California WaterFix

Clean Water Act Section 401 Water Quality Certification
Continuation Sheet

Background

In October 2006, various state and federal agencies, water contractors, and other stakeholders initiated a process to develop the Bay Delta Conservation Plan (BDCP) to advance the planning goal of restoring ecological functions to the Delta and improving water supply reliability in the State of California. In July 2012, Governor Edmund G. Brown, Jr. and United States Secretary of the Interior Ken Salazar reaffirmed both the State and federal commitment to the BDCP as a comprehensive solution to achieve the dual goals of a reliable water supply for California and a healthy California Bay Delta ecosystem that supports the State's economy.

In December 2013, after several years of preparation, DWR, Reclamation, USFWS, and NMFS, acting as joint Lead Agencies, published a draft of the BDCP and an associated Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS). The Draft EIR/EIS analyzed a total of 15 action alternatives, including Alternative 4, which was identified as DWR's preferred alternative. The 14 other action alternatives varied from Alternative 4 with respect to such factors as the number of proposed North Delta intakes, the types of conveyance facilities (e.g., surface canals versus underground pipelines), operational rules, and amounts of proposed habitat restoration.

Alternative 4 included three new intakes located in the North Delta and two parallel underground pipelines which would convey diverted water to the existing export facilities in the South Delta. The proposed operations for Alternative 4 reflected the outcome of many years of collaboration between DWR, Reclamation, the water contractors, USFWS, NMFS, and CDFW. By July 2014, at the end of the public review period, the Lead Agencies had received comments on the proposed BDCP from other agencies and members of the public. Many of these comments suggested improvements that could be made to the proposed project (i.e., Alternative 4, the BDCP). For example, some of the comments urged that the Lead Agencies reduce the level and scope of the construction activities, such as number of intakes, as means of reducing air quality and noise impacts. Other comments noted that Alternative 4 contemplated intensive construction activity on Staten Island, which is important wintering habitat for the Greater Sandhill Crane. Many commenters argued that, because the proposed project would lead to significant, unavoidable water quality effects, DWR could not obtain various approvals needed for the project to succeed (e.g., approval by the State Water Resources Control Board for new points of diversion for the north Delta intakes). Others suggested that DWR should pursue a permit with a term shorter than 50 years due to the level of uncertainty regarding both the future effects of climate change and the long-term effectiveness of habitat restoration in restoring fish populations. Still other comments suggested that the proposed conveyance facilities should be separated from the habitat restoration components of the BDCP, with the latter to be pursued separately.

Taking this public and agency input into account, the Lead Agencies substantially modified Alternative 4 and formulated three new sub-alternatives (2D, 4A, 5A). These sub-alternatives assume that incidental take authorizations would be issued for shorter durations than 50 years and propose habitat mitigation and restoration commensurate with impacts of the water conveyance facilities. Other important changes include: (i) the elimination of three pumping plants associated with new intake facilities; (ii) associated reductions in construction-related air pollutant emissions at intake sites; (iii) substantial reductions in the amount of construction occurring on Staten Island; and (iv) reductions in water quality effects.

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The proposed project (Alternative 4A), as well as two other sub-alternatives (2D, and 5A), were developed by the Lead Agencies to embody a different implementation strategy, in which State and federal endangered species incidental take authorizations would not be obtained through Section 10 of the Endangered Species Act (ESA) or through the Natural Community Conservation Planning Act (NCCPA), but rather through Section 7 of the ESA and Section 2081(b) of the California Endangered Species Act (CESA). These new sub-alternatives consist of the construction and operation of new north Delta intakes and habitat restoration actions necessary to address the effects associated with the new facilities. This alternative implementation strategy contemplates that other State and federal programs will address broader habitat restoration goals identified for species recovery. Alternative 4A, which is known as "The California WaterFix" is identified as DWR and Reclamation's preferred alternative in the Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) released for public comment in July 2015.

The construction and operation of new conveyance facilities would help resolve many of the concerns with the current south Delta conveyance system, including reducing impacts to endangered and threatened species in the Delta through operational changes to the SWP and CVP and state of the art fish screens to reduce entrainment. Implementing a dual conveyance system, in which water could be diverted from either the north or the south or both, depending on the needs of aquatic organisms, would align water operations to better reflect natural seasonal and east-west flow patterns. The new system is designed to reduce the impacts that occur through sole reliance on the southern diversion facilities and to allow for greater operational flexibility to enhance fish protection. The new conveyance facilities would also help protect critical water supplies against the threats of sea level rise and earthquakes.

Although Alternatives 4A, 2D, and 5A include only those habitat restoration measures necessary to mitigate for the effects of the new conveyance facilities, habitat restoration is still recognized as a critical component of the State's long-term plans for the Delta. Such larger endeavors, however, will likely be implemented over time under actions separate and apart from the proposed project. The primary habitat restoration program is called California EcoRestore (EcoRestore), which will be overseen by the California Natural Resources Agency and implemented under the California Water Action Plan. Under EcoRestore, the State will pursue restoration of more than 30,000 acres of fish and wildlife habitat by 2020.

Additional 401 Water Quality Certification Application Data

The following information is provided as a supplement to the State Water Resources Control Board Clean Water Act Section 401 Water Quality Certification Application Form and is provided in the same order in which information is requested on the form.

BLOCK 2. PROJECT DESCRIPTION

B) Project Purpose

One of the primary challenges facing California is how to comprehensively address the increasingly significant and escalating conflict between the ecological needs of a range of at-risk Delta species and natural communities that have been and continue to be adversely affected by a wide range of human activities, while providing for more reliable water supplies for people, communities, agriculture, and industry.

This challenge must be addressed, in decisions made by DWR, CDFW, and the State Water Resources Control Board (State Water Board), as they endeavor to strike a reasonable balance between these competing public policy objectives and various actions taken within the Delta, including the proposed project. State policy regarding the Delta is summarized in the Sacramento–San Joaquin Delta Reform Act of 2009, which states:

> "it is the intent of the Legislature to provide for the sustainable management of the Sacramento-San Joaquin Delta ecosystem, to provide for a more reliable water supply for the state, to protect and enhance the quality of water supply from the Delta, and to establish a governance structure that will direct efforts across state agencies to develop a legally enforceable Delta Plan." (California Water Code, Section 85001, subd. [c]).
>
> The Delta "serves Californians concurrently as both the hub of the California water system and the most valuable estuary and wetland ecosystem on the west coast of North and South America." (California Water Code, Section 85002).

The ecological health of the Delta continues to be at risk and the conflicts between species protection and Delta water exports have become more pronounced. Other factors, such as the continuing subsidence of lands within the Delta, increasing seismic risks and levee failures, and sea level rise associated with climate change, serve to further exacerbate these conflicts. Simply put, the overall system as it is currently designed and operated does not appear to be sustainable from an environmental perspective, and so a proposal to implement a fundamental, systemic change to the current system is necessary. This change is necessary if California is to "[a]chieve the two coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." (California Public Resources Code Section 29702, subd. [a]).

