CHAPTER 2
DESCRIPTION OF ALTERNATIVES

2.1 DEVELOPMENT OF ALTERNATIVES

2.1.1 Salton Sea Restoration Initial Planning Phase

Although projects to stabilize salinity and surface water elevation problems at the Sea have been proposed for many years, the initial planning process for the current set of alternatives began in 1996. Prior to initiation of a NEPA/CEQA process, an initial screening study was conducted in 1996 through an agreement with the Authority, the California Department of Water Resources (DWR), and Reclamation. In an effort to include a wide variety of potential solutions to the problems of the Sea, media announcements and public meetings were used to invite submittals of restoration alternatives. Through these efforts, 54 alternatives were subjected to the preliminary screening analysis. This preliminary screening effort provided the framework for developing the alternatives that are analyzed in this EIS/EIR. The NEPA/CEQA process, begun in June 1998, builds on these early efforts to incorporate concerns, issues, and comments made during these public meetings into the analysis of alternatives.

Twenty evaluation criteria were developed at an Authority public workshop held on April 8, 1996. The workshop included representatives from Reclamation, USFWS, California Department of Parks, DWR, CDFG, Authority board members, and the public. To facilitate alternative evaluation, the representatives developed a comparison technique to determine the order of importance of a list of evaluation criteria. The evaluation criteria were assigned weighted values and were ranked in order of relative importance to issues facing the Sea, as shown in Table 2.1-1. The last two criteria, water removal and benefits and impacts, were not given any weight in the first attempt at ranking, but were later assigned values of 1. Alternatives were then assigned scores ranging from 0 to 4 for each criteria, with 4 being best, and total weighted score was calculated. The results of the original screening process were published in the Salton Sea Alternative Evaluation

Table 2.1-1
Evaluation Criteria and Weighted Values

Criterion	Value	Criterion	Value
Agricultural Interest	33	Sport Fishery	14
Wildlife	32	Recreation Benefits	14
Elevation Control	31	Economic Development	11
Disposal	24	Intergovernmental Cooperation	9
Water Quality-Salinity	24	Land	7
Water Quality-Other	21	Time to Solve	6
OME&R Costs	19	Time to Construct	3
Finance Costs	17	Partnering Opportunity	2
Location	17	Water Removal	1
Construction Costs	14	Benefits and Impacts	1

Final Draft Report, which is available on the worldwide web at the US Bureau of Reclamation website, www.lc.usbr.gov.

2.1.2 Adaptation of Evaluation Criteria for the Current Effort

Following the initial alternative development and screening process and the initiation of the NEPA/CEQA process, the criteria were re-evaluated. The elimination criteria were determined to be too restrictive; consequently, a second phase of screening was initiated, in which restriction of the OME&R costs was removed. The new process involved the following:

- Working with stakeholders to determine if the original framework still made sense;
- Placing a greater emphasis on appropriate definitions and weighting; and
- Developing substantial public agreement.

Public involvement played an important role in this phase of the screening process. Four public meetings were held during the week of October 5, 1998, and were attended by approximately 100 individuals. The first meeting was with members of the Torres Martinez band of the Desert Cahuilla Indian Tribe and was designed to receive comments from the tribe on their interests. The joint leads also extended an invitation to tribal members to attend the public alternatives workshops. These workshops were designed to elicit comments regarding the alternative criteria and screening process and were held over the next three days in Desert Shores, El Centro, and San Diego. The results of the public involvement process suggested that the basic framework and approach was sound and that it should continue.

All original alternatives were reassessed, and new alternatives were considered, including those suggested by the public. The reassessment yielded 39 alternatives that were carried forward for additional screening analysis. A description of these alternatives is provided in the Salton Sea Alternatives Preappraisal Report (November 1998), which is also available on the worldwide web at www.lc.usbr.gov and incorporated by reference.

The top five alternatives, along with components of other highly rated alternatives were retained for more detailed analysis. The following alternatives received the top five scores, in order:

- Pumping Salton Sea water to the Gulf of California and importing water through the Yuma area;
- Desalting plant;
- Desalting plant with solar salt ponds;
- South basin pond system; and
- Pumping Salton Sea water to the Gulf of California and importing treated wastewater from San Diego.

In addition to scoring restoration alternatives, the No Action/No Project Alternative was evaluated. Both NEPA and CEQA require that project alternatives be evaluated against an alternative that assumes no project actions are taken to alter existing conditions. The No Action/No Project Alternative, as it is called, describes probable future conditions, based on the potential for current conditions to continue plus other assumptions regarding physical, biological, and socioeconomic features that might occur without the project. It includes historic and existing conditions and any changes or programs that have been approved and funded.

2.1.3 Alternatives Considered but Eliminated from Further Analysis

Results of the second phase of the screening process are documented in Screening Analysis of Preliminary Restoration Alternatives: Salton Sea Restoration Project (Tetra Tech 1999). This report provides a summary of the various alternatives that were carried through the second phase of the screening process but eliminated from analysis in this EIS/EIR. The process described in this report allowed the project team to focus its analysis on those alternatives that appeared to have the best potential of meeting the full set of objectives of the Salton Sea Restoration Project and goals of PL 105-372.

Out of 39 alternatives evaluated, no preliminary alternative fully satisfied all the project objectives. Therefore, the highest scoring alternatives were subjected to further evaluation and more detailed engineering design. Components of the top ranking alternatives also were combined to develop alternatives that better met the overall project objectives.

2.1.4 Alternative Refinement

At the conclusion of the screening process, the engineering effort focused on refining designs, improving cost estimates, mixing and matching components, and providing decision-makers with more information about costs, locations, and environmental consequences. Further evaluation indicated that the changes discussed in the following paragraphs were needed and that one alternative, the desalting plant, is probably not practical. The result of the alternative refinement process led to the alternatives that are evaluated in this EIS/EIR and discussed later in this chapter.

Elimination of the desalting plant alternative—The desalting plant would require a brine stream to be discharged to a receiving environment, such as the Gulf of California. Therefore, this alternative offers little advantage over similar alternatives without a desalting plant and adds considerable extra cost. It is not likely that a reverse osmosis desalting plant will receive any further consideration.

Modification of the south basin pond—After further evaluation of the large south basin pond, the cost of construction is prohibitive because of the need to make the structure earthquake tolerant. Therefore, much smaller south basin shallow water ponds are being evaluated.

Enhanced evaporation system—An enhanced evaporation system to reduce the volume of highly saline water was part of one of the original alternatives. This is now being considered on its own, and/or in conjunction with a south basin pond system and/or in conjunction with a pipeline to a dry lakebed.

Phasing of alternatives—As discussed above for the No Action/No Project Alternative, inflows to the Sea could be substantially reduced in the future. The current evaluation of alternatives is being conducted to assess the effects of a range of inflows from the current 1.36 million acre-feet per year (maf/yr) to a future condition of as low as 0.8 maf/yr. The need for imported water increases substantially as annual inflows decrease. Therefore, water could be imported as a later contingency phase of the project, should the need arise because of reduced inflows. In addition, a system that concentrates salinity in ponds, within or near the Sea, could operate for a number of years before a long-term solution to disposing of salt residue is constructed. Long-term disposal could be accomplished via a pipeline or local stockpiling of salt residue in a facility, such as a landfill. Therefore, a pond system with or without enhanced evaporation could be constructed in Phase 1, and a long-term disposal facility or pipeline and water imports could be constructed in Phase 2.

Common Actions—In addition to engineering design studies, a process was implemented to develop common actions to enhance the alternatives. These common actions would allow the alternatives to better meet the full range of objectives of the Salton Sea Restoration Program. A work group consisting of project and agency personnel was established to develop the common actions. Public meetings were held to review the alternative development process and to discuss possible common actions that would enable the alternatives to better meet project objectives.

2.1.5 Phased Implementation Strategy

The alternative screening and evaluation process has shown that certain components are needed sooner than others and that certain project components can be designed and constructed sooner than other components. For example, water imports will be needed only if future average inflows to the Sea decline; therefore, a phased alternative implementation strategy is proposed.

Phase 1 actions have been developed and analyzed in sufficient detail to allow for an appropriate action to be selected after the final version of this EIS/EIR is published. In addition to the EIS/EIR, other ongoing technical studies will be completed and made available to the lead agencies during refinement of Phase 2 actions. Recommendations will be provided by the lead agencies as to which Phase 2 actions should be retained for further analysis, design, and supplemental environmental analysis and documentation.

2.2 PREDICTIVE MODEL APPLICATIONS IN ALTERNATIVE DEVELOPMENT

A numerical water balance accounting model was used to predict the performance of alternatives assessed in this document. The model was used to predict the performance of the No Action Alternative and project alternatives under three possible future inflow scenarios. A numerical model first developed by Thiery (1998) and significantly enhanced for the Salton Sea Restoration Project (Reclamation 1999) was used to predict the salinity, elevation, and surface area of the Salton Sea over time. The most significant enhancement to the model was a new ability to perform stochastic simulations. The model was used to predict how salinity, elevation, and surface area would change over time for the No Action Alternative and for the project alternatives. The planning horizon addressed by the model is 100 years.

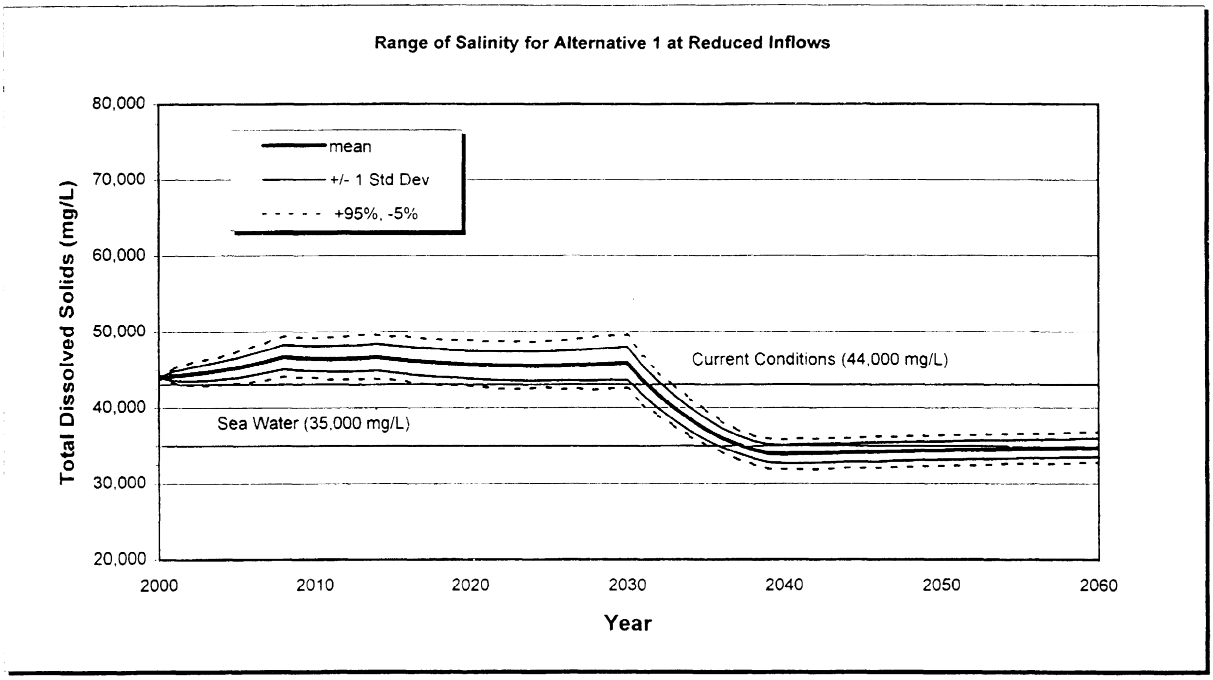
Historically, the inflow rate to the Salton Sea has varied from year to year. However, the average inflow rate over any 20 year period within the past 50 years has remained fairly stable. In any one year, changes in cropping patterns, weather, municipal use, water use in the Mexicali Valley, or variations in the deliveries through the All American Canal cause the inflow rate to the Sea to vary. The historical record indicates that in 95 percent of the years the inflow rate will not be higher than 1.55 maf/yr or lower than 1.19 maf/yr.

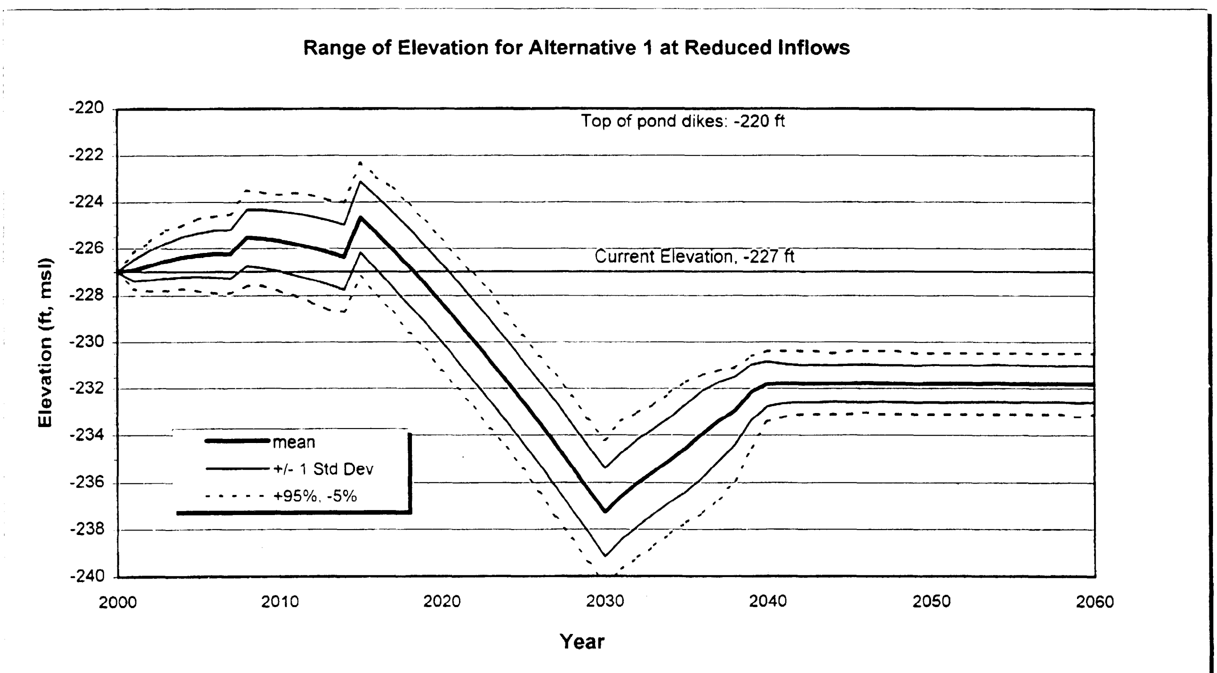
Three future scenarios were developed to predict possible inflow conditions without the project. The first scenario assumes that the mean annual inflow and standard deviation of annual inflows over the past 40+ years would continue into the future, with the mean value being about 1.36 maf/yr. The remaining two scenarios assumed there would be a gradual decline of the mean inflow value and that the standard deviation of the annual inflows would remain the same. Under the reduced inflow scenarios, the mean inflow would ultimately decline to either 1.06 maf/yr or 0.8 maf/yr. A stochastic process was used to develop future flow sequences that would preserve the statistical properties of each of the three inflow scenarios. In this process a large number of possible inflow sequences is generated for each inflow scenario.

The variability of model results is illustrated on Figure 2.2-1. Figure 2.2-1 illustrates the predicted behavior of Alternative 1, which would include construction of two evaporation ponds, under the scenario where the average annual inflow would ultimately decrease to 1.06 maf/yr. Figure 2.2-1 shows that, for water surface elevation, the standard deviation is about +/- 1 ft, and that from 5 to 95 percent of the time the elevation is within about 2 ft of the mean value in any given year.

