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## **1.0 BACKGROUND AND PROJECT OVERVIEW**

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### 1.1 STUDY AUTHORIZATION AND SCHEDULE

This document is a study to quantify the reduction in seepage and subsurface inflows to the Salton Sea and adjacent wetlands resulting from lining the All American Canal (AAC) and its Coachella Branch (CB). In January 1999, Tetra Tech, Inc. was authorized by the Salton Sea Authority (SSA) to conduct this seepage study under a contract administered jointly by the Coachella Valley Water District (CVWD) and the Imperial Irrigation District (IID). California State Senate Bill 1765 directs that a seepage study must be conducted prior to lining the AAC and CB and that "The study shall determine the nature of subsurface and drainage canal water movements from the unlined canals to the Salton Sea and to existing adjacent wetlands, and shall quantify the amount of water that may be lost to the Salton Sea and to those wetlands due to the canal lining projects."

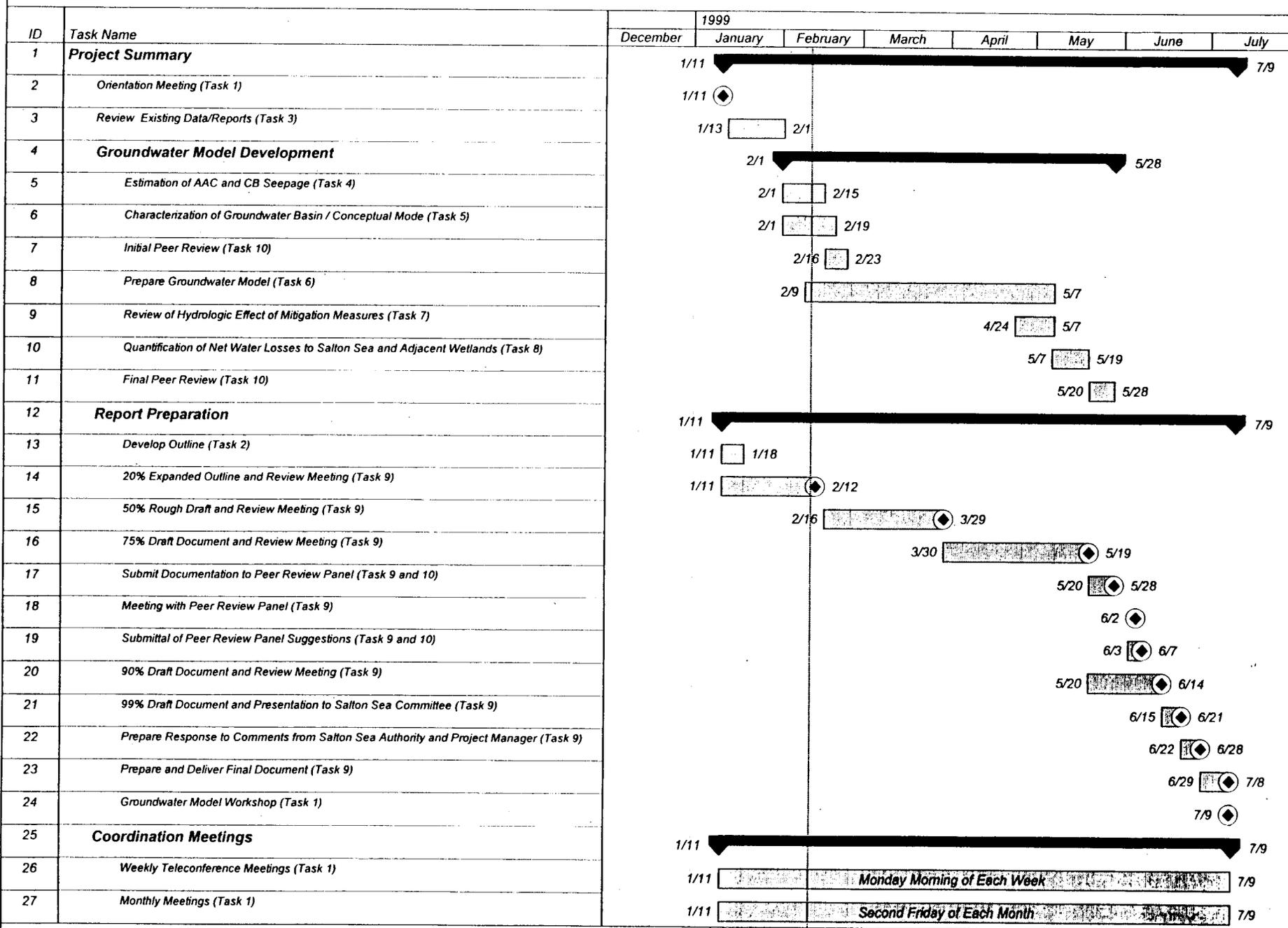
The contract period is from January 11, 1999 through July 11, 1999 as indicated in the schedule given in Figure 1-1. The IID and CVWD provided project management oversight of the technical elements of this study. Additional technical review of the study results was provided by an independent peer review panel upon completion of the draft report.