The purposes of the proposed actions are to achieve the following:

1. Construction and operation of facilities and/or improvements for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
2. Operation of the existing and potential new SWP facilities and existing CVP Delta facilities.
3. The activities described in 1) and 2) occurring in a manner that minimizes or avoids adverse effects to listed species, and allows for the protection, restoration and enhancement of aquatic, riparian and associated terrestrial natural communities and ecosystems.
4. Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.

These purposes reflect the intent to advance the coequal goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009 of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The above phrase—restore and protect the ability of the

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SWP and CVP to deliver up to full contract amounts—is related to the upper limit of legal CVP and SWP contractual water amounts and delineates an upper bound for development of EIR/EIS alternatives, not a target. It is not intended to imply that increased quantities of water will be delivered under the proposed project. As indicated by the "up to full contract amounts" phrase, alternatives need not be capable of delivering full contract amounts on average in order to meet the project purposes. Alternatives that depict design capacities or operational parameters that would result in deliveries of less than full contract amounts are consistent with this purpose.

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

- Delta Ecosystem Health and Productivity

Variability in the location and timing of flows, salinity, and habitat was common in the pre-European Delta. But for the past 70 years, the Delta has been managed as a tidal/freshwater system. During the same period, the ecological productivity for Delta native species and their habitats has been in decline. Removal of much of the variable pre-European heterogeneous mix of fresh and brackish habitats, necessary to support various life stages of some of the Delta native species, has had a limiting effect on the diversity of native habitat within the Delta. In addition, urban development, large upstream dams and storage reservoirs, diversions, hydraulic mining, and the development of a managed network of navigation, flood control, and irrigation canals have all affected water flow patterns and altered fish and wildlife habitat availability. Most of the original tidal wetlands and many miles of sloughs in the Delta were removed by channelization and levee construction between the 1850s and 1930s. These physical changes, coupled with higher water exports and declines in water quality from urban and agricultural discharges and changes in constituent dilution capacity from managed inflows and diversions have stressed the natural system and led to a decline in ecological productivity.

Significant declines have been reported in economically important fish species such as Chinook salmon. Delta smelt, considered by many to be an indicator species for the health of the Delta ecosystem, is just one component species in the community-wide pelagic organism decline. Fishery resource changes may be attributable to numerous factors, including water management systems and facilities, water quality/chemistry alterations, and nonnative species introductions.

- Water Supply Reliability

The distribution of precipitation and water demand in California is unbalanced. Most of the state's precipitation falls in the north, yet substantial amounts of water demand are located south and west of the Delta, including irrigation water for southern Central Valley agriculture, and municipal and industrial

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uses in southern California and the Bay Area. This supply/demand imbalance led to development of two major water projects: the SWP and the CVP.

Together, the SWP and CVP systems are two of the largest and most complex water projects in the nation and provide the infrastructure for the movement of water throughout much of California. They function under a suite of Congressional authorizations, interagency agreements, regulatory requirements, and contractual obligations that govern daily operations and seasonal performance. These include various authorizing legislation, the USFWS and NMFS Biological Opinions, including the Reasonable and Prudent Alternatives, and the water right permits issued by the State Water Board, among others.

The water rights of the SWP and CVP are conditioned by the State Water Board to protect the beneficial uses of water within the Delta under each respective project's water rights. In addition, under the COA, DWR and Reclamation coordinate their reservoir releases and Delta exports to enable each project to achieve benefit from their water supplies and to operate in a manner protective of beneficial uses as required by their water right permits.

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

- Delta Hydrology and Water Quality

Generally, Delta hydrodynamics are defined by complex interactions between tributary inflows, tides, in-Delta diversions, and SWP and CVP operations, including conveyance, pumping plants, and operations of channel barriers and gates. The degree to which each variable impacts the overall hydrology of the Delta varies daily, seasonally, and from year to year, depending on the magnitude of inflows, the tidal cycle, and the extent of pumping occurring at the SWP and CVP pumping plants. Changes in water inflow and outflow throughout the Delta affect the water quality within the Delta, particularly with regard to salinity. It has been estimated that seawater is pushing 3 to 15 miles farther inland since development began in the Delta over 150 years ago (Contra Costa Water District 6 2010).

Additionally, other water constituents of concern in the Delta have been identified through ongoing regulatory, monitoring, and environmental planning processes such as CALFED, planning functions of the State Water Board, and the CWA Section 303(d) list of state water bodies that do not meet applicable water quality standards. In June 2007 (with updates in February and May 2009), EPA gave final approval of a list of 18 chemical constituents identified in the Section 303(d) list for impaired Delta waters (State Water Resources Control Board 2007). Included in this list are dichlorodiphenyltrichloroethane (DDT) and other pesticides, mercury, polychlorinated biphenyls (PCBs), and selenium.

To further compound these challenges, fundamental changes to the Delta are certain to occur; the Delta is not a static ecological system. The anticipated effects of climate change will result in elevated sea

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levels, altered annual and inter-annual hydrological cycles, changed salinity and water temperature regimes in and around the Delta, and accelerated shifts in species composition and distribution. These changes add to the difficulty of resolving the intensifying conflict between the ecological needs of a range of at-risk Delta species and natural communities and the need to provide adequate and reliable water supplies for people, communities, agriculture, and industry. Anticipating, preparing for, and adapting to these changes are key underlying drivers for the proposed project.

C) PROJECT ACTIVITIES

The proposed project consists of the construction and operation of a dual-conveyance water delivery system that would modernize the hub of California's aging water supply system in a way that balances the needs of the Delta ecosystem and California's water supplies. The design of the new facilities has evolved over the years, due primarily to additional engineering analyses, environmental considerations, landowner concerns, and public comment. The original concept was the All Tunnel Option (ATO), which relied primarily on tunnels to convey the water through the Delta. The next concept was the Pipeline Tunnel Option (PTO), which included a combination of pipelines and tunnels. The third concept was the Modified Pipeline Tunnel Option (MPTO), which made significant changes to the earlier concepts, including reducing the number of intakes, increasing the size of the tunnels in the gravity-feed portion of the system, decreasing the size of the intermediate forebay, and eliminating an intermediate pumping plant.

The conveyance facility alignment in the proposed project (Alternative 4A) is identified as the "Dual Conveyance Facility Modified Pipeline/Tunnel Option – Clifton Court Forebay Pumping Plant Option," or "MPTO/CCO" in DWR's Conceptual Engineering Report which analyzes the project. This latest configuration optimizes the earlier MPTO design concept to better utilize the Clifton Court Forebay. Changes to the conveyance facilities resulting from the optimization in alignment and features, include the following:

- Larger north tunnels for gravity feed system;
- Reduction of the internal hydrostatic head within the tunnel system;
- Optimized intermediate forebay;
- Relocation of RTM sites off of Staten Island
- Consolidated pumping plant at Clifton Court Forebay (CCF);
- Modification to the CCF; and
- Elimination of the pumping plants at the intakes.

