions	Proposed Mitigation
AESTHETICS		
Impact AES-a: Have a substantial adverse effect on a scenic vista **Impact AES-b:** Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway **Impact AES-c:** Substantially degrade the existing visual character or quality of the site and its surroundings	**Potentially Significant**	
	Reservoir level changes may result in exposure of more unvegetated ground or "bathtub rings" Agriculture land conversion could affect aesthetic resources if properties are developed or neglected	**MM-AES-a–c: Mitigate impacts of the project that could have a substantial adverse effect on a scenic vista or could substantially damage a scenic resource or degrade the existing visual character or quality of the site and its surroundings** 1. Reservoir Management (MM-AQUA-a,d: 1) 2. Measures to Mitigate Conversion of Agricultural Land (MM-AG-a,e)
	Less than Significant	
	Altered streamflows could affect water levels and appearance Reduced Sacramento/Delta supply to municipalities could affect the visual quality of the urban environment Reduced Sacramento/Delta supplies to wildlife refuges could result in slight changes to the visual character of these areas Municipal water conservation measures could cause a change in the visual character of localized settings	—
Impact AES-d: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	**No Impact**	
	—	—
AGRICULTURE AND FOREST RESOURCES		
Impact AG-a: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland	**Potentially Significant**	
	Reduced Sacramento/Delta supply to agriculture could lead to changes in distribution of crop types and acreage and conversion of farmland to nonagricultural use Increased use of water transfers could further incentivize	**MM-AG-a,e: Mitigate impacts related to the conversion of Prime and Unique Farmland and Farmland of Statewide Importance (important farmland) to**

Impact	Impact Conclusions	Proposed Mitigation
Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use **Impact AG-e:** Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Important Farmland to nonagricultural use	farmland conversion, particularly in rapidly urbanizing areas Lower groundwater levels could reduce groundwater available for agricultural use Reduced streamflow and water levels at some locations could affect the ability of existing diversion intakes to divert water for agricultural use Increased inundation in the Sutter and Yolo Bypasses during the planting season could affect crop acreage	**nonagricultural use** 1. Voluntary Implementation Plans 3. Diversify Water Portfolios 4. Increase Efficiency of Agricultural Water Use 5. Impose Conditions on Land Use Changes or Other Discretionary Approvals 6. Reduce Impacts on Groundwater (MM-GW-b) 7. Oversight and Approval of Water Transfers 8. Ensure Effectiveness of Diversion Intakes 9. Minimize Disruptions to Agriculture in the Sutter and Yolo Bypasses from Increased Floodplain Inundation
Impact AG-b: Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract	**No Impact**	
	—	—
Impact AG-c: Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))	**No Impact**	
	—	—
Impact AG-d: Result in the loss of forest land or conversion of forest land to non-forest use	**No Impact**	
	—	—
AIR QUALITY		
Impact AQ-a: Conflict with or obstruct implementation of the applicable air quality plan	**Potentially Significant**	
	Increased groundwater pumping using diesel pumps and generators could result in emissions	**MM-AQ-a–c: Mitigate impacts from criteria air pollutant emissions from**

Impact	Impact Conclusions	Proposed Mitigation
Impact AQ-b: Violate any air quality standard or contribute substantially to an existing or projected air quality violation **Impact AQ-c:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)		**groundwater pumping**
	Less than Significant	
	Lower streamflows and reservoir levels could result in exposure to increased windblown dust emissions Agricultural land fallowing could result in exposure to increased fugitive dust Post-harvest rice burning could result in exposure to air pollutant emissions	—
	Beneficial	
	Water conservation could result in a reduction in emissions	—
Impact AQ-d: Expose sensitive receptors to substantial pollutant concentrations	**Less than Significant**	
	Lower reservoir levels could result in exposure to increased windblown dust emissions Agricultural land fallowing could result in exposure to increased fugitive dust on lands where soil is exposed Post-harvest rice burning, groundwater pumping, and the use of other water management actions could result in exposure to pollutant emissions	—
Impact AQ-e: Create objectionable odors affecting a substantial number of people	**Less than Significant**	
	Formation of harmful algal blooms from reduced flows and reservoir levels could produce odor compounds Reductions in overall wastewater flow and increased use of recycled water could result in increases in odors Increases in odors from increased groundwater pumping and other water management actions	—
BIOLOGICAL RESOURCES—TERRESTRIAL		
Impact TER-a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or	**Potentially Significant**	
	Increased inundation in flood bypasses during the planting season could affect crop acreage, which could affect special-status wildlife species that use croplands as habitat Reduced Sacramento/Delta supply to wildlife refuges and agricultural lands could affect habitat for special-status	**MM-TER-a: Mitigate impacts on special-status species** 1. Minimize Impacts on Sutter and Yolo Bypass Agricultural Lands (MM-AG-a,e: 4, MM-AG-a,e: 8)

Impact	Impact Conclusions	Proposed Mitigation
regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service	species, including giant gartersnake, Swainson's hawk, greater sandhill crane, tricolored blackbird, and California black rail Reduced Sacramento/Delta supply to municipal and agricultural use could affect special-status plant and wildlife species Capturing flood flows for groundwater storage and recovery could diminish instream ecological benefits of high-flow events* Water transfers based on cropland idling could affect special-status species that use agricultural fields Increased use of recycled water that would otherwise discharge to streams could diminish ecological benefits of instream flows, especially in dry seasons and in low-flow conditions where streamflow is dependent on wastewater discharges*	10. Habitat Protection and Restoration Actions 11. Voluntary Implementation Plans 12. Special-Status Species Management Measures 13. Diversify Water Portfolios 14. Regulation of Waste Discharges to Streams (MM-SW-a,f: 1) 15. Support and Approval of Water Recycling 16. Support and Approval of Groundwater Storage and Recovery 17. Oversight and Approval of Water Transfers
	Less than Significant	
	Increased winter flows on the Sacramento and Feather Rivers could affect bank swallow habitat Changes in reservoir water levels could affect habitat for bald eagle, American white pelican, western pond turtle, and amphibians Changes in streamflow below export reservoirs could affect habitat for special-status terrestrial species Lower groundwater levels could affect natural communities that are dependent on groundwater and sensitive species that are reliant on groundwater-dependent ecosystems	—
	Beneficial	
	Restoration and maintenance of natural flow would improve conditions for special-status plants and wildlife A more natural flow regime could contribute to the control of invasive species in combination with invasive species control efforts Increased frequency and duration of floodplain inundation would improve habitat for wintering waterfowl and other	—

