

CHAPTER 1

Purpose, Need and Objectives for the Los Vaqueros Reservoir Expansion Project

1.1 Introduction

The San Francisco Bay/Sacramento–San Joaquin Delta estuary is the largest estuary on the West Coast and provides essential habitat for a diverse array of fish and wildlife. It is also the critical hub in the conveyance of drinking water supplies to more than two-thirds of the California population and irrigation supplies to 7 million acres of agricultural lands.

In response to worsening ecological conditions and increasing risk to water supplies, the Governor of California assembled a Blue Ribbon Task Force to develop “a durable vision for sustainable management of the Delta” with the goal of “...managing the Delta over the long term to restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well-being of the people of the state.” The Task Force issued its Delta Vision report in December 2007, followed by the Delta Vision Strategic Plan in October 2008, both emphasizing the need to manage the Delta to two co-equal goals - restoring the Delta ecosystem and creating a more reliable water supply for California (Delta Vision Blue Ribbon Task Force, 2007 and 2008). This state-initiated planning process, known as Delta Vision, builds and expands upon the work of the CALFED Bay-Delta Program (CALFED).

CALFED, a consortium of state and federal agencies with resource management and regulatory responsibilities in the Bay-Delta estuary, was formed in the mid-1990s to develop “a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system” (CALFED, 2000). The CALFED planning phase culminated with publication of the Final Programmatic EIS/EIR on the proposed CALFED Bay-Delta Program in July 2000 and issuance of the federal Record of Decision (ROD) in August 2000. Implementation proceeded in twelve program areas including ecosystem restoration, water supply reliability, storage, conveyance and the Environmental Water Account (EWA). Expansion of the existing Los Vaqueros Reservoir (the reservoir), owned and operated by Contra Costa Water District (CCWD), is one of five surface water storage projects identified for further investigation in the CALFED Storage Program.

The planning phase of the Los Vaqueros Reservoir Expansion Project began in January 2001, managed by CCWD and supported and funded by the U.S. Department of Interior, Bureau of Reclamation, Mid-Pacific Region (Reclamation) and the California Department of Water Resources (DWR). After preliminary planning studies demonstrated that the proposed expansion

project could result in environmental, water supply reliability and water quality benefits, voters in CCWD's service area were asked to vote on whether CCWD should consider expansion of its reservoir. The 2004 advisory ballot measure won approval of 62 percent of the voters. Since the vote, the proposed expansion project has been further developed and refined through detailed studies and extensive public outreach.

The Los Vaqueros Reservoir is an off-stream storage reservoir near the Delta. CCWD currently pumps water from the Delta into this 100-thousand-acre-foot (TAF) capacity reservoir through state-of-the-art, positive barrier fish screens. Having this storage capacity allows CCWD to improve the water quality delivered to its customers and to adjust the timing of its Delta water diversions throughout the year to accommodate the life cycles of Delta aquatic species, thus reducing species impact and providing a net benefit to the Delta environment.

Expansion of the reservoir and related facilities would provide an opportunity to expand these benefits and improve related system reliability and flexibility, furthering the goals of Delta Vision and CALFED through a cooperative effort among CCWD and project participants. Through the use of the expanded reservoir and related facilities, along with existing CCWD facilities and assets, and through coordinated operations with the State Water Project (SWP) and Central Valley Project (CVP), fishery protection and Bay Area water supply reliability can be substantially improved.

The four project alternatives evaluated here all include an enlarged Los Vaqueros Reservoir and the related facilities to operate the reservoir. Two of the alternatives include a South Bay Connection, which would be accomplished through construction of a new Delta intake and pump station and a conveyance pipeline connecting the Los Vaqueros Reservoir facilities to three Bay Area water agencies: Alameda County Flood Control and Water Conservation District, Zone 7 (Zone 7), Alameda County Water District (ACWD) and Santa Clara Valley Water District (SCVWD), all of which receive SWP water through the South Bay Aqueduct. SCVWD also receives CVP water. Depending on which, if any of the alternatives is ultimately approved, such a project could reduce impacts to Delta fisheries resulting from SWP and CVP operations, provide water to improve environmental conditions in the Delta and its associated tributary rivers and wetlands, and improve water supply reliability for Bay Area water users.