The proposed project also includes the installation of a permanent barrier at the Head of Old River (HORB) to ensure fish remain in the San Joaquin River, rather than enter the South Delta through Old River.

The proposed project will include the following:

- Three Intake Facilities along the Sacramento River in the north Delta with fish-screened on-bank intake structures.
- Two gravity-flow water conveyance tunnels (North Tunnels) that connect the intakes to an Intermediate Forebay.

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- The Intermediate Forebay (IF) which receives water from the North Tunnels, equalizes pressure, and passes the water to the dual gravity-flow Main Tunnels.
- Dual Main Tunnels connecting the IF to Clifton Court Forebay (CCF).
- A Pumping Plant located at the northeast corner of CCF.
- Eleven disposal sites for tunnel material excavated from the North Tunnels and Dual Main Tunnels.
- Division of CCF into two parts: North Clifton Court Forebay (NCCF) and South Clifton Court Forebay (SCCF).
- A permanent operational barrier at the Head of Old River.

The water conveyance facilities included in the proposed project assume the following:

- The MPTO/CCO delivers up to 9,000 cubic feet per second (cfs) from the Sacramento River in the north Delta to the south Delta export pumping plants.
- The proposed project is engineered to:
  - Transport water through conveyance facilities isolated from existing rivers and sloughs.
  - Divert water from the Sacramento River through fish-screened intakes.
  - Deliver water to the SWP and CVP export pumping plants' intake channels downstream of their respective fish collection facilities.
- Withstand a 200-year flood event taking into account the sea level rise (SLR) predicted from climate change.
- Use gravitational flow through the Main Tunnels.

The physical characteristics of each of the proposed project's components are described below.

Intakes

The three Intake Facilities (Intakes No. 2, 3, and 5) will each have a capacity of 3,000 cfs as proposed by DWR and a team of experts, including State and federal fish agency biologists, called the Fish Facilities Technical Team (FFTT). The Intake Facilities are proposed for sites along the Sacramento River which were selected in coordination with the FFTT. Intake numbering is consistent with the earlier Pipeline/Tunnel Option (PTO) CER numbering system.

Each Intake Facility will consist of the following:

- A fish-screened intake structure that employs state-of-the-art on-bank fish screens.
- Twelve large gravity collector box conduits that will extend through the levee to convey flow to the sedimentation system.
- A sedimentation system consisting of gravity settling basin to capture sand-sized sediment and a drying lagoon for sediment drying and disposal.

Water will pass through baffled fish screens and flow under the modified levee and rerouted Highway 160 through gated box conduits. Water will exit the box conduits into one of two sediment basins, then flow through an afterbay to the discharge shaft that leads to the tunnel system. Electric power will be supplied through a substation with transformers and switching equipment that will be located at each site.

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North and Main Tunnel Alignments
The proposed conveyance tunnels consist of the North Tunnels, which consist of three separate tunnel reaches totaling approximately 14 miles that connect the three Intake Facilities to the IF, and two parallel Main Tunnels to the NCCF, each approximately 30 miles long. The North Tunnels are two single-bore 28-foot and one single-bore 40-foot inside diameter (ID) tunnels. The Main Tunnels are twin-bore 40-foot inside diameter tunnels. The inlets and outlets would be equipped with isolation structures to allow the tunnels to be dewatered, maintained, and inspected.

As part of the construction of the tunnels, five temporary barge landings would be constructed at locations adjacent to construction work areas for the delivery of construction materials. Each of the five proposed barge landings would include in-water and over-water structures, such as piling dolphins, docks, ramps, and possibly conveyors for loading and unloading materials; and vehicles and other machinery. Construction of the five barge landings would involve piles at each landing.

Disposal of Tunnel Material
The material excavated from both the North Tunnels and the Dual Main Tunnels will be disposed of near the tunnel boring machines' launch shafts. Proximity to the tunnel shafts is required to reduce truck traffic associated with the transport the material to a remote disposal site. There are currently 11 disposal sites identified, and excavated tunnel material will be transported to spoil sites a maximum of 16,000 feet from launch shafts, primarily by conveyor. The daily volume of tunnel material excavated during the tunneling operations at any one shaft location would vary, with an average volume of approximately 6,000 cubic yards per day. Transport of the material to the RTM storage sites would be nearly continuous during mining or advancement of the TBM. The material would be carried on a conveyor belt from the tunnel boring machines to the base of the launching shaft and then to a work area. The material would be segregated for transport to treatment area as appropriate. The material would be stacked to a height of between six and 15 feet, depending on storage location. If feasible, the tunnel material will be reused during the construction of various habitat restoration and creation efforts within the Delta.

Intermediate Forebay
The proposed Intermediate Forebay (IF) would be located on the Glanville Tract, east of the Pearson District and west of Interstate 5. The IF serves as an atmospheric break in the system from the inlet to the dual Main Tunnels. This break in the system allows the flows from each Intake to merge and be distributed equally to each barrel of the Main Tunnels, improving operational stability in the Clifton Court pumping plant, and allowing for independent operation of each of the North Tunnels and the Main Tunnels. The IF would have no regulating gates controlling gravitational flow to the Main Tunnels; therefore, no daily operational storage would be necessary at IF beyond that necessary to accommodate water surface changes at the downstream NCCF. The IF would have a bottom elevation of -20 feet and would be 28 acres in size. The sizing of the facility reflects the smallest practicable area that would accommodate construction of the inlet and outlet structures and provide sufficient reduction in velocity to capture sand-sized sediment not otherwise captured at the Intake Facilities.

Clifton Court Forebay
The Clifton Court Forebay (CCF), which has a water surface area of approximately 2215 acres, will be expanded by approximately 590 acres to the southeast of the existing forebay to create a new overall

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footprint of approximately 2805 acres. The existing CCF will be dredged, and the expansion area excavated, to design depths of -8 feet for the north cell (the NCCF) and -10 feet for the south cell (the SCCF). A new embankment would be constructed around the perimeter of the forebay, and coffer dam would divide the forebay into two sections, the NCCF and the SCCF; the new forebay sections would have a surface area of 822 acres and 1756 acres, respectively. Water from the Dual Main Tunnels would be pulled from the tunnels' terminus by the Clifton Court Pumping Plant at the northeastern end of the NCCF, south of Victoria Island, and enter the NCCF. Water flow from the tunnels into the NCCF by gravity only would be feasible when the Sacramento River is at exceptionally high stages.