Impact	Impact Conclusions	Proposed Mitigation
	wildlife species Changes in Delta inflows and Delta outflows would improve habitat conditions for freshwater and tidal marsh species in the Delta and Suisun Marsh	
Impact TER-b: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact TER-c:** Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means	**Potentially Significant**	
	Changes in reservoir levels and streamflow below reservoirs could affect associated riparian and wetland habitat Reduced Sacramento/Delta supply to wildlife refuges could decrease wetland area over time Reduced Sacramento/Delta supply could affect water quality in managed wetlands Reduced Sacramento/Delta supply to municipal and agricultural use could affect sensitive riparian and wetland habitat, and other natural communities Lower groundwater levels could affect riparian and wetland habitat, and sensitive groundwater-dependent natural communities and wetlands Capturing flood flows for groundwater storage and recovery could diminish the instream ecological benefits of high-flow events* Increased use of water transfers could affect groundwater-dependent natural communities and some perennial wetlands in some areas, and could exacerbate effects from lower groundwater levels on riparian and wetland habitat and sensitive natural communities Increased use of water recycling could diminish riparian and wetland habitat, especially in dry seasons and in low-flow conditions where streamflow depends on wastewater discharges*	**MM-TER-b,c: Mitigate impacts on riparian habitats or other sensitive natural communities, including wetlands** 1. Reservoir Management (MM-AQUA-a,d: 1) 18. Reduce Impacts on Groundwater-Dependent Ecosystems (MM-GW-b: 1–7) 19. Agricultural Drainage Control (MM-SW-a,f: 7) 20. Implement Mitigation Measure MM-TER-a elements to reduce impacts on riparian habitats and other sensitive natural communities, including wetlands: • Habitat Protection and Restoration Actions (MM-TER-a: 2) • Regulation of Waste Discharges to Streams (MM-TER-a: 6) • Support and Approval of Water Recycling (MM-TER-a: 7) • Support and Approval of Groundwater Storage and Recovery (MM-TER-a: 8) • Oversight and Approval of Water Transfers (MM-TER-a: 9)
	Less than Significant	
	Reduced streamflows below export reservoirs could affect riparian and wetland habitat Reduced agricultural and municipal discharges could affect	—

Impact	Impact Conclusions	Proposed Mitigation
	some wetland communities and native vegetation	
	Beneficial	
	A more natural flow regime would restore and maintain natural processes, such as sediment deposition, marsh accretion, nutrient transport, seed dispersal, and flow-related disturbance, which would benefit riverine and associated wetland and riparian habitat Increased frequency and duration of floodplain inundation would benefit riparian and wetland habitat and associated natural communities Changes in Delta inflows and Delta outflows would benefit freshwater marshes and tidal marshes Increased use of water recycling and municipal water conservation measures could reduce municipal discharges and support conditions favorable to wetlands and sensitive natural communities adapted to the natural flow regime	—
Impact TER-d: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	**Potentially Significant**	
	Reduced Sacramento/Delta supply for wildlife refuges and agriculture could decrease the amount of habitat available for resident and migratory waterfowl and shorebirds Increased use of water transfers could result in conversion of crop types that provide foraging habitat for migratory waterfowl and shorebirds	1. MM-TER-d: Mitigate impacts on wildlife movement wildlife nurseries 21. Implement Mitigation Measure MM-TER-a and Mitigation Measure MM-TER-b,c elements to mitigate impacts on the movement of native resident or migratory fish or wildlife species, migratory wildlife corridors, and native wildlife nursery sites. • Habitat Protection and Restoration Actions (MM-TER-a: 2) • Voluntary Implementation Plans (MM-TER-a: 3) • Oversight and Approval of Water Transfers (MM-TER-a: 9) • Reduce Impacts on Groundwater-Dependent Ecosystems (MM-TER-b,c: 2)

Impact	Impact Conclusions	Proposed Mitigation
	Less than Significant	
	Changes in reservoir levels could affect the amount of breeding habitat for resident or migratory waterfowl populations	—
	Beneficial	
	A more natural flow regime would benefit native resident and migratory wildlife that use riverine and associated wetland and riparian habitat and natural communities as migratory corridors or nursery sites	—
Impact TER-e: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	**No Impact**	
	—	—
Impact TER-f: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	**Less than Significant**	
	Reduced Sacramento/Delta supply could affect habitat goals of some habitat conservation plans	—
	Beneficial	
	Changes in Sacramento/Delta tributary flows, Delta inflows, and Delta outflows would complement actions identified in some habitat conservation plans	—
BIOLOGICAL RESOURCES—AQUATIC		
Impact AQUA-a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact AQUA-d:** Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established	**Potentially Significant**	
	Changes in reservoir levels could affect downstream flows and water temperatures below some reservoirs Reduced Sacramento/Delta supply to agriculture could affect habitat for special status species that depend in part on Sacramento/Delta water supply for habitat (i.e., irrigation runoff in agricultural drain for desert pupfish) Lower groundwater levels could affect stream-aquifer interactions and streamflows in some locations Diversion of surface water for groundwater storage and recovery could reduce peak flows that provide ecological and habitat functions (e.g., floodplain inundation)* Water transfers could alter hydrologic patterns and affect	MM-AQUA-a,d: Mitigate impacts on aquatic special-status species and wildlife movement or wildlife nurseries 1. Temperature Control and Reservoir Management 22. Voluntary Implementation Plans 23. Habitat Protection and Restoration Actions 24. Special-Status Species Management Measures 25. Regulation of Waste Discharges to

Impact	Impact Conclusions	Proposed Mitigation
native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	aquatic biological resources in some locations Increased water recycling could decrease the volume of treated wastewater effluent discharge into water bodies that are migratory corridors for fish*	Streams (MM-SW-a,f: 1) 26. Support and Approval of Recycled Water 27. Reduce Impacts on Groundwater (MM-GW-b: 1–7) 28. Diversify Water Portfolios 29. Support and Approval of Groundwater Storage and Recovery 30. Oversight and Approval of Water Transfers
	Less than Significant	
	Changes in interior Delta flows Changes in wet season flows (geomorphic flows) on regulated tributaries in the Sacramento/Delta regions could cause some erosion, but would also result in ecological benefits of floodplain inundation Changes in reservoir levels could affect native reservoir fish species, such as minnows and suckers	—
	Beneficial	
	A more natural flow regime would support a connected and functioning ecosystem and benefit native fish in the Sacramento/Delta Changes in Delta inflows and outflows would benefit native anadromous, estuarine, and resident fish species Increased frequency and duration of floodplain inundation in Feather River and Yolo Bypass would benefit aquatic species	—
Impact AQUA-f: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	**Less than Significant**	
	Reduced Sacramento/Delta supply could frustrate certain conservation plan management actions	—

Impact	Impact Conclusions	Proposed Mitigation
CULTURAL RESOURCES		
Impact CUL-a: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 **Impact CUL-b:** Cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5	**Potentially Significant**	
	Changes in reservoir levels could expose previously inundated cultural resources and/or significant historic or archaeological resources to increased wave action, erosion, and human activity	**MM-CUL-a,b: Mitigate impacts of project that could cause a substantial adverse change in the significance of a historical or archaeological resource** 1. Reservoir Management (MM-AQUA-a,d: 1) 31. Implement or Adhere to Cultural Resource Management Measures for Lands Surrounding Reservoirs 32. Unanticipated Discoveries
	Less than Significant	
	Changes in streamflows could result in inundation and exposure of historic or archaeological resources	—
Impact CUL-c: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	**No Impact**	
	—	—
Impact CUL-d: Disturb any human remains, including those interred outside of dedicated cemeteries	**Potentially Significant**	
	Changes in reservoir levels could expose previously inundated land containing human burials, which could result in disturbance of the burial and impacts from human activity	1. **MM-CUL-d: Mitigate impacts of project that could disturb any human remains, including those interred outside of dedicated cemeteries** 33. Implement MM-CUL-a,b
	Less than Significant	
	Changes in river flows could alter the baseline conditions of human burials interred within or outside of dedicated cemeteries	—