Major milestones in the project schedule are indicated in Figure 1-1, which list the following project deliverables:

- Completion of an outline for the project report (January 11, 1999);
- Completion of a 20 percent complete draft document (February 12, 1999);
- Completion of a 50 percent complete draft document (March 29, 1999);
- Completion of a 75 percent complete draft document (May 19, 1999);
- Completion of a 90 percent complete draft document (June 14, 1999); and
- Completion of a 99 percent complete draft document (June 21, 1999).

This report is the final deliverable, and contains the report outline, Executive Summary, Sections 1 through 9, the Peer Review Team final report, and accompanying appendices.

# Figure 1-1 Salton Sea Authority Seepage Study Schedule



1-2

Project: Salton Sea Authority, Seepage Study  
Company: Tetra Tech, Inc.

Task [ ]

Progress [ ]

Summary [ ]

Milestone ◆

## 1.2 PURPOSE, SCOPE, AND OBJECTIVES

The Salton Sea and the AAC and its CB are situated almost entirely within Imperial County in the southeastern corner of California (Figure 1-2). The AAC and its CB divert approximately 3.4 million acre-feet per year from the Colorado River for use in Imperial and Coachella Valleys. Approximately 117,000 acre feet of water per year, or 3 percent of the canal water, is lost by seepage into the ground along unlined portions of the AAC and its CB. In order to conserve water, California State Senate Bill 1765 provides funding to line portions of the AAC and its CB.

A Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) completed by the Bureau of Reclamation and IID (Bureau of Reclamation, 1994) calls for lining a 23-mile section of the AAC from 1 mile west of Pilot Knob Mesa to Drop 3 (Figure 1-2). This 23-mile section of the unlined AAC loses approximately 84,500 acre-feet of water per year due to seepage. A draft EIS/EIR completed by the Bureau of Reclamation and CVWD (Bureau of Reclamation, 1993) calls for lining a 33.4-mile section of the CB from Siphons 7 to 14 and 15 to 32 (Figure 1-2). This 33.4-mile section of the unlined CB loses approximately 32,350 acre-feet of water per year due to seepage. The EIS/EIR for these projects indicates that the primary environmental consequences of the proposed lining projects are (1) the potential loss of wetlands habitat along the canals that have been induced by seepage, and (2) the reduction of the fish population in the canals. The EIS/EIR for each project also proposes mitigation plans to permit their implementation with no significant loss of environmental resources.

The objectives of this seepage study are to use existing data to (1) determine the nature of subsurface and drainage canal water movements from the unlined canals to the Salton Sea and to existing adjacent wetlands of concern, and (2) quantify the amount of seepage that may discharge to the Salton Sea and to existing adjacent wetlands of concern. The wetlands mitigation measures proposed in the AAC EIS/EIR and the CB EIS/EIR will be reviewed based on the quantification of reduced seepage losses to the existing adjacent wetlands. The location of the Salton Sea and the existing adjacent wetlands that are the focus of this study are summarized in the AAC EIS/EIR (Figure III-1) and the CB EIS/EIR (Figure II-4), and identified in Figure 1-3 of this report.