The NCCF provides the daily operational storage required to equalize and balance differences between the south Delta inflow and water exported by the SWP and CVP pumps. Preliminary calculations indicate an operational storage capacity range of approximately 4,300 to 10,200 acre-feet (AF), with an approximate water storage surface area of 822 acres, depending on depth. Constraints on the exporting pumping plants fixed a normal forebay operating range of 7.0 feet (elevation +0.50 to +7.5 feet). This operating range would allow for approximately 4,300 AF of potential active storage in the NCCF. Additional operating storage up to 10,200 AF may be obtained by operating NCCF at a range of up to 9.0 feet, which would be within the efficient operating range of both NCCF and the export pumping plants.

The SCCF has been designed to be hydraulically dependent on Delta waterways and to be operated under the same criteria as the existing CCF. The SCCF would incorporate part of Byron Tract located on the south side of the existing CCF. The SCCF would draw its supply from the West Canal using intake gates and would provide flow to Banks PP. SCCF would have an approximate water storage surface area of 1756 acres at maximum water elevation. Constraints on the exporting pumping plants limit the normal operating range to 7.0 feet (elevation +1.1 to +8.1 feet). This operating range would allow for approximately 14,000 AF of potential active storage in SCCF. Additional operating storage could be created with increase to the existing operating range.

An emergency spillway would be constructed in the NCCF east side embankment, south of the CCPP fill pad. The spillway has been sized to carry emergency overflow (9,000 cfs, the maximum inflow) to the Old River, so a containment area is not necessary. The shallow foundation beneath this existing structure requires improvements to prevent strength loss and seismic settlement. The ground improvement would be to elevation -50.0 feet within the footprint of the structure and beyond the structure by a distance of approximately 25 feet. The work would be performed within the sheet pile installed for embankment filling.

Head of Old River Barrier

The proposed project includes the construction of a barrier at the Head of Old River, which would consist of fish and flow control gates as well as a small boat lock to allow recreational boat passage during operation of the gates. The barrier gates would be operated from October 1 through June 15 each year. From June 16 through September 30, the gates would be open.

Figures showing engineering details of the proposed project can be found at **TAB E, Project Figures**, Modified Pipeline/Tunnel – Clifton Court Forebay Pumping Plant Option, CCO Rev5a.

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D) PROJECT SCHEDULE

In addition to completion of the CEQA/NEPA process, a number of permits and authorizations are required prior to DWR beginning construction of the California WaterFix Project. DWR is continuing to coordinate compliance with the various regulatory requirements related to these permits. In particular, Section 85088 of the California Water Code (Delta Reform Act) requires that the State Water Board "issues an order approving a change in the point of diversion of the State Water Project and the federal Central Valley Project [prior to the commencement of the] construction of any diversion, conveyance, or other facility necessary to divert and convey water pursuant to the change in point of diversion." Because no construction can begin prior to completion of the change petition process (which the State Water Board has mentioned are, for complex proceedings, often multiyear processes), it is expected that all necessary permits will be obtained prior to completion of the State Water Board change petition process. On August 26, 2015, DWR and Reclamation submitted a petition for the change in point of diversion to the State Water Board, and it is our understanding that a schedule for processing the petition is currently being developed. DWR will initiate the project in the following manner:

Activity	Initiation	Duration
Construction of project utilities	3 months after permit acquisition	Approximately 4 years
Ground and foundation preparation at construction sites[1]	3 months after permit acquisition	Approximately 4 years
Construction of Tunnels	1.5 years after project initiation	Approximately 10 years
Construction/Modification of Clifton Court Forebays	5 years after project initiation	Approximately 7 years
Construction of Intakes	5.5 years after project initiation	Approximately 7 years
Construction of Intermediate Forebay	9 years after project initiation	Approximately 4 years
Construction of Pumping Plant	9.5 years after project initiation	Approximately 2 years
Project completion, commencement of operation	13 years after project initiation	

[1] for more information on construction activities, see Conceptual Engineering Report (CER)

BLOCK 7. PROJECT SITE DESCRIPTION -- GENERAL

A) Project Location - Sacramento-San Joaquin Delta in Sacramento, Contra Costa, San Joaquin, and Alameda Counties

The location of the proposed project is shown on **Figure 1** of **TAB E, Project Figures**. The northern most component of the project is located at approximate Latitude 38.42° North and Longitude 121.51° West, while the southern-most component is located at approximate Latitude 37.80° North and Longitude 121.58° West. The location of each waterway and wetland crossing is included on the Table of Impacts at **TAB C**.

B) Total Project Size 9838 acres linear feet: see Block 8

C) Site Description of the entire project area

The project is located within the Sacramento-San Joaquin Delta, a region composed of 57 leveed island tracts and 700 miles of sloughs and winding channels. Although most of its historical wetlands have been converted to agricultural uses, the Delta continues to support many types of aquatic resources. Waterways include tidally influenced rivers and sloughs, nontidal irrigation ditches, ponds and lakes. Wetlands include tidal and nontidal emergent marshes, alkaline wetlands, vernal pools, and other seasonal wetlands. Riparian areas are defined by trees and shrubs that develop along waterways and floodplains; they are considered wetlands, and waters of the state, if they exhibit wetland plants, soils, and hydrology.

BLOCK 8. WATERBODY IMPACT

The proposed project is located in the Sacramento/San Joaquin Delta and crosses several waterways and wetland features within the Delta. A comprehensive list of each waterbody/wetland affected by the proposed project can be found at **TAB C, Table of Impacts**, and **TAB D, Map Book of Impacts**.

A) Named waterbodies include: Clifton Court Forebay, Italian Slough, Old River, West Canal, San Joaquin River, North Victoria Canal, Potato Slough, Connection Slough, Middle River, Snodgrass Slough, and the Sacramento River.

B) Fill and Excavation

Construction of the proposed project would result in the unavoidable fill of waters of the state. The delineation of waters and wetlands within the project area was conducted using the Preliminary Jurisdictional Determination (PJD) process with the Corps of Engineers whereby all aquatic features are mapped and assumed to be federally jurisdictional. Therefore, this process has also identified all waters of the state. Descriptions of the mapped waters of the state that are impacted by the project are provided below, including general characterizations of the associated vegetation expected to occur within each type of aquatic habitat.

Wetlands - 249.14 acres

Wetlands are dominated by hydrophytic vegetation. Four types of permanent and seasonal wetlands were mapped in the Project Area.