Impact	Impact Conclusions	Proposed Mitigation
ENERGY		
Impact EN-a: The effects of the project on energy resources **Impact EN-b:** The effect of the project on peak and base period demands for electricity and other forms of energy **Impact EN-c:** The effects of the project on local and regional energy supplies and requirements for additional capacity **Impact EN-d:** The degree to which the project complies with existing energy standards **Impact EN-e:** Energy requirements and energy use efficiencies by amount and fuel type for each stage of the project	**Potentially Significant**	
	Changes in hydrology would result in a decrease in hydropower generation in the summer which could be significant for an individual project or community Changes in water supply could cause an increase in energy use to replace Sacramento/Delta supplies from actions such as increased groundwater pumping and other water management actions	**MM-EN-a–e: Mitigate the project effects on energy resources** 1. Voluntary Implementation Plans 34. Temperature Control and Reservoir Management in the Sacramento/Delta 35. Coordination with Existing Requirements 36. Diversify Water Portfolios 37. Increase Water Efficiency 38. Promote the Use of Renewable Energy 39. Implement Greenhouse Gas Emissions Mitigation (MM-GHG-a and MM-GHG-b)
	Beneficial	
	Changes in water supply could result in a reduction in the energy used to export water from the Delta Water conservation could result in a reduction in energy use	—
Impact EN-f: The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives	**Less than Significant**	
	Reduction in agricultural production could increase energy use for transportation	—
GEOLOGY AND SOILS		
Impact GEO-a: Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving: rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure including liquefaction, or landslides	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
Impact GEO-b: Result in substantial soil erosion or the loss of topsoil	**Less than Significant**	
	Agriculture fallowing could temporarily increase erosion and sedimentation	—
Impact GEO-c: Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse	**Potentially Significant**	
	Lower groundwater levels could exacerbate existing problems associated with ground subsidence	**MM-GEO-c: Mitigate impacts associated with unstable soils and steep slopes (landslide, lateral spreading, subsidence, liquefaction, or collapse)** 1. Actions to Reduce Subsidence 40. Reduce Impacts on Groundwater (MM-GW-b)
I**mpact GEO-d:** Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property	**No Impact**	
	—	—
Impact GEO-e: Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater	**No Impact**	
	—	—
GREENHOUSE GAS EMISSIONS		
Impact GHG-a: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	**Potentially Significant**	
	Increased groundwater pumping from wells with diesel-powered pumps could generate additional greenhouse gas emissions Groundwater storage and recovery, water transfers, and water recycling could result in emissions associated with energy use	**MM-GHG-a: Mitigate impacts from greenhouse gas emissions** 1. Water Use Efficiency 41. Water Conservation 42. Energy Efficiency 43. Irrigation Systems 44. Restoration, Pricing Strategies, and Mitigation Credits 45. Implement Energy Mitigation

Impact	Impact Conclusions	Proposed Mitigation
		(Mitigation Measure MM-EN-a–e: 1–6) 46. Implement Mitigation Measure MM-GHG-b, Comply with applicable greenhouse gas emissions reduction plans, policies, or regulations
	Less than Significant	
	Reductions in hydropower generation could result in additional energy generation at fossil-fuel facilities Increased groundwater pumping from wells with electric fuel pumps could generate additional greenhouse gas emissions	—
	Beneficial	
	Changes in water supply could result in a reduction in the energy used to export water from the Delta and a corresponding reduction in greenhouse gas emissions Water conservation could result in a reduction in energy use and greenhouse gas emissions	—
Impact GHG-b: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases	**Potentially Significant**	
	Increased groundwater pumping from wells with diesel-powered pumps could result in emissions in excess of existing thresholds and could conflict with the state's long-term emission reduction trajectory	**MM-GHG-b: Comply with applicable greenhouse gas emission reduction plans, policies, or regulations** 1. Implement Air Quality Plans and Programs 47. Renewable Energy 48. Implement Mitigation Measure (MM-GHG-a): 1–6, Mitigate impacts from greenhouse gas emissions
	Beneficial	
	Water use efficiency, water recycling, and reuse of urban runoff would be beneficial in meeting other state and local GHG goals	—

Impact	Impact Conclusions	Proposed Mitigation
HAZARDS AND HAZARDOUS MATERIALS		
Impact HAZ-a: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	**No Impact**	
	—	—
Impact HAZ-b: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	**No Impact**	
	—	—
Impact HAZ-c: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	**No Impact**	
	—	—
Impact HAZ-d: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment	**No Impact**	
	—	—
Impact HAZ-e: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
Impact HAZ-f: For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area	**No Impact**	
	—	—
Impact HAZ-g: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	**No Impact**	
	—	—
Impact HAZ-h: Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	**Less than Significant**	
	Changes in reservoir levels in areas likely to continue experiencing forest fires could affect wildland fire suppression practices	—
HYDROLOGY AND WATER QUALITY—SURFACE WATER		
Impact SW-a: Violate any water quality standards or waste discharge requirements **Impact SW-f**: Otherwise substantially degrade water quality	**Potentially Significant**	
	Reduced streamflows of smaller streams below some reservoirs could result in less dilution and increased concentration of contaminants Increased flows could result in increased input of mercury and methylmercury production downstream, including in areas such as the Yolo Bypass Increases in water level fluctuation at some reservoirs could result in increased bioaccumulation of methylmercury in fish Changes in reservoir levels and lowered streamflows below reservoirs could result in increased water temperature in some locations and times of year, particularly while specific cold water habitat implementation measures are refined Changes in reservoir levels could result in increased production of harmful algal blooms (HABs) in some locations Lower summer and fall flows in some Delta channels could	**MM-SW-a,f: Avoid or reduce violations of water quality standards or waste discharge requirements, and/or degradations of water quality** 1. Water Quality Contaminants and Regulation of Waste Discharges 49. Minimize Mercury Impacts 50. Temperature Control and Reservoir Management (MM-AQUA-a,d: 1) 51. Avoid or Reduce Harmful Algal Blooms and Invasive Aquatic Weeds 52. Protect Municipal Water Quality 53. Reduce Impacts on Groundwater (MM-GW-b) 54. Agricultural Drainage Control 55. Diversify Water Portfolios

Impact	Impact Conclusions	Proposed Mitigation
	result in incremental increased production of HABs and invasive aquatic plants Changes in water supply could result in temporary exceedances of maximum contaminant levels in municipal water supply Changes in water supply and indoor water conservation could result in site-specific exceedances of waste discharge requirements due to changes in wastewater treatment plant (WWTP) influent and effluent quality and quantity Reductions in delivery of higher quality Sacramento/Delta supplies to wildlife refuges and managed wetlands could affect water quality Reductions in groundwater accretions could cause decreases in water quality associated with lower streamflows or higher temperatures Diversion of surface water for groundwater storage and recovery could limit the dilution effect of existing flows and exacerbate existing water quality impairments* Increased use of water transfers could affect water quality in some locations Increased water recycling could reduce instream flows, which could reduce dilution of local sources of contaminants*	56. Support and Approval of Groundwater Storage and Recovery 57. Oversight and Approval of Water Transfers 58. Support and Approval of Water Recycling
	Less than Significant	
	Changes in flows could result in moderately elevated turbidity and total suspended solids (TSS) levels in some locations, and reduced occurrence of the highest turbidity and TSS levels Increased Delta outflow would result in little change or beneficial reductions in electrical conductivity (EC) in the Delta Increased Delta outflow would result in little change or beneficial reductions in chloride and bromide at municipal intakes in the Delta Increased floodplain inundation could affect nutrients, organic material, invasive aquatic plants, and HABs	—