In developing alternatives, an attempt was made to achieve model results of salinity and elevation that would be as close as possible to the objectives described in chapter 1. The elevation objective has been stated as -230 ft msl. For modeling purposes, the –230 elevation was assumed to be an upper limit, and a long-term target for the mean value of elevation was set at -232 ft msl. As a practical matter, this allows for an approximate +/- 2-ft buffer in the operating level of the Salton Sea, such that structures placed at or near the –230 ft msl elevation would not be impacted by natural variations in the elevation of the Sea. Figure 2.2-1 demonstrates generalized elevations. Actual elevations simulated in the model varied, such that the elevation of the Sea ranged between –230 and –235 ft msl. Hundreds of simulations were performed to gather enough information to draw the generalized curves shown in Figure 2.2-1. In the model, this variation is represented statistically by the standard deviation from the mean, and the upper and lower 95 percent confidence limits). As shown in Figure 2.2-1, the target elevation of -230 ft msl lies just above the upper 95 percent confidence limit, indicating that the target elevation has a low probability of being exceeded. In the simulations, the elevation of the Sea is predicted to be between the 95 percent line (approximately –230.5 ft) and the –230 ft elevation about 5 percent of the time. Upon further refinement of the modeling process in the future, this value can be adjusted closer to -230 ft msl. For modeling purposes, the long-term target for mean salt concentration was set at 37,500 mg/L. As described for the elevation objective, setting the modeling target lower than the project objective insures with a high degree of confidence that, provided that the alternative can meet the target, the upper limit of the salinity range will not exceed the project salinity target of 40,000 mg/L. Note, however, that even with the target set below the 40,000 mg/L, Alternative 1 is unable to meet the project salinity target during Phase 1.

It is likely that the project alternatives would actually perform better than indicated by the current model results. Following selection of an alternative, and during the final design phase, it will be possible to refine the model to show monthly or seasonal inflow variations. It will also be possible to model





* This model does not specifically simulate the impact of the IID/San Diego water transfer. Those impacts will be evaluated in a separate EIS/EIR and may demonstrate more or less severe salinity/elevation impacts than shown here.

Figure 2.2-1 Range of Variability in Salinity and Elevation due to Variable Annual Inflows, Alternative 1 with Reduced Inflow Scenario (1.06 maf/yr*)

management scenarios that would allow for changes in operation in response to seasonal changes in inflow. For example, with an enhanced evaporation system it may be possible to increase salt removal operations during periods of high inflow and reduce operations during low inflow periods. In this way, both seasonal and long-term elevation fluctuations could be better controlled.

More details of the modeling process along with more detailed descriptions of the project alternatives are published in a companion project planning report (Reclamation 2000).

2.3 NO ACTION/NO PROJECT ALTERNATIVE

Project alternatives must be evaluated against a scenario that could reasonably be expected to occur in the foreseeable future if the project is not approved. This evaluation allows decision-makers to compare the effects of approving a project against the effects of not approving a project. The No Action Alternative describes probable future conditions based on the potential for current conditions to continue plus other assumptions about physical, biological, and socioeconomic changes that might occur without the project. The No Action Alternative includes historic and existing conditions and any changes or programs that have been approved and funded. In addition, the No Action Alternative includes expected and reasonably predictable changes to all aspects of the environment that can be anticipated without the project.

According to Public Law 105-372, "In evaluating options, the Secretary shall apply assumptions regarding water inflows into the Salton Sea Basin that encourage water conservation, account for transfers of water out of the Salton Sea Basin, and are based on a maximum likely reduction in inflows into the Salton Sea Basin which could be 800,000 acre-feet or less per year." Given this direction to evaluate a range of inflows from the current average inflow of 1.36 maf/yr to 0.8 maf/yr, the Salton Sea Restoration Project alternatives have been designed to function under a variety of inflow scenarios. Project effects will be evaluated against three No Action/No Project scenarios, each with different inflows: current inflow conditions and incremental reductions using assumed average annual inflows of 1.06 maf/yr and 0.8 maf/yr.

Projecting hydrologic conditions for this project is complicated by uncertainties of future water flows into the Sea. The flow of water will depend on external factors not associated with the Salton Sea Project, and the timing of the flow is unknown. Acknowledging these uncertainties, the law directs the project to consider potential reduced future inflows in feasibility studies and these potential future reductions in inflows to the Sea were considered in the design engineering of actions evaluated as alternatives. Thus, possible No Action conditions can be defined with both current and reduced flows. Therefore, for purposes of analysis, project effects have been evaluated against three No Action/No Project inflow scenarios:

- Current (present-day) inflow conditions continue throughout both Phases 1 and 2, with average annual inflows of 1.36 maf/yr;

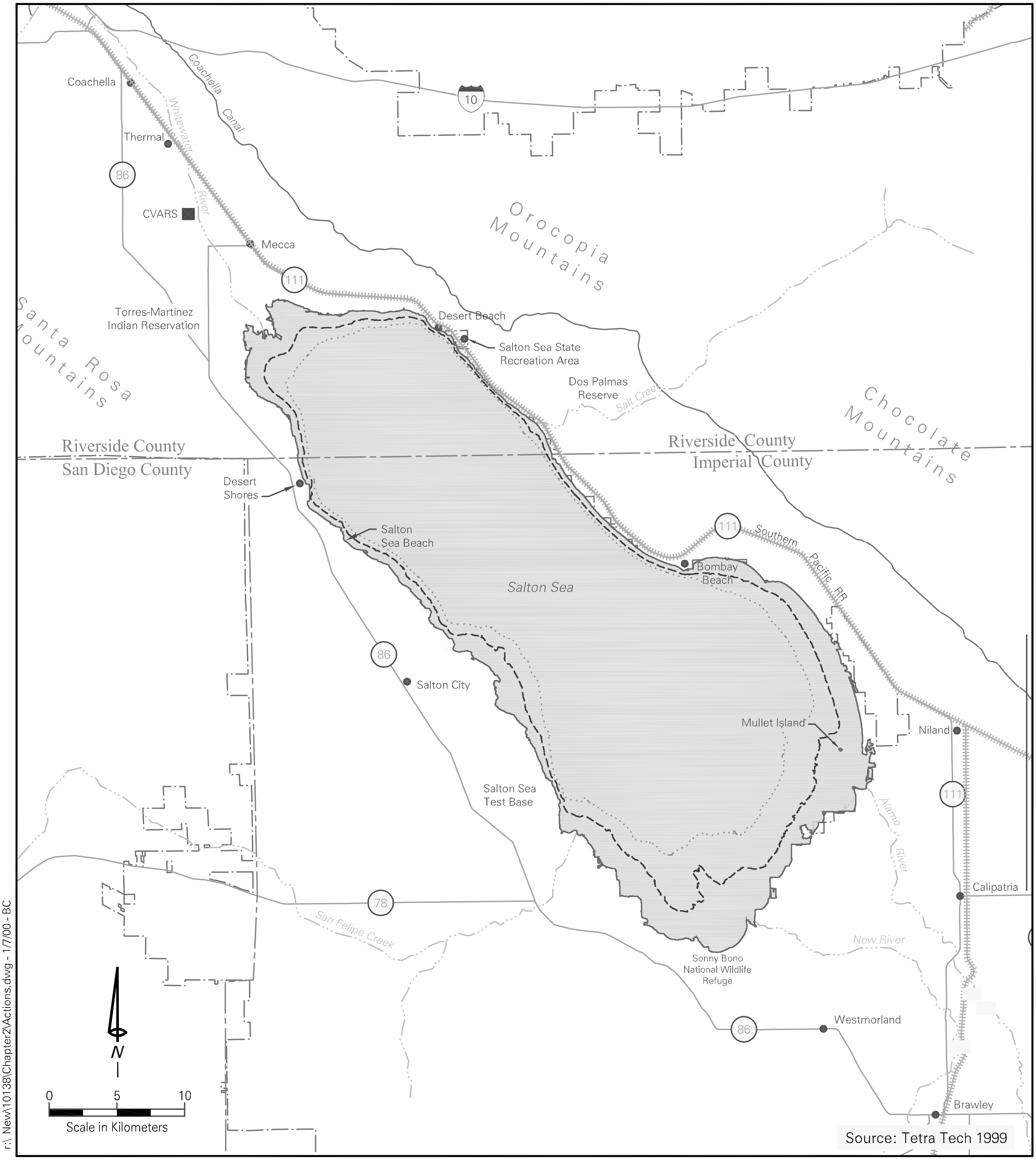
- Average annual inflows are incrementally reduced throughout Phase 1 to 1.06 maf/yr at the beginning of Phase 2; inflows remain at 1.06 maf/yr throughout Phase 2; and
- Average annual inflows are incrementally reduced throughout Phase 1 to 1.06 maf/yr at the beginning of Phase 2, and continue to decline at the same rate into Phase 2 until they reach 0.8 maf/yr.

These potential future inflows are considered reasonable future scenarios, in light of the varied projects currently under consideration that may ultimately gain approval. Figure 2.3-1 illustrates potential shoreline locations, based on model projections for 2060, which could be associated with the No Action Alternative for each of the three inflow scenarios.

The reduced inflow scenarios assume only that reductions of inflow may take place over time. Agricultural to urban water transfers may account for a majority of inflow reductions over time. Such transfers can be accomplished in a variety of ways. It is beyond the scope of this EIS/EIR to identify how current and future proposed transfers will be accomplished. However, it is important to note that alternative mechanisms to transfer water do exist and do have markedly different impacts on flows to the Salton Sea. System improvements, such as lateral interceptors, and on-farm conservation involving pumping back "tailwater" for reuse would likely have a more negative impact on the Salton Sea and its tributaries. These systems essentially reduce the relatively "good" inflow water (tailwater) into the Sea and increases the relative impact the "poorer" quality water (tile water) has on these surface waters. For every acre-foot of water conserved using a pumpback system will mean one less acre-foot (maximum probable impact) entering the agricultural drains and ultimately the Salton Sea. Other alternatives to pumpback systems do exist: converting agricultural land to a less water intensive use (e.g. intermittent wetlands) and temporary fallowing or other options. Generally, these other alternatives will result in a less than a one to one loss of water to the Sea. The less than a one to one loss means a better water quality would remain in the drains and a resultant better water quality flowing to the Sea.

Depending on the magnitude of an inflow parameter, the quantities may be expressed in units of million-acre-feet per year (maf/yr), or in units of thousand-acre-feet per year (kaf/yr) or simply acre-feet per year (af/yr). All of these units are used in this EIS/EIR.

In the future, in addition to changes in the quantities of inflows, the quality of inflowing water may also change. The California Regional Water Quality Control Board, Colorado River Basin Region (CRWQCB – CRBR) has primary



Legend

- - - - Lakeshore at 241 feet Below Sea Level (Average inflow = 1.06 million acre-feet)

· · · · Lakeshore at 249 feet Below Sea Level (Average inflow = 800,000 acre-feet)

Possible Future Shorelines at 2060 with No Action Alternative

Salton Sea, California

Figure 2.3-1

jurisdiction over the establishment and enforcement of Water Quality Standards (WQSs) for waters within its Region, pursuant to the United States Clean Water Act (CWA) and the California Porter-Cologne Water Quality Control Act (Porter-Cologne). WQSs are defined as provisions of State or Federal law, which consist of a designated beneficial use or uses of waters of the United States and water quality criteria for such waters, based upon such uses. The Regional Board's WQS for waters of the Region are contained in the Board's "Water Quality Control Plan for the Colorado River Basin Region (Basin Plan)."

The California Environmental Quality Act (CEQA) requires an analysis of past current, and reasonably foreseeable future actions that may affect the project. CWA § 303(d) requires the CRWQCB to: (1) identify the Region's waters that do not comply with water quality standards applicable to such waters, (2) rank the impaired water bodies taking into account factors including the severity of the pollution and the uses made of such waters, and (3) establish Total Maximum Daily Loads (TMDLs) for those pollutants causing the impairments to ensure that impaired waters attain their beneficial uses. If the State fails to develop a TMDL, or if USEPA rejects the State's TMDL, USEPA must develop one. Upon approval of the TMDL by USEPA, the State is required to incorporate the TMDL, along with appropriate implementation measures, into the State Water Quality Management Plan.

Pursuant to CWA § 303(d), the CRWQCB – CRBR is developing a silt TMDL for the Alamo River and a bacteria TMDL for the New River. Following the completion of the current target TMDLs, Regional Board staff will begin development of other TMDLs in accordance with the priority ranking established on the Regional Board's 1998 § 303(d) list and pursuant to funding. The TMDL process should have a long-term beneficial effect on the quality of waters flowing into the Sea. This benefit is expected to occur under the No Action Alternative as well as under project alternatives. While the project alternatives are focused on restoration of the Sea itself, the TMDL process should enhance the effectiveness of the restoration alternatives by improving the quality of the inflows.

2.4 RESTORATION ALTERNATIVES EVALUATED IN THE EIS/EIR

2.4.1 Overview

Alternatives have been developed with the recognition that inflows to the Sea may decrease in the future. Thus, each alternative includes actions that would be implemented under the reduced inflows considered. Table 2.4-1 displays how five complete alternatives have been formulated from individual actions for three inflow scenarios described in the previous section for the No Action alternative. A detailed description of each alternative is provided in sections 2.4.2 through 2.6.2. Schematic representations of all five alternatives can be found in Appendix A.

Table 2.4-1
Summary of Salton Sea Restoration Project Alternative Actions

Inflow (maf/yr)	-----------------------------Phase 1 (before 2030)---------------------------------			----------Phase 2 (2030 and beyond)----------	
	2003	**2008**	**2015**	**2030**	**2060**
Alternative 1					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	2 Ponds at 98 kaf/yr Pupfish Pond	Accelerated Export – 150 kaf/yr[1]		
1.06	Same as above	Same as above	Same as above, plus Displacement Dike	Import Central Arizona Salinity Interceptor (CASI) Water (up to 304.8 kaf/yr, as required)	
0.80	Same as above	Same as above	Same as above	Same as above, plus Import Flood Flows	
Alternatives 2 and 3					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	150 kaf/yr EES (showerline technology)			
1.06	Same as above	Same as above	Displacement Dike Import Flood Flows	Import CASI Water (up to 304.8 kaf/yr, as required)	
0.80	Same as above	Same as above	Same as above	Same as above	Additional Displacement or Inflow
Alternative 4					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	100 kaf/yr EES 1 Evaporation Pond (S) at 68 kaf/yr Pupfish Pond		Increase EES capacity to 150 kaf/yr	
1.06	Same as above	Same as above	Displacement Dike Import Flood Flows	Same as above, plus Import CASI Water (up to 304.8 kaf/yr, as required) Reduce EES at 100 kaf/yr	
0.80	Same as above	Same as above	Same as above	Same as above	
Alternative 5					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	150 kaf/yr EES in-Sea Evaporation Pond (N)		Export – 150 kaf/yr	
1.06	Same as above	Same as above	Displacement Dike Import Flood Flows	Import CASI Water (up to 304.8 kaf/yr, as required)	
0.80	Same as above	Same as above	Same as above	Same as above	Additional Displacement or Inflow

[1] Accelerated export implemented as a Phase 2 action

The alternatives are designed to address the wildlife, fishery, and recreation goals and objectives presented in chapter 1. In part, these objectives would be addressed by halting the present trend of increasing salinity and by ultimately reducing salinity to a target concentration of about 40,000 mg/L or below. All alternatives include salinity control measures during Phase 1. For Alternatives 1 and 5, an additional export action would be required to provide long-term salinity control. This action could be required as early as 2015 for Alternative 1, and is considered an accelerated Phase 2 action. Export options under consideration are described in Section 2.6.

Historically, the rising water levels in the Sea have flooded facilities in near-shore areas, including camping and boating facilities. The uncontrolled changes in the Sea's level have affected recreational uses and may be limiting the potential for economic development that depends on the Sea. Continued fluctuations in elevation also may adversely affect rookery success for some of the avian species that nest at the Sea. All of the alternatives presented are designed to help stabilize elevation of the Sea to a range around -230 feet, mean sea level (msl).

Four common actions have been developed to further address the goals of wildlife maintenance and enhancement, restoration of recreational uses, maintenance of the sport fishery, and identification of economic development opportunities. The common actions are designed to supplement the alternative actions discussed below. The common actions would be included with each alternative except No Action, and could be implemented as early as 2003. To avoid repetition, each common action is discussed once in Section 2.5.

All alternatives, including No Action, have been analyzed using a water-budget accounting model that includes a stochastic analysis of multiple future inflow scenarios. Table 2.4-2 provides a summary of the model results of the expected values of salinity, elevation, and surface area associated with each alternative at specific times. Predicted mean values of salinity and elevation over time for each of the alternatives are shown on figures 2.4-1 through 2.4-3 for each of the three assumed inflow scenarios.