- **Emergent Wetland -** Emergent wetlands are dominated by emergent marsh plants such as tules and cattails, or native or ruderal hydrophytic herbaceous forbs. Nontidal emergent wetlands occur above the waterline in ditches or other nontidal channels, at the edge of ponds or lakes, or where seepage occurs on the landside of levees. Tidal emergent wetlands occur in the vegetated zone along tidal or muted tidal channels, in areas such as mud flats, waterside levee toes, and in-channel islands.
- **Vernal Pool -** Vernal pool wetlands are depressions with an impervious soil horizon close to the surface. These depressions fill with rainwater and may remain inundated through spring or early summer; they often occur in complexes of many small pools that are hydrologically

interconnected. Vernal pools support distinct plant species adapted to the characteristic flooding and drying cycles of the habitat. The vernal pools in the project area are located south and west of Clifton Court Forebay and have been somewhat disturbed by past land use activities.

- **Seasonal Wetland -** A type of seasonal wetland occurs in the central Delta within plowed agricultural fields. Although a system of pumps and drainage ditches controls water levels on the subsided islands, a high water table persists in some areas. Upland crops are planted in the surrounding fields but hydrophytic ruderal forbs become established in the wet areas, and crops usually fail if planted there. The vegetation in these wetlands consists mostly of annual weedy wetland species.
- **Alkaline Wetland** - Alkaline wetlands are a type of seasonal wetland influenced by strongly alkaline or saline soils. Alkaline wetlands support alkaline or saline tolerant species such as iodine bush and alkali heath, but may also have large unvegetated areas that are seasonally ponded or saturated.

Streambed – 162.77 acres

Two types of aquatic resources that occur in channels were mapped; water may flow either intermittently or perennially.

- **Agricultural Ditches -** Throughout the Delta there are many ditches constructed for the purpose of irrigating and/or draining agricultural land. The mapped ditches range in size from one to 22 meters wide. They are generally unvegetated with mud bottoms, but may support floating species such as duckweed or water hyacinth.
- **Tidal Channels -** Tidal channels may be naturally occurring perennial riverine waterways, though most have been modified with leveed banks and often reinforced with rock revetment. Water velocity and depth fluctuates under tidal influence, and the channel bottom is generally comprised of mud or sand. Tidal channels that have been created by excavation are usually straight rather than sinuous, and usually have heavily diked or reinforced banks. These excavated channels were often created to provide for navigation, water conveyance, material for levees, or to raise the land surface on adjacent property. Tidal channels are largely unvegetated, or may support floating or submerged aquatic vegetation.

Lake/Reservoir – 328.48 acres permanent; 1930.95 acres temporary

These aquatic resources are bodies of non-flowing water. Reservoirs and associated conveyance channels impound water and are usually constructed in uplands.

- **Depressions -** Depressions are ponds that are permanently, seasonally, or artificially wet, with little to no rooted vegetation on a mud or sand bottom. They may be artificially filled or result from a high water table. Depressions are less than 20 acres in size with a depth of less than 2 meters. These water bodies are often created in grazing lands for use as stock ponds, and may be diked or otherwise artificially impounded.
- **Lakes -** Lakes have characteristics similar to depressions, but are greater than 20 acres in size and may have a wave-formed shoreline.
- **Clifton Court Forebay -** Clifton Court Forebay, a constructed reservoir, is a highly modified perennial water body which is semi-enclosed by land, and engineered to be periodically open to tidal

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influences via a moveable gate structure. The Forebay is characterized by an artificial rock shore (rock revetment) and an aquatic bed of varying depths. The forebay is largely unvegetated, however, emergent perennials such as cattails and tules are found in shallow areas, and submerged aquatics such as Brazilian waterweed are found in areas of moderate depth.

- **Conveyance channels -** Several large rock-lined conveyance channels associated with reservoirs were mapped in the study area. These constructed water features were mapped along with all other aquatic resources in the Project Area because they may be subject to some tidal effects and therefore may be considered jurisdictional by the Army Corps of Engineers. These features are unvegetated.

Riparian – 35.03 acres

Riparian communities occur adjacent to water bodies and exhibit distinct vegetation. In some cases riparian areas were not mapped as jurisdictional because, although the trees were established during wetter times, wetland hydrology and wetland understory plants are no longer present and the area no longer meets the Army Corps of Engineers three parameter test. Also, some riparian shrub species are not wetland indicators; areas where these species were identified are not mapped as wetlands. However, since the California Department of Fish and Wildlife has jurisdiction over all riparian areas, a Streambed Alteration Agreement application will address impacts to upland riparian habitat as well as wetland riparian habitat.

- **Scrub-Shrub -** Scrub-shrub wetlands are dominated by woody vegetation that is less than 6 m tall and includes riparian shrubs such as native blackberries, dogwoods, buttonbush, and California wild rose, as well as willow and cottonwood seedlings or saplings. Scrub-shrub wetlands may occur in depressions or other nontidal areas such as the banks of ditches and the edges of ponds or lakes. This plant community also occurs in tidally influenced areas along tidal channels and on in-channel islands.
- **Forested -** Forested wetlands are defined by woody vegetation that is 6 m tall or taller. Riparian trees in the study area include: Goodding's willow, arroyo willow, sandbar willow, and Fremont's cottonwood. Forested wetlands are found in areas with tidal and nontidal water regimes, as described for scrub-shrub wetlands.

The proposed project will result in permanent impact to approximately 774 acres of waters of the state and temporary impact to approximately 1,931 acres of waters. Of the permanent impacts, 178.62 acres are temporary impacts treated as permanent because the temporary impacts are expected to last over one year. These impact sites will eventually be restored to pre-project conditions; however, due to the duration of effect, the impacts are treated as permanent. Impacts to 52 acres of pond and lake habitat is actually conversion from open water to a mosaic of wetlands types (e.g. seasonal wetland, scrub-shrub, riparian, emergent marsh) at four lakes that were created as a result of the construction of Interstate 5 in 1979. This conversion is a part of the planned mitigation discussed in Block 9, Compensatory Mitigation, below. All of the temporary impact is due to the dredging of Clifton Court Forebay. The impacts to waters of the state are summarized in Table 1 below.

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Table 1. Acreages of Impact to Communities within each Water Body Type

Habitat Type	Permanent Impact	Temporary Impacts Treated as Permanent[1]	Temporary Impact[2]
Agricultural Ditch	45.48	17.38	0
Alkaline Wetland	20.35	0.06	0
Clifton Court Forebay	258.00	0	1930.95
Conveyance Channel	7.99	2.86	0
Depression	29.33	7.06	0
Emergent Wetland	57.24	31.52	0
Forest	8.27	8.62	0
Lake	23.25	0	0
Scrub-Shrub	12.79	5.35	0
Seasonal Wetland	114.58	25.08	0
Tidal Channel	19.22	80.68	0
Vernal Pool	0.31	0	0
Total[3]	596.80	178.62	1930.95

Linear impacts occurring along channels are due to intakes, barge landings, an operable barrier, and overflow structures. These impacts total 25,356 feet.

