# 1.0 PURPOSE AND NEED

## 1.1 INTRODUCTION

This document is a Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) addressing a proposal to line 33.2[1] miles of the existing Coachella Canal in Riverside and Imperial Counties in southeastern California (see Figure 1-1). This Final EIS/EIR incorporates revisions and responses to public and agency comments received during the 60-day review period for the Revised and Updated Draft EIS/EIR. That review period extended from September 22, 2000 through November 21, 2000, and the comments and responses to those comments are contained in Volume II of this Final EIS/EIR. A public hearing on the Revised and Updated Draft EIS/EIR was held on Wednesday, October 25, 2000, at the Coachella Valley Water District. Transcripts from that public hearing are also provided in Final EIS/EIR Volume II.

A previous Draft EIS/EIR evaluating the proposed action had been circulated for a 60-day public review period ending in March 1994. Scoping meetings for the previous Draft EIS/EIR were held in April 1988, September 1989, and December 1992. The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and Coachella Valley Water District (CVWD) were the federal and State lead agencies, respectively, for the previous Draft EIS/EIR, and they are also the lead agencies for this document. The Metropolitan Water District of Southern California (MWD) is a potential Responsible Agency under CEQA. Subsequent to the close of the public review period on the previous Draft EIS/EIR, it was determined that there were not adequate funds available to continue the proposed canal lining project at that time. Accordingly, work on a Final EIS/EIR was postponed until funding became available.

Funds to construct the proposed canal lining project were appropriated by the State of California in 1998. With plans to implement the project, Reclamation and CVWD, in coordination with State and regional water resource agencies, revised and updated the Draft EIS/EIR and circulated it for public review, as described above. The specific roles of these agencies under NEPA and CEQA are addressed in Chapter 8.0. The purpose of preparing and circulating a revised draft document, as opposed to simply proceeding with a Final EIS/EIR based on the 1994 Draft EIS/EIR, was to incorporate updated information on the proposed project's physical, human, and regulatory

[1] A previous (1994) Draft EIS/EIR for the Coachella Canal Lining Project mistakenly identified the total length of unlined canal sections as 33.4 miles.

environment, address comments received on the previous Draft EIS/EIR, and provide an opportunity for public review and comment on this new information.

In accordance with the implementing guidelines of the California Environmental Quality Act (CEQA), the lead agency shall, "in the revised EIR, or by an attachment to the revised EIR, summarize the revisions made to the previously circulated draft EIR" (Cal. Code Regs., Title 14, § 15088.5 (2)(g)). Consistent with state law and implementing regulations, a summary of revisions to the previous Draft EIS/EIR was provided in Attachment A of the Revised and Updated Draft EIS/EIR. Attachment G is a copy of the letters received during review of the previous Draft EIS/EIR.

## 1.2 LOCATION

The Coachella Canal is located in Imperial and Riverside counties, California (see Figure 1-1). The 121-mile-long Coachella Canal originates as a branch of the All-American Canal (AAC) at Drop 1 near the international boundary between the United States and Mexico and runs in a northwesterly direction, before terminating in the Coachella Valley.

The proposed project lies along a section of the existing unlined Coachella Canal between siphons 7 and 14 and siphons 15 and 32[2], several miles east of the Salton Sea. (Siphons are buried pipes by which the canal flow passes under desert washes and runoff channels.) This section of canal contains 33.2 miles of unlined canal in segments between siphons. The length does not include the siphons, which are not proposed for replacement. The 33.2 miles of canal to be lined carry Colorado River water diverted at Imperial Dam.

## 1.3 PROJECT PURPOSE

The purpose of this federal action is to conserve 30,850 acre-feet annually of water presently being lost as seepage from the earthen reaches of the Coachella Canal. A specific quantity of conserved water would be assigned to the Department of the Interior to facilitate implementation of the San Luis Rey Indian Water Rights Settlement Act[3] (P.L. 100-675, November 17, 1988). Remaining quantities of conserved water would be distributed to southern California to meet present water demand and to assist the State in attaining the goals of California's Colorado River Water Use Plan.

[2] The canal was lined between Siphons 14 and 15 as part of a demonstration project.

[3] Conserved water would not be made available for transfer under the San Luis Rey Indian Water Rights Settlement Act until the separate environmental documentation for changes in the point of delivery has been completed and approved by the Secretary of the Interior.

## 1.4 AUTHORIZATION

Project construction is authorized by P.L. 100-675, signed by President Reagan on November 17, 1988. Title II of this legislation authorizes the Secretary of the Interior (Secretary) to line the unlined sections of the All-American and Coachella Canals or pursue other means to recover the lost water (see Attachment B in Volume II of this Final EIS/EIR for a copy of P.L. 100-675, Title II).

No federal funds were authorized to be appropriated for the project; however, P.L. 100-675 authorizes California water districts with Colorado River water delivery contracts to fund the project. The conserved water is to be made available for consumptive use by the California districts within their service areas according to the priorities under existing Colorado River water delivery contracts (discussed in this chapter as Section 1.6, "Background").

Per Section 203(a)(2) of P.L. 100-675, the Secretary is authorized to (1) implement measures for the replacement of incidental fish and wildlife values adjacent to the canal that are forgone as a result of lining the existing canal, or (2) mitigate resulting impacts on fish and wildlife resources from construction of a new canal or a portion thereof. Such measures shall be on an acre-for-acre basis, based on ecological equivalency, and shall be implemented concurrent with construction of the works, at non-federal expense. The Secretary is also authorized to develop groundwater, with a priority given to nonpotable sources, from public lands to supply water for fish and wildlife purposes associated with such replacement, at the expense of non-federal entities.

Funds for construction of the Coachella Canal Lining Project were authorized by California Senate Bill (S.B.) 1765 during the 1998 legislative session, which amended the California Water Code and appropriated State funding for the project. California Water Code § 12560 et seq. appropriated $200 million from the State General Fund for use by the Director of the Department of Water Resources to finance and arrange for lining portions of the AAC and the Coachella Canal, and it calls for these two projects to be completed by December 31, 2006, unless "extraordinary circumstances" require a later completion date. The appropriated State funds may only be made available for the respective canal lining projects after their CEQA and NEPA documents and any other permits required by federal and State environmental laws have been approved and certified. In addition, the appropriation of funds is contingent upon the Director of the California Department of Fish and Game (DFG) making a finding that the respective canal lining projects will avoid or mitigate all significant effects on fisheries and other wildlife. The DFG Director's finding must be accompanied by a statement from the Secretary of the Interior certifying that measures for the replacement of incidental fish and wildlife values adjacent to the canal comply with P.L. 100-675.

## 1.5 WATER NEED

Water that would be conserved as a result of the proposed canal lining project is needed to meet existing demand in the southern California area, and it is also needed to help the Federal Government meet its Indian Trust Asset requirements under the San Luis Rey Indian Water Rights Settlement Act. Even in years of average supply, sufficient amounts of Colorado River water are not expected to be available to satisfy all requests for water in California in the future. The last quarter century has been one of expansion and growth for southern California, reflecting the national trend of migration to warmer climates and the economic prosperity of the west and southwest. As described in Sections 1.6 and 1.8.5 of this EIS/EIR, however, California for the first time is faced with limited deliveries of Colorado River water down to its 4.4 million acre-foot per year basic (non-surplus year) apportionment. Consumptive use in California has exceeded its basic apportionment with supplies of surplus water and/or water apportioned to, but unused by, Arizona and/or Nevada. The quantity of these supplies made available by the Secretary of the Interior is expected to diminish. The water being conserved by the Coachella Canal Lining Project will help offset this reduction in supply.

There are several potential users for the conserved water, as described in Section 1.4. Under the current Law of the River, an amount of water equal to (1) 83 percent of the amount conserved would be made available to meet a portion of the needs of the California agencies with contracts for Colorado River water in accordance with their priorities under the Seven-Party Agreement (see Table 1-1 in Section 1.6.2) (P.L. 100-675, Section 204 (b)) and (2) 17 percent of the amount conserved would be furnished by the Secretary for the benefit of the La Jolla, Pala, Pauma, Rincon, and San Pasqual Bands of Mission Indians, the City of Escondido, and Vista Irrigation District in accordance with a to-be-executed settlement agreement (P.L. 106-377, Appendix B, Section 211(a)). The California normal year (basic) apportionment is only sufficient to cover the first four priorities under the Seven-Party Agreement. MWD, which holds the fifth priority, has the next right to receive water above the basic annual apportionment in an amount of 662,000 acre feet.

## 1.6 BACKGROUND

The existing Coachella Canal was constructed in the 1940s by the Bureau of Reclamation, and initial water delivery occurred in 1949. The CVWD operates the Coachella Canal in accordance with the terms of its contracts with the Secretary entered into pursuant to the Boulder Canyon Project Act.

### 1.6.1 Coachella Canal Water Conservation Planning

The first (upstream) 49 miles and last (downstream) 37 miles of the Coachella Canal are concrete-lined. The first 49 miles were "lined" by constructing a concrete-lined parallel canal, which was completed in 1980 pursuant to Title I of the Colorado River Basin Salinity Control Act (P.L. 93-320). The last 37 miles were lined with concrete when the canal was originally constructed in 1948. The remaining 34.6 miles of the canal were not lined originally because seepage there was relatively low compared to other reaches.

In 1987, a technical proposal was developed to line the Coachella Canal in place, under water, rather than to construct a parallel canal as in the past. In 1988, MWD expressed interest in funding the construction of the Coachella Canal Lining Project, provided the conserved water could be used in the MWD service area for municipal and industrial water needs.

A 1.4-mile section of canal between siphons 14 and 15 was lined under water between 1989 and 1991, demonstrating the technical feasibility of this method. This prototype lining project was constructed under an Advance Funding Agreement among the United States, MWD and CVWD.

### 1.6.2 Colorado River Entitlements

The California Seven-Party Agreement of 1931 recommended priorities for use of Colorado River water in California. Delivery of water is provided through water delivery contracts entered into with the Secretary pursuant to Section 5 of the Boulder Canyon Project Act, which incorporated these priorities. The parties and their priorities are shown in Table 1-1.