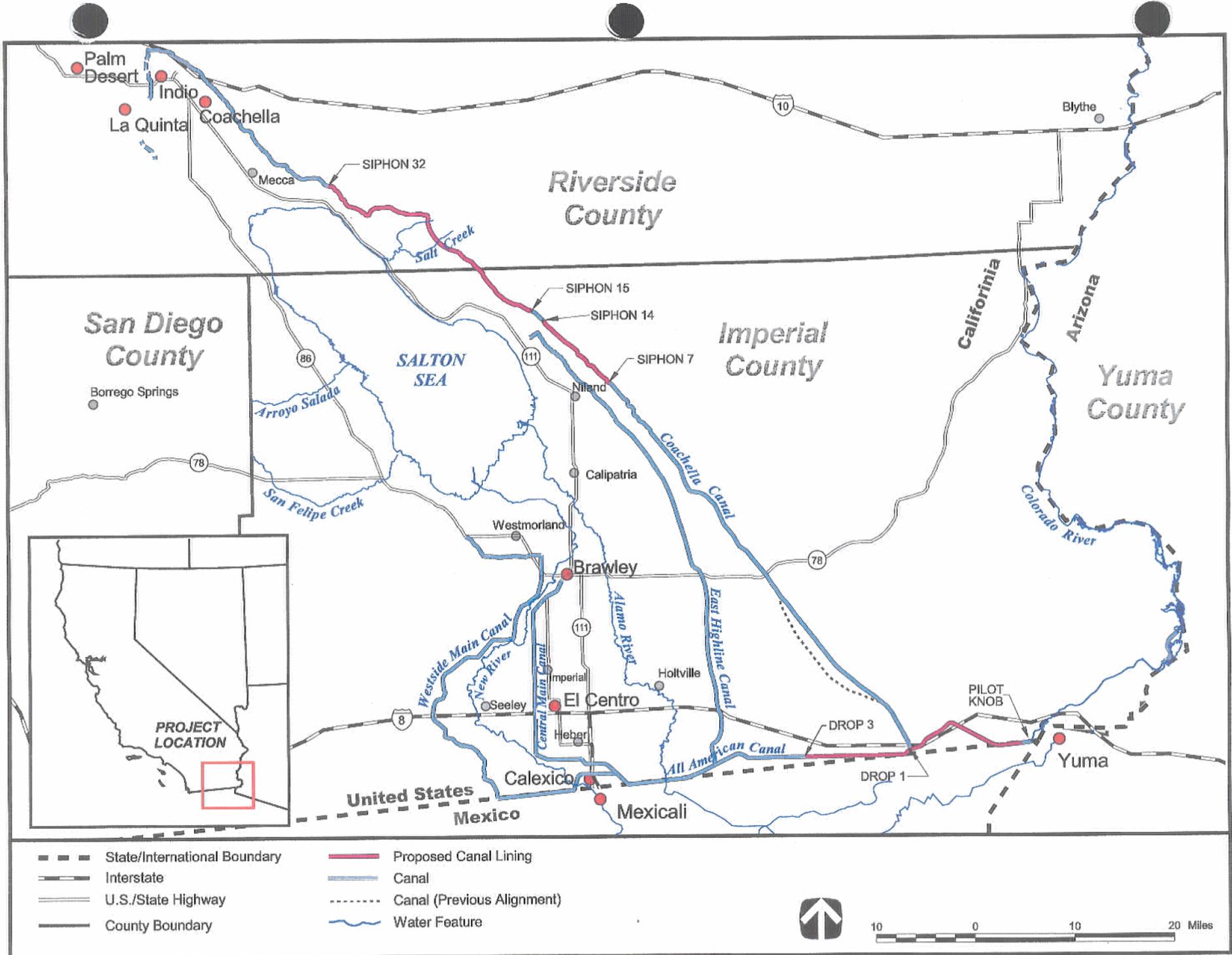
The seepage study has been sub-divided into the following components in order to accomplish the seepage study objectives (also see Figure 1-1):

- Collect regional and local data/reports and construct a project database and GIS;
- Interpret data/reports (Section 2);
- Construct a groundwater conceptual model and water balance (Section 3);
- Estimate the location, rate, and extent of AAC and CB canal seepage (Sections 4 and 5);
- Construct and calibrate a groundwater flow model (Section 6);
- Predict post lining seepage conditions using the groundwater flow model, and considering the proposed mitigation measures (Section 7);
- Estimate reduced seepage to Salton Sea and wetlands due to lining AAC and CB using conceptual and numerical models (Section 8 and 9);
- Conduct independent peer review (Appendix E); and
- Conduct public groundwater model workshop (Appendix A and B).

The peer review has been conducted to comment on the reliability of the model and its ability to predict the reduced seepage to the Salton Sea and its adjacent wetlands due to the canal lining projects, and to recommend what measures, if any, are needed to achieve the project objectives.