[1] Temporary impacts treated as permanent are temporary impacts expected to last over one year. These impact sites will eventually be restored to pre-project conditions; however, due to the duration of effect, compensatory mitigation will be included for these areas.

[2] Temporary impacts are due to dredging Clifton Court Forebay.

[3] Some of these impact totals are overestimated. For example, transmission lines have been mapped as a 150-foot wide corridor, although the actual footprint would be 100' X150' for power pole pads that are spaced 450' apart for 69kV lines and 750' apart for 230kV lines; a narrow access road may also follow the transmission line alignment. The location of some pads may be changed to avoid wetlands. Impacts to Tidal Channels are also overestimated due to errors in mapping access roads on levees; the project footprint is not intended to impact the channels.

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D) Info on Q2, Q10, Q100

Because of the nature of this project, calculation of pre-and post-project flows do not apply in the typical sense. None of the project components requiring a physical land disturbance will result in a change to the 2-year, 10-year, or 100-year peak flows of the hydrology of those work areas. Further, flow rates in the Sacramento River are not expected to change as a result of construction activities of project facilities. However, the operation of the three diversions in the Sacramento River, each of which can divert up to 3,000 cfs, will decrease flow downstream of the diversions.

The following changes are expected:

If Pre-project flow is:	Post-project flow would be:
64,000 cfs	>/= 55,000 cfs
35,000 cfs	>/= 26,000 cfs
20,000 cfs	>/= 13,000 cfs
15,000 cfs	>/= 12,000 cfs
9000 cfs	>/= 8460 cfs
5000 cfs	>/= 5000 cfs

Flows greater than 64,000 cfs above the project intakes would decrease </= 9000 cfs below the project intakes. Because average 2-year, 10-year, and 100-year peak flows exceed 35,000 cfs, the expected change in the peak flows would be a decrease of </= 9000 cfs.

E) Types of material to be discharged into waters of the state by each facility are shown in Table 2 below.

Table 2. Estimate of fill into waters of the state.

Facility-- Hybrid Constructability	CY Fill	Estimate Assumptions	Fill Material
Barge Unloading Facility	260000	Engineering calculation	Clean soil and rock
Work Areas	97009	1 foot deep	Clean soil, rock, concrete
Concrete Batch Plant	7464	1 foot deep	Clean soil, rock, concrete
Control Structure	9759	1 foot deep	Clean soil, rock, concrete
Forebay and Spillway	1793	1 foot deep	Clean soil, rock, concrete
Forebay Embankment	11192500	Engineering calculation	Clean soil and rock
Forebay Overflow Structure	9689	Engineering calculation	Concrete and rock
Fuel Station	1490	1 foot deep	Clean soil, rock, concrete
Intake	141675	Engineering calculation	Concrete
Intake end curves/walls	180000	Engineering calculation	Clean soil and rock
Operable Barrier	12230	Engineering calculation	Clean rock and grout
Operable barrier sheet piles		Engineering calculation	Sheet piles 32,146 sq feet
Power trans/PGE	8029	1 foot deep	Clean soil, rock, concrete
Reusable Tunnel Material	2099259	6 feet deep	Reusable tunnel material
additional dredge material from CCF	241193	additional 13 feet	Dredged material
Road Interchange	15917	1 foot deep	Clean soil, rock, concrete
Shaft Locations	53724	1 foot deep	Clean soil, rock, concrete
additional at Pumping Plant	660000	Engineering calculation	Clean soil, rock, concrete
Transmission Line	27427	1 foot deep, assume max 17.08 acre footprint	Clean soil, rock, concrete
Tunnel Conveyor Facility	3487	1 foot deep	Clean soil, rock, concrete
Canal		Excavation, no fill needed	
Forebay		Excavation, no fill needed	
Forebay Dredging Area		Excavation, no fill needed	
New Forebay		Excavation, no fill needed	
Total Fill	**15022645**		

BLOCK 9. COMPENSATORY MITIGATION

The proposed project conforms to the general rule that avoidance, minimization, and compensation are to be applied in a sequential fashion. The applicant has designed the proposed project to avoid waters of the state where practicable and minimize any unavoidable impacts. The applicant will provide compensatory mitigation for any remaining impacts.

In 2008, the Corps and the EPA issued regulations, known as the "Mitigation Rule", governing compensatory mitigation for activities authorized by permits issued by the Corps (33 CFR §§325, 332). In 2015, the Corps' South Pacific Division issued "Regional Compensatory Mitigation and Monitoring Guidelines (Final January 12, 2015)" (Division Guidelines) to supplement the Mitigation Rule. Compensatory mitigation under the Mitigation Rule and Division Guidelines fulfill the long standing

national goal of replacing the loss of wetland and other aquatic resource acreages and functions, known as the "no net loss" goal (National Wetlands Mitigation Action Plan (December 24, 2002)). To achieve the no net loss goal, the Corps and EPA have concluded that, where appropriate and practicable, compensatory mitigation "should provide, at a minimum, one for one functional replacement (i.e., no net loss of values), with an adequate margin of safety."[4] The long-term objective of the no net loss policy is to increase wetland acreages and functions nationally.

The Mitigation Rule defines compensatory mitigation as (1) restoring existing wetlands or reestablishing former wetlands; (2) creating new wetlands in upland areas; (3) enhancing the functional values of degraded wetlands; and (4) preserving existing aquatic resources. Restoration is generally the preferable form of compensatory mitigation because the likelihood of success is greater while the impacts to potentially ecologically important uplands are less, as compared to creation. Moreover, the potential gains in terms of aquatic resources functions are often greater with restoration as compared to enhancement and preservation (33 CFR §332.3(a)(2)). The Mitigation Rule and Division Guidelines stress the benefits of a watershed approach to compensatory mitigation, and the preference for compensatory mitigation to be located in the same watershed as the site of the impact site and where it is most likely to successfully replace lost functions and services (33 CFR §332.3; Division Guidelines, §3.2).

Wetland Functions

Mitigation will be provided to compensate for the loss of acreage and functions associated with unavoidable construction-related impacts to waters of the state. Wetland functions are defined as a process or series of processes that take place within a wetland, such as those related to the storage of water, transformation of nutrients, growth of living matter, and diversity of wetland plants. Functions can be grouped broadly as habitat, hydrologic, or water quality.

Not all wetlands perform all functions nor do they perform all functions equally well. The location and size of a wetland may determine the nature of the wetland function. For example, the geographic location may determine habitat functions, and the location of a wetland within a watershed may determine its hydrologic or water-quality functions. Many factors determine how well a wetland will perform these functions: climatic conditions, quantity and quality of water entering the wetland, and disturbances or alteration within the wetland or the surrounding ecosystem. Wetland disturbances may be the result of natural conditions, such as an extended drought, or of human activities, such as land clearing, dredging, or the introduction of nonnative species. Wetlands are among the most productive habitats in the world, providing food, water, and shelter for fish, shellfish, birds, and mammals, and serving as a breeding ground and nursery for numerous species. Many endangered plant and animal species are dependent on wetland habitats for their survival. Hydrologic functions are those related to the quantity of water that enters, is stored in, or leaves a wetland. These functions include such factors

[4] Memorandum of Agreement between the Environmental Protection Agency and the USACE concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines, 55 Fed. Reg. 9210, 9212 (1990) ("Mitigation MOA").