MWD has entered into contracts with the Secretary for delivery of 1.212 million acre-feet of Colorado River water and an additional 180,000 acre-feet of surplus water (when available) from the river. MWD diverts Colorado River water from Lake Havasu. In 1963, the United States Supreme Court (Court), in its decision *Arizona* v. *California*, and its subsequent Decree on March 9, 1964, apportioned use of 4.4 million acre-feet of Colorado River water to California, 2.8 million acre-feet to Arizona, and 0.3 million acre-feet to Nevada. The Court permitted the Secretary to make available the unused apportionments of the respective States to the other respective States. The Court also apportioned the use of surplus water that may be available in excess of 7.5 million acre-feet as follows: California—50 percent, Arizona—46 percent, and Nevada—4 percent of the amount available.

**Table 1-1. Priorities in California Seven-Party Agreement and Water Delivery Contracts**

| Priority | Description | | Acre-feet annually |
|---|---|---|---|
| 1 | Palo Verde Irrigation District (PVID) gross area of 104,500 acres of valley lands | | |
| 2 | Yuma Project (Reservation Division) not exceeding a gross area of 25,000 acres within California | | 3,850,000 |
| 3(a) | Imperial Irrigation District (IID) and other lands in Imperial and Coachella Valleys served by the AAC | | |
| 3(b) | PVID—16,000 acres of lands on the Lower Palo Verde Mesa | | |
| 4 | MWD for use on the coastal plain of southern California | | 550,000 |
| | | Subtotal | 4,400,000 |
| 5(a) | MWD on the coastal plain of southern California | | 550,000 |
| 5(b) | City and/or County of San Diego[1] | | 112,000 |
| 6(a) | IID and other lands in Imperial and Coachella valleys served by the AAC | | 300,000 |
| 6(b) | PVID—16,000 acres of lands on the Lower Palo Verde Mesa | | |
| 7 | Agricultural use in the Colorado River Basin in California | | - - - |
| | | Total | 5,362,000 |

[1]In 1946, the City of San Diego, San Diego Water Authority, MWD and the Secretary entered into a contract in which the right to storage and delivery of Colorado River water vested in the City of San Diego was merged with and added to the rights of MWD under conditions since satisfied.

The Court also identified "present perfected rights" to use of water for a number of individuals, towns, and Indian tribes along the Colorado River in California which were not included in priorities 1 to 6 of the Seven-Party Agreement. Satisfaction of consumptive use demands under these present perfected rights, totaling 41,260 acre-feet per year, would be satisfied from the amount of water apportioned to California each year.

MWD may use water in addition to the amount it would have available within California's basic apportionment when such water is declared to be available by the Secretary. Under the *1970 Criteria for Coordinated Long Range Operation of Colorado River Reservoirs,* the Secretary determines how much water is to be allocated for use in Arizona, California, and Nevada and, thus, whether a surplus, normal, or shortage condition exists. In its consideration of adopting more specific criteria in making these determinations, Reclamation prepared the Colorado River Interim Surplus Criteria EIS. The Final Colorado River Interim Surplus Criteria EIS was completed in December 2000, and a Record of Decision adopting the criteria was signed by the Secretary of the Interior on January 16, 2001.

CVWD would reduce its diversions from the Colorado River in an amount equal to the conserved water from the proposed lining project, thus creating unused water under priority 3 that would be made available for consumptive use by California entities with contracts with the Secretary of the Interior for use of Colorado River water, and to the Secretary for facilitating implementation of the San Luis Rey Indian Water Rights Settlement Act. It is reasonably foreseeable that the water made available for consumptive use would be provided to MWD. The conserved water used by MWD would not be new water but would replace a portion of the water currently diverted by MWD from Lake Havasu.

## 1.7 WATER SYSTEMS INVOLVED

Colorado River water is diverted at Imperial Dam and is conveyed from this point to the Imperial Valley via the 80-mile-long AAC, which was built by Reclamation in the 1930s. Through this gravity flow canal, Colorado River water is conveyed to the IID system headings at the East Highline Canal, the Central Main Canal, and the Westside Main Canal.

IID has recently (1990-1999) diverted up to 3.16 million acre-feet per year of Colorado River water to nearly 500,000 acres of agricultural lands and nine cities and towns in Imperial Valley.

CVWD's average annual import of Colorado River water is approximately 330,000 acre-feet. This water is delivered through the Coachella Canal, which branches off the AAC at Drop 1 and terminates at Lake Cahuilla, a storage reservoir used to balance canal system operation. The earthen sections of the canal lose approximately 32,350 acre-feet of water per year through seepage.

MWD diverts Colorado River water from Lake Havasu and conveys the water through the Colorado River Aqueduct (owned and operated by MWD), which extends 242 miles from Lake Havasu to its

terminal reservoir, Lake Mathews, near Riverside, California. The aqueduct is capable of diverting about 1.25 million acre-feet of water per year.

## 1.8 RELATIONSHIP TO OTHER PROJECTS

### 1.8.1 Coachella Canal In-Place Lining Prototype Project

This prototype project tested a new canal lining method on a 1.4-mile reach of the Coachella Canal between siphons 14 and 15. This new lining method involved placement of an impervious layer of plastic lining covered by protective layer of concrete while the canal was still in service. The project was completed in March 1991, demonstrating that this is a feasible means of lining the canal.

### 1.8.2 Coachella Valley Groundwater Management Plan

The CVWD is currently preparing a plan to guide water management practices within CVWD's service area through 2035. The Draft EIR for the Coachella Valley Groundwater Management Plan is under preparation by CVWD and has not yet been circulated for public review. This proposed plan is related to the Coachella Canal Lining Project in that it addresses how the CVWD's water resources will be managed. Although the proposed Coachella Canal Lining Project would affect groundwater in some areas (see Section 3.3), it would not affect groundwater in areas covered by the Coachella Valley Groundwater Management Plan.

### 1.8.3 San Luis Rey Indian Water Rights Settlement

The San Luis Rey Indian Water Rights Settlement Act, enacted by Congress in 1988 (Title I of P.L. 100-675), authorized a settlement of water rights claims to San Luis Rey River water among the City of Escondido, the Escondido Mutual Water Company, Vista Irrigation District, and the La Jolla, Pala, Pauma, Rincon, and San Pasqual Bands of Mission Indians. This settlement is expected to be facilitated through the use of 11,500 acre-feet per year of water conserved by the proposed AAC Lining Project, and 4,500 acre-feet per year from this project, for a total of 16,000 acre-feet per year. This is expected to permit resolution of pending litigation and a proceeding before the Federal Energy Regulatory Commission of an important Indian Trust Asset.

Conserved water would not be made available for transfer under the San Luis Rey Indian Water Rights Settlement Act until this separate environmental documentation for changes in the point of delivery has been completed and approved by the Secretary of the Interior.

### 1.8.4 All-American Canal (AAC) Lining Project

This project entails the construction of a new concrete-lined canal parallel to 23 miles of the earthen AAC, beginning approximately 1.6 miles downstream of Pilot Knob and ending at Drop 3. The Final EIS/EIR for the AAC Lining Project (Reclamation/IID 1994) estimates that this project will conserve approximately 67,700 acre-feet of water annually. This project is separate from lining the Coachella Canal, but, like the Coachella Canal Lining Project, it could result in reduced water diversions at Imperial Dam and thus maintain diversions to the southern California coastal plain from Lake Havasu. Also, both of these canal projects have been authorized by P.L. 100-675 and appropriated funds for construction by California Water Code § 12560 et seq. Reclamation issued a Record of Decision for the AAC Lining Project in 1994, and it is still valid.

### 1.8.5 California's Colorado River Water Use Plan

California, for the first time, is faced with limited deliveries of Colorado River water. Over the last ten years, California's annual use of Colorado River water has varied from 4.5 to 5.2 million acre-feet. In contrast, California's basic (non-surplus year) apportionment of Colorado River water is 4.4 million acre-feet. In surplus years, California has an additional apportionment of 50 percent of the surplus water made available to the three Lower Division states—California, Arizona, and Nevada. The historic and current use of water up to 5.2 million acre-feet per year stems from the occurrence of surplus conditions and the availability of water apportioned to, but unused by, Arizona and Nevada. As a result of the other Lower Basin States increasing the use of their apportionments, California will no longer be assured the availability of water apportioned to, but unused by, Arizona and Nevada or the availability of surplus water under its surplus water apportionment.

In response to the need for California to reduce use of Colorado River water to its basic apportionment when necessary, the Colorado River Board of California is developing California's Colorado River Water Use Plan (Plan).

The Plan provides the framework for coordination between California water agencies with rights to Colorado River water, and it also provides a framework for planning future Colorado River water-related resource and financial investments. The Plan includes policies, programs, projects, actions, and other activities that deal with safeguarding, protecting, and optimizing California's Colorado River resources. The Plan also addresses actions, such as water reuse and other local projects, that do not directly involve the Colorado River but that affect those California water agencies with rights to Colorado River supplies.

The Coachella Canal Lining Project is identified in the Plan as one of several cooperative projects. Collectively, these projects, which are described as a "linchpin" component of the Plan, provide for the transfer of up to 393,700 acre-feet per year from agricultural use to principally urban use for up to 75 years. Based on the terms of a proposed Quantification Settlement Agreement (see description below), water conserved by the Coachella Canal Lining Project accounts for about 26,000 acre-feet (6.6 percent) of the 393,700-acre-foot total.

The Colorado River Board of California has prepared a working draft of the Plan (Colorado River Board 2000b). As stated in the working draft of the Plan, it will be subject to further revisions based on additional information, comments received, and ongoing associated reviews of Plan components. The draft Plan will be finalized upon completion of environmental reviews and the subsequent execution of agreements associated with the Plan, which are proposed to occur before the end of 2001.

### 1.8.6 Quantification Settlement Agreement

The Quantification Settlement Agreement is a new approach to quantifying the amount of Colorado River water that would be available to IID, CVWD, and MWD. Because the Quantification Settlement Agreement addresses the use of Colorado River water, it is an important component of California's Colorado River Water Use Plan. As described in Section 1.6.2 and shown on Table 1-1, there has been up to 3.85 million acre-feet per year available to the users of the first three priorities of California's annual Colorado River water apportionment. Use of water on PVID valley lands has first priority, the Yuma Project, Reservation Division land has second priority, and the third priority is shared among lands in IID, CVWD and PVID, the latter being for 16,000 acres of the adjoining lower Palo Verde Mesa lands. Without further quantification of the third priority, it would be difficult to develop and implement water conservation and exchange programs, including several of the "linchpin" programs included in California's Plan. The Quantification Settlement Agreement would quantify third priority water rights, interests, and uses to allow for the further development of cooperative water supply programs; water conservation, transfer, and exchange programs; improved resource management; and enhanced water supply reliability. A Draft Program EIR for the Quantification Settlement Agreement is being prepared by MWD, CVWD, IID, and the San Diego County Water Authority (SDCWA). Separate NEPA analysis is also being prepared by Reclamation for the associated Secretarial Implementation Agreements.