2.4.2 Alternative 1

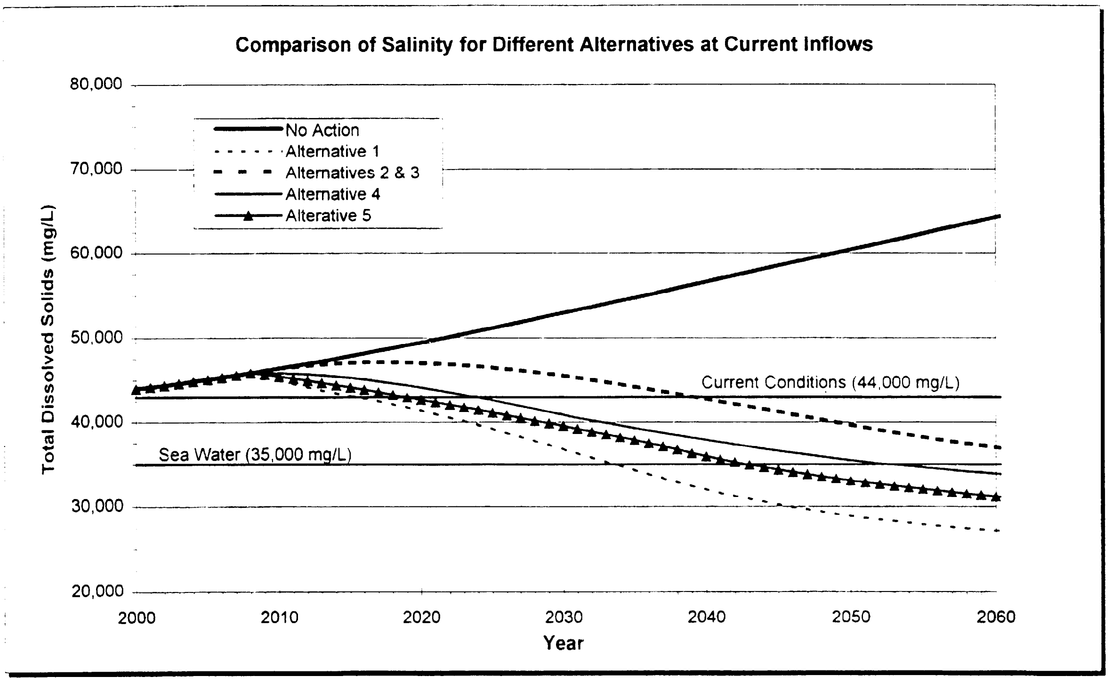
Current Inflow Conditions – Alternative 1: Phase 1

Evaporation Ponds: In addition to the common actions described in Section 2.5, Alternative 1 would involve construction of two evaporation ponds within the Sea. The combined surface area of the ponds would be approximately 33 square miles but would depend on the elevation of the water surface in the ponds and may also fluctuate seasonally. The ponds would act to concentrate the salts from the Sea and to assist in stabilizing the Sea's surface elevation. Approximately 98,000 af/yr of water would be pumped into these ponds from the Sea each year. Evaporation of this water would tend to concentrate salts in the ponds and allow

Table 2.4-2
Summary of Modeling Results and Assumptions

Inflow Rate/Alternative	Middle of Phase 1 2015 Elevation (ft, msl)	Middle of Phase 1 2015 Salinity (mg/L)	Middle of Phase 1 2015 Surface Area (acres)	Middle of Phase 1 2015 Surface Area (sq mi)	End of Phase 1/Start of Phase 2 2030 Elevation (ft, msl)	End of Phase 1/Start of Phase 2 2030 Salinity (mg/L)	End of Phase 1/Start of Phase 2 2030 Surface Area (acres)	End of Phase 1/Start of Phase 2 2030 Surface Area (sq mi)	30 years of Phase 2 2060 Elevation (ft, msl)	30 years of Phase 2 2060 Salinity (mg/L)	30 years of Phase 2 2060 Surface Area (acres)	30 years of Phase 2 2060 Surface Area (sq mi)
Current Inflow Scenario, 1.36 maf/yr												
No Action	-225	47,835	238,955	373	-224	52,896	241,436	377	-223	64,253	243,576	381
Alternative 1	-224	43,166	217,474	340	-229	36,824	208,385	326	-227	27,196	212,146	331
Alternatives 2 & 3	-229	47,043	230,640	360	-232	45,510	222,881	348	-234	37,042	219,255	343
Alternative 4	-227	44,161	219,616	343	-229	39,566	216,199	338	-229	31,165	215,126	336
Alternative 5	-229	45,246	223,348	349	-232	40,854	217,996	341	-231	33,926	218,808	342
Reduced Inflow Scenario, 1.06 maf/yr												
No Action	-228	52,001	232,980	364	-234	75,050	218,371	341	-241	122,530	198,267	310
Alternative 1	-225	46,394	200,091	313	-237	45,862	181,074	283	-232	34,742	189,404	296
Alternatives 2 & 3	-230	50,847	213,002	333	-237	53,726	196,945	308	-232	38,120	208,371	326
Alternative 4	-228	47,575	202,134	316	-235	47,467	190,758	298	-232	40,436	195,877	306
Alternative 5	-230	48,857	205,790	322	-236	46,197	195,738	306	-232	37,343	202,843	317
Reduced Inflow Scenario, 0.80 maf/yr												
No Action	-228	51,998	232,978	364	-234	75,043	218,368	341	-249	177,848	169,435	265
Alternative 1	-225	46,405	200,086	313	-237	45,868	181,064	283	-234	38,203	186,677	292
Alternatives 2 & 3	-230	50,846	213,000	333	-237	53,668	197,032	308	-238	45,347	184,159	288
Alternative 4	-228	47,574	202,133	316	-235	47,508	190,717	298	-234	44,467	191,537	299
Alternative 5	-230	48,849	205,782	322	-236	46,161	195,776	306	-236	40,745	195,443	305

Notes: *Base Year: 2000*
Elevation in Base Year: -227 ft msl
Salinity in Base Year: 44,000 mg/L
Surface Area of Sea in Base Year: 233,898 acres (365 square miles)



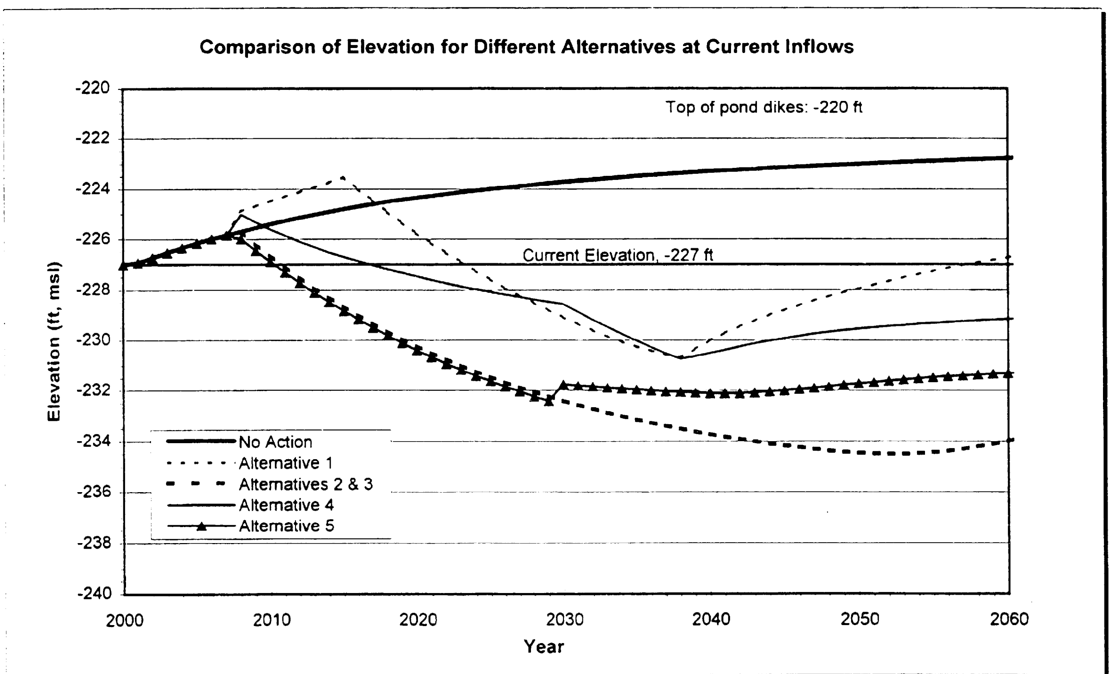
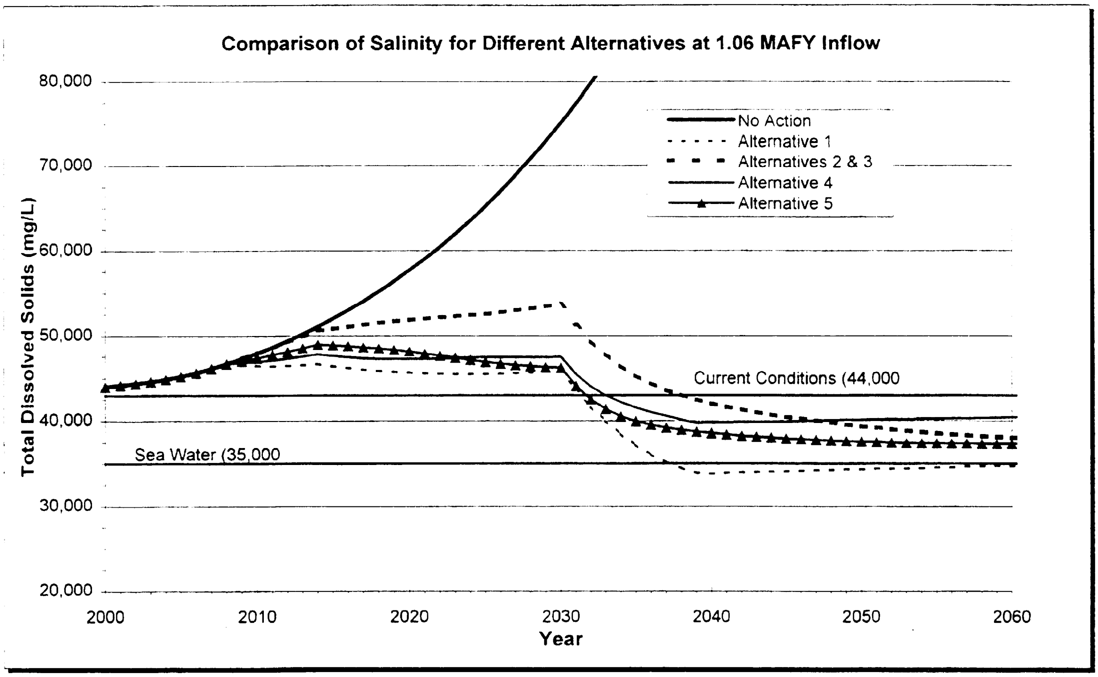
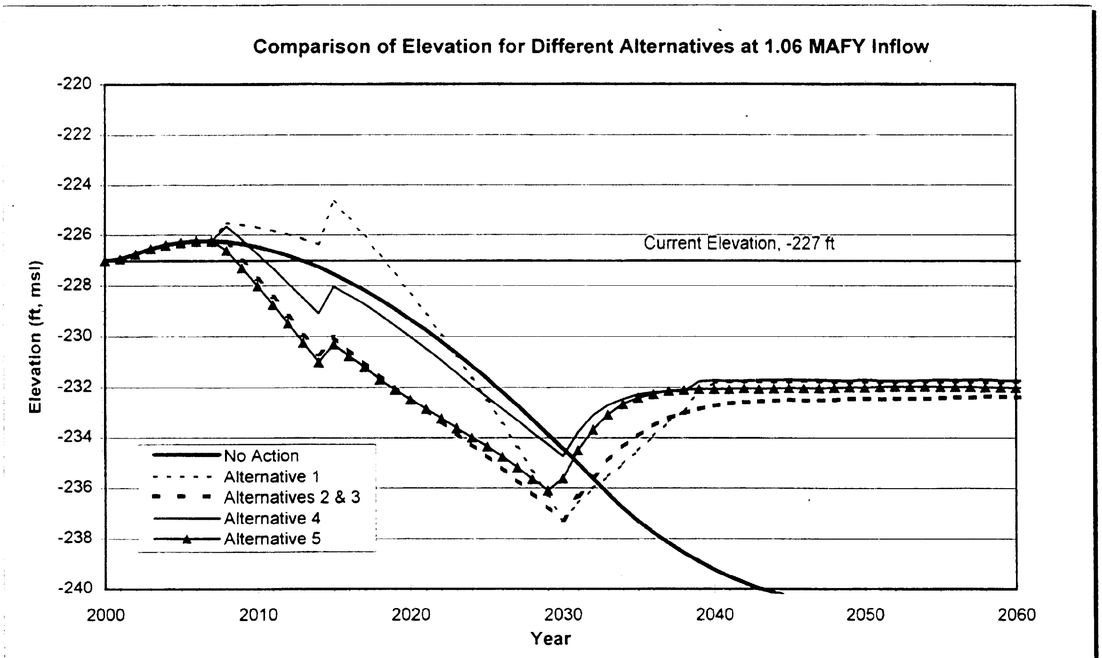


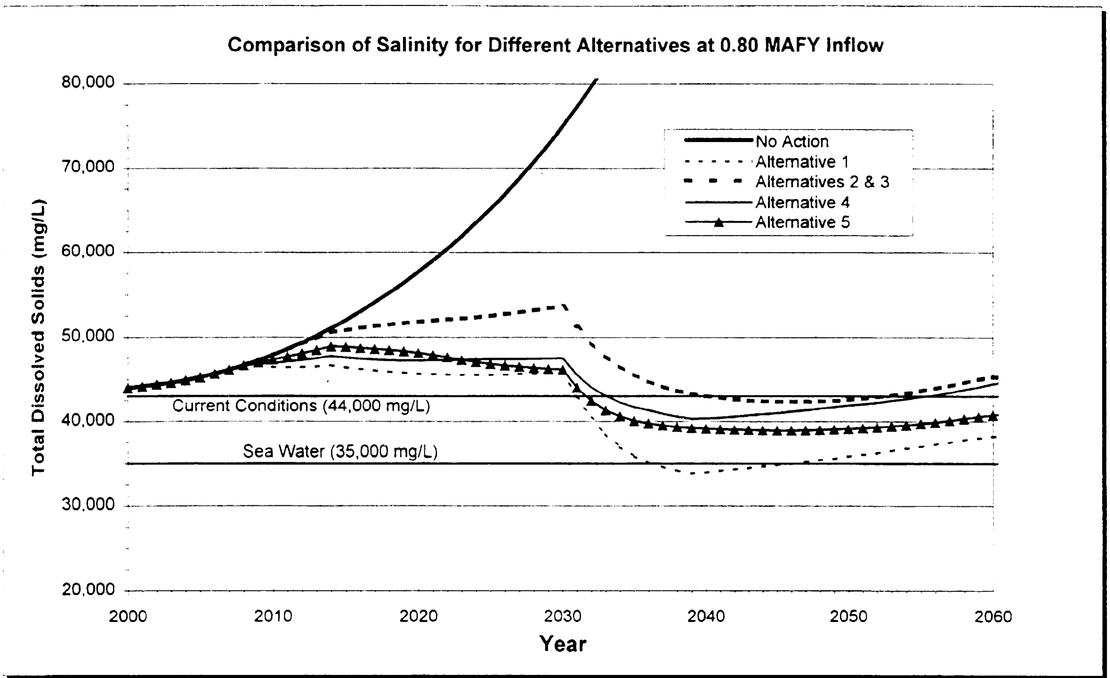
Figure 2.4-1. Projected Changes in Salinity and Elevation Over Time at Current Inflows





* This model does not specifically simulate the impact of the IID/San Diego water transfer. Those impacts will be evaluated in a separate EIS/EIR and may demonstrate more or less severe salinity/elevation impacts than shown here.