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as the reduction of flow velocity, the role of wetlands as ground-water recharge or discharge areas, and the influence of wetlands on atmospheric processes. Water-quality functions include the trapping of sediment, pollution control, and the biochemical processes that take place as water enters, is stored in, or leaves a wetland.

The applicant has conducted a qualitative functional assessment to assign a relative ranking system to the wetlands and other waters for which a discharge is being proposed. Additional analysis may be conducted during development of a compensatory mitigation plan. The assessment of existing functions will be compared to the functions expected to result from the proposed mitigation for the purpose of demonstrating that the compensatory mitigation will, at a minimum, fully replace the function of the waters proposed to be filled.

Wetlands and other aquatic features provide many functions, such as providing habitat, storing and conveying water, and trapping sediment. Wetlands that are undisturbed, with natural hydrologic connections and native species, tend to have a higher functional value than disturbed wetlands. DWR has worked with the Corps of Engineers to propose a qualitative functional assessment of the mapped wetlands in the Project Area by sorting the impacted wetlands into three functional value groups:

Low functional value: most agricultural ditches, seasonal and emergent wetlands within agricultural fields, Clifton Court Forebay, and constructed conveyance channels and other highly disturbed aquatic features.

Medium functional value: emergent, forest, scrub-shrub, depressions, and alkaline wetlands that are moderately disturbed or fragmented aquatic features and agricultural ditches that have developed adjacent marsh or riparian habitat.

High functional value: tidal channels, lakes, emergent, forest, scrub-shrub, depressions, alkaline wetlands and vernal pools that are relatively undisturbed.

The qualitative functional assessment of the impacted aquatic features is summarized in Table 3, below. The majority of the permanent impacts (approximately 72%) are to either low or moderate functional habitats. The largest single permanent impact (258 acres) is to Clifton Court Forebay, which as described above, is a man-made feature with extremely limited habitat function. The second largest permanent impact (115 acres) is to seasonal wetlands, which occur within plowed agricultural fields.

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Table 3. Qualitative Functional Assessment of Impacted Aquatic Features

Type	Total impacted acres	High Function	Medium Function	Low Function
Agricultural Ditch	*63*		7	56
Alkaline Wetland	*20*	9	9	2
Clifton Court Forebay	*258*			258
Conveyance Channel	*11*			11
Depression	*36*	29	7	
Emergent Wetland	*89*	36	26	27
Forest	*17*	11	6	
Lake	*23*	23		
Scrub-Shrub	*18*	10	6	3
Seasonal Wetland	*140*			140
Tidal Channel	*100*	100		
Vernal Pool	*0.3*	0.2		<0.1
Totals	*775.3*	218	61	497
Percent of Total		28%	8%	64%

Compensatory Mitigation

Compensatory mitigation will be proposed to off-set the impacts associated with the physical construction of the project. In some cases, restoration actions designed to provide habitat for species may also serve as compensatory mitigation for the loss of waters of the state (e.g. created emergent marsh may function as both habitat for delta smelt, as well as compensatory mitigation for physical impacts to emergent marsh habitat). The proposed compensatory mitigation will be subject to specific success criteria, success monitoring, long-term preservation, and long-term maintenance and monitoring pursuant to the requirements of the Mitigation Rule. In some cases, proposed mitigation is likely to afford significantly higher function and value than that of waters proposed for discharge.

Compensation ratios, which are developed by the Corps, are guided by type, condition, and location of replacement habitat as compared to type, condition and location of impacted habitat. Compensatory mitigation usually includes restoration, creation, or rehabilitation of aquatic habitat. The Corps does not typically accept preservation as the only form of mitigation; use of preservation as mitigation typically requires a very high ratio of replacement to impact. It is anticipated that mitigation ratios will be at a minimum of 1:1, depending on the factors listed above. Based on preliminary discussions with the Corps, it is anticipated that ratios will be developed for each affected habitat type, and further, for each functional ranking (see Table 2 above) within each habitat type.

Typically, impacted habitat is replaced with in-kind habitat; consistent with this approach, for example, the applicant expects to mitigate for permanent impacts to Clifton Court Forebay with waters created through the expansion of CCF into North CCF and South CCF. Impacts to some lower functioning habitat

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types, such as seasonal wetland and agricultural ditches may be mitigated out-of-kind with higher functioning habitat types.

The applicant will propose compensatory mitigation using one or more of the following methods:

- Purchase of credits for restored/created/rehabilitated habitat at an approved wetland mitigation bank;
- On-site (adjacent to the project footprint) restoration or rehabilitation of wetlands converted to uplands due to past land use activities (such as agriculture) or functionally degraded by such activities;
- On-site (adjacent to the project footprint) creation of aquatic habitat;
- Off-site (within the Delta) restoration or rehabilitation of wetlands converted to uplands due to past land use activities (such as agriculture) or functionally degraded by such activities;
- Off-site (within the Delta) creation of aquatic habitat;
- Payment into the Corps' Fee-in-Lieu program.

Purchase of Credits or Payment into In-lieu Fee Program

The applicant may purchase bank credits and/or make payments into an in-lieu fee program to compensate for impacts. The applicant would utilize programs that have been agency-approved and have service areas that encompass areas impacted by the proposed project.

On-Site Restoration, Rehabilitation and/or Creation

Much of the Delta consists of degraded or converted habitat that is generally functioning as upland. The applicant would seek opportunities to conduct on-site restoration, rehabilitation, and/or creation in areas adjacent to project footprints. It is anticipated that some of the compensatory mitigation would fall into this category.

Off-Site Restoration, Rehabilitation and/or Creation

Within the immediate vicinity of the project area, much of the land has been subject to agricultural or other land uses which have degraded or even converted wetlands that existed historically. The applicant would evaluate sites within the Delta to determine their potential for restoration, rehabilitation, and/or creation. It is anticipated that most of the compensatory mitigation obligation would be satisfied through this approach.

Construction of wetlands at a location in the north Delta would likely include sculpting the interior of the tract to elevations that would support a mosaic of habitat types, including woody riparian, scrub-shrub, seasonal wetland, emergent wetland, and open water. One or more breach or notch in the existing (non-project) levee at the lowest end of the island would be excavated to allow for water to enter the island. Much of the island would be subject to the ebb and flow of the tide and created habitats would mimic that of natural habitats in the area. The sculpting would be designed to ensure that no fish would be entrapped as water receded at low tide.