### 1.8.7 IID-San Diego County Water Authority Water Conservation and Transfer Project

Reclamation, IID, and SDCWA are currently preparing an EIS/EIR to address a proposed agreement for a long-term transfer of conserved water from the Imperial Valley to San Diego County. Under the water transfer agreement, IID and its agricultural water customers would conserve water and sell it to SDCWA for at least 45 years. Either agency may extend the contract for another 30 years beyond the initial term (IID 2000).

Water deliveries would start at 20,000 acre-feet per year and increase incrementally by 20,000 acre-feet per year to an annual maximum of 200,000 acre-feet. The transfer would include water that is voluntarily conserved by farmers in IID, although fallowing (retiring) farm land to conserve water for this transfer is specifically prohibited. IID proposes to transfer the conserved water in order to provide IID with sufficient funds to implement a water conservation program, including the cost of on-farm and system improvements, certain environmental mitigation costs, and other implementation costs.

IID has the option to conserve an additional 100,000 acre-feet of water per year under this agreement. Under the terms of the proposed Quantification Settlement Agreement described above, this 100,000 acre-feet is referred to as the First and Second 50,000 Acre-Feet Transfers of conserved water to CVWD and/or MWD. CVWD would have the first option to acquire this conserved water and transferred water and would divert this water at Imperial Dam. If CVWD chose not to exercise part of or its full option to this water, MWD could exercise an option to divert this water at Lake Havasu. The First and Second 50,000 Acre-Feet Transfers would be supplied by the reduction of consumptive use in the IID service area from Year 1 to Year 45. After Year 45, the obligation to provide the Second 50,000-Acre-Foot Transfer to CVWD would be transferred from IID to MWD.

Although this transfer agreement is not associated with the Coachella Canal Lining Project, it is similar in that both would reduce water diversions at Imperial Dam and thus assist in maintaining diversions from Lake Havasu to the southern California coastal plain. The biological resource impacts of reduced releases from Parker Dam were addressed in a Biological Assessment for Interim Surplus Criteria, Secretarial Implementation Agreements, Water Administration, and Conservation Measures, prepared by Reclamation, and in the resulting Biological Opinion issued by the U.S. Fish and Wildlife Service (FWS) in January 2001.

### 1.8.8 Lower Colorado Water Supply Project

This project, authorized by P.L. 99-655, consists of a well field along the AAC that produces water by exchange for the City of Needles, California, and other persons, or federal or non-federal governmental entities whose lands or interests in lands located adjacent to the Colorado River in the State of California do not hold rights to use of Colorado River water, or whose rights are insufficient to meet their present or anticipated future needs. The well field, located in the Sand Dunes area along the AAC between Pilot Knob and Drop 1, will recover a combination of regional groundwater and water that has seeped from the canal. The completely constructed first stage of the well field has the capacity to pump 5,000 acre-feet annually into the AAC. Maximum authorized capacity of the Lower Colorado Water Supply Project is 10,000 acre-feet per year.

This project benefits parties near the river by means of an exchange agreement. For example, the water that would be diverted from the Colorado River by the City of Needles would be offset by water pumped from the well field into the AAC, allowing CVWD and IID to reduce their diversion from the river by a corresponding amount. Reclamation has contracted 1,150 acre-feet of project capacity to the BLM for its lands in California. The remaining capacity is contracted to the City of Needles.

This project does not affect the Coachella Canal Lining Project.

### 1.8.9 Colorado River Water Underground Storage and Recovery Study, Imperial County

This project would consist of storing surplus Colorado River water in the groundwater basin underlying the East Mesa of Imperial County for future use. A study has been completed that identifies: quantity and availability of excess Colorado River flows; capacity of existing canals to convey excess flows for recharge; and groundwater basin capability for recharge, storage, and control of excess flows. A test was conducted using the old unlined Coachella Canal for recharge during 1988-1990.

This project does not affect the Coachella Canal Lining Project.

### 1.8.10 IID/MWD Water Conservation Program

This program, now completed, consists of numerous structural and nonstructural water conservation projects within the irrigated area of IID. Measures implemented as part of this 1988 agreement between IID and MWD include lining existing canals, constructing regulating reservoirs and lateral

canal interceptor systems, and installing nonleak gates and distribution system automation equipment, as well as implementing on-farm management measures. As a result of these measures, IID conserved an estimated 109,640 acre-feet of water in 2000, and it is anticipated that these conservation projects will conserve 110,000 acre-feet of water annually in the future (Colorado River Board 2000b).

This project is not related to lining the Coachella Canal but, like canal lining, has resulted in reduced water diversions at Imperial Dam as compared to what would have been diverted absent the program and thus assists in maintaining diversions to the southern California coastal plain from Lake Havasu.

### 1.8.11 Salton Sea Restoration Project

As described in the Draft Salton Sea Restoration Project EIS/EIR (Salton Sea Authority and Reclamation 2000), the Salton Sea is an excessively saline, nutrient-rich lake in a closed basin. The unlined portion of the Coachella Canal is generally located several miles east of the sea's shoreline (see Figure 1-1). The basin which forms the Salton Sea has been flooded by overflows from the Colorado River on multiple occasions, and in 1905 an accidental breach of an irrigation structure resulted in uncontrolled flow from the Colorado River into the basin for a period of 18 months, creating the Salton Sea. Today, the sea exists primarily due to continued agricultural drainage from the Imperial, Coachella, and Mexicali valleys and smaller contributions from municipal effluent precipitation, and stormwater runoff.

The Salton Sea is an important component of the Pacific Flyway, providing migratory and resident bird habitat. Factors currently degrading Salton Sea ecosystems include increasing salinity, nutrient loading, oxygen depletion, and temperature fluctuations. In response to these issues, Congress passed two laws which directed the Secretary of the Interior to develop options to reclaim the Salton Sea: Title II of P.L. 102-575 in 1992 and P.L. 105-372 in 1998. Pursuant to these laws, Reclamation, under the direction of the Secretary and working with the Salton Sea Authority, is developing potential measures for a Salton Sea Restoration Project. These restoration measures were evaluated in a January 2000 Draft EIS/EIR. Reclamation and the Salton Sea Authority will release a revised and supplemented Draft EIS/EIR for the restoration project.

The objectives of the proposed Salton Sea Restoration Project are to maintain the sea as a repository for agricultural drainage; provide a safe, productive environment at the sea for resident and migratory birds and endangered species; restore recreational uses at the sea; maintain a viable sport fishery at the sea; and enhance the sea to provide economic development opportunities. Due to a lack of drainage sites and its importance in maintaining the agricultural economy, the continued use of the

Salton Sea as a repository for agricultural runoff is a fundamental component of the restoration project.

As described in Sections 3.2 and 3.3 of this Final EIS/EIR, the proposed Coachella Canal Lining Project is not expected to have a measurable effect on the volume of surface or groundwater flows entering the Salton Sea.

## Table 2-1. Existing Unlined Canal Characteristics

| Existing canal segment | Flow capacity ($ft^3/s$)[1] | Bottom width (feet) |
|---|---|---|
| Siphon 7 to siphon 14 | 1,600 | 46 |
| Siphon 15 to siphon 24 | 1,600 | 46 |
| Siphon 24 to siphon 31 | 1,350 | 42 |
| Siphon 31 to siphon 32 | 1,300 | 40 |

[1] Cubic feet per second.

## Table 2-2. Length of Coachella Canal Unlined Section (Siphons 7 to 14 and Siphons 15 to 32)

| Reach (Siphon Nos.) | Length (Miles) | Reach (Siphon Nos.) | Length (Miles) |
|---|---|---|---|
| 7 to 8 | 0.83 | 20 to 21 | 1.10 |
| 8 to 9 | 1.38 | 21 to 22 | 1.64 |
| 9 to 10 | 1.25 | 22 to 23 | 2.28 |
| 10 to 11 | 0.84 | 23 to 24 | 2.68 |
| 11 to 12 | 1.55 | 24 to 25 | 1.02 |
| 12 to 13 | 2.03 | 25 to 26 | 1.50 |
| 13 to 14 | 1.16 | 26 to 27 | 0.88 |
| 14 to 15 | N/A | 27 to 28 | 0.44 |
| 15 to 16 | 1.69 | 28 to 29 | 1.49 |
| 16 to 17 | 1.35 | 29 to 30 | 2.72 |
| 17 to 18 | 1.41 | 30 to 31 | 1.23 |
| 18 to 19 | 1.06 | 31 to 32 | 0.44 |
| 19 to 20 | 1.23 | **TOTAL** | **33.2** |

N/A – Reach 14 to 15 of the Coachella Canal is currently lined and is, therefore, not applicable in this table.

**Table 2-3. Summary of Physical Properties and Costs (Estimated)**

| Dimension | Existing canal | Conventional lining | Underwater lining | Parallel canal |
|---|---|---|---|---|
| Length of canal to be lined (miles) | 33.2 | 33.2 | 33.2 | 32.5 |
| Excavation volume (million cubic yards) | – | 0.4 | 2.3 | 9.9 |
| Concrete volume (cubic yards) | – | 97,500 | 175,500 | 121,400 |
| Sand and gravel volume (cubic yards) | – | 105,000 | 520,000 | 120,000 |
| Canal water width, average (feet) | 66 | 43 | 80 | 43 |
| Water depth, maximum (feet) | 6.0 | 11.2 | 9.0 | 11.2 |
| Side Slopes[1] | 2:1 | 1.5:1 | 2.5:1 | 1.5:1 |
| Water volume[2] (acre-feet) | 1,180 | 1,131 | 1,679 | 1,131 |
| Water velocity[2] (feet per second) | 1.5 to 2.0 | 1.4 to 2.9 | 0.8 to 2.0 | 1.4 to 2.9 |
| Water conserved[3] (acre-feet per year) | – | 30,850 | 29,850 | 30,850 |
| Construction cost[4] (millions of dollars) | – | 61.8 | 103.8 | 79.1 |

[1] Horizontal distance to vertical distance.
[2] At typical water flow (500 cubic feet per second).
[3] Does not include deduction for water that may be required to mitigate surface water and biological resource impacts.
[4] January 2001 dollars. Does not include cost of mitigation.

This alternative would permit water delivery during construction. Work could proceed continuously throughout the year, resulting in a relatively short construction period.