A decision to approve any of the project alternatives requires compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). CCWD is the CEQA lead agency and Reclamation is the federal NEPA lead agency. State CEQA Guidelines require that an EIR provide a clearly written statement of the purpose of a proposed project. Section 15124 (b) of the state CEQA Guidelines requires a statement of the project objectives, including the underlying purpose of the project. NEPA regulations require a statement of "the underlying purpose and need to which the agency is responding in proposing the alternatives, including the proposed action" (40 CFR 1502.12).

1.2 Project Objectives

The Los Vaqueros Reservoir Expansion Project objectives are to use an expanded Los Vaqueros Reservoir system to:

Primary Objectives:

- Develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs.
- Increase water supply reliability for water providers within the San Francisco Bay Area, to help meet municipal and industrial water demands during drought periods and emergencies or to address shortages due to regulatory and environmental restrictions.

Secondary Objective:

- Improve the quality of water deliveries to municipal and industrial customers in the San Francisco Bay Area, without impairing the project's ability to meet the environmental and water supply reliability objectives stated above.

In addition to these objectives, CCWD Board of Directors' Resolution No. 03-24 provides important guidance for identifying and evaluating plans involving the expansion of the reservoir (CCWD, 2003). The CCWD Board Principles are discussed in detail in Chapter 2.

1.3 Purpose and Need

The primary project purpose is to use an expanded Los Vaqueros Reservoir system to develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs in the Delta and tributary river systems, and to improve water supply reliability for urban users in the San Francisco Bay Area.

The need for this project is driven by the following conditions:

- The Delta ecosystem is in a state of serious decline, with primary productivity very low and fish populations decreasing to record low levels, putting at least one species (the delta smelt) on the brink of extinction.
- Insufficient quantities of water and lack of storage and flexibility in managing the timing and location of diversions for environmental and municipal water supplies are contributing to the ecosystem's decline.
- Ecosystem decline has put other beneficial uses of water supplies conveyed through the Delta at risk, leading to court-ordered limits on Delta pumping and greatly reducing water supply reliability for millions of people.

Improved storage and conveyance of environmental water supplies can help to improve Delta ecosystem conditions and reduce conflict among beneficial uses of Delta water supplies.

1.4 Background on Need for Project

1.4.1 The Delta Supports Multiple Beneficial Uses

The Sacramento–San Joaquin Delta is an area of transition between the freshwater runoff from the Sacramento and San Joaquin Rivers and the tidally driven saltwater flows from the Pacific Ocean and San Francisco Bay. The San Francisco Bay/Sacramento–San Joaquin Delta estuary is the largest estuary on the West Coast. It is a complex system of rivers, sloughs, islands, open water areas, and constructed features such as barriers, tide gates, and water diversion pumps. A number of smaller tributaries also flow into the Delta. Additional inflows derive from agricultural and municipal wastewater discharges within the Delta and upstream.

The Delta is critical to California’s economy, supplying drinking water for more than two-thirds of Californians and irrigation water for about 7 million acres of highly productive agricultural land. The Delta is also a key component of California’s two largest water distribution systems: the CVP, operated by Reclamation, and the SWP, operated by DWR. Both the federal and state systems pump water out of the southwestern Delta to agricultural and urban contractors in the Bay Area and in central and southern regions of the state.

The Bay and Delta are habitat for a rich ecosystem of aquatic, terrestrial, and avian species, including more than 30 species protected under federal and state regulations. The aquatic habitat supports anadromous fish such as chinook salmon and steelhead trout that pass through the Delta on their way to the ocean and back to upstream rivers to spawn, as well as many resident species such as delta smelt that live their entire lives in the Delta. All these species are susceptible to flow and water quality conditions in the Delta. Additionally, the Delta supports an extensive sport and commercial fishery.

1.4.2 Declining Delta Ecosystem

Annual monitoring of fish abundance since 2000 includes record lows of delta smelt and young striped bass, and near-record lows of longfin smelt and threadfin shad (Resources Agency, 2007). In its January 2008 progress report, the Pelagic Organism Decline work team wrote: “Although several species show evidence of long-term declines, the recent low levels were unexpected given the relatively moderate winter-spring flows of the past several years” (Baxter, et al, 2008). The decline in multiple species with different life histories makes the changes during this period particularly concerning. Low abundance of these species remained through 2006 despite moderate to wet hydrologic conditions (Baxter, et al, 2008).