Figure 2.4-2. Projected Changes in Salinity and Elevation Over Time with Inflow Reduced to 1.06 maf/yr *



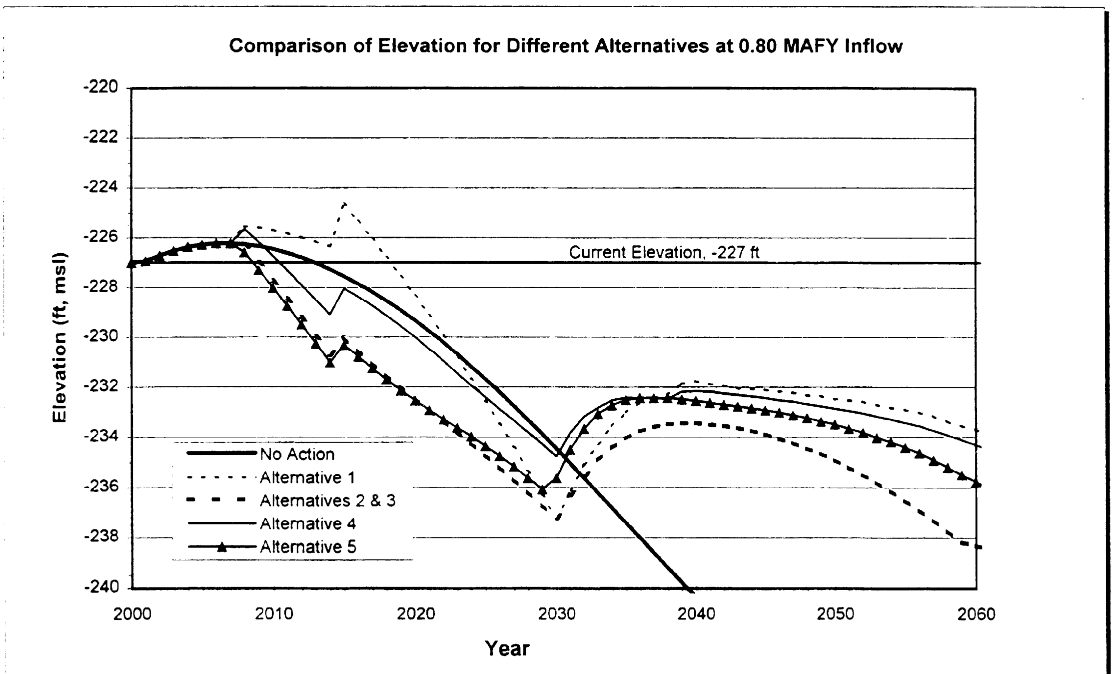


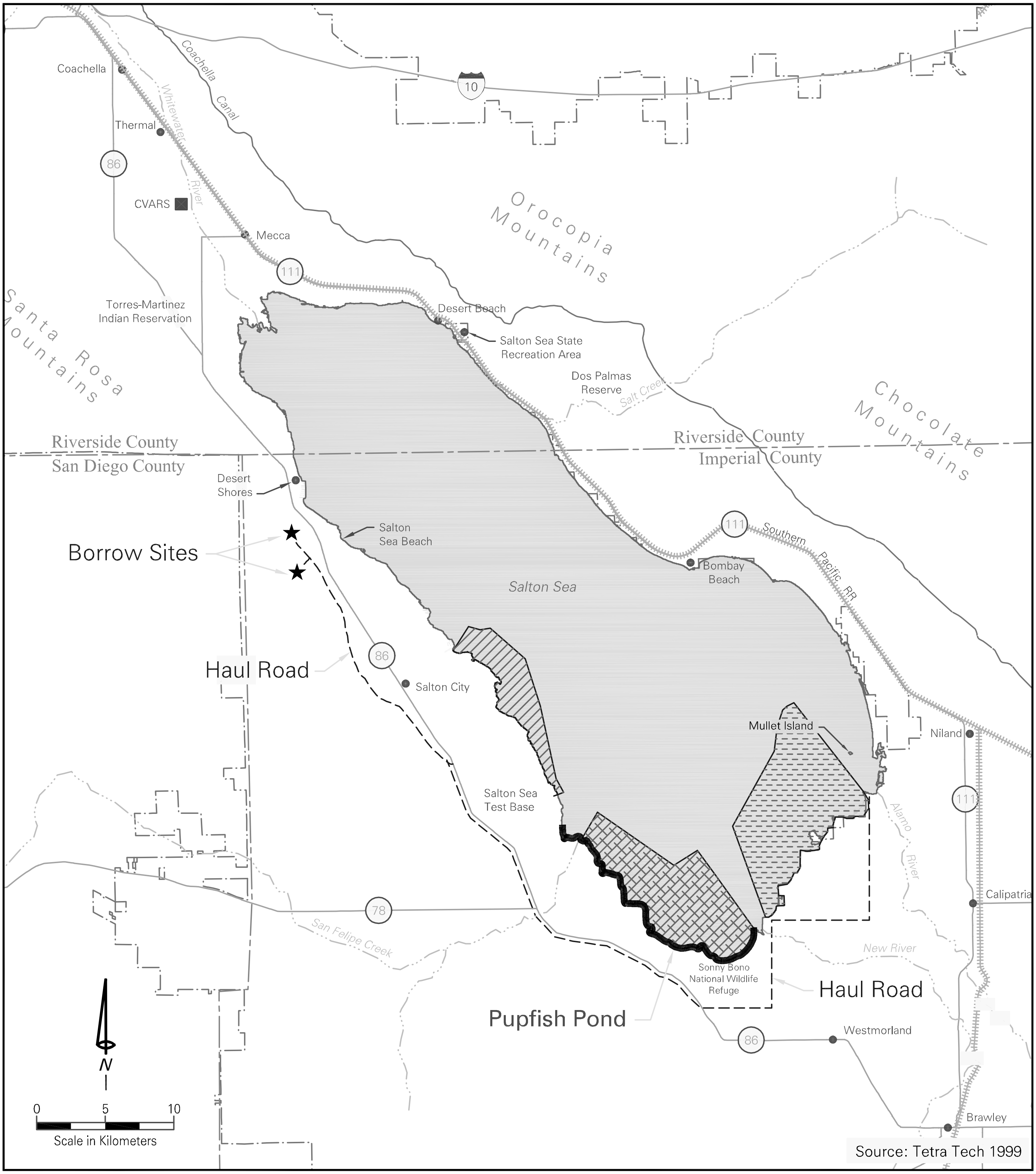
Figure 2.4-3. Projected Changes in Salinity and Elevation Over Time with Inflow Reduced to 0.80 maf/yr

the salinity in the remainder of the Sea to be maintained at an acceptable level. The ponds would also create a displacement, which would assist in maintaining the target elevation level of the Sea (+/- -230 feet), should inflows to the Sea decrease in the future.

Construction activities would temporarily disturb some areas along the shoreline, would take approximately 48 months to complete, and would involve a maximum of 440 to 480 workers. Construction resources are included on Table 2.4-3; the location of the evaporation ponds is shown on Figure 2.4-4.

Table 2.4-3
Salton Sea Restoration Resource Requirements for Selected Phase 1 Actions

Resource Requirements	Evaporation Ponds	EES at Bombay Beach or Test Base	Displacement Dikes	North Wetland Habitat
Surface Area Disturbance (acres)				
• On-shore Area Disturbed				
- Temporary Construction Disturbance	280	26	360	3
- Area Permanently Converted to a New Use	0	7,500	0	Less than 1
• In-Sea Area Disturbed				
- Temporary Disturbance	735	20	520	21
- Area Occupied by New Structures	735	20	520	21
- Pond or Displacement Surface Area	21,900	N/A	13,500	1,000
Construction Schedule				
• Approximate Start Date	Jan. 2, 2002	Jan. 2, 2002	2015	Varies
• Duration of Construction (months)	48	36	48	24
• Phases of Construction	2	0	2	2
• Period of Peak Construction Activity (months)	40	36	40	20
Work Force				
• Construction Phase				
- Average Number of Workers	440	260	300	12
- Peak Number of Workers	480	300	330	12
• Operations Phase Workforce	Less than 5	72	Less than 5	Less than 5
Construction Resources				
• Riprap Revetment (1,000 cubic yards)	490	0	323	Less than 2
• Hydraulically Excavated Sludge (1,000 cubic yards)	7,100	0	4,726	0
• Aggregate (1,000 cubic yards)	21,100	45,000	14,500	0
• Water use (gallons per day)	38,000	300,000	26,000	0
Power Requirements				
• Construction Phase				
- Average Load (kilowatts)	Minimal	250	Minimal	25
- Peak Load (kilowatts)	Minimal	500	Minimal	25
• Operations Phase				
- Average Load (kilowatts)	Minimal	9,500	Minimal	25
- Peak Load (kilowatts)	Minimal	12,700	Minimal	25
Construction Traffic				
• Average daily truck trips (trips per day)	1,000	2,100	690	1
• Peak daily truck trips (trips per day)	1,024	2,100	700	10
• Haul routes (miles)	2@18 mi	varies	50	Varies



Legend

North Evaporation Pond

South Evaporation Pond

Displacement Dike

Haul Road

Borrow Sites

Potential Locations for Evaporation Ponds and Displacement Dike

Salton Sea, California

Figure 2.4-4

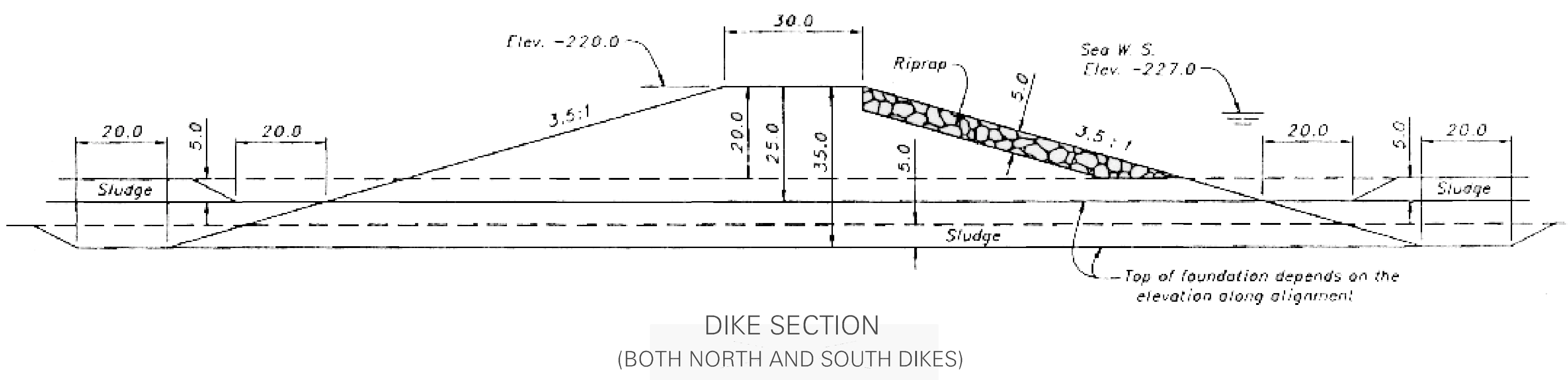
The evaporation ponds would be constructed by first dredging sludge material by suction from the dike foundation area using floating barges. A minimum of one trailing hydraulic high-production dredge mounted on a barge would likely be used per dike. Dredged material would be discharged into the sea between two floating silt barriers anchored to the Sea bottom and ultimately would be redistributed by currents throughout the Sea over time. Dredging would begin several months ahead of the earthfill placement operation and would proceed ahead of the fill at a reasonable distance.

Dikes containing the ponds would be a maximum of approximately 35 feet high, measured from top of foundation, and 30 feet wide on top. The dikes' footprint beneath the Sea would cover approximately 1.2 square miles (735 acres). A typical dike cross section is provided as Figure 2.4-5. While the north evaporation pond dike would intersect the shoreline at both ends of the pond and use the shoreline to close the pond on the west side, the south evaporation pond would be constructed completely within the Sea. This is necessary to protect the near shore habitat of the federally listed endangered desert pupfish.

Borrow material would be trucked into the construction site by way of a 60-foot wide dedicated temporary haul road. The gravel-based road would originate at the borrow area west of Salton Sea Beach within the Torres Martinez Indian Reservation or commercial borrow areas. Riprap would come from Section 20, T9S, R9E; embankment material would come from sections 28 and 34, T9S, R9E. Approximate locations of borrow areas are shown on Figure 2.4-4. As shown on Figure 2.4-4, the haul road would extend south along the west side of Highway 86, approximately 16 miles to a point due west of the construction site within the test base. A traffic control system would stop vehicles on the highway to allow the haul trucks to cross. Alternately, a bridge could be constructed to cross the highway at the same location. Once construction of the dikes is completed, the road would be restored to pre-construction condition.

The dike foundation and where it meets the dike embankment would be constructed to meet design and safety assumptions. This could involve special materials handling and placement methods on the dike itself to avoid haul materials from being re-handled. A bottom dump placement barge could be used for this task or materials could be transported along the constructed dike. Detailed construction procedures would be determined after final designs of the ponds and dikes are completed. The evaporation ponds are expected to be efficient for the first 30 years of the project. At the end of this 30-year operational lifespan, the water behind the dikes would be allowed to evaporate. Depending on their condition, the dikes probably would be reinforced on the pond side and left in place, along with the salt. The area would be capped with soil, if necessary.

Pupfish Pond: What little is known about pupfish ecology at the Sea suggests that their habitat includes not only the creeks and drains that empty into the Salton



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Dike Cross Section

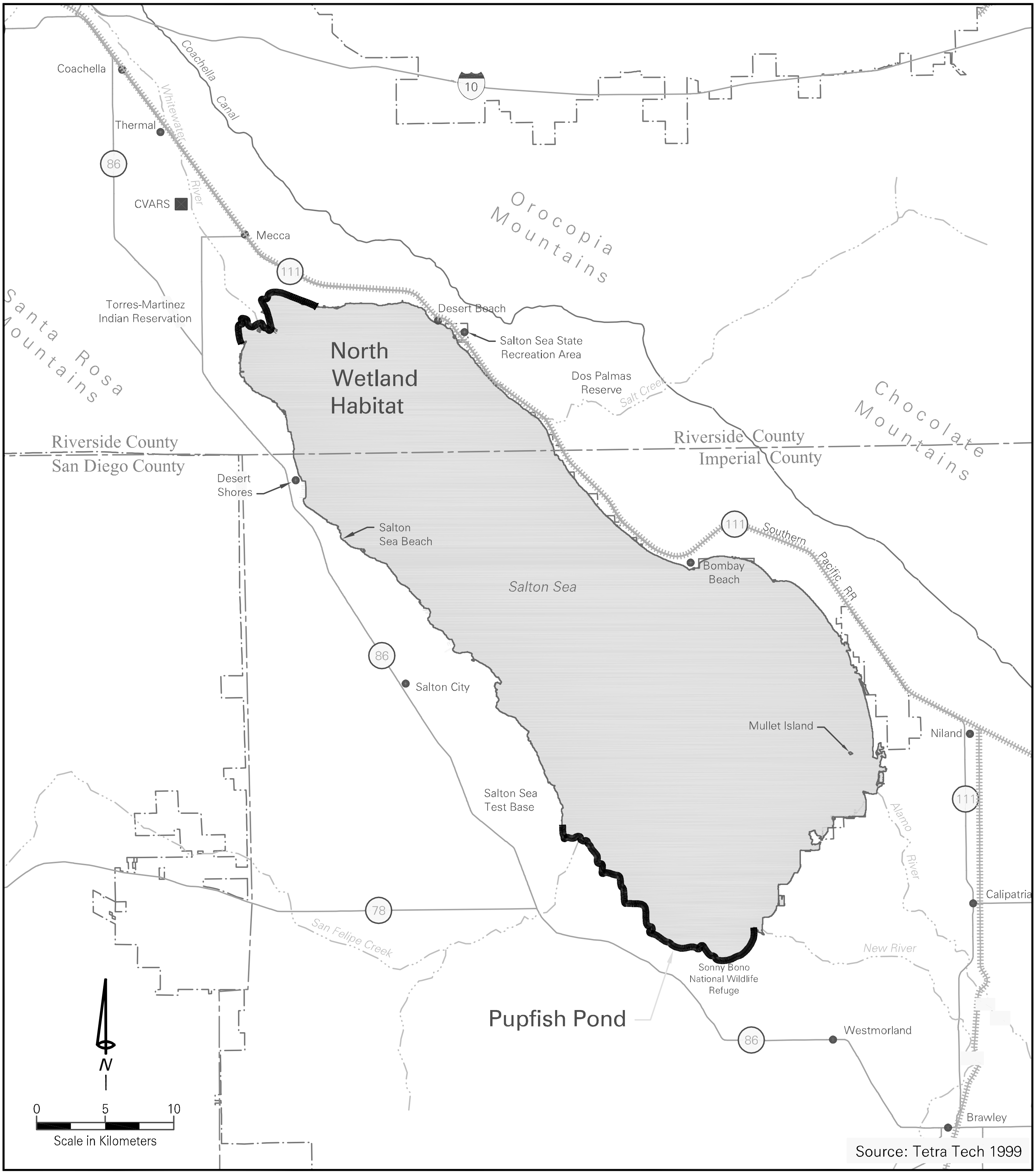
Salton Sea, California

Figure 2.4-5

Sea, but also the shallow areas along the shoreline. Pupfish use the shallow areas to move between the creeks and drains, while evading their predators in the Sea, such as the tilapia. This movement from inlet to inlet might contribute to maintaining a healthy desert pupfish population in the Salton Sea by providing genetic diversity and hence, a stronger species and is therefore, important to protect.