### 2.2.1 Existing Canal Configuration

The sections of canal to be lined were originally constructed with side slopes of 2 horizontal to 1 vertical (2:1) and varying bottom widths. Existing bottom widths and associated flow capacities are listed in Table 2-1.

### 2.2.2 Lining Design

Design studies to date have produced a canal design with a 16-foot bottom width and side slopes of 1.5 horizontal to 1 vertical (1.5:1). The hydraulic design is governed by the existing inlet/outlet elevations of the siphons. Therefore, the canal slope and bottom elevation would be fixed. Figure 2-1 shows a typical section of the proposed canal.

Concrete ridges would be cast on the side slopes from the top to below the minimum water level to provide grip for humans and allow for escape from the canal by large mammals. These ridges would

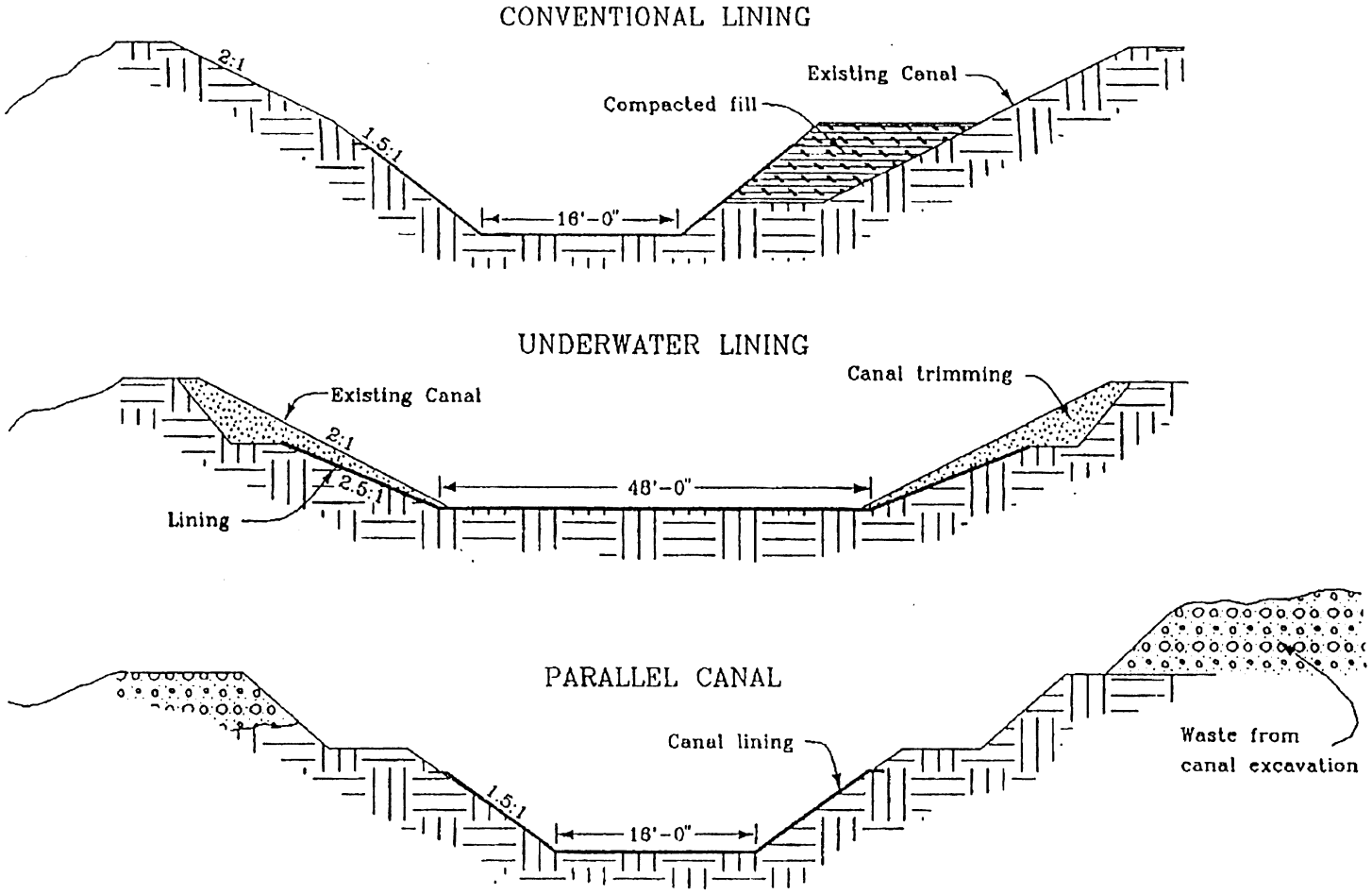


**Figure 2-1**
**Proposed Typical Canal Cross Sections**

protrude approximately 1.5 inches from the canal lining and would be spaced about 18 inches apart along the entire length of the new lining (see Figure 2-2). In addition, escape ladders would be added every 750 feet along each side of the canal. At areas of high wildlife visitation, such as at siphon 20, escape ramps would be added to help facilitate large mammal escape from the canal.

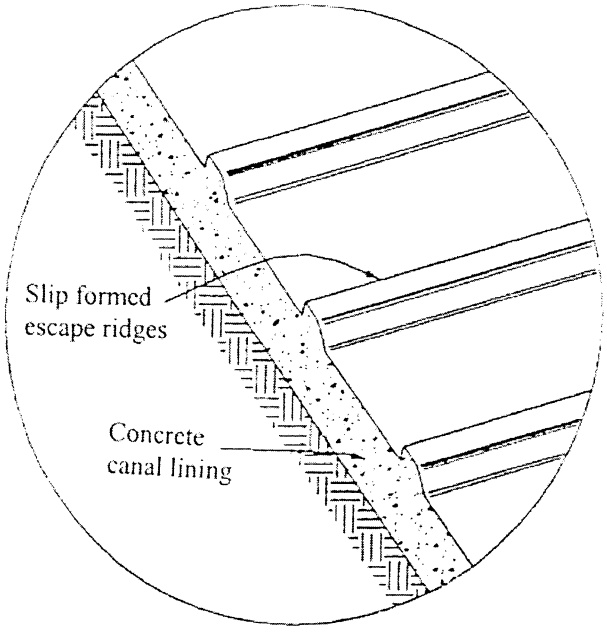


Figure 2-2. Escape Ridges.

The canal lining design is based on a flow capacity of 1,300 cubic feet per second ($ft^3/s$), which is more than the estimated maximum diversion currently required to serve CVWD during peak use periods. However, final design studies may produce slightly different canal cross sections. Canal characteristics of the Conventional Lining Alternative are shown in Table 2-4.

### 2.2.3 Construction Activities

Construction would probably begin at the downstream end of the project at siphon 32 and proceed upstream on a section-by-section basis (between siphons). A second construction operation could be carried out simultaneously, either at the upstream end or beginning near the midpoint of the canal.

**Table 2-4. Conventional Lining Alternative Canal Characteristics**

| Siphons | Distance (miles) | Flow capacity ($ft^3/s$) | Design water depth (feet) |
|---|---|---|---|
| 7 to 14 | 9.04 | 1,300 | 11.2 |
| 15 to 24 | 14.44 | 1,300 | 11.2 |
| 24 to 31 | 9.28 | 1,300 | 10.9 |
| 31 to 32 | 0.44 | 1,300 | 10.8 |

Between siphons, each section of the existing canal would be dewatered by bypass pumping of the canal flow around the section. The water would be conveyed through a portable set of 72-inch-diameter temporary pipelines from just above the upstream siphon to just below the downstream siphon. Depending on water demand, a maximum of five pipelines would be used, fed by large-capacity portable pumps positioned in the canal. Since pumping operations usually require fuel storage, the selected contractor would be required to develop and implement a spill prevention and response plan.

The bypass pipelines would occupy a strip of land approximately 65 feet wide, amounting to 275 acres for the entire project. This strip of land would not be cleared and would be graded only where abrupt changes in elevation need to be altered to permit positioning of the bypass pipelines. The bypass pipelines would be located on alternating sides of the canal, depending upon topography, natural vegetation, land ownership, and the location of cultural resources. Disturbance of vegetation would be minimized because there is a graded access road along each side of the canal. Also, because it is possible to drive from one side of the canal to the other side at any of the siphons, the use of alternating sides of the canal for bypass pipelines would not preclude vehicular access along the canal. Use of the pipe corridor would not require uprooting of vegetation between pipe supports. The proposed locations of the bypass pipelines are listed in Table 2-5.

The construction contractor may elect to use more, smaller bypass pipelines (for example, seven pumps and seven 36-inch-diameter steel pipes could be used). This approach would narrow the width of the bypass pipeline corridor to less than 65 feet, with a corresponding reduction in ground disturbance-related project impacts. The impact assessments and mitigation requirements in this EIS/EIR are based on the more conservative, 65-foot-wide bypass pipeline corridor described above.

**Table 2-5. Location of the Bypass Pipelines**

| Between siphons | Pipeline location in relation to existing canal[1] |
|---|---|
| 7-9 | west |
| 9-10 | east |
| 10-14 | west |
| (14-15 already lined) | |
| 15-19 | east |
| 19-20 | west |
| 20-24 | east |
| 24-29 | west |
| 29-32 | east |

[1] Pipeline location may be changed to avoid impacts to sensitive resources

The construction sequence would potentially be as follows (using the last segment as an example): an earthen cofferdam would be constructed downstream from the siphon 32 outlet and one would be constructed just upstream from the siphon 31 inlet. At the same time, a pumping facility would be installed upstream from the cofferdam at the siphon 31 inlet with the discharge directed into bypass pipelines placed along the canal reach being lined. The pumping units would be large-capacity, low-head, portable pumps driven by electrical motors and/or gas/diesel engines.

The bypass pipelines would parallel the canal and re-enter the canal downstream from the cofferdam at the outlet of siphon 32. The remaining water in the canal section between siphons 32 and 31 would then be pumped out into the canal downstream from siphon 32, and the canal would be allowed to dry for a short period of time. If the cofferdam is built on the upstream end first, water in the reach to be dewatered would flow by gravity, significantly reducing the amount of water that would need to be pumped out.

The canal would be cleaned and one side excavated to the required line, slope, and grade for the new canal. On the other side, a new compacted embankment would be constructed using material from the existing spoil banks. This rough graded prism would then be trimmed to the desired prism dimensions and lined with concrete. A hand-lined tie-in would be made to each of the structures. Hand-lining would also be required where the canal is traversed by the Eagle Mountain Railroad (approximately 4,000 feet upstream of siphon 24).