Many factors have been cited for the decline of the Delta ecosystem generally, and for fish species in particular including: invasive species; low primary productivity (phytoplankton); increasing temperatures; reduced and altered timing of inflows to the Delta; increased and altered timing of exports from the Delta; declining water quality due to increased discharges from wastewater treatment plants, agricultural drains, industrial operations, and non-point sources; changes in physical and chemical parameters such as flow and salinity; and loss of wetlands and

floodplains to urbanization and agricultural land conversion (see, e.g., Healey, 2007 and Baxter, et al, 2008).

On December 14, 2007, U.S. District Court Judge Oliver Wanger issued an Interim Order curtailing water exports from the Delta to protect delta smelt, a native species on the brink of extinction (NRDC, *et al v. Kempthorne, et al*, U.S. District Court, Eastern District of California, No. 1:05-cv-1207 OWW GSA). In this order, Judge Wanger set flow requirements designed to prevent extinction of delta smelt and avoid adverse modification of critical habitat. Meeting the flow requirements has necessitated CVP and SWP pumping curtailments that reduce the reliability of water supplies delivered to urban and agricultural water users dependent on these pumps. The CVP and SWP pumping reductions ordered in this decision were part of interim actions to protect fish until a new biological opinion could be issued by the U.S. Fish and Wildlife Service (USFWS) (Delta Export Restrictions). That biological opinion was issued on December 15, 2008 (USFWS, 2008).

The analyses pertaining to operation of the SWP and CVP in this document are based on the Interim Order and the 2004 plan for coordinated operations of the SWP and CVP, known as the Operations Criteria and Plan. Once a new opinion on salmon and steelhead is issued by the National Marine Fisheries Service (NMFS) (expected in mid-summer 2009), Reclamation and DWR intend to complete an analysis of the effects that the new biological opinions will have on the operation of the SWP and CVP. It is possible that the new opinions may result in moderate to severe fishery restrictions being imposed on Delta exports, depending on annual hydrologic conditions, above and beyond those caused by the Interim Order. The analysis of the effects of the new biological opinions on operations of the SWP and CVP will be described in the Final EIS/EIR for this project.

1.4.3 Insufficient Water Supply for Environmental Purposes

Public Law 102-575, the CVP Improvement Act (CVPIA), was enacted in 1992 to “protect, restore, and enhance fish, wildlife and associated habitats in the Central Valley and Trinity River basins of California” as well as to improve the operations flexibility of the CVP. It contains numerous requirements to modify CVP operations to ensure in-stream flows, carry-over storage, and temperature control to protect and restore, in particular, anadromous fisheries.

During dry periods, the CVP has difficulty meeting these requirements while still meeting contractual water supply obligations. As stated above, additional protective measures may be required in the new biological opinion being prepared by NMFS to address the effects of operation of the CVP and SWP on salmon and steelhead. The new opinion was required by the 2008 court decision in *Pacific Coast Federation of Fishermen’s Associations v. Gutierrez* which invalidated the 2005 biological opinion. The new opinion is expected in mid-summer 2009.

One of the specific actions required under the CVPIA is provision of “firm water supplies of suitable quality to maintain and improve wetland habitat areas on units of the National Wildlife Refuge System in the Central Valley of California” (CVPIA Section 3406(d)(1)). The CVPIA required about 430 TAF of CVP yield be delivered as base refuge supply. These arrangements were addressed

in long-term contracts between Reclamation and the Grassland Resource Conservation District, the California Department of Fish and Game and the USFWS.

The Act also set a target for supplying an additional 130 TAF of Incremental Level 4 refuge water within 10 years. This water was to be acquired through measures that do not require involuntary reallocations of CVP yield. Reclamation, in cooperation and coordination with the USFWS, implements the CVPIA Water Acquisition Program to acquire supplies to meet this and other environmental water requirements under the CVPIA. The program attempts to purchase or otherwise acquire as much of the target supply of 130 TAF as is available on the water market, to the extent of available funds, to meet optimal waterfowl habitat management needs and to support in-stream flows. The program purchases water through both short and long-term agreements, relying on market mechanisms to acquire water assets.