Impact	Impact Conclusions	Proposed Mitigation
	Beneficial	
	Reduced seawater intrusion could result in water quality improvements in the Delta, including dilution and flushing of some contaminants and reductions in EC, bromide, and chloride Increased flows would enhance water quality for fish Increased flows could dilute certain constituents in waterbodies that would provide a water quality benefit Changes in Delta outflows could reduce HABs and invasive vegetation	—
Impact SW-c: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site **Impact SW-d:** Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site	**Potentially Significant**	
	Increases in Clear Creek flow downstream of Whiskeytown Lake could increase risk of erosion and flooding in this area*	**MM-SW-i: Avoid or reduce exposure of people or structures to flood risk on Clear Creek**
	Beneficial	
	A more natural flow regime could contribute to the restoration of beneficial geomorphic processes (i.e., those that clean fine sediment from spawning gravels, maintain a diversity of bed forms, and help maintain functional floodplain and riparian habitats through floodplain inundation) Changes in Delta inflows would provide for floodplain inundation to benefit native species	—
Impact SW-e: 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	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
Impact SW-g: Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map **Impact SW-h:** Place within a 100-year flood hazard area structures which would impede or redirect flood flows	**No Impact**	
	—	—
Impact SW-i: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam	**Potentially Significant**	
	Increases in Clear Creek flow downstream of Whiskeytown Lake could increase the risk of downstream flooding in this area*	**MM-SW-i: Avoid or reduce exposure of people or structures to flood risk on Clear Creek**
Impact SW-j: Inundation by seiche, tsunami, or mudflow	**No Impact**	
	—	—
HYDROLOGY AND WATER QUALITY—GROUNDWATER		
Impact GW-b: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)	**Potentially Significant**	
	Increased groundwater pumping and reductions in incidental groundwater recharge from applied irrigation could lower groundwater levels and contribute to groundwater overdraft Lower groundwater levels could result in an increase in frequency and severity of critical shortages or dry wells occurring in some areas for communities that rely on groundwater, including economically disadvantaged communities Reduced Sacramento/Delta supplies could have localized impacts on groundwater storage in areas where Sacramento/Delta supplies are used for groundwater banking Surface water transfers through groundwater substitution could result in lower groundwater levels in basin of origin Agricultural conservation measures could reduce incidental groundwater recharge that would lower groundwater levels	**MM-GW-b: Mitigate the substantial depletion of groundwater supplies or the substantial interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level** 1. Implement the Sustainable Groundwater Management Act (SGMA) 2. SGMA Oversight 3. Diversify Water Portfolios 4. Support and Approval of Groundwater Storage and Recovery 5. Support and Approval of Water Recycling Projects 6. Oversight and Approval of Water Transfers

Impact	Impact Conclusions	Proposed Mitigation
		7. Voluntary Implementation Plans
	Less than Significant	
	Reduced flows downstream of reservoirs could affect stream-aquifer interactions Increased water recycling could have effects on groundwater levels Municipal water conservation measures could reduce incidental groundwater recharge from urban runoff	—
	Beneficial	
	Groundwater storage and recovery could enhance groundwater levels Water recycling could increase groundwater levels in some areas if a portion of the recycled water reaches the aquifer or if the recycled water offsets a use that previously was supplied by groundwater	—
Impact GW-a: Violate any water quality standards or waste discharge requirements **Impact GW-f:** Otherwise substantially degrade water quality	**Potentially Significant**	
	Lower groundwater levels can result in changes in groundwater flow direction and gradients in localized areas, which could exacerbate the migration of contaminants In some locations, lower groundwater levels may concentrate salts and nutrients in groundwater over time through evaporative enrichment Lower groundwater levels could affect groundwater quality and potentially affect drinking water wells in some areas, including economically disadvantaged communities Lower groundwater levels could have localized effects on groundwater quality by concentrating pollutants where groundwater contamination already exists Groundwater storage and recovery projects that use poor quality water to recharge groundwater basins could contribute to salt and nutrient loading or introduce contaminants to the underlying aquifer* Other water management actions (water transfers through groundwater substitution and agriculture water	**MM-GW-a,f: Mitigate impacts to groundwater quality from depletion of groundwater supplies or the substantial interference with groundwater recharge** 1. Drinking Water Programs 59. Implement the State and Regional Board's Irrigated Lands Regulatory Program 60. Reduce Impacts on Groundwater (MM-GW-b)

Impact	Impact Conclusions	Proposed Mitigation
	conservation) could result in lower groundwater levels, which could exacerbate groundwater quality impairments or contribute to contaminant loading in localized areas	
	Less than Significant	
	Recycled water may percolate into the underlying groundwater basin, and could affect groundwater quality	—
	Beneficial	
	Increased infiltration from stream-aquifer interactions from increased flows in the Sacramento/Delta could improve groundwater quality Groundwater storage and recovery projects that use high-quality water to recharge groundwater basins may provide an effective strategy to maintain or improve groundwater quality	—
LAND USE AND PLANNING		
Impact LU-a: Physically divide an established community	**No Impact**	
	—	—
Impact LU-b: Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect	**No Impact**	
	—	—
Impact LU-c: Conflict with any applicable habitat conservation plan or natural community conservation plan	**Less than Significant**	
	See Section 7.6.1, *Terrestrial Biological Resources,* Impact TER-f	—
MINERAL RESOURCES		
Impact MIN-a: Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
Impact MIN-b: Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan	**No Impact**	
	—	—
NOISE		
Impact NOI-a: Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies **Impact NOI-c:** A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project **Impact NOI-d:** A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project	**Potentially Significant**	
	Increased groundwater pumping for replacement water supply, groundwater storage and recovery, or groundwater substitution transfers could result in higher noise levels	**MM-NOI-a,c,d: Mitigate exposure of persons to or generation of noise levels in excess of established standards and to substantial permanent or temporary increases in ambient noise levels in the project vicinity** 1. Applicable Policies and Regulations 61. Noise-Reduction Consideration in Operations
Impact NOI-b: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels	**Less than Significant**	
	Increased groundwater pumping could result in localized and intermittent perceptible vibration	—
Impact NOI-e: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels	**No Impact**	
	—	—
Impact NOI-f: For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
excessive noise levels		
POPULATION AND HOUSING		
Impact POP-a: Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)	**No Impact**	
	—	—
Impact POP-b: Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere	**No Impact**	
	—	—
Impact POP-c: Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere	**No Impact**	
	—	—
PUBLIC SERVICES		
Impact PS-a: Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: fire protection, police protection, schools, parks, or other public facilities	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
RECREATION		
Impact REC-a: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated	**Potentially Significant**	
	Changes in reservoir levels could affect boat ramp accessibility affecting recreation opportunities at some reservoirs	**MM-REC-a: Mitigate recreation impacts associated with reservoir level changes** 1. Reservoir Management (MM-AQUA-a–d: 1) 62. Recreation Management Measures
	Less than Significant	
	Reduced summer flows could affect the boating difficulty of rapids for rafting and kayaking at some locations Increased spring and early summer flows could reduce opportunities for swimming or wading in rivers at some locations Incremental increase in potential harmful algal blooms could cause closures to recreation in some waterbodies Changes in reservoir water surface area and elevation could affect sportfish populations and reduce fishing opportunities at some locations Reduced deliveries to wildlife refuges could affect recreational opportunities (e.g., wildlife viewing) Reduced municipal water supply could affect municipal recreational opportunities at parks, playfields, and swimming pools	—
	Beneficial	
	Changes in flow could improve recreational opportunities	—
Impact REC-b: Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment	**Potentially Significant**	
	Changes in reservoir levels could affect boat ramp accessibility and lead to modification of existing or development of new boat ramps in some locations	**MM-REC-b: Mitigate impacts from construction or expansion of recreational facilities (boat ramps)** 1. Implement MM-REC-a 63. If construction of new or modified boat ramps is necessary, implement mitigation measures described in