Once the hand-lined tie-ins are complete, water would be released through the newly lined section and the process repeated on the next canal section.

The bypass pipelines and pumping units would be sized to deliver a total of approximately 600 $ft^3/s$. This rate of delivery would meet the water need during most of the year, except for occasional, short-duration peak requirements that would be met with storage downstream from the work area. CVWD would be able to adjust its system operations to smooth out peak flow deliveries.

Other land disturbances associated with construction would include a ten-acre concrete batch plant and one five-acre staging area. Existing unpaved roads in other areas would be used for construction activities.

### 2.2.4 Permits, Agreements, and Approvals

Title II of P.L. 100-675 (see Attachment B) authorizes the Secretary to line the canal, implement mitigation measures, and accept non-federal funding from specifically named California water agencies that have Colorado River water delivery contracts with the Secretary. Prior to initiation of construction, participating agencies would enter into a construction and/or funding agreement with the Secretary that would specify funding arrangements for construction and operation, responsibilities of the various parties involved, and other matters.

Section 12560-12565 of the California Water Code appropriates $200 million from the State's General Fund for use by the Director of the Department of Water Resources to finance and arrange for lining portions of the AAC and the Coachella Canal. Funding is contingent on certain requirements being met including: completion of a study on seepage and subsurface inflows to the Salton Sea which has been completed; certification and approval of CEQA and NEPA environmental documents; a finding by the Director of DFG that the project will avoid or mitigate all significant effects upon fisheries and wildlife; and receipt of a statement from the Secretary certifying that measures for the replacement of incidental fish and wildlife values adjacent to the canal forgone as a result of canal lining, or mitigation of resulting impacts on fish and wildlife resources, meet the statutory requirements of Section 203(a)(2), P.L. 100-675.

The U.S. Army Corps of Engineers (USACOE) has considered this project and the coordinated mitigation planning involved and has decided not to exercise its authority under the Clean Water Act for construction of the project. Accordingly, a Clean Water Act Section 404 permit would not be

required.[1] In a comment letter on the Revised and Updated Draft EIS/EIR, the Colorado River Basin Regional Water Quality Control Board indicated that a Clean Water Act Section 401 Water Quality Certification may be required for project construction.

Depending on the alternative selected, a Section 1601 Streambed Alteration Agreement may be required from DFG should alteration of streambeds in the project area occur. Although the canal itself is not subject to §1601 of the Fish and Game code, which governs Streambed Alteration Agreements, construction in the drainages and washes at the siphons may require a §1601 Streambed Alteration Agreement.

Air quality permits would be required from the South Coast Air Quality Management District (SCAQMD) and the Imperial County Air Pollution Control District (ICAPCD) for the concrete batch plant, earthwork activities, and motors for the bypass water pumps during construction.

Compliance with Section 7 of the federal Endangered Species Act must be completed before project implementation. Informal consultation with FWS and DFG has been initiated.

Reclamation has also initiated a new Native American contact program for the project and is reinitiating consultations with the State Historic Preservation Officer (SHPO) regarding compliance with Section 106 of the National Historic Preservation Act. The Section 106 compliance process must be completed prior to project approval by Reclamation. Any Native American burial sites encountered during construction would be treated in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA).

Upon completion of the Final EIS/EIR, CVWD would be required to certify the document, make finding under CEQA (see State CEQA Guidelines Sections 15091 and 15093), and approve the project if the canal lining project is to be constructed. Also, Reclamation must sign the Record of Decision (ROD) in order for construction to commence. As a potential Responsible Agency under CEQA, MWD may also use this EIS/EIR as the basis for considering the proposed project's environmental effects. Prior to its approval of the project, MWD would also be required to make findings under CEQA (see State CEQA Guidelines Section 15096 (h)).

[1] A Section 404 permit covers dredging and placement of fill in associated navigable waters of the United States. The USACOE reserves the right on a case-by-case basis to determine whether a particular water body requires a Section 404 permit.

### 2.2.5 Construction Schedule

Construction of the lining would take three years. This schedule includes a one-year preconstruction period for items such as establishing a field organization, hiring personnel, conducting cultural resources surveys, collecting engineering and environmental design data through drilling and surveying, and developing construction specifications. Construction of the lined canal would begin in the second year and would be completed in two years.

### 2.2.6 Project Operation

#### Canal Operation During Construction

Continuous water delivery for CVWD would be maintained during construction by means of the bypass pipelines described previously. With the bypass facilities, available storage in the canal downstream from the construction area, and CVWD's ability to regulate its deliveries (i.e., dampen summer peak flows), no interruption of water to CVWD's customers is expected.

#### Canal Operation and Maintenance After Construction

CVWD would continue to operate and maintain the canal year-round in accordance with existing contracts with Reclamation. Typical operation is discussed in Section 3.2, under "Surface Water." No interruption of water service to CVWD's customers is expected.

### 2.2.7 Use of Conserved Water

Conserved water would, in effect, be left in the Colorado River system. The water would then be available for use in California under the Secretary's water delivery contracts in which California's apportionment to the use of Colorado River water is allocated. For the purposes of analysis in this EIS/EIR, it is assumed that this water would be diverted by MWD at Lake Havasu in accordance with a proposed Quantification Settlement Agreement and the Federal Secretarial Implementation Agreement for which separate CEQA and NEPA analyses, respectively, are pending. P.L. 100-675 provides that four California agencies, Palo Verde Irrigation District (PVID), Imperial Irrigation District (IID), CVWD, and/or Metropolitan Water District of Southern California (MWD), may fund project construction; however, the State of California is providing funding for the Coachella Canal Lining Project under California Water Code §12560 et seq. With implementation of a proposed Quantification Settlement Agreement among CVWD, MWD, and IID, approximately 21,500 acre-

feet per year would be made available to MWD, and 4,500 acre-feet per year would be made available for facilitating implementation of the San Luis Rey Indian Water Rights Settlement Act. The remaining 4,850 acre-feet of conserved water is expected to be managed by CVWD for environmental mitigation purposes. Conserved water would not be made available for transfer under the San Luis Rey Indian Water Rights Settlement Act until the separate environmental documentation for changes in the point of delivery has been completed and approved by the Secretary of the Interior.

### 2.2.8 Project Cost

#### Construction Cost

The cost of constructing the preferred alternative has been estimated at $61.8 million (calendar year [CY] 2001 dollars), which includes allowances for contingencies and overhead of 10 percent each. The addition of mitigation features would increase the overall project cost by a currently unquantified amount.

#### Operation and Maintenance (O&M) Cost

The cost of operating and maintaining the new lined canal would differ from the cost of operating and maintaining the present unlined canal. Based on operation and maintenance (O&M) costs reported by CVWD, it is estimated that, after lining, the cost of operating and maintaining the canal would increase by approximately $19,300 per year. This estimate is subject to change through more detailed analysis during the design phase, to comply with P.L. 100-675. Mitigation requirements would also increase annual O&M costs by a currently unquantified amount.

## 2.3 UNDERWATER LINING ALTERNATIVE

The Underwater Lining Alternative also would line the canal from siphons 7 to 14 and siphons 15 to 32. The existing canal would be lined while still in service, allowing uninterrupted delivery of irrigation water.

### 2.3.1 Lining Design

The preliminary design is based on placing a polyvinylchloride (PVC) impervious plastic liner on the bottom of the canal and covering it with a three-inch layer of concrete. When lined, the canal

### 2.3.4 Construction Schedule

The project schedule would be 4.5 years. This schedule includes a 1.5-year preconstruction period for items such as establishing a field organization, hiring personnel, conducting cultural resources surveys, collecting design data, and preparing construction specifications. Construction would begin the second year and would continue for three years but would be limited to the fall through spring period of the year to avoid high flows in the canal.

### 2.3.5 Project Operation

Project operation provisions would be similar to the Conventional Lining Alternative, except that no bypass pipelines would be used. The rate of flow in the canal would not need to be restricted, but lining work would be suspended during the peak summer flow period

### 2.3.6 Project Cost

#### Construction Cost

The cost of constructing the lining has been estimated at $103.8 million (CY 2001 dollars), which includes allowances for contingencies and overhead. The addition of mitigation features would increase the overall project cost by a currently unquantified amount.

Lining the existing canal in place would result in the availability of a larger volume of regulatory and storage capacity in the canal than under present conditions. The water level is currently kept below design level to minimize seepage. This additional volume would provide additional operational flexibility to the CVWD irrigation water system. For this reason, an as-yet-undetermined portion of the cost of the project may be allocated to operational flexibility.

#### Operation and Maintenance Cost

O&M costs would be the same as for the Conventional Lining Alternative.

## 2.4 PARALLEL CANAL ALTERNATIVE

Under this alternative, a parallel canal would be constructed from siphons 7 to 14 and siphons 15 to 32. Construction would potentially begin at the downstream end of the project from siphon 32 and proceed to siphon 7 on a reach-by-reach (between siphons) basis.

The centerline of the new canal would be offset from the old centerline of the original canal by 100 to 500 feet, depending on terrain, ease of construction, and location of existing structures. The extent to which the existing canal and embankment are incorporated into the design will also determine the location of the centerline.

The new canal would be constructed on alternating sides of the existing canal, depending on terrain, as shown in Table 2-6. It would run generally parallel to the existing canal. However, between siphons 29 and 30, the unlined canal changes direction toward the northwest. Instead of running exactly parallel to the existing canal, the new canal would have a more direct route, shortening the overall length by approximately 0.7 mile to 32.5 miles.

**Table 2-6. Location of Parallel Canal**

| Between siphons | New canal location in relation to existing canal[1] |
|---|---|
| 7-12 | west |
| 12-14 | east |
| (14-15 already is lined) | |
| 15-19 | east |
| 19-20 | west |
| 20-24 | east |
| 24-29 | west |
| 29-32 | east |

[1] Location may change to avoid impacts

### 2.4.1 Canal Design

Design studies to date have produced a canal design with a 16-foot-wide bottom and side slopes of 1.5:1. As with the Conventional Lining Alternative (preferred alternative), the hydraulic design is governed by the existing inlet/outlet elevations, and, therefore, the canal invert slope and bottom elevation would be fixed. Figure 2-1 shows the proposed cross section. Final design studies may produce slightly different canal cross sections.

At each of the 26 siphons, a tie-in with an S-curve configuration would be constructed into the existing inlet and outlet transitions. At the railroad crossing, a new tie-in to the existing canal section under the bridge would be constructed.