Reclamation has been able to secure some, but not all, of the supplemental refuge water supply for these wetland habitat areas (Reclamation, 2006). Constraints in meeting the target include budget constraints, cost and availability of water, pumping capacity at the Delta facilities, storage, and conveyance infrastructure.

1.4.4 Lack of Management Flexibility

The existing state and federal water systems lack flexibility in terms of when, where, and how water is pumped from the Delta. This lack of flexibility adds to the difficulty of addressing fish impacts, ecosystem decline, and supply reliability problems. CALFED's EWA Program is an example of an environmental water program aimed at protecting Delta fish species by increasing flexibility in SWP and CVP operations. The EWA has operated since 2001 and has been authorized by Congress through September 30, 2010. The EWA is intended to provide water "to augment streamflows, Delta outflows, to modify exports to provide fishery benefits and to replace the regular project water supply interrupted by the changes to project operations." (CALFED, 2000)

EWA performance was evaluated by CALFED in 2007. An important finding about the existing EWA program that could be applied to future EWA or other environmental water programs was that the lack of storage for EWA water assets south of the Delta is a serious constraint on EWA management and affects the ability to make the best use of the water for environmental purposes (CALFED, 2007). Additional storage capacity, along with the means to fill that storage without relying on the SWP and CVP Delta pumps, and to convey the stored water to offset Delta export curtailments, would substantially benefit the management of environmental water in the Delta and provide improved fishery conditions over and above those required by permits.

1.4.5 Decreasing Supply Reliability

Bay Area water agencies rely heavily on water supplies conveyed through the Delta to meet their normal year demands as well as prepare them for drought periods. CCWD customers receive almost 90 percent of their supply from the Delta while the three South Bay water agencies that receive SWP water – ACWD, SCVWD and Zone 7 – each receive about 40 to 65 percent of their supply from the Delta (ACWD, 2005; SCVWD, 2005; Zone 7, 2005). All of these agencies have long-term water supply plans to provide for their customers into the future under normal conditions and

during extended droughts and emergencies. Each agency has a diversified water supply portfolio including resource management strategies such as increased conservation, water recycling, desalination of brackish groundwater, and water banking.

ACWD, SCVWD, and Zone 7 also each have local groundwater basins that provide additional storage for conjunctive use of surface water. Local groundwater supply and storage gives these three agencies valuable flexibility and time to respond to droughts and emergencies. Still, Delta water remains an essential component of each of their water supply plans.

In the San Francisco Bay Area, water supply reliability can be adversely affected by the effects of droughts and emergencies, and by regulatory actions taken to protect Delta fish that result in constraints on pumping water from the Delta. For example, in February 2008, DWR notified SWP contractors that they would receive just 35 percent of their requested supplies in 2008. The allocation, which is significantly less than the 60 percent of requested supplies initially projected for calendar year 2008, takes into consideration current water supply conditions and SWP operational constraints, including the federal court-ordered 2008 Delta Export Restrictions to protect delta smelt.

The level of Delta supply reduction resulting from both dry-year conditions and regulatory actions experienced in 2008 will greatly affect the Bay Area water supply agencies if it extends to multiple years, such as occurred during the droughts of 1928 through 1935, 1976 through 1977, and 1987 through 1992. Local supplies, such as groundwater and locally stored runoff, drop during extended dry periods. At the same time, SWP deliveries can be reduced from an average of 63 percent of the contracted water supply (SWP Table A¹) to about 6 percent of the contracted water supply during a single dry year with conditions similar to those in 1977 (DWR, 2008). A 4-year drought, similar to the period of 1931 to 1934, with the 2008 Delta Export Restrictions in place, would result in reductions of SWP deliveries to about 34 percent of full Table A deliveries.