Impact	Impact Conclusions	Proposed Mitigation
		Section 7.22, *New or Modified Facilities*
TRANSPORTATION/TRAFFIC		
Impact TRA-a: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit **Impact TRA-f:** Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities	**Less than Significant**	
	Increased intermittent inundation of floodplains bounded by levees where roads and pedestrian and bicycle paths exist could affect transportation Increased closures of the Delta Cross Channel (DCC) gates could affect recreational boat navigation Changes in agricultural land use or fallowing could lead to changes in agricultural product-related transportation	—
Impact TRA-b: Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways	**No Impact**	
	—	—
Impact TRA-c: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	**No Impact**	
	—	—
Impact TRA-d: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
(e.g., farm equipment)		
Impact TRA-e: Result in inadequate emergency access	**No Impact**	
	—	—
UTILITIES AND SERVICE SYSTEMS		
Impact UT-a: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	**Potentially Significant**	
	Changes in hydrology and water supply could alter the assimilative capacity of some streams where treated wastewater is discharged Changes in water supply could result in the use of other lower quality water supply sources that affect WWTP influent and effluent Reduced municipal supply and increased indoor water conservation could lead to a decrease in the production of wastewater and increase chemical constituent concentrations in WWTP influent Groundwater storage and recovery or water transfers could increase concentrations of some pollutants of concern in WWTP influent, if the source of the stored groundwater or transfer is of lower quality	**MM-UT-a: Avoid or reduce potential to exceed wastewater treatment requirements** 1. Water Quality Contaminants and Regulation of Waste Discharges 64. Protect Municipal Water Quality 65. Increased Coordination between Water Suppliers and Wastewater Agencies 66. Minimize Surface Water Quality Effects on Wastewater Treatment Plants (MM-SW-a,f) 67. Minimize Groundwater Quality Effects on Wastewater Treatment Plants (MM-GW-a,f)
Impact UT-b: Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	**Potentially Significant**	
	Changes in hydrology and water supply could result in construction to modify or expand existing treatment facilities in order to prevent or mitigate exceedances of drinking water standards and wastewater discharge water quality objectives	**MM-UT-b: Avoid or reduce impacts from the construction of new water or wastewater treatment facilities or expansion of existing facilities** 1. Implement MM-UT-a 68. If construction of new water or wastewater treatment facilities or expansion of existing facilities is necessary, implement mitigation measures described in Section 7.22, *New or Modified Facilities*

Impact	Impact Conclusions	Proposed Mitigation
Impact UT-c: Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	**No Impact**	
	—	—
Impact UT-d: Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed	**Potentially Significant**	
	Reduced Sacramento/Delta supply to municipal use could affect municipal water supplies Reduced groundwater levels could affect water supplies for communities that rely on groundwater as their primary municipal water source, including economically disadvantaged communities Reduced streamflows and water levels at some locations could affect the ability of existing diversion intakes to divert water, which could affect municipal water supplies	**MM-UT-d: Avoid or reduce impacts on municipal supplies** 1. Voluntary Implementation Plans 69. Diversify Water Portfolios 70. Increase Water Use Efficiency 71. Implement Municipal Water Shortage Policy 72. Prioritize Water Supplies for Health and Safety 73. Reduce Impacts on Groundwater (MM-GW-b) 74. Protect Municipal Water Supplies 75. Ensure Effectiveness of Diversion Intakes (MM-AG-a,e: 7)
	Beneficial	
	Other water management actions (groundwater storage and recovery, water transfers, water recycling, water conservation) could contribute to meeting water demands for municipal use	—
Impact UT-e: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
Impact UT-f: Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs **Impact UT-g:** Comply with federal, state, and local statutes and regulations related to solid waste	**Less than Significant**	
	Changes to agricultural crop type or production resulting from changes in water supply could generate solid waste Increased water recycling could lead to an increase in solid waste byproducts	—

Note:

[1] Table 1-1 is the same Impact and Mitigation Measure Summary Table presented in Section 7.1, *Introduction, Project Description, and Approach to Environmental Analysis* (see Table 7.1-2).

[2] Additional impacts and mitigation measures associated with habitat restoration and other ecosystem projects, as well as new and modified facilities, are presented in Section 7.21, *Habitat Restoration and Other Ecosystem Projects* (Table 7.21-1) and Section 7.22, *New and Modified Facilities* (Table 7.22-1).

Table 1-2. Impact and Mitigation Measure Summary—Proposed Voluntary Agreements [1,2]

Impact	Impact Conclusions	Proposed Mitigation
AESTHETICS		
Impact AES-a: Have a substantial adverse effect on a scenic vista **Impact AES-b:** Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway **Impact AES-c:** Substantially degrade the existing visual character or quality of the site and its surroundings	**Potentially Significant** Reservoir level changes may result in exposure of more unvegetated ground or "bathtub rings" Agriculture land conversion could affect aesthetic resources if properties are developed or neglected	**MM-AES-a–c: Mitigate impacts of the project that could have a substantial adverse effect on a scenic vista or could substantially damage a scenic resource or degrade the existing visual character or quality of a site and its surroundings** 1. Reservoir Management (MM-AQUA-a,d: 1.ii) 2. Measures to Mitigate Conversion of Agricultural Land (MM-AG-a,e)
	Less than Significant Altered streamflows could affect water levels and appearance Reduced Sacramento/Delta supply to municipalities could affect the visual quality of the urban environment	—
Impact AES-d: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	**No Impact**	—
AGRICULTURE AND FOREST RESOURCES		
Impact AG-a: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use **Impact AG-e:** Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Important Farmland to	**Potentially Significant** Reduced Sacramento/Delta supply to agriculture could lead to changes in distribution of crop types and acreage and conversion of farmland to nonagricultural use Lower groundwater levels could reduce groundwater available for agricultural use	**MM-AG-a,e: Mitigate impacts related to the conversion of Prime and Unique Farmland and Farmland of Statewide Importance (important farmland) to nonagricultural use** 2. Diversify Water Portfolios 3. Increase Efficiency of Agricultural Water Use 4. Impose Conditions on Land Use Changes or Other Discretionary Approvals 5. Reduce Impacts on Groundwater (MM-GW-b, 1-6)