Concrete ridges would be provided to improve human safety and reduce the drowning hazard for large mammals. Escape ladders would also be installed for human safety, and escape ramps would be added in areas of high wildlife use, such as at Siphon 20. Concrete ridges would have a rough finish, protrude about 1.5 inches from the canal lining, and be spaced about 18 inches apart. Escape ladders would be added along each side of the canal at every 750 feet.

The parallel canal would be connected to the existing canal immediately upstream and downstream from the existing siphons and immediately upstream and downstream of the Eagle Mountain Railroad bridge. These connections would require a total of 50 tie-ins to the existing canal—two at each siphon, except one at siphons 7, 14, 15, and 32, and one on each side of the railroad bridge. The tie-ins would be paved with concrete.

O&M roads would be 20 feet wide to match the existing canal roads. The road on one side would be gravel-surfaced.

### 2.4.2 Construction Activities

The required depth of canal excavation would depend mainly on the elevation of affected terrain and the ultimate depth of the new canal. From siphons 7 through 29, the terrain pattern is fairly consistent, requiring an average cut of 21.4 feet. The major exceptions are the lengths of canal between siphons 17 and 18 and between siphons 20 and 21, where the depth of cut is considerably greater—approximately 49.5 feet and 36.9 feet, respectively. The remaining distance from siphons 29 through 32 has an average cut of 37.7 feet, with the maximum cut of 46 feet between siphons 29 and 30.

The new canal would require excavation of approximately 10 million cubic yards of earth. (Less earthwork would be required if portions of the existing canal embankment were used for the new parallel canal.) Excavated material in excess of that needed for canal embankments would be deposited in the abandoned canal. No borrow for earthfill would be required. Water for construction purposes would be obtained from the Coachella Canal.

The relocated canal would require an estimated maximum of 460 acres of new rights-of-way, most of which are under federal control, but 31 of which are in private ownership. (The number of acres impacted would be reduced if existing portions of the canal embankment are utilized to construct the parallel canal.) The 460 acres consist of land outside the existing right of-way. The centerline of the new canal would generally lie on the right of-way boundary of the existing canal, except between siphons 29 and 30 where the new canal would run cross-country for a mile.

Other land disturbances associated with construction would include a ten-acre concrete batch plant and three, five-acre staging areas.

All the tie-ins would be constructed by installing earthen or sheet piling cofferdams upstream and downstream from the inlet and outlet structures, respectively. Pumping facilities and pipelines would be installed to pump the water around the construction area. The selected contractor would be required to develop and implement a spill prevention and response plan for fuels. After work is completed, the cofferdams would be removed and the process repeated at the next structure.

Based on preliminary field investigations, there would be no major relocation of people or homes required.

### 2.4.3 Permits, Agreements, and Approvals

The same permits, agreements, and approvals would be required as for the Conventional Lining Alternative.

### 2.4.4 Construction Schedule

Project schedule would be three years. This schedule includes a one-year preconstruction period for items such as establishing a field organization, hiring personnel, completing cultural resources surveys, collecting design data, and preparing construction specifications. Construction would begin in the second year and would be completed in two years.

### 2.4.5 Project Operation

Project operation provisions would be generally the same as for the Conventional Lining Alternative. The rate of flow in the canal would not need to be restricted.

### 2.4.6 Project Cost

#### Construction Cost

The cost of constructing the lining has been estimated at $79.1 million (CY 2001 dollars), which includes allowances for contingencies and overhead of 10 percent each. The addition of mitigation features would increase the overall project cost by a currently unquantified amount.

#### Operation and Maintenance Cost

O&M costs would be similar to that for the Conventional Lining Alternative.

## 2.5 NO ACTION ALTERNATIVE

Under this alternative, no action would be taken. The canal would remain unlined, and the water seepage would continue. CVWD would continue to operate and maintain the canal. This alternative forms the baseline from which project effects are measured.

Under the No Action Alternative, conserved water from the Coachella Canal would not be available for MWD or the parties involved in the San Luis Rey Indian Water Rights Settlement. Furthermore, the No Action Alternative would not assist California in meeting the goals of California's Colorado River Water Use Plan. The No Action Alternative would not, however, preclude other actions from being taken to help California meet the goals of California's Colorado River Water Use Plan.

## 2.6 SELECTION OF ALTERNATIVE

The Conventional Lining Alternative has been identified as the preferred alternative.

It is possible that technological developments or the market for construction by contract will change the relative cost of the alternative methods of construction. To maintain flexibility and ensure the lowest cost of construction, the final selection of alternative may be deferred until after bids are received from potential contractors. If this approach is pursued, the construction specifications could include any or all of the alternative methods of construction presented herein, and contractors would then have the option of bidding on any or all of the methods or combinations thereof. The environmental analysis in this document is adequate for construction of any of the alternatives.

## 2.7 ALTERNATIVES CONSIDERED BUT ELIMINATED

### 2.7.1 Seepage Recovery with Horizontal Underdrains

Consideration was given to the possibility of recovering seepage by installing buried horizontal drains west of the canal. The drains would be placed parallel to the canal, deep enough to intercept the shallow groundwater layer caused by the seepage. This alternative would be practicable where an underlying clay layer keeps the seepage water at relatively shallow depths and keeps it separate from poorer quality local groundwater.

An examination of this method indicated that it would be workable in hydrologic units C and D (defined in Chapter 3.0), at most. However, the quality of the recovered water would be significantly poorer than canal water. To minimize drawing poor quality groundwater into the underdrains, only about half of the seepage would be recoverable. This alternative was eliminated as being impractical.

### 2.7.2 Lining Canal Side Slopes Only

This alternative involves omitting the lining from the level bottom of the canal in sections with a clay bottom that does not seep appreciably. In those sections, the side slopes of the canal would be lined with concrete in place, under water.

A trench would need to be excavated in the canal bottom at the foot of the side slope to provide a firm foundation for the sloping concrete panel. The cost of the work involved in excavating the trench and extending the lining downward is not appreciably different than just lining the entire canal bottom. The alternative was eliminated because the overall cost savings were estimated to be relatively small compared to lining the entire canal, and considering the uncertainty regarding the lining integrity of the side slopes.

### 2.7.3 Leaving the Canal Unlined Between Siphons 23 and 29 (Hydrologic Unit D)

Leaving the canal unlined between Siphons 23 and 29 would not meet the purpose and need of the proposed project. As described in Chapter 3.0, lining the Coachella Canal would reduce the amount of canal seepage water that enters the local perched (shallow) aquifer down-gradient from the canal. This, in turn, would cause impacts to marsh/aquatic and desert riparian vegetation that is supported by the shallow aquifer and canal seepage. (See Section 3.5 for a discussion of these impacts and how

they would be mitigated to less than significant levels.) Many of the impacts to marsh/aquatic and desert riparian vegetation would occur down-gradient of the canal reach extending from siphon 23 to siphon 29, an area identified as hydrologic unit D in this EIS/EIR and in its supporting appendices. Hydrologic unit D roughly corresponds to the location where the Coachella Canal passes adjacent to the Bureau of Land Management-designated Dos Palmas Area of Critical Environmental Concern (ACEC). Canal seepage helps support significant amounts of native and nonnative vegetation within the Dos Palmas ACEC, which is home to federally and State-listed threatened and endangered species such as the desert pupfish, Yuma clapper rail, and California black rail.

The estimated seepage between siphons 23 and 29 is 16,500 acre-feet per year. Lining this section of canal is projected to annually conserve 15,800 acre-feet of water. Accordingly, leaving the canal unlined between siphons 23 and 29 would cause the project to fall more than 50 percent short of its 30,850-acre-foot annual water conservation objective, as stated in the Purpose and Need (see Section 1.3).

Leaving the canal unlined between siphons 23 and 29 would allow canal seepage to continue to support marsh/aquatic and desert riparian vegetation within the Dos Palmas ACEC. Thus, leaving the canal unlined between these siphons would (1) substantially reduce project impacts to marsh/aquatic and desert riparian vegetation and (2) minimize the need for mitigation of such impacts. Based on these factors, leaving the canal unlined between siphons 23 and 29 was initially considered as a possible project alternative. However, as described below, Reclamation and CVWD determined that this alternative would not adequately meet the Purpose and Need of the proposed action, as identified by Congress in P.L. 100-675.

The net (post-mitigation) water conservation expected to result from the Coachella Canal Lining Project is 26,000 acre-feet per year. This estimate accounts for the fact that some canal water would need to be used to help support project mitigation efforts (for example, canal water may be used to irrigate native plant revegetation). In contrast, the net water conservation associated with leaving the canal unlined between siphons 23 and 29 would be roughly 15,000 acre-feet per year. This would be approximately 42 percent lower than the projected net 26,000 acre-feet of water that would be conserved annually by the proposed action.

Based on these factors, this alternative was not carried forward for more detailed environmental evaluation in the EIS/EIR, nor was it considered a viable means of mitigating project impacts at the Dos Palmas ACEC.

### 2.7.4 Other Alternatives Eliminated

Seepage recovery wells were eliminated because of the irregular shape of the groundwater aquifer and because the wells would also intercept poor quality local groundwater. Enclosing the flow of the canal in a large diameter pipeline was eliminated because the cost would be prohibitive. A variation of the Conventional Lining Alternative with a temporary water delivery to CVWD from MWD's Colorado River Aqueduct was examined. The water would be released from the aqueduct northeast of Coachella and conveyed to the Coachella Valley by pipeline and open channel flow through a canyon. This would have permitted the shutdown of the canal during the low flow months, which would permit lining without the need for temporary bypass pipes. However, the cost of such a temporary delivery appeared to be far in excess of the cost of the bypass pipes.