To maintain this habitat and connectivity between the drains in this area, additional dikes would be constructed from the north and south ends of the south evaporation pond extending to the shoreline, effectively creating a nearshore habitat protection pond between the shore and the evaporation pond. Significant snag habitat on the west side of the New River and the habitat around the mouth of San Felipe Creek would also be protected within this pond. Salinity levels appropriate to maintain conditions suitable for pupfish habitat would be attained by using a pump system, bringing in Salton Sea water to mix with a smaller portion of drain water. Water quality levels will be monitored as a part of the management actions described in section 2.7. The pupfish pond location is shown on Figure 2.4-6. A cross-section of a typical pupfish pond dike is shown on Figure 2.4-7. Borrow material would be transported into the construction site in the same manner described for the evaporation ponds under Current Inflow Conditions – Alternative 1: Phase 1.

<u>North Wetland Habitat:</u> Reduced annual inflows to the Sea would threaten the important island and snag habitat currently used by wildlife in the northern portion of the Sea. This area provides the largest expanse of snag habitat at the Sea along with low island habitat. The north wetland habitat area would be constructed to preserve these existing values in the area as well as allow adaptive management of a freshwater/Salton Sea water interface to enhance habitat values. Prior to construction of the wetland, physical and biological parameters would be measured and recorded to use as a baseline for evaluating changes that occur ofter construction, in accordance with adaptive management strategies. Dikes would be constructed at the -230 foot contour on both sides of the Whitewater River Delta, leaving the mouth of the Whitewater River free to flow in to the Sea. The created ponds would have up to 3 feet of water depth and would ensure that the several low islands within the area would not become connected to the shoreline due to drops in elevation. The western dike system would begin west of the mouth of the Whitewater River and continue approximately 2 miles west along the -230 foot contour to the Avenue 76 drain. The eastern dike system would begin east of the mouth of the Whitewater River and continue approximately 3 miles east along the-230 foot contour. The distance from shoreline would range between approximately 100 feet to a maximum distance of 1,800 feet. The total area within the two diked areas would total about 1,000 acres. Figure 2.4-6 shows the location of the North Wetland Habitat.



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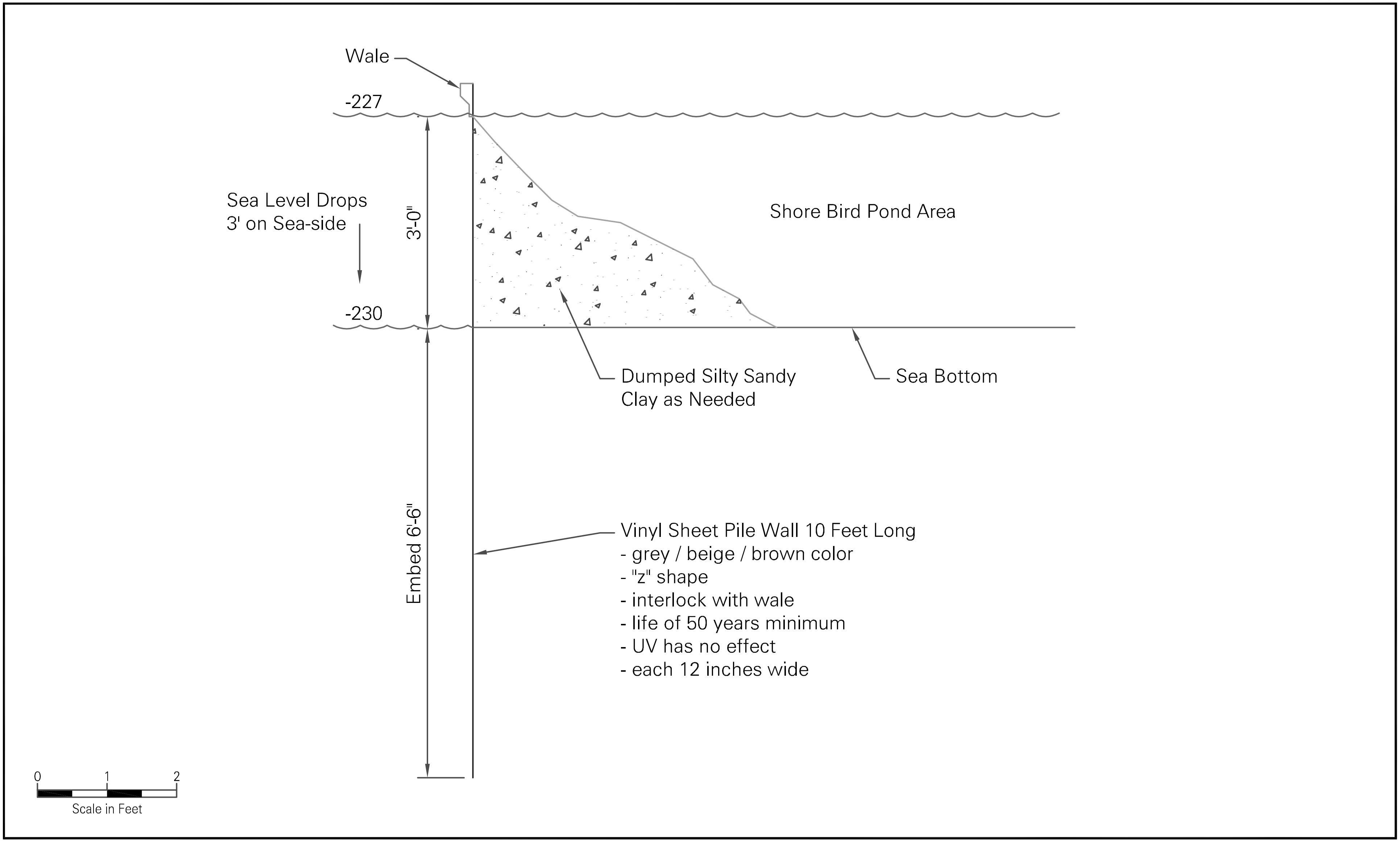
Potential Locations of North Wetland Habitat and Pupfish Pond

Salton Sea, California

Figure 2.4-6



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Typical Dike Cross Section for North Wetland Habitat and Pupfish Pond

Salton Sea, California

Figure 2.4-7

The two habitat areas would be constructed using 10-foot long sheet piling which would be driven into the Sea bed about 6 feet. Sheet piling forms a Z-shaped dike when completed. A cross-section of a typical sheet-piling dike is shown on Figure 2.4-7. Construction would be accomplished from barges or with specialized equipment. During construction, occasional piles of rock would be placed against the sheet piling to provide roosting and nesting opportunities and provide rock substrate for benthic invertebrates. Water from the Whitewater River would be pumped or gravity fed into the two areas in a manner which allows for gravity flow through the system. Water within the two areas would be at a slightly higher elevation then that of the Sea, allowing for gravity flow back into the sea via outflow structures. Maximum capacity for diversion would be approximately 100 cfs into each area. Pumping facilities would be constructed to supplement the outflow structures to allow maximum flexibility of water elevation and water quality management. Water quality would be monitored before and after construction, as part of the management actions described in sections 2.5.6 and 2.5.7.

Once the existing habitat values have been protected, the north habitat areas would be used to test management techniques to enhance threatened habitat values within the Salton Sea. Interior dikes, upland management, and adaptive management of sub-units would be developed as appropriate in the future. These interior features would be developed as goals for the entire Sea as part of the long-term management and strategic science plans described in sections 2.5.6 and 2.5.7, respectively. Any future construction or management may require additional compliance actions before implementation. Knowledge gained through the management of the north wetland habitat would be applied to other areas along the shoreline of the Sea, as appropriate. If selected, construction on this action would begin as soon as possible so that the north wetland habitat could be in place by as early as 2003.

Current Inflow Conditions – Alternative 1: Phase 2

<u>Export</u>: Generally, it has been assumed that Phase 2 actions would be implemented around the year 2030. However, for this alternative, Phase 2 actions would be required sooner under all inflow conditions to continue to maintain acceptable levels for salinity and water surface elevations within the Sea. This alternative would then involve acceleration to the year 2015 of a Phase 2 export to remove approximately 150,000 af/yr of Salton Sea water. Various Phase 2 export options are described in Section 2.6. Removal of this quantity of water per year from the Sea would result in a gradual decrease in the Sea's elevation.

Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 1

<u>Displacement Dike</u>: Alternative 1 with a reduction of annual inflows to 1.06 maf/yr would be the same as described above for current inflow conditions with the addition of a displacement dike to maintain elevations near target goals. This dike would be constructed in the southern portion of the Sea as shown on Figure 2.4-4. It is designed to essentially reduce the total area of the Sea, effectively displacing enough water to maintain elevations if annual inflows are reduced to 1.06 maf/yr. Construction activities for the displacement dike would temporarily disturb approximately 360 on-

shore acres, would take approximately 48 months to complete, involving a maximum of 300 to 330 workers. In-Sea area disturbed or occupied by new structures would total approximately 520 acres.

Borrow material would be obtained from the same locations used for construction of the evaporation ponds. The dedicated haul road would be extended along the west side of State Route (SR) 86 to the southern end of the Sea where it would proceed east to the mouths of the New and Alamo Rivers. A traffic control system would stop vehicles on the highway to allow the haul trucks to cross. Alternately, a bridge could be constructed to cross the highway at the same location. Once construction of the dikes is completed the haul road along SR 86 would be restored to pre-construction condition.

It is anticipated that, while some seepage into the area behind the dike may occur, evaporation would result in the area remaining dry most of the year. For the purposes of modeling the performance of alternatives, it has been assumed that this action could be taken as early as the year 2015.

Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 2

Import from the Central Arizona Salinity Interceptor (CASI): In order to maintain target elevation goals, additional water must be delivered to augment reduced annual inflows to the Sea. This action would involve the import of water that originates as a brine stream from the proposed CASI, through Yuma to the Salton Sea. The CASI is designed to transport brackish water by gravity from the Tucson and Phoenix areas to Yuma. This water would be less saline, at approximately 4,400 mg/L, than the existing Salton Sea water and would help reduce salinity and stabilize elevation if annual inflows are significantly reduced. CASI water is expected to be available in approximately 25 years, with the current plans for its disposal including discharge to the Gulf of California. Approximately 300,000 af/yr are estimated to become available for diversion to the Salton Sea. This amount of CASI water could be conveyed continuously at approximately 420 cfs through a newly constructed canal to parallel the existing, All-American Canal.

CASI is proposed to to accomplish two things. First, CASI would transport brackish waters generated by municipal, industrial and agricultural sources away from the Tucson and Phoenix areas. Second, CASI would remove salt from the region brought in by the Colorado River water delivered to Phoenix and Tucson through the Central Arizona Project before the water is received by the municipal domestic water distribution system. If CASI water is not available as a replenishment source at the Sea, other sources of water would be sought as replacement for reduced inflows from current sources.

Reduction of Inflows to 0.8 maf/yr – Alternative 1: Phase 1

No additional actions are planned for Phase 1 since the 0.8 maf/yr inflow scenario is the same as the 1.06 maf/yr scenario during Phase 1, and, under the lowest inflow assumption, 0.8 maf/yr is not expected to be reached until well into Phase 2.

Reduction of Inflows to 0.8 maf/yr – Alternative 1: Phase 2

Flood Flows: In addition to those actions described above, Alternative 1 - Phase 2 actions with a reduction of inflows to 0.8 maf/yr would include augmenting inflow to the Sea by using flood flows from the Colorado River. Colorado River flood flows are generally available approximately every three to seven years. The variability and uncertainty of flood flows is discussed in sections 3.1 and 4.1 of this EIS/EIR.

Reclamation regulates discharges of Colorado River flood flows in coordination with the Corps of Engineers. While not considered as allocations of Colorado River water, these flows may be available to Colorado River water users or others provided they have the capability to capture, divert, and use this water when available. The All American Canal system could divert this water at Imperial Dam and convey the flood or anticipatory flood releases to the Salton Sea. When available, the floodwater flows would be conveyed through the existing facilities to either the Alamo River or the Coachella Canal and into the Salton Sea.

Use of these facilities may require improvements in the Alamo channel and some minor maintenance of evacuation areas along the Coachella Canal to the Salton Sea. The evacuation gates have sufficient capacity to carry approximately 700 cubic feet per second (cfs) that could be diverted at Imperial Dam and delivered through the All American Canal to the Coachella Canal and released through evacuation channels located at Detention Channel #1. Approximately 550 cfs could be diverted at Imperial Dam and delivered through the All American Canal and released through the Alamo River. Up to 300,000 af/yr or a total of 1250 cfs could be available during flood releases over a one to four month period.

2.4.3 Alternative 2

Current Inflow Conditions – Alternative 2: Phase 1

In addition to the common actions described in section 2.5, if current inflow conditions continue, Phase 1 actions would involve construction of an EES and the north wetland habitat.

Enhanced Evaporation System (EES): The EES is a method to remove salts from the Sea by increasing evaporation rates through spraying. Alternative 2 involves constructing tower modules on a site north of Bombay Beach to process 150,000 af/yr of Salton Sea water. The system would operate on average 18 hours per day and automatically shut down when winds exceed 14 miles per hour (mph). Each module would consist of a line of towers and precipitation ponds. A typical module configuration is shown on Figure 2.4-8.

The 80- to 130-foot high towers would be connected with hoses extending from the main line to the others through which water would be delivered. Nozzles attached to the hoses would spray Salton Sea water from a height sufficient to allow the water to evaporate and the salts or brines to precipitate into a catchment basin, and then be moved to precipitation ponds constructed below the towers.

The ponds are formed utilizing the natural topography and diking. The salt, approximately 9-10 million tons/yr, would be disposed of in-place in the final precipitation pond, through conventional landfill techniques. The ponds will be lined using techniques similar to those used for conventional landfills.

The intake structure for the system would be within the Sea, and would include a screened pipe approximately 87 inches in diameter. The horizontal intake structure would include a trash rack and fish screens. The buried pipeline would extend from the shoreline to the EES Bombay Beach site, under the existing railroad and Highway 111.

A total area of 17 square miles would be necessary for this alternative at this site. The Bombay Beach site includes a mix of federal government and privately owned lands, and the project would require some land acquisition. High power (230-kilovolt [kv]) electrical lines and towers traverse the site and would need to be relocated, in consultation with IID, at a distance from the EES. The location of the Bombay Beach site is shown on Figure 2.4-9.

North Wetland Habitat: The north wetland habitat would be constructed as described under Alternative 1 – Current Inflow: Phase 1.