Impact	Impact Conclusions	Proposed Mitigation
nonagricultural use		6. Oversight and Approval of Water Transfers
	Less than Significant Reduced streamflow and water levels at some locations could affect the ability of existing diversion intakes to divert water for agricultural use Increased inundation in the Sutter and Yolo Bypasses during the planting season could affect crop acreage	—
Impact AG-b: Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract	**No Impact**	—
Impact AG-c: Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))	**No Impact**	—
Impact AG-d: Result in the loss of forest land or conversion of forest land to non-forest use	**No Impact**	—
AIR QUALITY		
Impact AQ-a: Conflict with or obstruct implementation of the applicable air quality plan **Impact AQ-b:** Violate any air quality standard or contribute substantially to an existing or projected air quality violation **Impact AQ-c:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed	**Potentially Significant** Increased groundwater pumping using diesel pumps and generators could result in emissions	**MM-AQ-a–c: Mitigate impacts from criteria air pollutant emissions from groundwater pumping**
	Less than Significant Lower streamflows and reservoir levels could result in exposure to increased windblown dust emissions Agricultural land fallowing could result in exposure to increased fugitive dust Post-harvest rice burning could result in exposure to air pollutant emissions	—

Impact	Impact Conclusions	Proposed Mitigation
quantitative thresholds for ozone precursors)		
Impact AQ-d: Expose sensitive receptors to substantial pollutant concentrations	**Less than Significant** Lower reservoir levels could result in exposure to increased windblown dust emissions Agricultural land fallowing could result in exposure to increased fugitive dust on lands where soil is exposed Post-harvest rice burning and groundwater pumping could result in exposure to pollutant emissions	—
Impact AQ-e: Create objectionable odors affecting a substantial number of people	**Less than Significant** Formation of harmful algal blooms from reduced flows and reservoir levels could produce odor compounds Increases in odors from increased groundwater pumping	—
BIOLOGICAL RESOURCES—TERRESTRIAL		
Impact TER-a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service	**Potentially Significant** Reduced Sacramento/Delta supply to agricultural lands could affect habitat for special-status species, including giant gartersnake, Swainson's hawk, greater sandhill crane, tricolored blackbird, and California black rail	**MM-TER-a: Mitigate impacts on special-status species** 2. Habitat Protection and Restoration Actions 4. Special-Status Species Management Measures 5. Diversify Water Portfolios
	Less than Significant Increased winter flows on the Sacramento and Feather Rivers could affect bank swallow habitat Changes in reservoir water levels could affect habitat for bald eagle, American white pelican, western pond turtle, and amphibians Lower groundwater levels could affect natural communities that are dependent on groundwater, and sensitive species that are reliant on groundwater dependent ecosystems	—

Impact	Impact Conclusions	Proposed Mitigation
	Beneficial Restoration and maintenance of natural flow would improve conditions for special-status plants and wildlife Increased frequency and duration of floodplain inundation would improve habitat for wintering waterfowl and other wildlife species Changes in Delta inflows and Delta outflows would improve habitat conditions for freshwater and tidal marsh species in the Delta and Suisun Marsh	—
Impact TER-b: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact TER-c:** Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means	**Potentially Significant** Lower groundwater levels could affect riparian and wetland habitat, and sensitive groundwater-dependent natural communities and wetlands	**MM-TER-b,c: Mitigate impacts on riparian habitats or other sensitive natural communities, including wetlands** 1. Reduce Impacts on Groundwater (MM-GW-b, 1-6)
	Less than Significant Changes in reservoir levels and streamflow below reservoirs could affect associated wetland and riparian habitat Reduced Sacramento/Delta supply could affect water quality in some managed wetlands	—
	Beneficial Providing higher flows could restore and maintain natural processes, such as sediment deposition, marsh accretion, nutrient transport, seed dispersal, and flow-related disturbance, which would benefit riverine and associated wetland and riparian habitat Increased frequency and duration of floodplain inundation would benefit riparian and wetland habitat and associated natural communities Changes in Delta inflows and Delta outflows would benefit freshwater marshes and tidal marshes	—

Impact	Impact Conclusions	Proposed Mitigation
Impact TER-d: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	**Less than Significant** Changes in reservoir levels could affect the amount of breeding habitat for resident or migratory waterfowl populations Changes in groundwater levels could affect habitat for resident or migratory waterfowl and shore birds	—
	Beneficial Providing higher flows could benefit native resident and migratory wildlife that use riverine and associated wetland and riparian habitat and natural communities as migratory corridors or nursery sites	—
Impact TER-e: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	**No Impact**	—
Impact TER-f: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	**No Impact**	—
BIOLOGICAL RESOURCES—AQUATIC		
Impact AQUA-a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact AQUA-d:** Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory	**Potentially Significant** Changes in reservoir levels could affect water temperatures below some reservoirs Lower groundwater levels could affect stream-aquifer interactions and streamflows in some locations	**MM-AQUA-a,d: Mitigate impacts on aquatic special-status species and wildlife movement or wildlife nurseries** 1. 1. ii. Temperature Control and Reservoir Management Habitat Protection and Restoration Actions 2. Reduce Impacts on Groundwater (MM-GW-b, 1-6) 3. Diversify Water Portfolios 4. Support and Approval of Groundwater Storage and Recovery

Impact	Impact Conclusions	Proposed Mitigation
wildlife corridors, or impede the use of native wildlife nursery sites	**Less than Significant** Changes in wet season flows (geomorphic flows) on VA tributaries could cause some erosion Reduced Sacramento/Delta supply to agriculture could affect habitat for special status species that depend in part on Sacramento/Delta water supply for habitat (i.e., irrigation runoff in agricultural drain for desert pupfish)	—
	Beneficial Providing higher flows could support a connected and functioning ecosystem and benefit native fish in the Sacramento/Delta	—
Impact AQUA-f: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	**No Impact**	—
CULTURAL RESOURCES		
Impact CUL-a: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 **Impact CUL-b:** Cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5	**Potentially Significant** Changes in reservoir levels could expose previously inundated cultural resources and/or significant historic or archaeological resources to increased wave action, erosion, and human activity	**MM-CUL-a,b: Mitigate impacts of project that could cause a substantial adverse change in the significance of a historical or archaeological resource** 1. Reservoir Management (MM-AQUA-a,d: 1.ii) 2. Implement or Adhere to Cultural Resource Management Measures for Lands Surrounding Reservoirs
	Less than Significant Changes in streamflows could result in inundation and exposure of historic or archaeological resources	—
Impact CUL-c: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	**No Impact**	—