Other factors also can limit water supply. Catastrophic emergency events with the potential to affect the Delta and the delivery of Delta water supplies include earthquakes, chemical spills, levee failures, and other events that have the potential to disrupt individual or multiple water conveyance facilities such as aqueducts, tunnels, and pump stations. More than 1,100 miles of levees, mostly un-engineered earthen berms, are deteriorating. This deterioration increases the risk of catastrophic failure, which could result in long-term disruption of water supplies as well as significant losses from flood damage to agricultural land and critical infrastructure in the Delta (including aqueducts, railroads, highways, gas and petroleum pipelines and power facilities). In addition, the likely consequences of climate change on the Delta are still being evaluated, but it is clear that climate change is a new and significant uncertainty factor in all Delta resource management activities.

¹ The contracts between DWR and the 29 SWP contractors define the terms and conditions governing water delivery and cost repayment for the SWP. Table A refers to an exhibit to each water supply contract. It governs the contractual method for allocating available supply and for allocating some of the costs among the contractors. The total of all Table A amounts for deliveries from the Delta is 4.133 MAF (million-acre-feet) per year. Each contract's Table A amount is the volume in acre-feet that is used to determine the portion of available supply to be delivered to that contractor each year (DWR, 2008).

1.4.6 Declining Drinking Water Quality

Delta water quality for drinking water supplies has generally declined because of saltwater intrusion resulting from water resources management actions; polluted runoff from urban, agricultural, and other land development; and changes in the physical environment. Seasonal variations as well as longer-term degradation of Delta water quality result in elevated salinity, total dissolved solids, bromide, total organic carbon, algae concentrations, and high levels of hardness and turbidity, which can affect treatment cost and effectiveness, taste and odor, and health considerations.

1.5 Improving the Delta Ecosystem, Water Supply Reliability and Water Quality

Over the last 15 years, the federal and state governments together with numerous stakeholders have embarked on several large-scale programs to protect, improve, and better balance competing uses in the Delta. The most comprehensive of these efforts are CALFED and the Delta Vision process. Common to these two programs is recognition that both a healthy Delta ecosystem and a reliable water supply are necessary for a sustainable future in the State of California. Also common to both of these programs is recognition that key to any sustainable solution to the Delta crisis is increased storage and flexibility to manage the water supply system to optimally deliver water to meet environmental needs as well as urban and agricultural needs.

1.5.1 Improving Environmental Water Management and Water Supply Reliability

The Los Vaqueros Reservoir Expansion Project would provide storage and conveyance capabilities to help achieve these objectives. The proposed project facilities would be operated in a coordinated fashion with the SWP and CVP facilities to improve fishery protection, habitat management and supply reliability. Depending on the alternative selected, the project could contribute to the dual and interrelated goals of a healthy Delta ecosystem and a reliable water supply in multiple ways, as follows:

- **The Los Vaqueros Reservoir Expansion Project would develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs:**
 - Fish Protection through Improved Fish Screening. All water diverted through reservoir expansion project facilities would be through intakes equipped with state-of-the-art positive barrier fish screens designed and operated to regulatory agency specifications. The SWP and CVP pumps do not have positive barrier fish screens but instead use salvage facilities that can result in significant fish mortality. Diverting water through Expanded Los Vaqueros Reservoir system intakes would result in less impact to fish than the same amount of water diverted from either the SWP or CVP export facilities. This is because the scale of the diversions is much smaller, new technology fish screens are highly effective at preventing entrainment, and the intakes are in areas where fish screen sweeping flow criteria can be met.

- Fish Protection through Water Management Flexibility. The Los Vaqueros Reservoir Expansion Project would increase water management flexibility by adding storage and developing multiple intakes. Increased storage allows diversions from the Delta into the expanded Los Vaqueros Reservoir system to be reduced or eliminated during the most sensitive fish period without disrupting supplies. Current requirements for Los Vaqueros Reservoir operations include a no-diversion period during the most critical spring fish period. During this period, CCWD ceases pumping from the Delta and relies on the water stored in the reservoir for deliveries to its customers. All the alternatives evaluated in this document include a similar no-diversion period during which water is delivered from the expanded Los Vaqueros Reservoir in lieu of pumping from the Delta, protecting fish when they are most vulnerable.