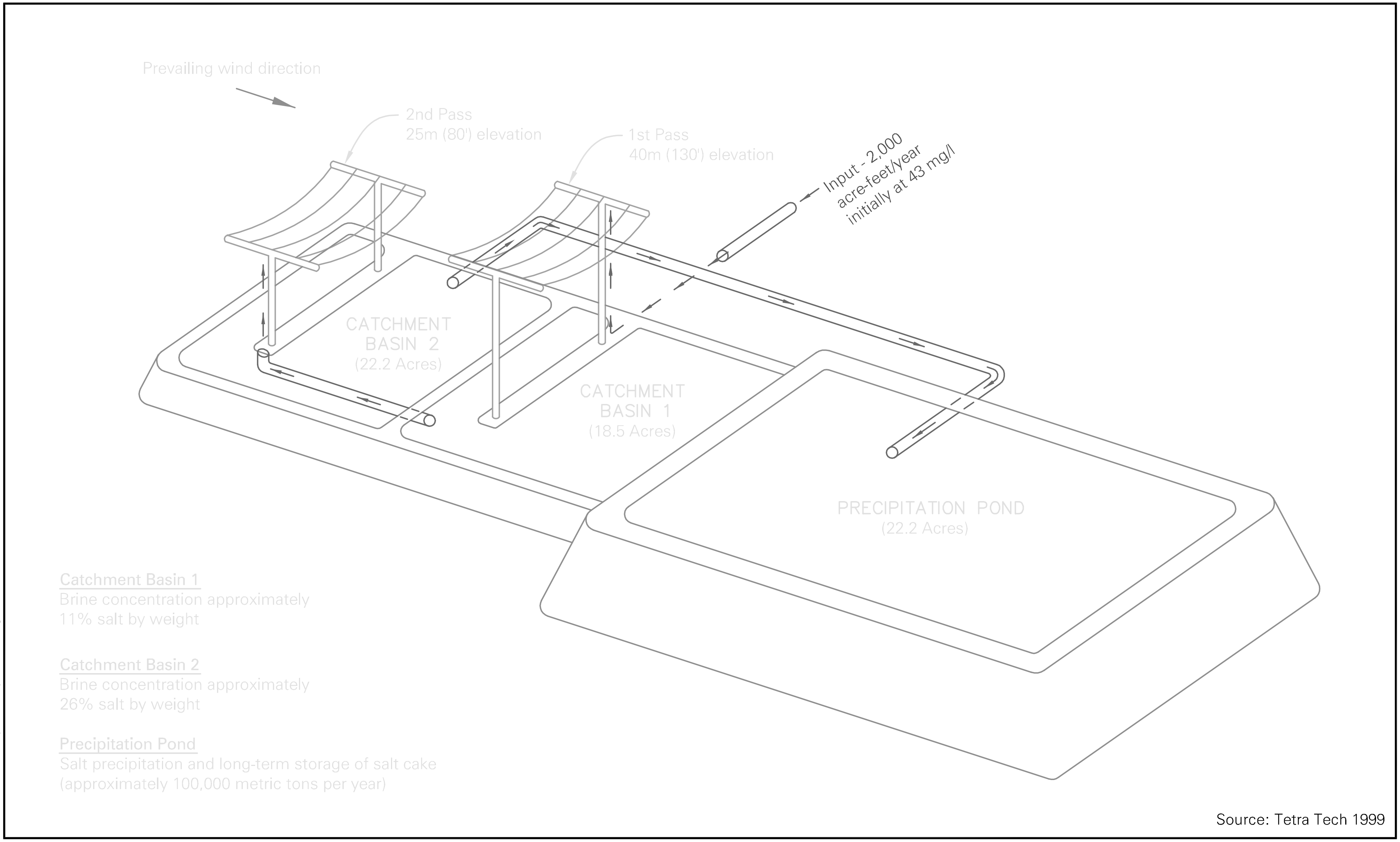
Current Inflow Conditions – Alternative 2: Phase 2

Under current annual inflow conditions, no additional actions would be needed during Phase 2 for Alternative 2.

Reduction of Inflows to 1.06 maf/yr – Alternative 2: Phase 1

With a reduction of annual inflows to 1.06 maf, Alternative 2 would initially be the same as described above for current inflow conditions. However, by about 2015, two additional actions designed to maintain the Sea's elevation would be initiated.

Displacement Dike: A displacement dike, as described under Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 1, would be constructed in the southern portion of the Sea as shown on Figure 2.4-4.



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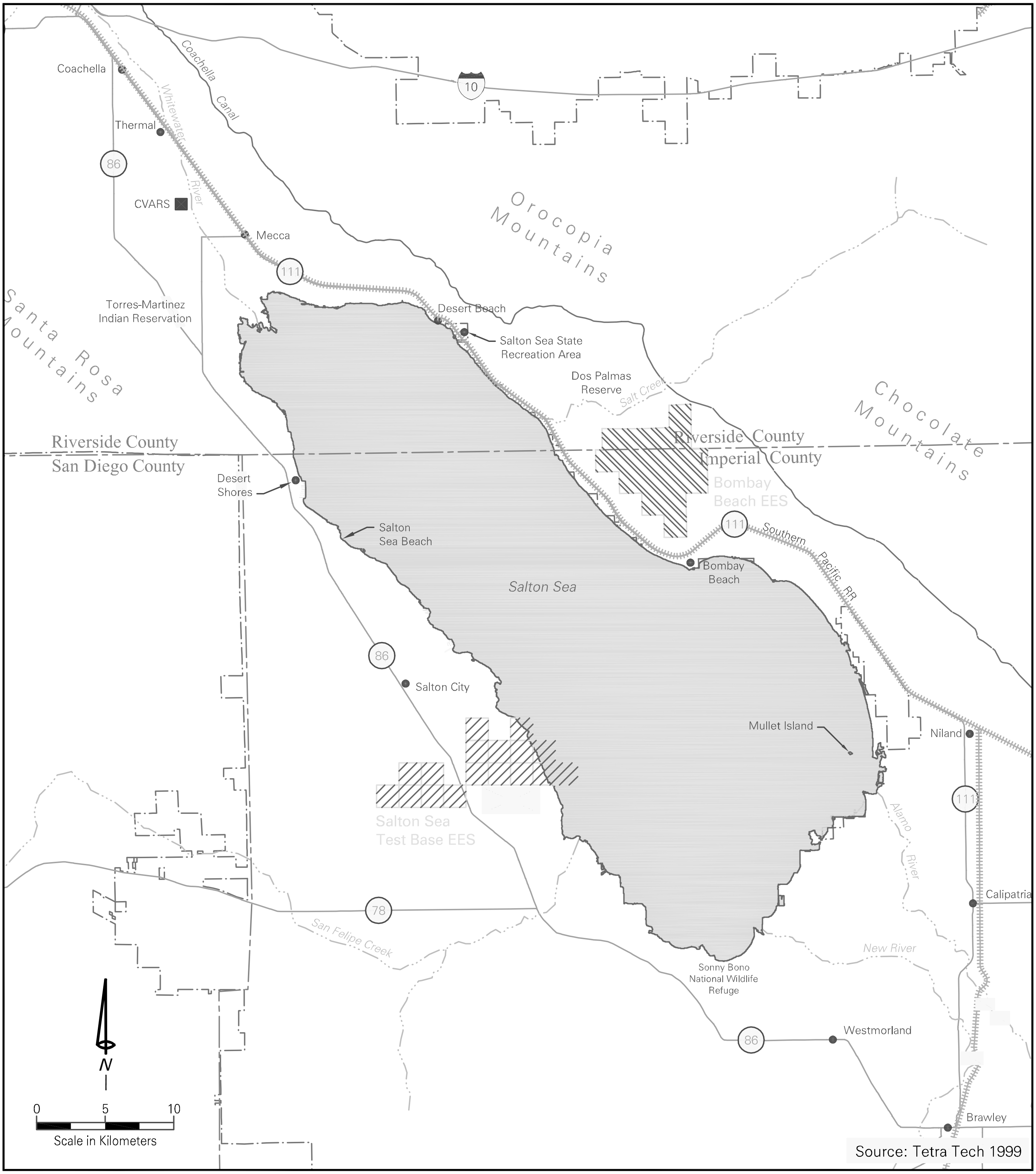
There would be approximately 75 modules in Phase 1 and 50 additional modules in Phase 2.

Typical Enhanced Evaporation System Module

Salton Sea Restoration Project

Figure 2.4-8



Legend

EES Location Used for Alternative 2

EES Location Used for Alternatives 3 and 4

EES at Bombay Beach and Salton Sea Test Base

Salton Sea, California

Figure 3

Flood Flows: At this same time, additional inflow to the Sea would come from periodic flood flows as described under Reduction of Inflows to 0.8 maf/yr – Alternative 1: Phase 2.

Reduction of Inflows to 1.06 maf/yr – Alternative 2: Phase 2

Import of Central Arizona Salinity Interceptor (CASI): Under reduced inflows to 1.06 maf/yr, Alternative 2 would require inflow of CASI water as described for Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 2.

Reduction of Inflows to 0.8 maf/yr – Alternative 2: Phase 1

No additional actions are planned for Phase 1 since the 0.8 maf/yr inflow scenario is the same as the 1.06 maf/yr scenario during Phase 1, and, under the lowest inflow assumption, 0.8 maf/yr is not expected to be reached until well into Phase 2.

Reduction of Inflows to 0.8 maf/yr – Alternative 2: Phase 2

Alternative 2: Phase 2 with reduction of annual inflows to 0.8 maf/yr would be the same as that described for reduced inflows to 1.06 maf/yr - Phase 2. However, at approximately year 2060, additional displacement or inflow would be necessary to maintain salinity and elevation targets.

2.4.4 Alternative 3

All Conditions, Alternative 3: Phases 1 and 2

This alternative, located on the Salton Sea Test Base site, differs from Alternative 2 in location and quantity of land acquisition only. A smaller powerline also crosses a portion of this site and would likely need to be relocated. Most of the Salton Sea Test Base site is federal government property, but the property west of the test base and Highway 86 is a mixture of government and privately owned land, therefore additional property would need to be acquired. A total area of 17 square miles would be necessary for this alternative at this site to process 150,000 af/yr of Salton Sea water per year. The location of the EES Salton Sea Test Base site is shown on Figure 2.4-9.

2.4.5 Alternative 4

Current Inflow Conditions – Alternative 4: Phase 1

In addition to the common actions described in section 2.5, if current inflow conditions continue, Phase 1 actions would involve construction of an EES and an evaporation pond plus the north wetland habitat.

EES and Evaporation Pond: This alternative combines the technology of Alternatives 1 and 3 to increase the effectiveness and speed at which salts are removed from the Sea. The EES would be constructed on the Salton Sea Test Base site, but the size of the EES would be reduced to a capacity of 100,000 af/yr. The south evaporation pond and the pupfish pond would be constructed as described in Alternative 1. The evaporation pond would receive approximately 68,000 af/yr through pumping from the Sea.

Construction techniques for both the pond and the EES would be the same as for alternatives 1 and 3, respectively.

North Wetland Habitat: The north wetland habitat would be constructed as described under Alternative 1 – Current Inflow: Phase 1.

Current Inflow Conditions – Alternative 4: Phase 2

Expanded EES: With current annual inflows, Phase 2 of Alternative 4 would require an expansion of the EES capacity by 50,000 af/yr. The area necessary for the expanded system is contained within the original area shown for the Salton Sea Test Base site on Figure 2.4-9. Pipelines and intakes constructed during Phase 1 would be sufficient to carry the additional flows necessary to operate the expanded system under this alternative. The total number of EES line showers would be increased by two thirds and the quantity of water evaporated from 100,000 af/yr to 150,000 af/yr. Phase 1 units would continue to be operational and would require continued maintenance.

Reduction of Inflows to 1.06 maf/yr – Alternative 4: Phase 1

With a reduction of inflows to 1.06 maf/yr, Alternative 4 would initially be the same as described above for current inflow conditions. However, around the year 2015, two additional actions designed to maintain the Sea's elevation and protect nearshore habitat values would be initiated.

Displacement Dike: A displacement dike would be constructed in the southern portion of the Sea as described under Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 1.

Flood Flows: At this same time, additional inflow to the Sea would come from periodic flood flows, as described under Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 2.

Reduction of Inflows to 1.06 maf/yr – Alternative 4: Phase 2

Import of Central Arizona Salinity Interceptor (CASI): Under reduced inflows to 1.06 maf/yr, Alternative 4 would require inflow of CASI water as described for Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 2.

EES: With reduced inflows, Phase 2 of Alternative 4 would require continuation of Phase 1 EES at 100,000 af/yr capacity (as compared to a 150,000 af/yr capacity EES that would be required for Phase 2 at existing inflow levels). The area necessary for the expanded system is contained within the original area shown for the Salton Sea Test Base site on Figure 2.4-9. Pipelines and intakes constructed during Phase 1 would be sufficient to carry the additional flows necessary to operate the expanded system under this alternative. Phase 1 units would continue to be operational and would require continued maintenance.

Reduction of Inflows to 0.8 maf/yr – Alternative 4: Phase 1

No additional actions are planned for Phase 1 since the 0.8 maf/yr inflow scenario is the same as the 1.06 maf/yr scenario during Phase 1, and, under the lowest inflow assumption, 0.8 maf/yr is not expected to be reached until well into Phase 2.

Reduction of Inflows to 0.8 maf/yr – Alternative 4: Phase 2

Alternative 4, phase 2 with reduction of inflows to 0.8 maf/yr would be the same as that described for Reduction of Inflows to 1.06 maf/yr – Alternative 4: Phase 2.

2.4.6 Alternative 5

Current Inflow Conditions – Alternative 5: Phase 1

In addition to the common actions described in section 2.5, if current inflow conditions continue, Phase 1 actions would involve construction of an EES within an evaporation pond plus the north wetland habitat.

<u>EES within Evaporation Pond:</u> Under Alternative 5, the north evaporation pond would be constructed as described in Alternative 1. In addition, a 150,000 af/yr EES would be incorporated within the pond itself. The EES used in this alternative would involve technology typically used in artificial snowmaking. Instead of dropping water from the tower configuration described in Alternative 1, this method would use a series of portable, ground-based blowers. The blowers would use air to spray piped Salton Sea water up into the air above the evaporation pond.

<u>North Wetland Habitat:</u> The north wetland habitat would be constructed as described under Alternative 1 – Current Inflow: Phase 1.

Current Inflow Conditions – Alternative 5: Phase 2

<u>Export:</u> Under current annual inflow conditions, Alternative 5 would require an export to remove approximately 150,000 af/year of Salton Sea water to maintain target elevations. Various Phase 2 export options are described in Section 2.6.

Reduction of Inflows to 1.06 maf/yr – Alternative 5: Phase 1

With a reduction of inflows to 1.06 maf/yr, Alternative 5 would initially be the same as described above for current inflow conditions however, around the year 2015, two additional actions designed to maintain the Sea's elevation would be initiated.

<u>Displacement Dike</u>: A displacement dike, as described under Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 1, would be constructed in the southern portion of the Sea as shown on Figure 2.4-4.

<u>Flood Flows</u>: At this same time, additional inflow to the Sea would come from periodic flood flows as described under Reduction of Inflows to 0.8 maf/yr – Alternative 1: Phase 2.

Reduction of Inflows to 1.06 maf/yr – Alternative 5: Phase 2

Import of Central Arizona Salinity Interceptor (CASI): Under reduced inflows to 1.06 maf/yr, Alternative 5 would require inflow of CASI water as described for Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 2.

Reduction of Inflows to 0.8 maf/yr – Alternative 5: Phase 1

No additional actions are planned for Phase 1 since the 0.8 maf/yr inflow scenario is the same as the 1.06 maf/yr scenario during Phase 1, and, under the lowest inflow assumption, 0.8 maf/yr is not expected to be reached until well into Phase 2.

Reduction of Inflows to 0.8 maf/yr – Alternative 5: Phase 2

Alternative 5, phase 2 with reduction of inflows to 0.8 maf/yr would be the same as that described for reduced inflows to 1.06 maf/yr - Phase 2. However, at approximately year 2060, additional displacement or inflow would be necessary to maintain salinity and elevation targets.

2.5 COMMON ACTIONS

2.5.1 Overview

The following actions are common to all alternatives described in the previous section. Taken together these common actions, integrated with one of the alternatives described above, define plans that partially address the project's multiple goals and objectives. These initial actions will help halt further degradation of the Sea and will be supplemented by later actions developed under the adaptive management efforts of the Restoration Plan. Pilot projects are planned for each common action to finalize the specifications of each action and test its effectiveness. Because these pilot projects are likely to be implemented prior to publication of the Final EIS/EIR, separate environmental reviews will be conducted for each action, as necessary.

2.5.2 Fish Harvesting

Tilapia, feeding on benthic organisms, accumulate nutrients in the form of body mass throughout their lives. These nutrients are ultimately returned to the environment through death and decay. Harvesting tilapia is being considered as a method to reduce the internal nutrient load and fish population densities within the Salton Sea. In addition to reducing nutrient loads, reducing tilapia densities is expected to provide a healthier environment for the fishery and could improve the health of the tilapia population. Fish harvesting also provides a local industry. Tilapia would be commercially harvested and processed for marketable fertilizer or fish meal.

Boat dock facilities and a processing plant could be at one of several locations along the shore of the Salton Sea, including the Salton Sea Test Base or on Torres Martinez Indian Reservation lands. Figure 2.5-1 shows a conceptual design for a pier and appurtenant facilities to be located on the south corner of the northern evaporation pond within the Salton Sea Test Base site. If the evaporation ponds are not constructed, the pier could be at the site of the abandoned Navy pier along the diked area adjacent to the test base encampment area. The pier would be constructed to accommodate four berths, but only two berths would be used for harvesting fish; the other two berths would accommodate shoreline and nearshore cleanup operations.