## Table 2-7. Summary of Environmental Effects

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Surface water**<br><br>*Coachella Canal*<br>Max. Water Depth:<br>6 feet<br>Water volume:<br>1,180 acre-feet<br>Water velocity:<br>1.5 to 2 $ft^3/s$ | Less than significant effects on flows in Coachella Canal, Colorado River, and Salt Creek. Negligible impact to Salton Sea. | No mitigation required; however, mitigation for biological resources would maintain flows in Salt Creek at current levels.<br><br>Not significant. | Less than significant effects on flows in Coachella Canal, Colorado River, and Salt Creek. Negligible impact to Salton Sea. | No mitigation required; however, mitigation for biological resources would maintain flows in Salt Creek at current levels.<br><br>Not significant. | Less than significant effects on flows in Coachella Canal, Colorado River, and Salt Creek. Negligible impact to Salton Sea. | No mitigation required; however, mitigation for biological resources would maintain flows in Salt Creek at current levels.<br><br>Not significant. | No impact, but no benefits of conserved water. |
| **Groundwater**<br><br>Groundwater is augmented by canal seepage. Groundwater table currently is shallow under thousands of acres west of the canal. | Groundwater recharge along 33.2 miles of unlined canal would be reduced by approx. 30,850 acre-feet.<br><br>Recharge not natural or a planned function of the canal; impacts not significant. | No mitigation needed.<br><br>Not significant. | Groundwater recharge along 33.2 miles of unlined canal would be reduced by approx. 29,850 acre-feet.<br><br>Recharge not natural or a planned function of the canal; impacts not significant. | No mitigation needed.<br><br>Not significant. | Groundwater recharge along 33.2 miles of unlined canal would be reduced by approx. 30,850 acre-feet.<br><br>Recharge not natural or a planned function of the canal; impacts not significant. | No mitigation needed.<br><br>Not significant. | No impact. |
| **Water quality**<br><br>The canal currently reflects the quality of Colorado River water diverted at Imperial Reservoir. | No permanent change in canal water quality. Less than significant turbidity change in canal during construction. Less than significant effects on Colorado River. | No mitigation needed.<br><br>Not significant. | No permanent change in canal water quality. Less than significant turbidity and possible pH change during construction. Less than significant effects on Colorado River. | No mitigation needed, although acid may be added to canal water during construction to balance pH levels.<br><br>Not significant. | No permanent change in canal water quality. Less than significant turbidity change in canal during construction. Less than significant effects on Colorado River. | No mitigation needed.<br><br>Not significant. | No impact. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Marsh/aquatic and desert riparian habitat along the Coachella Canal** 456 acres of marsh/aquatic and 7,421 acres of desert riparian habitat in project area. | Loss of 122 acres of marsh/aquatic habitat, loss of 4,576 acres of desert riparian habitat (78% of which are stands entirely of salt cedar), 1,339 acres of desert riparian degraded (of which 62% are stands entirely of salt cedar). | Marsh/aquatic and native desert riparian habitat impacts avoided or habitat replaced at 1:1 ratio. Salt cedar habitat replaced at ratios of 1:3 to 1:10.<br><br>Not significant. | Loss of 122 acres of marsh/aquatic habitat, loss of 4,576 acres of desert riparian habitat (78% of which are stands entirely of salt cedar), 1,339 acres of desert riparian degraded (of which 62% are stands entirely of salt cedar). | Marsh/aquatic and native desert riparian habitat impacts avoided or habitat replaced at 1:1 ratio. Salt cedar habitat replaced at ratios of 1:3 to 1:10.<br><br>Not significant. | Loss of 122 acres of marsh/aquatic habitat, loss of 5,576 acres of desert riparian habitat (78% of which are stands entirely of salt cedar), 1,339 acres of desert riparian degraded (of which 62% are stands entirely of salt cedar). | Marsh/aquatic and native desert riparian habitat impacts avoided or habitat replaced at 1:1 ratio. Salt cedar habitat replaced at ratios of 1:3 to 1:10.<br><br>Not significant. | Natural succession of marsh/ aquatic and desert riparian vegetation to salt cedar-dominated habitat would continue to occur. |
| **Marsh/aquatic and desert riparian habitat along the Colorado River.** | Minor reduction in water levels with correspondingly less than significant project-specific impact to backwaters and associated habitat.<br><br>Incremental contribution to combined effects of other Colorado River projects addressed under "Cumulative Impacts." | No mitigation necessary for project-specific impact.<br><br>Not significant. | Minor reduction in water levels with correspondingly less than significant project-specific impact to backwaters and associated habitat.<br><br>Incremental contribution to combined effects of other Colorado River projects addressed under "Cumulative Impacts." | No mitigation necessary for project-specific impact.<br><br>Not significant. | Minor reduction in water levels with correspondingly less than significant project-specific impact to backwaters and associated habitat.<br><br>Incremental contribution to combined effects of other Colorado River projects addressed under "Cumulative Impacts." | No mitigation necessary for project-specific impact.<br><br>Not significant. | No impact. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Terrestrial habitat**<br><br>Approximately 29,000 acres of undisturbed desert lie in the project study area. | Construction would affect 290 acres, of which 239 acres represent undisturbed terrestrial habitat. Impacts to mature vegetation (trees) would be significant; disturbed land would ultimately revegetate naturally. | Impacts to vegetation minimized through careful placement of bypass pipelines; impacts to mature trees mitigated at 2:1 replacement ratio.<br><br>Not significant. | Construction would affect 230 acres, of which 177 acres represent undisturbed terrestrial habitat. Impacts to mature vegetation (trees) would be significant. Disturbed habitat would generally recover in 1 to 2 years (faster recovery than Conventional Alt. due to lower level of disturbance). | Impacts to vegetation minimized through careful placement of bypass pipelines; impacts to mature trees mitigated at 2:1 replacement ratio.<br><br>Not significant. | Construction would affect 873 acres, of which 752 acres represent undisturbed terrestrial habitat. Majority of this impact would result from new canal construction, not bypass pipelines. Impacts to mature vegetation (trees) would be significant; disturbed land would ultimately revegetate naturally. | Some impacts to vegetation minimized through careful placement of bypass pipelines; impacts to mature trees mitigated at 2:1 replacement ratio.<br><br>Not significant. | No impact. |
| **Special status species**<br><br>Marshes support Yuma clapper rail, and California black rail. Salt Creek supports desert pupfish. Desert tortoise may occasionally occur near canal. Transient and migrant, but not breeding, south-western willow flycatcher and least Bell's vireo may use some habitat in project area. | Loss of habitat for Yuma clapper rail, California black rail, desert pupfish. Possible impacts to desert tortoise that enter construction area.<br><br>Less than significant effects on southwestern willow flycatcher, least Bell's vireo, and several State species of concern. | No net loss of habitat. Tortoises relocated from construction zone as they occur. No direct impacts to species.<br><br>Not significant. | Loss of habitat for Yuma clapper rail, California black rail, desert pupfish. Possible impacts to desert tortoise that enter construction area.<br><br>Less than significant effects on southwestern willow flycatcher, least Bell's vireo, and several State species of concern. | No net loss of habitat. Tortoises relocated from construction zone as they occur. No direct impacts to species.<br><br>Not significant. | Loss of habitat for Yuma clapper rail, California black rail, desert pupfish. Possible impacts to desert tortoise that enter construction area.<br><br>Less than significant effects on southwestern willow flycatcher, least Bell's vireo, and several State species of concern. | No net loss of habitat. Tortoises relocated from construction zone as they occur. No direct impacts to species.<br><br>Not significant. | No impact. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Large mammal escape**<br><br>Current banks are steep and unlined. Source of drinking water for large mammals (e.g., mule deer and bighorn sheep).<br><br>Escape ridges on bank of prototype lining project shown to be effective in a test. | Escape ridges and strategically placed escape ramps included in project design would reduce the existing drowning hazard levels for large mammals.<br><br>Canal side slope would be steeper than with prototype lining project. | Ridges and ramps should be adequate to avoid signif-icant mammal escape impacts; if monitoring indicates additional escape features are necessary, they will be added to the canal.<br><br>Not significant. | Escape ridges and strategically placed escape ramps included in project design would reduce the existing drowning hazard levels for large mammals.<br><br>Canal side slope would be same steepness as prototype lining project. | No mitigation necessary.<br><br>Not significant. | Escape ridges and strategically placed escape ramps included in project design would reduce the existing drowning hazard for large mammals.<br><br>Canal side slope would be steeper than with prototype lining project. | Ridges and ramps should be adequate to avoid signif-icant mammal escape impacts; if monitoring indicates additional escape features are necessary, they will be added to the canal.<br><br>Not significant. | No reduction in potential drowning hazard to large mammals. |
| **Canal fishery**<br><br>The canal has capacity to support roughly 35,200 fish of various kinds. | Number of fish would be reduced as a result of draining canal segments during construction (direct impacts) and from replacement of soil banks with concrete lining (habitat loss). | Gamefish and their habitat would be maintained or replaced to near current levels.<br><br>Not significant. | Number of fish would be reduced from replacement of soil banks with concrete lining (habitat loss). | Gamefish habitat would be maintained or replaced to near current levels.<br><br>Not significant. | Number of fish would be reduced as a result of canal draining following parallel canal construction (direct impacts) and from replacement of soil banks with concrete lining (habitat loss). | Gamefish and their habitat would be maintained or replaced to near current levels.<br><br>Not significant. | No impact on canal fishery. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Cultural resources**<br><br>The canal is in an archaeologically sensitive area. The 51-year-old canal is potentially a historical resource. | Potential disturbance of some archaeological sites; the canal would be modified, a potential historical resource impact. | Archaeological sites avoided where feasible; impacts to sites mitigated in compliance with National Historic Preservation Act and Native American Graves Protection and Repatriation Act and by preparation of a Historic American Engineering Record.<br><br>Not significant. | Potential disturbance of some archaeo-logical sites; the canal would be modified, a potential historical resource impact. | Archaeological sites avoided where feasible; impacts to sites mitigated in compliance with National Historic Preservation Act and Native American Graves Protection and Repatriation Act and by preparation of a Historic American Engineering Record.<br><br>Not significant. | Potential disturbance of some archaeological sites; the existing canal would essentially be abandoned and replaced, a potential historical resource impact. | Archaeological sites avoided where feasible; impacts to sites mitigated in compliance with National Historic Preservation Act and Native American Graves Protection and Repatriation Act.<br><br>Pending new consultations with the State Historic Resources Protection Officer, impacts to canal's historical resource values may be unmitigable. | No impact. |
| **Indian Trust Assets**<br><br>Indian Trust Assets in or near area of potential effect include reservation along Salton Sea and Federal Government's obligations under the San Luis Rey Indian Water Rights Settlement. | No impact to Torres-Martinez Indian Reservation lands. Beneficial effects associated with provision of water to help facilitate implementation of the San Luis Rey Indian Water Rights Settlement. | No mitigation needed.<br><br>Not significant. | No impact to Torres-Martinez Indian Reservation lands. Beneficial effects associated with provision of water to help facilitate implementation of the San Luis Rey Indian Water Rights Settlement. | No mitigation needed.<br><br>Not significant. | No impact to Torres-Martinez Indian Reservation lands. Beneficial effects associated with provision of water to help facilitate implementation of the San Luis Rey Indian Water Rights Settlement. | No mitigation needed.<br><br>Not significant. | No impact to Torres-Martinez Indian Reservation. However, no benefit for parties to the San Luis Rey Indian Water Rights Settlement. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Recreation**<br><br>Local and regional recreation facilities. | Minor disruption of recreational activities during construction. Potential BLM trail closure could be significant impact. | Maintain access to BLM trail.<br><br>Not significant. | Minor disruption of recreational activities during construction. Potential BLM trail closure could be significant impact. | Maintain access to BLM trail.<br><br>Not significant. | Minor disruption of recreational activities during construction. Potential BLM trail closure could be significant impact. | Maintain access to BLM trail.<br><br>Not significant. | No Impact. |
| **Land ownership and use**<br><br>Canal right-of-way is federally owned. Some neighboring lands are privately owned. | No significant impact. Purchase of privately owned land for mitigation purposes would comply with applicable federal and State requirements. | No mitigation needed.<br><br>Not significant. | No significant impact. Purchase of privately owned land for mitigation purposes would comply with applicable federal and State requirements. | No mitigation needed.<br><br>Not significant. | No significant impact. Purchase of privately owned land for canal right of-way and mitigation purposes would comply with applicable federal and State requirements. | No mitigation needed.<br><br>Not significant. | No Impact. |
| **Sand and gravel supplies**<br><br>Active sand and gravel quarries, as well as undeveloped sand and gravel resources, located in the region. | Sand and gravel requirements during construction would not exhaust local resources. Less than significant impact to these resources.<br><br>Development of new resources could affect biological and cultural resources. | No mitigation needed for sand and gravel use. Impacts from development of new resources would be mitigated to a less than significant levels if those resources are developed.<br><br>Not significant. | Sand and gravel requirements during construction would not exhaust local resources. Less than significant impact to these resources.<br><br>Development of new resources could affect biological and cultural resources. | No mitigation needed for sand and gravel use. Impacts from development of new resources would be mitigated to a less than significant levels if those resources are developed.<br><br>Not significant. | Sand and gravel requirements during construction would not exhaust local resources. Less than significant impact to these resources.<br><br>Development of new resources could affect biological and cultural resources. | No mitigation needed for sand and gravel use. Impacts from development of new resources would be mitigated to a less than significant levels if those resources are developed.<br><br>Not significant. | No Impact. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Transportation**<br><br>Nearby Highway 111 is a major regional transportation route. Several local roads provide access to the canal. | Short-term inconveniences to users of the local roadway network. No significant impacts to Highway 111 or other roads. Traffic control plan would be developed and implemented as part of project design. | No mitigation needed.<br><br>Not significant. | Short-term inconveniences to users of the local roadway network. No significant impacts to Highway 111 or other roads. Traffic control plan would be developed and implemented as part of project design. | No mitigation needed.<br><br>Not significant. | Short-term inconveniences to users of the local roadway network. No significant impacts to Highway 111 or other roads. Traffic control plan would be developed and implemented as part of project design. | No mitigation needed.<br><br>Not significant. | No Impact. |
| **Air Quality**<br><br>Unlined canal is in the Salton Sea Air Basin, which is in nonattainment with federal and State standards for particulate matter less than 10 microns in diameter ($PM_{10}$) and oxides of nitrogen ($NO_x$). | Without mitigation, $PM_{10}$ emissions would exceed federal *de minimis* thresholds. $PM_{10}$ emissions would exceed South Coast Air Quality Management District (SCAQMD) significance thresholds. Prevailing winds would carry most pollutants generated by project into uninhabited Chocolate Mountains Aerial Gunnery Range. | Watering unpaved roads would reduce $PM_{10}$ emissions below *de minimis* thresholds, but not below SCAQMD thresholds.<br><br>Air quality impacts would remain significant, but because prevailing wind would carry pollutants over undeveloped gunnery range, this would not cause significant effects to the environment. | Without mitigation, $PM_{10}$ emissions would exceed federal *de minimis* thresholds, and $PM_{10}$ and $NO_x$ emissions would exceed SCAQMD significance thresholds. Prevailing winds would carry most pollutants generated by project into uninhabited Chocolate Mountains Aerial Gunnery Range. | Watering unpaved roads would reduce $PM_{10}$ emissions below *de minimis* thresholds, but $PM_{10}$ and $NO_x$ emissions would exceed SCAQMD thresholds.<br><br>Air quality impacts would remain significant, but because prevailing wind would carry pollutants over undeveloped gunnery range, this would not cause significant effects to the environment. | Without mitigation, $PM_{10}$ emissions would exceed federal *de minimis* thresholds, and $PM_{10}$ and $NO_x$ emissions would exceed SCAQMD significance thresholds. Prevailing winds would carry most pollutants generated by project into uninhabited Chocolate Mountains Aerial Gunnery Range. | Watering unpaved roads would reduce $PM_{10}$, but not $NO_x$, emissions, below *de minimis* thresholds. Both pollutants would exceed SCAQMD thresholds.<br><br>Air quality impacts would remain significant, but because prevailing wind would carry pollutants over undeveloped gunnery range, this would not cause significant effects to the environment. | No Impact. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Hydroelectric power**<br><br>Affected environment along Colorado River includes hydro-electric power-plants at Parker and Headgate Rock dams. | Incremental, approximately 0.36 percent reduction in hydroelectric generation at Parker Dam and 0.10 Percent reduction at Headgate Rock Dam associated with approximately 26,000 acre-foot reduction in annual flows through those facilities. | No mitigation needed.<br><br>Not significant. | Incremental, approximately 0.36 percent reduction in hydroelectric generation at Parker Dam and 0.10 percent reduction at Headgate Rock Dam associated with approximately 26,000 acre-foot reduction in annual flows through those facilities. | No mitigation needed.<br><br>Not significant. | Incremental, approximately 0.36 percent reduction in hydroelectric generation at Parker Dam and 0.10 percent reduction at Headgate Rock Dam associated with approximately 26,000 acre-foot reduction in annual flows through those facilities. | No mitigation needed.<br><br>Not significant. | No impact. |
| **Public safety**<br><br>Canal used illegally by anglers, a potential drowning hazard. | Escape ridges and ladders would provide improved safety (decreased drowning hazard). Standard construction measures would avoid significant construction-related safety impacts. | Not significant. | Escape ridges and ladders would provide improved safety (decreased drowning hazard). Standard construction measures would avoid significant construction-related safety impacts. | Not significant. | Escape ridges and ladders would provide improved safety (decreased drowning hazard). Standard construction measures would avoid significant construction-related safety impacts. | Not significant. | No Impact. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Socioeconomics**<br><br>The unemployment rate in the Imperial and Coachella Valleys exceeds State average. | 320 construction work years of local employment. Economic impact - $24.5 million to local economy.<br><br>Project would comply with Executive Order 12898 regarding "Environmental Justice." | Beneficial Impact. No mitigation | 500 construction work years of local employment. Economic impact - $45.8 million to local economy.<br><br>Project would comply with Executive Order 12898 regarding "Environmental Justice." | Beneficial Impact. No mitigation. | 410 construction work years of local employment. Economic impact - $31.5 million to local economy.<br><br>Project would comply with Executive Order 12898 regarding "Environmental Justice." | Beneficial Impact. No mitigation. | No impact, but no benefit to local economy from short-term creation of construction jobs. |
| **Growth Inducement** | This alternative would not induce growth. | | This alternative would not induce growth. | | This alternative would not induce growth. | | No growth inducement. |