Impact	Impact Conclusions	Proposed Mitigation
Impact CUL-d: Disturb any human remains, including those interred outside of dedicated cemeteries	**Potentially Significant** Changes in reservoir levels could expose previously inundated land containing human burials, which could result in the disturbance of the burial and impacts from human activity	**MM-CUL-d: Mitigate impacts of project that could disturb any human remains, including those interred outside of dedicated cemeteries**
	Less than Significant Changes in river flows could alter the baseline conditions of human burials interred within or outside of dedicated cemeteries	—
ENERGY		
Impact EN-a: The effects of the project on energy resources **Impact EN-b:** The effect of the project on peak and base period demands for electricity and other forms of energy **Impact EN-c:** The effects of the project on local and regional energy supplies and requirements for additional capacity **Impact EN-d:** The degree to which the project complies with existing energy standards **Impact EN-e:** Energy requirements and energy use efficiencies by amount and fuel type for each stage of the project	**Less than Significant** Changes in hydrology would result in a decrease in hydropower generation in the summer	—
Impact EN-f: The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives	**Less than Significant** Reduction in agricultural production could increase energy use for transportation	—
GEOLOGY AND SOILS		
Impact GEO-a: Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving: rupture of a known earthquake fault, strong seismic ground shaking,	**No Impact**	—

Impact	Impact Conclusions	Proposed Mitigation
seismic-related ground failure including liquefaction, or landslides		
Impact GEO-b: Result in substantial soil erosion or the loss of topsoil	**Less than Significant** Agriculture fallowing could temporarily increase erosion and sedimentation	**—**
Impact GEO-c: Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse	**Potentially Significant** Lower groundwater levels could exacerbate existing problems associated with ground subsidence	**MM-GEO-c: Mitigate impacts associated with unstable soils and steep slopes (landslide, lateral spreading, subsidence, liquefaction, or collapse)** Actions to Reduce Subsidence 1. Reduce Impacts on Groundwater (MM-GW-b, 1-6)
I**mpact GEO-d:** Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property	**No Impact**	**—**
Impact GEO-e: Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater	**No Impact**	**—**
GREENHOUSE GAS EMISSIONS		
Impact GHG-a: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	**Potentially Significant** Increased groundwater pumping from wells with diesel-powered pumps could generate additional greenhouse gas emissions	**MM-GHG-a: Mitigate impacts from greenhouse gas emissions** 1. Water Use Efficiency 2. Water Conservation 3. Energy Efficiency 4. Irrigation Systems 5. Restoration, Pricing Strategies, and Mitigation Credits 6. Implement Energy Mitigation (Mitigation Measure MM-EN-a–e: 1–6) 7. Implement Mitigation Measure MM-GHG-b, Comply with applicable greenhouse gas

Impact	Impact Conclusions	Proposed Mitigation
		emissions reduction plans, policies, or regulations
	Less than Significant Changes in hydropower generation could result in additional energy generation at fossil-fuel facilities Increased groundwater pumping from wells with electric fuel pumps could generate additional greenhouse gas emissions	—
Impact GHG-b: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases	**Potentially Significant** Increased groundwater pumping from wells with diesel-powered pumps could result in emissions in excess of existing thresholds and could conflict with the state's long-term emission reduction trajectory	**MM-GHG-b: Comply with applicable greenhouse gas emission reduction plans, policies, or regulations** 1. Implement Air Quality Plans and Programs 2. Renewable Energy 3. Implement Mitigation Measure (MM-GHG-a): 1–6, Mitigate impacts from greenhouse gas emissions
HAZARDS AND HAZARDOUS MATERIALS		
Impact HAZ-a: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	**No Impact**	—
Impact HAZ-b: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	**No Impact**	—
Impact HAZ-c: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	**No Impact**	—

Impact	Impact Conclusions	Proposed Mitigation
Impact HAZ-d: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment	**No Impact**	—
Impact HAZ-e: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area	**No Impact**	**—**
Impact HAZ-f: For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area	**No Impact**	**—**
Impact HAZ-g: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	**No Impact**	**—**
Impact HAZ-h: Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	**Less than Significant** Changes in reservoir levels in areas likely to continue experiencing forest fires could affect wildland fire suppression practices	**—**
HYDROLOGY & WATER QUALITY—SURFACE WATER		
Impact SW-a: Violate any water quality standards or waste discharge requirements **Impact SW-f**: Otherwise substantially degrade water quality	**Potentially Significant** Reduced streamflows of streams below some reservoirs could result in less dilution and increased concentration of contaminants Increased flows could result in increased input of mercury and methylmercury production in some locations Changes in reservoir levels and lowered	**MM-SW-a,f: Avoid or reduce violations of water quality standards or waste discharge requirements, and/or degradations of water quality** 1. Water Quality Contaminants and Regulation of Waste Discharges 2. Minimize Mercury Impacts

Impact	Impact Conclusions	Proposed Mitigation
	streamflows below reservoirs could result in increased temperature in some locations and times of year Changes in reservoir levels could result in increased production of harmful algal blooms in some locations Reductions in groundwater accretions could cause decreases in water quality associated with lower streamflows or higher temperatures	3. Temperature Control and Reservoir Management (MM-AQUA-a,d: 1.ii) 4. Avoid or Reduce Harmful Algal Blooms and Invasive Aquatic Weeds 5. Protect Municipal Water Quality 6. Reduce Impacts on Groundwater (MM-GW-b, 1-6) 8. Diversify Water Portfolios
	Less than Significant Changes in flows could result in moderately elevated turbidity and total suspended solids (TSS) levels in some locations, and reduced occurrence of the highest turbidity and TSS levels Increased Delta outflow would result in little change in electrical conductivity (EC) in the Delta Increased Delta outflow would result in little change in chloride and bromide at municipal intakes in the Delta Lower flows at times in some Delta channels could result in incremental increased production of harmful algal blooms and invasive aquatic plants Increased floodplain inundation could have effects on nutrients, organic material, invasive aquatic plants, and harmful algal blooms Changes in water supply and indoor water conservation could result in site-specific exceedances of waste discharge requirements due to changes in wastewater treatment plant (WWTP) influent and effluent quality and quantity Reductions in delivery of higher quality	—

Impact	Impact Conclusions	Proposed Mitigation
Impact SW-c: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site **Impact SW-d:** Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site	**Less than Significant** Changes in high peak flows could increase risk of erosion and flooding	
Impact SW-e: 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	**No Impact**	—
Impact SW-g: Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map **Impact SW-h:** Place within a 100-year flood hazard area structures which would impede or redirect flood flows	**No Impact**	—
Impact SW-i: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam	**Less than Significant** Increases in flow downstream of reservoirs could increase the risk of downstream flooding	—
Impact SW-j: Inundation by seiche, tsunami, or mudflow	**No Impact**	—