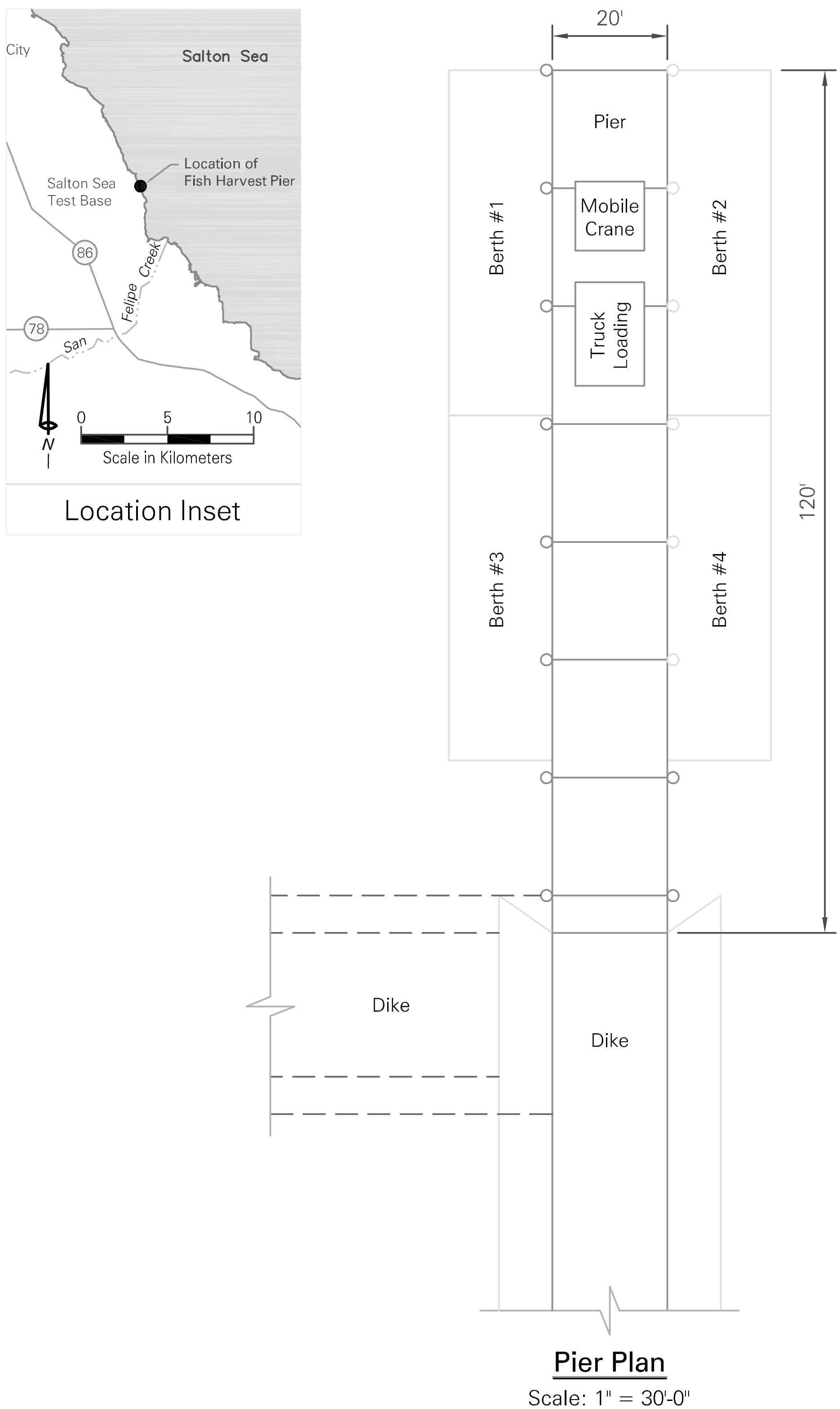
The facilities would cover approximately two acres and would include a 150-foot by 20-foot pier, capable of supporting the weight of a loaded dump truck and mobile crane, and a pier access road. A grinder facility would be required and would consist of a conveyor and loading hopper, grain silo, storage bins, diesel fuel storage, administrative and maintenance building, open storage space, and support equipment. The support equipment would include two commercial fishing boats, a mobile pier crane, dump trucks, front-end loader, maintenance truck, tub grinder, wash rack, and administrative vehicles.

Fish harvesting would involve diesel-powered fishing boats netting tilapia and transporting them to the pier, where the catch would be offloaded onto dump trucks by a mobile crane. The dump trucks would haul the fish to a tub grinder to be ground into fish meal or fertilizer, which would be transported to a silo using a conveyor system and stored until taken to an off-site processing plant. Dump trucks used to transport the fish would be washed down daily at a wash rack equipped with containment berms and an oil/water separator. The wastewater from the wash rack would be processed through a sewer system.

2.5.3 Improved Recreational Facilities

There are numerous public boat ramps around the Salton Sea that are in need of repairs. The main concerns are safety and usability, as some of the ramps require major rehabilitation. Some of the ramps have cracks and holes, several should be widened, and some should be replaced entirely. Some minor dredging will be required to provide access from most of the boat ramps to the water. Breakwaters or jetties may need to be constructed to block the movement of sand in front of the ramps. Some channelization may be required to provide deeper water for the boats where the seabed is too flat.

Major boat ramp rehabilitation would involve one-time dredging of approximately 10,000 cubic yards of material within about three acres of the Sea per ramp, with a temporary surface disturbance of approximately three acres. The workforce necessary for this task at each boat ramp is estimated to be three to six people, and the job would take about 90 days. Minor boat ramp rehabilitation would involve dredging approximately 5,000 cubic yards of material within about two acres of



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Fish Harvesting/Shoreline Cleanup Pier Plan

Salton Sea, California

Figure 2.5-1

the Sea per ramp; temporary surface disturbance would involve approximately two acres. The construction work force would be three to six people, and construction would take approximately 90 days.

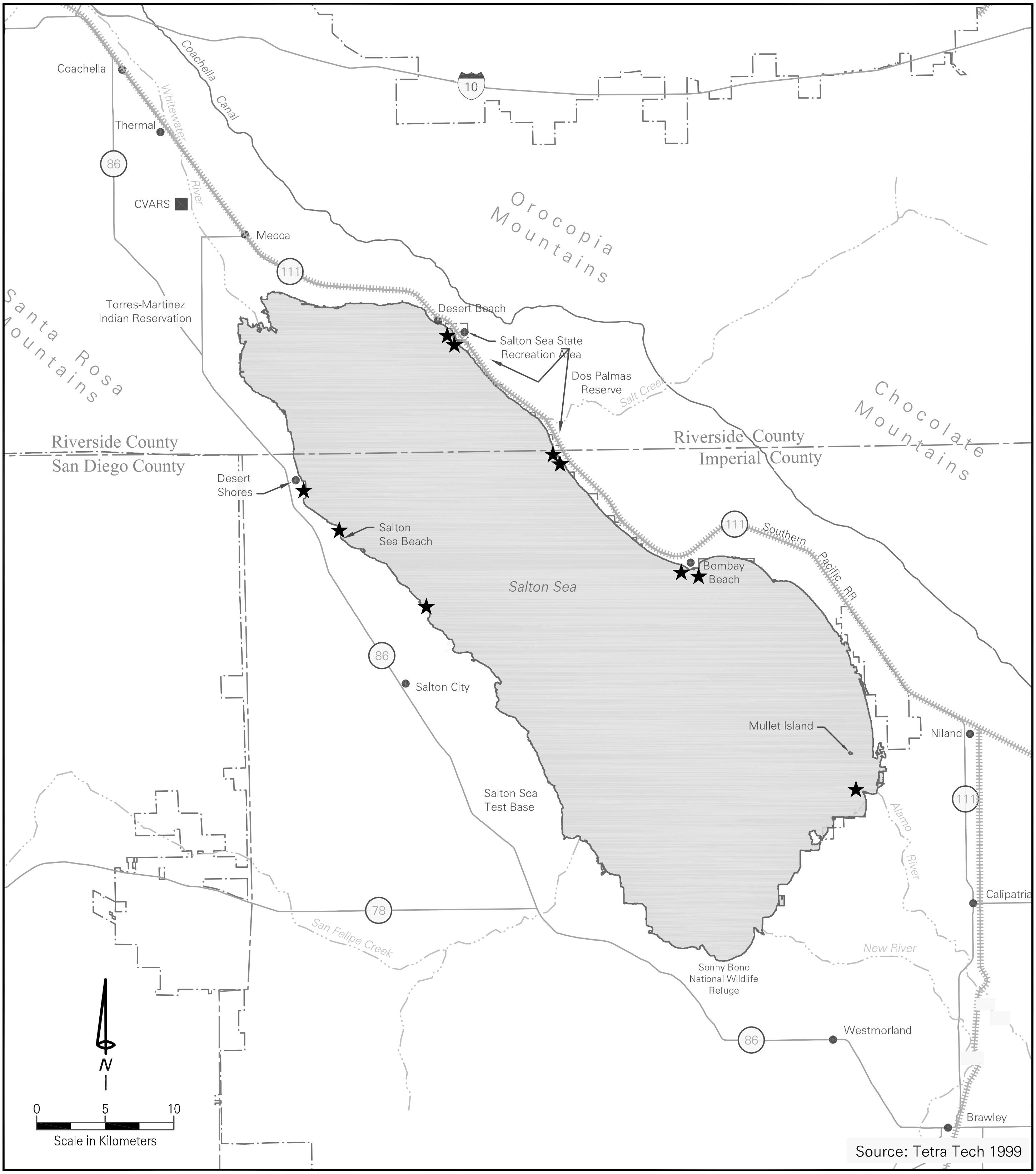
Boat ramp access roads are also in need of repairs. Many of the roads need patching, oiling, or resurfacing. Some of the roads are in very poor condition and need to be rebuilt. Major road reconstruction per ramp would involve temporarily disturbing the surface of approximately six acres and would involve four to eight workers over a period of about 90 days. Minor road rehabilitation per ramp would include patching, oiling, and/or chipping and sealing and would temporarily disturb the surface of approximately three acres. The workforce would include four to eight workers over a period of about 90 days. Construction traffic for all boat ramp and access road work would require temporary closures and detours until work is completed. Energy requirements are expected to be minimal. Rehabilitated boat ramps would be designed to operate within the elevation range expected under the selected alternative. Locations of existing public boat ramps and access roads are included on Figure 2.5-2.

2.5.4 Shoreline Cleanup

A shoreline cleanup program would consist of removing dead fish on the water surface and on the shoreline. Removing the fish would reduce odors and nutrients from the Sea. The Sea cleanup operation would use skimmer barges to retrieve fish floating on the water surface. The skimmer barges would have conveyor systems to pick up the dead fish and load them onto the barge. A minimum of two skimmer barges would be needed, one with a deep draft that could handle rough seas and one with a shallow draft that could get in close to the shoreline. Each barge would have a 50- to 60-ton haul capacity. Since similar facilities would be required for shoreline cleanup and fish harvesting activities, shared facilities would be constructed. (See the discussion on fish harvesting for details on the dock and appurtenant facilities.) In addition, an incinerator and holding bins would be constructed to support cleanup activities. The fish and other material collected from cleanup operations would be incinerated before being deposited in a landfill.

The beach cleaning equipment would involve a conveyor system that rakes the beach. The rake has hundreds of tines, mounted in offset rows, that rake the sand and remove broken glass, plastic, cigarette butts, straws, cans, half-inch to four-inch diameter stones, fish, fish bones, and small pieces of wood. The hopper capacity is one and a half-cubic yards. The tractor and rake can cover three to five acres per hour.

Shoreline cleanup would be conducted at public access locations, including but not limited to the Salton Sea Recreational Area, Sonny Bono National Wildlife Refuge, Bombay Beach, Desert Beach, Salton Sea Beach, Mecca Beach, Desert Shores, Salton City, and Niland.



Legend

★ Public Boat Launches

Existing Public Boat Docks

Salton Sea, California

Figure 2.5-2

2.5.5 Integrated Wildlife Disease Program

Bird and fish mortality at the Salton Sea can result in high profile events requiring rapid response actions. The ability to minimize losses from the various causes of disease depends on several factors, including early detection of outbreaks, timely, accurate diagnosis of the disease agent involved, appropriate response actions, and monitoring during the course of the event to determine if adjustments to response actions are needed. In the past, these principles have not been applied routinely at the Salton Sea due to lack of resources. However, the increasing frequency of bird die-offs during recent years and the severity of these losses demand increased efforts to reduce the number of bird deaths while solutions are being sought for restoring the health of this ecosystem.

An integrated, multi-agency effort involving the National Wildlife Health Center of the US Geological Survey (USGS), the USFWS, the Salton Sea Authority, and CDFG is intended to address this need. The Salton Sea Authority would provide field technician-level support for on-site methodical monitoring for wildlife die-offs at the Sea, response assistance, biological sample collection, and scientific information compilation relative to wildlife mortality at the Sea.

The National Wildlife Health Center will provide scientific oversight for the effort and will contribute resources by conducting diagnostic evaluations, including specimen processing in response to mortality events and by training technical support personnel. The center also will conduct field investigations, as warranted, regarding bird mortality events, will provide technical advice to the USFWS on disease control actions, and will participate in such activities to the extent warranted. USFWS will provide office space at the National Wildlife Refuge and some logistical support for the technical personnel. CDFG will provide diagnostic support for evaluating the causes of fish die-offs and will participate in combating major bird die-offs.

The program will provide support for a full-time field technician and for processing diagnostic samples that require special assays outside the scope of routine diagnostic capabilities or that significantly increase the caseload of the National Wildlife Health Center and CDFG. In addition, resources will be provided for supplemental field support for the technician, possibly through the Torres Martinez Indian Tribe. The technician and the National Wildlife Health Center will train such individuals to participate at the level needed.

2.5.6 Long-term Management Strategy

The Salton Sea Restoration Project could include both construction and management actions that would involve:

- Long-term operation and maintenance requirements;
- Scientific investigations of ecological conditions and relationships that either exist or develop in the Sea;
- Monitoring to determine the effectiveness of the actions implemented; and

- Potential opportunities to modify the actions to improve their effectiveness in meeting Project goals.

When a Project is recommended, a long-term management plan would be developed. The management plan would define activity coordination, project operational responsibilities, scientific research and monitoring responsibilities, and resource protection and management. The plan would be based on the concept that management is adaptable, given the recognized unknowns that exist in the Salton Sea ecosystem and the need for operational flexibility to respond to future monitoring and research findings and varying resource conditions. Physical and economical conditions would be considered in any proposed modification to project operation or implementation of any additional restoration measures. The plan would be designed to strengthen the restoration effort and to better meet the purpose and need of the project.

Consultation would be maintained with agencies of the Federal government (including the USFWS, the Bureau of Indian Affairs, and EPA), California state resource agencies, the California Regional Water Quality Control Board, affected tribal organizations, and with the general public, including representatives of academic and scientific communities, environmental organizations, and the recreation industry. The plan would define opportunities for information exchange and involvement by all parties.

A management work group would be selected by the lead agencies, and would include tribal representation. The management work group would make recommendations and facilitate consultation with all stakeholders and interested parties. The work group would be responsible for refining the goals defined in this EIS/EIR, defining management plan policy, preparing a final management plan (based upon the final decision and Congressional authorities), defining conditions needed for modifying operating criteria and other resource management actions and direction, and for overseeing and coordinating the implementation of the various components of the approved action (including construction, operations, mitigation, monitoring, and new investigations).

An additional critical role of the management work group is to coordinate the continued implementation of the selected action with other actions, identified in the discussion of cumulative effects, which may have positive or negative effects to the goals of this program. Opportunities for future cooperation with other entities such as state agencies (for example, CRWQCB for implementation of TMDLs) or local entities, such as IID for drainage management, in terms of timing, management, and perhaps funding can be investigated.

Finally, as the management program develops, adaptive management principles would be applied by the work group to assure that the management decisions made under conditions of uncertainty be monitored and evaluated in a scientifically sound manner for their effectiveness in attaining defined project goals.

The management work group would also coordinate the implementation of the Strategic Science Plan (see Section 2.5.7). The Science Plan, drafted by the science sub-committee, defines the long-term science needs and recommends effective management of the scientific effort into the future. The plan would include a scientific staff and monitoring and research activities (designed by qualified scientists) in direct response to commitments identified in the Record of Decision (ROD) and to the needs of management agencies. The Science Plan would be an integral part of planning and evaluation. A process would be developed to assure funding, to coordinate and communicate management agency needs to researchers, to develop recommendations for decision-making, and to transfer new scientific information to the management agencies. Independent, external review processes would be critical to this science component, and the scientific effort may be further enhanced by various technical working groups, an on-sea common use field station, and a coordinated database. It is critical to the process that the science staff is both independent of the management work group and yet responsive to their needs.

A critical role for the science staff would be to facilitate the development of a conceptual model of the Salton Sea ecosystem, providing a common frame of reference for scientists, stakeholders, and the interested public, and guiding long-term monitoring and focused investigations. This conceptual model would be an early priority of the science staff and would be a working tool, emphasizing processes rather than details. As information is developed and relationships are defined, quantitative models of the relationships defined in the conceptual model would be developed for predicting ecosystem responses to specific restoration actions.