## Table 2-7. Summary of Environmental Effects (continued)

| Resource and current status | Conventional Lining Alternative | | Underwater Lining Alternative | | Parallel Canal Alternative | | No Action Alternative |
|---|---|---|---|---|---|---|---|
| | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | Potential project impact | Net impact after mitigation | |
| **Cumulative Impacts** | Canal lining would not incrementally contribute to impacts that are cumulatively considerable except potentially on the lower Colorado River, where the 26,000 acre-foot annual reduction in flows from Parker Dam downstream to Imperial Dam would incrementally contribute to effects of other water conservation and transfer projects. This incremental impact would be mitigated through the creation/ restoration of backwaters, creation of willow flycatcher habitat, and release of razorback suckers along the lower Colorado River. In addition, funding would be provided for a bonytail chub hatchery program. This mitigation would be consistent with "Biological Opinion for Interim Surplus Criteria, Secretarial Implementation Agreements, Water Administration, and Conservation Measures on the Lower Colorado River, Lake Mead to the Southerly International Boundary, Arizona, California and Nevada" which was issued in January 2001 by the U.S. Fish and Wildlife Service. As mitigated, the proposed project would not incrementally contribute to cumulatively significant impacts. | | Canal lining would not incrementally contribute to impacts that are cumulatively considerable except potentially on the lower Colorado River, where the 26,000 acre-foot annual reduction in flows from Parker Dam downstream to Imperial Dam would incrementally contribute to effects of other water conservation and transfer projects. This incremental impact would be mitigated through the creation/ restoration of backwaters, creation of willow flycatcher habitat, and release of razorback suckers along the lower Colorado River. In addition, funding would be provided for a bonytail chub hatchery program. This mitigation would be consistent with "Biological Opinion for Interim Surplus Criteria, Secretarial Implementation Agreements, Water Administration, and Conservation Measures on the Lower Colorado River, Lake Mead to the Southerly International Boundary, Arizona, California and Nevada" which was issued in January 2001 by the U.S. Fish and Wildlife Service. As mitigated, the proposed project would not incrementally contribute to cumulatively significant impacts. | | Canal lining would not incrementally contribute to impacts that are cumulatively considerable except potentially on the lower Colorado River, where the 26,000 acre-foot annual reduction in flows from Parker Dam downstream to Imperial Dam would incrementally contribute to effects of other water conservation and transfer projects. This incremental impact would be mitigated through the creation/ restoration of backwaters, creation of willow flycatcher habitat, and release of razorback suckers along the lower Colorado River. In addition, funding would be provided for a bonytail chub hatchery program. This mitigation would be consistent with "Biological Opinion for Interim Surplus Criteria, Secretarial Implementation Agreements, Water Administration, and Conservation Measures on the Lower Colorado River, Lake Mead to the Southerly International Boundary, Arizona, California and Nevada" which was issued in January 2001 by the U.S. Fish and Wildlife Service. As mitigated, the proposed project would not incrementally contribute to cumulatively significant impacts. | | No Impact. |