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Construction of wetlands at a tract in the central Delta would utilize the low elevation of the interior of the island to create seasonal wetland and emergent marsh habitat through excavation. In other locations, setback levees might be constructed such that the existing (non-project) levees could be removed or breached in multiple locations resulting in the creation of riparian, scrub-shrub, and emergent wetlands. If portions of the existing levee can be left intact, the result would be the creation of new in-channel islands which would be an important, high function resource within the Delta where existing in-channel islands are subject to erosion and degradation.

DWR also proposes to provide additional compensatory mitigation from within the four lakes that were created during the construction of Interstate 5. Currently each of the lakes is open water with sparse or no edge vegetation (either emergent wetland or riparian vegetation). It is envisioned that excavated tunnel material would be used to partially fill the open water, resulting in a mosaic of open water, emergent wetland, seasonal wetland, scrub-shrub, and riparian habitats.

As mentioned above, the permanent impacts associated with work at Clifton Court Forebay would be mitigated through the expansion of CCF into North CCF and South CCF.

A comprehensive conceptual mitigation plan for the proposed project is currently being developed and will be submitted to the Corps for review and comment upon completion. The final mitigation plan for the project will identify the location, type, and amount of habitat to be created and will include all thirteen components identified in the Mitigation Rule.

Impacts Resulting from the Construction of Compensatory Mitigation
The restoration, rehabilitation, and/or creation of aquatic habitat during the construction of the compensatory mitigation would result in relatively minor environmental impacts. Expected impacts include noise and air quality during construction, the conversion of upland to aquatic habitat, and potential changes to existing channel hydraulics where levees will be breeched or lowered to create weirs.

BLOCK 10. THREATENED/ENDANGERED SPECIES

DWR is responsible for the operations and maintenance of the State Water Project (SWP) and the Bureau of Reclamation (Reclamation), an agency of the U. S. Department of the Interior, is responsible for operations and maintenance of the Central Valley Project (CVP). Reclamation will serve as the lead federal agency for the Federal Endangered Species Act Section 7 consultation. DWR will serve as the lead agency for the California Endangered Species Act Section 2081 consultation.

A) In conjunction with DWR, Reclamation has initiated formal consultation with both the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) regarding the potential effect of the construction and operation of the new facilities on federally listed species and designated critical habitat. The Section 7 consultation regarding these new facilities is intended to cover all potential ESA-related impacts associated with construction and new operations, including impacts that may occur as a result of the issuance of USACE permits.

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B) DWR has initiated formal consultation with the California Department of Fish and Wildlife (CDFW) regarding the potential effect of construction and operation of the new facilities on State listed species. The Section 2081 consultation regarding these new facilities is intended to cover all potential CESA-related impacts associated with the construction and new operations.

BLOCK 11. OTHER ACTIONS/BEST MANAGEMENT PRACTICES (BMPs)

Avoidance and Minimization Measures

The proposed project has been designed to avoid impacts to waters of the United States to the maximum extent practicable. Numerous iterations of footprint locations for each of the conveyance components were evaluated to maximize the use of upland areas. Once construction begins, measures will be implemented to further avoid and minimize impacts to waters of the state as well as to special status species. The AMMs will be implemented at all phases of the project, including siting, design, construction, and operations and maintenance. The AMMs that pertain specifically to waters of the state are summarized in the Table 4 below.

Table 4. Summary of the Avoidance and Minimization Measures

Number	Title	Summary
AMM1	Worker Awareness Training	Includes procedures and training requirements to educate construction personnel on the types of sensitive resources in the project area, the applicable environmental rules and regulations, and the measures required to avoid and minimize effects on these resources.
AMM2	Construction Best Management Practices and Monitoring	Standard practices and measures that will be implemented prior, during, and after construction to avoid or minimize effects of construction activities on sensitive resources (e.g., species, habitat), and monitoring protocols for verifying the protection provided by the implemented measures.
AMM3	Stormwater Pollution Prevention Plan	Includes measures that will be implemented to minimize pollutants in stormwater discharges during and after construction, and that will be incorporated into a stormwater pollution prevention plan to prevent water quality degradation related to pollutant delivery from project area runoff to receiving waters.
AMM4	Erosion and Sediment Control Plan	Includes measures that will be implemented for ground-disturbing activities to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities, and that will be incorporated into plans developed and implemented as part of the National Pollutant Discharge Elimination System permitting

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		process for covered activities.
AMM5	Spill Prevention, Containment, and Countermeasure Plan	Includes measures to prevent and respond to spills of hazardous material that could affect waters of the United States, including navigable waters, as well as emergency notification procedures.
AMM6	Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material	Includes measures for handling, storage, beneficial reuse, and disposal of excavation or dredge spoils and reusable tunnel material, including procedures for the chemical characterization of this material or the decant water to comply with permit requirements, and reducing potential effects on aquatic habitat, as well as specific measures to avoid and minimize effects on species in the areas where reusable tunnel material would be used or disposed.
AMM7	Barge Operations Plan	Includes measures to avoid or minimize effects on aquatic species and habitat related to barge operations, by establishing specific protocols for the operation of all project-related vessels at the construction and/or barge landing sites. Also includes monitoring protocols to verify compliance with the plan and procedures for contingency plans.
AMM10	Restoration of Temporarily Affected Natural Communities	Restore and monitor natural communities in the Plan Area that are temporarily affected by construction activities. Measures will be incorporated into restoration and monitoring plans and will include methods for stockpiling and storing topsoil, restoring soil conditions, and revegetating disturbed areas; schedules for monitoring and maintenance; strategies for adaptive management; reporting requirements; and success criteria.
AMM12	Vernal Pool Crustaceans	Includes provisions to require project design to minimize indirect effects on vernal pool habitat, avoid effects on core recovery areas, minimize ground disturbing activities or alterations to hydrology, conduct protocol-level surveys, and redesign the project to ensure that habitat loss is minimized where practicable.
AMM30	Transmission Line Design and Alignment Guidelines	Design the alignment of proposed transmission lines to minimize impacts on sensitive terrestrial and aquatic habitats when siting poles and towers. Restore disturbed areas to preconstruction conditions.
AMM34	Construction Site Security	Provide all security personnel with environmental training similar to that of onsite construction workers, so

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		that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time.
AMM36	Notification of Activities in Waterways	Before in-water construction or maintenance activities begin, notify appropriate agency representatives if these activities could affect water quality or aquatic species.

Measures that will be implemented to avoid and minimize impacts to aquatic species and species which utilize aquatic habitats such as California tiger salamander, giant garter snake, California red legged frog, western pond turtle, riparian woodrat, riparian brush rabbit, Suisun shrew, and salt marsh harvest mouse, will also serve to reduce project impacts to waters of the state.

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