Multiple intakes, coupled with additional storage capacity, would improve water management flexibility to respond to changing fishery conditions in the Delta. With these facilities, the timing and/or location of water diversions would be coordinated with the CVP and SWP and adjusted to avoid sensitive periods and locations for fish.

- Dedicated Storage for Environmental Water. Storage capacity dedicated to water supply for environmental purposes (environmental water) provides an opportunity to secure more water for environmental purposes than is now possible, potentially at lower cost, and ensures that this water can be reserved until called upon to support environmental water needs. Water reserved in storage for environmental purposes can be used in many ways such as altering timing of pumping to avoid sensitive periods for aquatic species while maintaining water deliveries, increasing river flows when needed for spawning or migrating fish or delivering supply to managed wildlife refuges² that support extensive wetlands and waterfowl populations. The reservoir expansion project could establish dedicated storage for environmental water.

- **The Los Vaqueros Reservoir Expansion Project would increase water supply reliability for the Bay Area:**

- Increased Reliability through Water Management Flexibility. The same system flexibility to change the location and/or timing of diversions in coordination with the SWP and CVP that would reduce impacts to fish (noted above) would also increase supply reliability. Having multiple points of diversion in the Delta means that, at times, while one diversion location needs to be closed to protect fish, another can remain open, allowing some level of supply delivery to be maintained. With additional storage, demands can be met with releases from the reservoir even when Delta diversions are curtailed to avoid sensitive fish periods and protect environmental resources.
- Increased Reliability through Expanded Storage. An expanded Los Vaqueros Reservoir system could be used to partially restore delivery reductions for ACWD, SCVWD and Zone 7 due to regulatory restrictions at the SWP and

² The CVP Improvement Act (1992) requires the Secretary of Interior, through Reclamation and U.S. Fish and Wildlife Service, to operate the CVP for project purposes including fish and wildlife protection, restoration, enhancement and mitigation as well as power generation, irrigation and domestic water use. One of the programs required to further these purposes is the refuge water supply program. Under this program, specific amounts of water are to be provided to certain Central Valley wildlife refuges. This water cannot always be provided due to a variety of constraints including cost and availability of water, pumping capacity, storage, and conveyance infrastructure.

CVP Delta pumps to protect fisheries. The expanded storage capacity would also allow additional water to be reserved from one year to another to respond to drought periods and emergencies. An expanded reservoir could provide as much as 235 TAF of storage capacity on average that could be available to Bay Area communities during emergencies.

1.5.2 Improving Drinking Water Quality

A secondary objective of the reservoir expansion project is to improve the quality of water deliveries to municipal and industrial customers in the San Francisco Bay Area, without impairing the project's ability to meet the environmental water management and water supply reliability objectives.

The existing quality of water supplies from the Delta has generally declined because of saltwater intrusion resulting from water resources management actions; polluted runoff from urban, agricultural, and other land development; and changes in the physical environment. Seasonal variations as well as longer-term degradation of Delta water quality result in elevated salinity, total dissolved solids, bromide, total organic carbon, and algae concentrations and high levels of hardness and turbidity. As a result, some drinking water supplies originating in the Delta are subject to water treatment challenges for utilities; taste and odor problems for consumers; and increased health risks for certain populations. At the same time, water quality regulations are becoming more restrictive, requiring agencies supplied from the Delta to continue to strive to improve the quality of water they divert so, in turn, they can improve the quality of water delivered to their customers.

The reservoir expansion project could provide incidental improvements in the quality of Delta water provided to Bay Area water agencies that receive deliveries from the South Bay Aqueduct. Salinity levels would be reduced in South Bay Aqueduct deliveries in dry periods as a result of storing water in Los Vaqueros Reservoir at times when water quality is high, and then providing that higher quality water in lieu of direct diversions from the Delta when water quality is poor. The reservoir expansion project could also improve other aspects of water quality for the agencies on the South Bay Aqueduct, as the water delivered from Los Vaqueros Reservoir would no longer pass through Clifton Court Forebay, where algae growth in the warm, shallow, slow-moving water results in an increase in organic carbon content and taste and odor issues.

The expanded reservoir would also improve water quality for CCWD by providing a larger supply of high quality water stored in the reservoir to blend with Delta supplies in dry years.