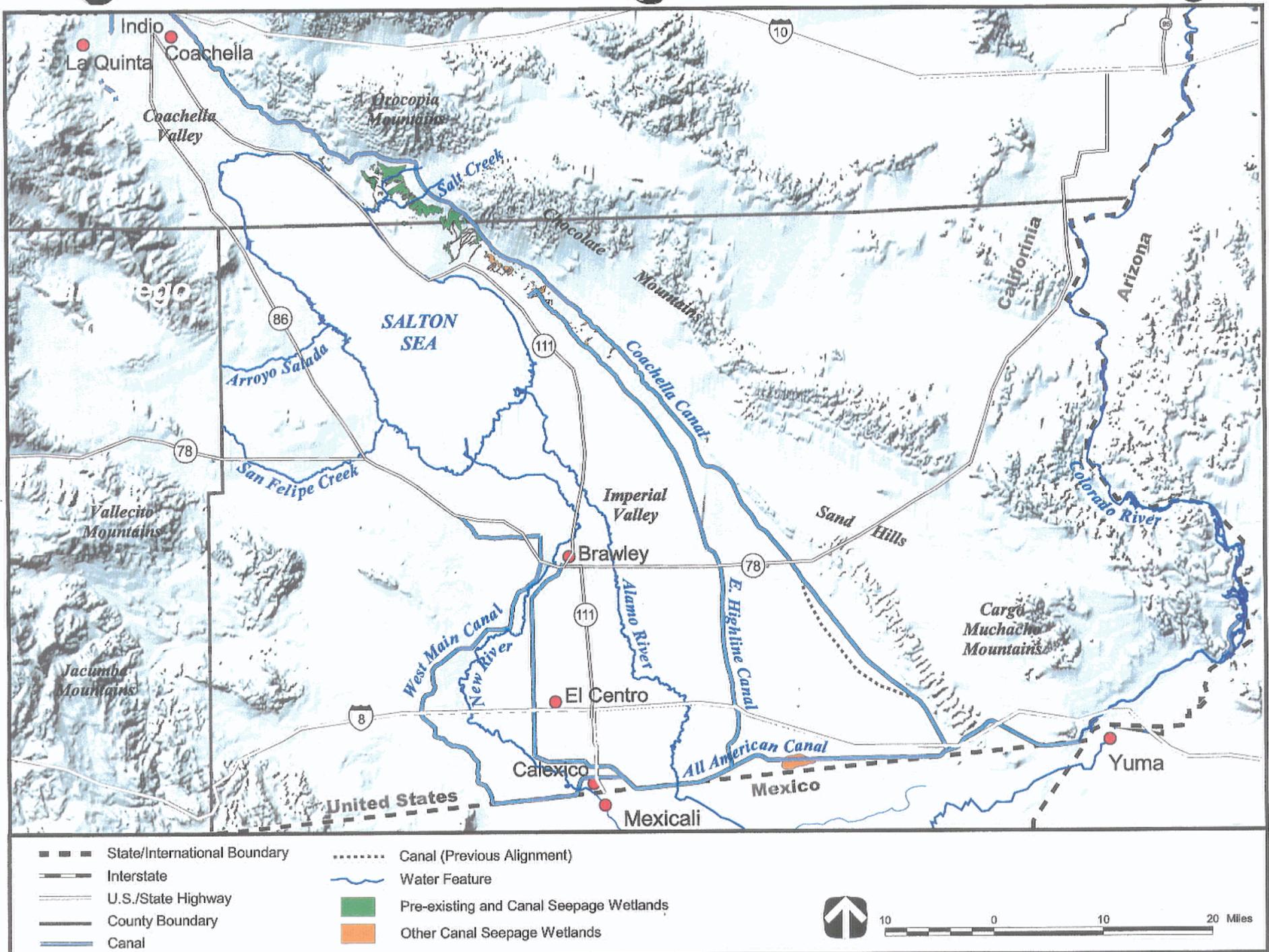
### **1.3 DOCUMENT SCOPE**

Section 2 of this report presents a physical description and a summary of land and water use in the study area. Section 3 summarizes the characterization of the Imperial Valley groundwater basin including the definition of aquifers and a groundwater conceptual model. Sections 4 and 5 summarize seepage from the AAC and CB, respectively. Section 6 presents the groundwater flow model development and calibration, and Section 7 presents an evaluation of AAC and CB lining using the calibrated groundwater flow model. Section 8 quantifies the net water losses to the Salton Sea and adjacent wetlands based on estimates derived from both the groundwater flow model and water balance calculations for the aquifer in the study area. Section 9 presents the final study conclusions.



X:\GIS\SLTON\_SEA\LOC\MAP\APR - FIG1-1

Figure 1-2 Project Location Map



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Figure 1-3 Location of Salton Sea and Existing Adjacent Wetlands