Impact	Impact Conclusions	Proposed Mitigation
HYDROLOGY & WATER QUALITY—GROUNDWATER		
Impact GW-b: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)	**Potentially Significant** Increased groundwater pumping and reductions in incidental groundwater recharge from applied irrigation could lower groundwater levels and contribute to groundwater overdraft	**MM-GW-b: Mitigate the substantial depletion of groundwater supplies or the substantial interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level** 1. Implement the Sustainable Groundwater Management Act (SGMA) 2. SGMA Oversight 3. Diversify Water Portfolios 4. Support and Approval of Groundwater Storage and Recovery 5. Support and Approval of Recycled Water Projects 6. Oversight and Approval of Water Transfers
	Less than Significant Reduced flows downstream of reservoirs could affect stream-aquifer interaction	—
Impact GW-a: Violate any water quality standards or waste discharge requirements **Impact GW-f:** Otherwise substantially degrade water quality	**Potentially Significant** Lower groundwater levels can result in changes in groundwater flow direction and gradients in localized areas, which could exacerbate the migration of contaminants In some locations, lower groundwater levels may concentrate salts and nutrients in groundwater over time through evaporative enrichment Lower groundwater levels could have localized effects on groundwater quality by concentrating pollutants where groundwater contamination already exists	**MM-GW-a,f: Mitigate impacts to groundwater quality from depletion of groundwater supplies or the substantial interference with groundwater recharge** 1. Drinking Water Programs 2. Implement the State and Regional Board's Irrigated Lands Regulatory Program (ILRP) 3. Reduce Impacts on Groundwater (MM-GW-b, 1-6)

Impact	Impact Conclusions	Proposed Mitigation
LAND USE AND PLANNING		
Impact LU-a: Physically divide an established community	**No Impact**	—
Impact LU-b: Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect	**No Impact**	—
Impact LU-c: Conflict with any applicable habitat conservation plan or natural community conservation plan	**Less than Significant** See Section 9.7.6.1, *Terrestrial Biological Resources* Impact TER-f	—
MINERAL RESOURCES		
Impact MIN-a: Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state	**No Impact**	—
Impact MIN-b: Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan	**No Impact**	—
NOISE		
Impact NOI-a: Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies **Impact NOI-c:** A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project **Impact NOI-d:** A substantial temporary or	**Potentially Significant** Increased groundwater pumping for replacement water supply, groundwater storage and recovery, or groundwater substitution transfers could result in higher noise levels	**MM-NOI-a,c,d: Mitigate exposure of persons to or generation of noise levels in excess of established standards and to substantial permanent or temporary increases in ambient noise levels in the project vicinity** 1. Applicable Policies and Regulations 2. Noise-Reduction Consideration in Operations

Impact	Impact Conclusions	Proposed Mitigation
periodic increase in ambient noise levels in the project vicinity above levels existing without the project		
Impact NOI-b: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels	**Less than Significant** Increased groundwater pumping could result in localized and intermittent perceptible vibration	—
Impact NOI-e: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels	**No Impact**	—
Impact NOI-f: For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels	**No Impact**	—
POPULATION AND HOUSING		
Impact POP-a: Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)	**No Impact**	—
Impact POP-b: Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere	**No Impact**	—
Impact POP-c: Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere	**No Impact**	—
PUBLIC SERVICES		
Impact PS-a: Result in substantial adverse physical impacts associated with the	**No Impact**	**—**

Impact	Impact Conclusions	Proposed Mitigation
provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: fire protection, police protection, schools, parks, or other public facilities		
RECREATION		
Impact REC-a: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated	**Less than Significant** Changes in streamflows and reservoir levels could affect recreational facilities and opportunities Incremental increase in potential harmful algal blooms could cause closures to recreation in some waterbodies Changes in reservoir water surface area and elevation could affect sportfish populations and reduce fishing opportunities at some locations Reduced agricultural water supply could affect recreational opportunities (e.g., wildlife viewing)	—
	Beneficial Changes in flow could improve recreational opportunities	—
Impact REC-b: Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment	**No Impact**	

Impact	Impact Conclusions	Proposed Mitigation
TRANSPORTATION/TRAFFIC		
Impact TRA-a: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit **Impact TRA-f:** Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities	**Less than Significant** Increased intermittent inundation of floodplains bounded by levees where roads and pedestrian and bicycle paths exist could affect transportation Changes in agricultural land use or fallowing could lead to changes in agricultural product-related transportation	—
Impact TRA-b: Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways	**No Impact**	—
Impact TRA-c: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	**No Impact**	—
Impact TRA-d: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	**No Impact**	—
Impact TRA-e: Result in inadequate emergency access	**No Impact**	—

Impact	Impact Conclusions	Proposed Mitigation
UTILITIES AND SERVICE SYSTEMS		
Impact UT-a: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	**No Impact**	—
Impact UT-b: Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	**No Impact**	—
Impact UT-c: Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	**No Impact**	**—**
Impact UT-d: Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed	**Potentially Significant** Reduced groundwater levels could affect water supplies for communities that rely on groundwater as their primary municipal water source, including economically disadvantaged communities	**MM-UT-d: Avoid or reduce impacts on municipal supplies** 1. Diversify Water Portfolios 2. Increase Water Use Efficiency 5. Prioritize Water Supplies for Health and Safety 6. Reduce Impacts on Groundwater (MM-GW-b, 1-6)
	Less than Significant Reduced Sacramento/Delta supply to municipal use could affect municipal water supplies	
Impact UT-e: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	**No Impact**	**—**
Impact UT-f: Be served by a landfill with sufficient permitted capacity to	**No Impact**	**—**

Impact	Impact Conclusions	Proposed Mitigation
accommodate the project's solid waste disposal needs **Impact UT-g:** Comply with federal, state, and local statutes and regulations related to solid waste		

Note:

[1] Table 1-2 is the same Impact and Mitigation Measure Summary Table presented in Chapter 9, *Proposed Voluntary Agreements* (see Table 9.7-13).

[2] Additional impacts and mitigation measures associated with other water management actions are presented in Section 7.1, Table 7.1-2; habitat restoration and other ecosystem projects, as well as new and modified facilities, are presented in Section 7.21, *Habitat Restoration and Other Ecosystem Projects* (Table 7.21-1) and Section 7.22, *New and Modified Facilities* (Table 7.22-1).

1.6 References

1.6.1 Common References

^Delta Stewardship Council (DSC). 2013. *The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value*. May. Sacramento, CA.

^SacWAM 2023. Sacramento Water Resources Control Board (SWRCB) 2023. *Sacramento Water Allocation Model (SacWAM) Documentation*.

^State Water Resources Control Board (SWRCB). 2018. *July 2018 Framework for the Sacramento/Delta Update to the Bay-Delta Plan.*

^Voluntary Agreements Parties 2022. California Natural Resource Agency, California Environmental Protection Agency, California Department of Water Resources, California Department of Fish and Wildlife, Yuba Water Agency, Garden Highway Mutual Water Company, Metropolitan Water District of Southern California, River Garden Farms, State Water Contractors, Sutter Mutual Water Company, Glenn-Colusa Irrigation District, Westlands Water District, Regional Water Authority, Kern County Water Agency, U.S. Bureau of Reclamation – California-Great Basin Region, Western Canal Water District, San Luis & Delta-Mendota Water Authority, Friant Water Authority, Tehama-Colusa Canal Authority, Solano County Water Agency, East Bay Municipal Utility District, Contra Costa Water District, San Francisco Public Utilities Commission, Modesto Irrigation District, and Turlock Irrigation District (the Parties). *Memorandum of Understanding Advancing a Term Sheet for the Voluntary Agreements to Update and Implement the Bay-Delta Water Quality Control Plan, and Other Related Actions.* March 29.

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1.6.2 Section References

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National Oceanic and Atmospheric Administration (NOAA). 2023. *What is a Watershed?* Available: https://oceanservice.noaa.gov/facts/watershed.html. Accessed: September 20, 2023.

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