2.5.7 Strategic Science Plan

The strategic science plan would include the following components:

- Conceptual modeling to guide both long-term monitoring and focused studies toward goals and objectives identified for the project;
- Monitoring to evaluate the success of restoration actions and to collect long-term data from which quantitative models could be validated;
- Quantitative modeling to generate hypotheses about these processes and ecosystem functions, which focused investigations then would explore;
- Focused investigations to fill in key information gaps, to support monitoring by identifying important measures that were not initially recognized, and to help in validating quantitative models;
- Technical assistance to involve time-responsive short-term needs, such as consultations, data synthesis and evaluation, and other scientific evaluations to guide management response and actions; and
- Data management to help integrate data among monitoring, focused investigations, modeling, and management.

This program would allow managers to adapt restoration actions to future ecological needs and assure scientific evaluation is an integral part of adaptive management. “Adaptive management” frequently is cited as an effective approach to managing natural systems; however, the term is widely misunderstood, and rarely is it actually undertaken. Under adaptive management, scientists design restoration actions and monitor the results, which restoration managers then use to make needed adjustments. Adaptive management works best if scientists design restoration experiments whose outcomes can be predicted and then measured. Restoration managers could then examine the scientists’ models, apply them to the problems they face, and send the models back to the scientists for fine-tuning.

The Executive Summary of the Strategic Science Plan is provided in Appendix B.

2.6 PHASE 2 EXPORT AND IMPORT OPTIONS

These actions have been developed on a programmatic level; thus, descriptions provided represent typical alignments and pipeline details that could be used. These actions, taken in conjunction in conjunction with Phase 1 actions, would be intended to provide long-term solutions to the problems at the Sea. Because none of these Phase 2 actions would be constructed for at least 15 to 30 years, detailed analyses of potential environmental consequences are not currently feasible. The joint leads plan to continue to develop and refine these actions. Once specifics are determined, additional environmental analysis would be performed. The actions discussed below are included as part of the larger alternatives presented in Section 2.4.

2.6.1 Export Options

Export of water from the Sea is included as an accelerated Phase 2 action as part of Alternative 1, if current average annual inflows continue. The following export options are being considered for this alternative.

Expanded EES

The large EES facility would be an expansion of the EES facility constructed during Phase 1. The area necessary for the expanded system is contained within the original areas shown on Figure 2.4-9. Pipelines and intakes constructed during Phase 1 to support alternative 2, 3, or 4 would be sufficient to carry the additional flows necessary to operate the expanded system under this alternative. The total number of modules would be increased by two thirds, and the quantity of water would be increased from 150,000 af/yr to 250,000 af/yr. Phase 1 units would continue to be operational and would require continued maintenance.

Export to Gulf of California

This action would involve pumping water directly out of the Salton Sea to the Gulf of California through an enclosed pipeline. The pipeline would terminate south of either Golfo de Santa Clara on the east or San Felipe on the west, immediately outside of the United Nations-designated biosphere. Alternately, the outfall structure could be extended approximately a mile into the Gulf of California. The screened intake structure would use the same design as that described for the EES and would be offshore of the Salton Sea Test Base site. The 112-inch diameter pipeline or canal would convey 250,000 af/yr of water, or 345 cfs, and would be constructed of polymer-lined steel. The pipeline route would extend 140 miles and would require two pumping stations to lift the water 453 feet. General pipeline alignments are indicated on Figure 2.6-1.

Export to Pacific Ocean

This action would involve pumping water directly out of the Salton Sea to the Pacific Ocean through an enclosed pipeline and tunnel that would terminate in Oceanside. The screened intake structure would use the same design as that described for the EES and would be offshore of the Salton Sea Test Base site. The 112-inch diameter pipeline would convey 250,000 af/yr, or 345 cfs, and would be constructed of polymer-lined steel. General pipeline alignment is indicated on Figure 2.6-1.

Export to Palen Dry Lakebed

This action could be implemented using either one of two approaches. Water could be pumped directly out of the Salton Sea or pumped as concentrated brine water to Lake Palen lakebed through an enclosed pipeline. If the water is pumped directly from the Sea, the screened intake structure would use the same design as that described for the EES. The intake would be located offshore of the Bombay Beach site. A 112-inch diameter pipeline would convey 250,000 af/yr (about 345 cfs) of water, and would be constructed of polymer-lined steel. If water is pumped as brine, it would most likely be pumped from an evaporation pond. General pipeline alignment is indicated on Figure 2.6-1.

2.6.2 Import through Yuma, Arizona

This action would involve the import of water that originates as a brine stream from the proposed CASI, through Yuma to the Salton Sea. The CASI is designed to transport brackish water by gravity from the Tucson and Phoenix areas to Yuma. This water would be less saline, at approximately 4,400 mg/L, than the existing Salton Sea water and would help reduce salinity and stabilize elevation if annual inflows are significantly reduced. CASI water is expected to be available in approximately 25 years, with the current plans for its disposal including discharge to the Gulf of California. Approximately 304,800 af/yr are estimated to become available for diversion to the Salton Sea. This amount of CASI water could be conveyed continuously at approximately 420 cfs through a newly constructed canal to parallel the existing, All-American Canal. Additional discussion of CASI is provided in section 2.4.2 under Reduction of Inflows to 1.06 maf/yr – Alternative 1: Phase 2.

2.7 PROJECTS INCLUDED IN CUMULATIVE IMPACT ANALYSIS

2.7.1 Overview

The CEQ regulations that govern the preparation of environmental impact statements provide that where federal actions would generate “cumulative impacts,” those impacts should be considered in relevant EISs (40 CFR 1508.25 [1988]). CEQA Guidelines (section 15130) require that cumulative impacts must be discussed when they are cumulatively considerable. The cumulative analysis evaluates a particular project viewed over time and in conjunction with other related past, present, and reasonably foreseeable future projects whose impact might compound or interrelate with those of the project at hand. The cumulative impact analysis presented here is prepared in response to this regulatory requirement. “Cumulative impact” is defined as the impact on the environment that results from the action when added to other past, present, and probable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 CFR 1508.7 [1988]).

In order to analyze cumulative effects, a region must be identified in which effects of restoration activities and other past, proposed, and reasonably foreseeable actions would be recorded or experienced. The cumulative effects region for Phase 1 restoration activities is generally defined as the Salton Sea watershed. It is defined as the entire watershed in order to identify and consider activities that may occur in the upper reaches of the watershed but that still could affect the objectives of the restoration activities (for example, implementing water quality improvement programs or water transfers).

The projects considered in the analysis of cumulative effects cover a broad range of regional and local actions. The list of projects (Table 2.7-1) has been developed with a focus on those that would have the most potential to have cumulative effects when combined with Phase 1 actions. Additional projects may be added in supplemental documents that are prepared to support decisions on Phase 2 actions.

Table 2.7-1 shows the resource areas that could potentially be affected by each project. The greatest probability that any given project would have cumulative effects would occur if the project could potentially cause some change to the future inflows to the Sea. With the competing demands for water in California, it is most likely that the cumulative effects of almost any combination of the projects listed in Table 2.7-1 would be a future reduction of inflows to the Sea. Rather than attempt to forecast the individual effects of each project, two reduced inflow scenarios have been evaluated for all alternatives including the No Action Alternative. These reduced inflow scenarios account for long term reductions to

Table 2.7-1
Summary of Resources Potentially Impacted by Cumulative Actions

	Environmental Resources																	
Cumulative Action	**Surface Water**	**Ground Water**	**Geology and Soils**	**Air Quality**	**Noise**	**Fisheries and Aquatic**	**Avian**	**Vegetation and Wildlife**	**Socioeconomics**	**Land Use**	**Agriculture**	**Recreation**	**Aesthetics**	**Public Health**	**Utilities**	**Cultural**	**Indian Trust**	**Environmental Justice**
California 4.4 Plan	X	X							X	X	X						X	X
Imperial Irrigation District Water Transfer Program	X	X							X	X	X							X
All American and Coachella Canal Lining Projects	X	X							X		X							
Total Maximum Daily Load Program	X					X					X							
Mexicali Wastewater System Improvements	X	X												X	X			
West Mojave Coordinated Management Plan						X	X	X		X								
Coachella Valley Multiple Species Habitat Conservation Plan						X	X	X										
Northern and Eastern Colorado Desert Coordinated Ecosystem Management Plan						X	X	X		X								
Lower Colorado River Desert Region Plan	X	X	X	X		X	X	X		X	X						X	
Colorado River Basin Watershed Management Strategy	X	X				X	X	X		X	X	X	X	X				
Coachella Valley/Salton Sea Nonpoint Source Project	X	X				X	X	X		X		X		X			X	
Coachella Valley Water Management Plan	X	X							X									
Mesquite Regional Landfill	X	X	X	X	X				X	X			X	X				
Newmont Gold Company's Expansion of the Mesquite (Gold Field) Gold Mine	X	X	X	X	X				X	X								
Gateway of the Americas Specific Plan as the New Port of Entry									X	X					X			X
Heber Wastewater Treatment System Project	X	X					X							X	X			
Drain Water Quality Improvement Plan—Imperial Irrigation District	X	X								X	X			X				
Dos Palmas Habitat Restoration/Enhancement						X	X	X		X		X						
Caltrans: Route 86 Expressway Mitigation						X	X	X										
Coachella Valley National Wildlife Refuge—Salt Cedar Removal								X										
Lewis Drain Treatment Facility	X	X									X							
Peach/Pampas Watershed Study	X	X									X							
Duck Club Evaporative Ponds	X	X									X							
Brawley, California Wetlands Project	X	X				X	X	X			X							
Whitewater River Flood Control Project	X									X				X				
Colorado River Basin Salinity Control Program	X	X								X	X							

the inflows to the Sea that could occur if a number of the projects listed in Table 2.7-1 are implemented. Within each resource discussion in chapter 4, the effects of both reduced inflow scenarios have been discussed for each alternative. These discussions in essence address the cumulative effects of any number of projects that could cause reductions to the inflows to the Sea. In addition, a discussion of any other specific cumulative effects is included near the end of each resource section in chapter 4. Environmental documentation prepared for any of the projects considered in the cumulative analysis is expected to include any specific impacts that project would have on the Salton Sea.

2.7.2 California 4.4 Plan

The rights of the Colorado River seven states (including California) and Mexico to use Colorado River water is governed by a body of permits, agreements, contracts, court decrees, acts, laws, and treaties collectively referred to as the “Law of the River” or “Colorado River Law.” California’s entitlement to divert and consumptively use Colorado River water under the Law of the River is 4.4 maf/yr, and 50 percent of any surplus water in any one year. The water use of the water has been allocated by Supreme Court decrees, the California Seven-Party Agreement, contracts with the Secretary of the Interior, and agreements among water entitlement holders.

Both Arizona’s and Nevada’s water uses are increasing and they will likely be fully using their Colorado River water entitlements in a few years, which will reduce the amount of water available to California. The Secretary of the Interior has requested that the Colorado River water users in California develop a plan to reduce their use of Colorado River water to within California=s basic entitlement.

Under the California 4.4 Plan framework, the Colorado River Board of California, the water users, and other interested parties will establish and agree on strategies by which California’s consumptive use of Colorado River water would be reduced over time to its basic apportionment of 4.4 maf/yr and 50 percent of any surplus water. This would be accomplished in phases, by water conservation, conveyance system improvements, water transfers, banking water, and the establishment of water budgets among those users who share an entitlement. The objective is to allow California time to reduce its use of Colorado River water as the states of Arizona and Nevada grow into their full use of their Colorado River water apportionments. Some of the actions contemplated would likely result in reduced irrigation drainage flowing to the Salton Sea.

2.7.3 Imperial Irrigation District Water Transfer Program

Depending on local conditions, San Diego County obtains up to 95 percent of its water from the MWD, which imports water from the Colorado River and receives water delivered by the Department of Water Resources through State Water Project facilities pursuant to Metropolitan’s State Water Project Contract. The San Diego County Water Authority (SDCWA) has negotiated an agreement for the long-term transfer of conserved water from the Imperial Irrigation District (IID). Under the proposed contract, IID customers would undertake water conservation efforts to reduce the use of Colorado River water within IID. Water conserved through these efforts would be transferred to SDCWA. Since the production of conserved water will depend on the level of voluntary landowner participation, the agreement does not specify an amount of water to be transferred. The agreement instead sets the transfer quantity at a maximum of 200,000 af/yr. The initial transfer quantity would be 20,000 af for the first year, with a build up of 20,000 af/yr thereafter for ten years or until the transfer amount is reached. An additional 100,000 af/yr of conserved water may be made available in the future to Coachella Valley Water District (CVWD).

The initial transfer target date is 2002 or whenever the conditions necessary for the agreement to be finalized are satisfied or waived, whichever is later. The initial term of the transfer agreement is 45 years from the effective date (after certain conditions are satisfied or waived) with a 30-year renewal option. These agreements could play a significant role in helping the Colorado River Board develop a plan that allows California to live within its 4.4 maf/yr water entitlement from the Colorado River.

The IID Water Transfer Environmental Impact Statement/Environmental Impact Report (EIS/EIR) will analyze options for conserving and transferring water. It is believed that at least one option will be on-farm conservation, another includes system improvements, which may include such improvements as lateral interceptors. On-farm conservation improvements such as pump-back systems could result in significant reductions of water to the Salton Sea. In a worst case scenario for the Salton Sea, for every one acre-foot conserved via a pumpback system could be one acre-foot transferred by the farmers. On-farm conservation would most likely result in increased concentrations of salts, selenium and other constituents remaining in the drains. As tail water is "conserved", tile water will make up a greater portion of total flows to the drains and the Sea. Other alternatives may have less harmful impacts on surface waters, such as conversion of land to less water intensive use (e.g. intermittent wetlands), temporary fallowing to finance pumpback systems and, of course, the no action, alternative. The IID/San Diego Transfer EIS is in the early stages of development and there will continue to be close coordination between the lead agencies.

2.7.4 All American and Coachella Canal Lining Projects

The All American Canal diverts approximately 3.4 maf/yr from the Colorado River for use in the Imperial and Coachella valleys. Approximately 100,000 af/yr seeps into the ground along unlined portions of the system. Public Law 100-675, approved on November 17, 1988, authorized the Secretary of the Interior to reduce the seepage of this water by implementing actions with non-Federal funds. Chapter 7 to Part 5 of Division 6 of the California Water Code appropriates money from the State's General Fund to finance and arrange for lining portions of the All American Canal and the Coachella Canal. In addition, California State Senate Bill 1765 provided specific funding to line portions of the system after a seepage study has been conducted. The seepage study was designed to determine the nature of subsurface and drainage canal water movements from the unlined canals to the Salton Sea and to existing wetlands adjacent to the Coachella Branch. The study (Tetra Tech 1999) used a numerical model to predict the amount of water that may be lost to the Salton Sea and nearby wetlands due to the canal lining projects. The seepage losses are thought to be somewhat uncertain due to the large distance and travel time from the canals. The reduction in seepage to the Salton Sea may range from 3,000 to 23,000 af/yr.

A Final EIS/EIR prepared by Reclamation in 1994 calls for lining a 23-mile section of the All American Canal to conserve approximately 67,700 af/yr of water. The ROD prepared by Reclamation in 1994 approved this preferred alternative. A Draft EIS/EIR prepared by Reclamation in 1993 calls for lining a 33.4-mile section of the Coachella Branch to conserve approximately 25,680 af/yr of water after providing water for wetlands mitigation. The canal lining projects are projected to be completed in 2006 (Chapter 7 to Part 5 of Division 6 of the California Water Code).

2.7.5 Total Maximum Daily Load Program

Congress, through the CWA, established the legal requirement that States list and rank impaired waterbodies, and that TMDLs be established for those waterbodies, in accordance with the priority ranking. Pursuant to the requirements of CWA §303(d) and 40 CFR 130.7, the CRWQCB – CRBR identified impaired waters.

Upon approval of the TMDLs by EPA, the State is required to incorporate the TMDLs, along with appropriate implementation measures, into the State Water Quality Management Plan. This is equivalent to a Basin Plan Amendment. CWC 13242 requires that a program of implementation for achieving water quality objectives be included in any Basin Plan Amendment. Pursuant to these requirements, the Regional Board will develop and adopt Implementation Plans for each TMDL for each listed water body/pollutant combination. Implementation Plans must include a description of actions necessary to achieve WQOs, a time schedule for actions to be taken, and a description of monitoring and surveillance activities to determine compliance with the objectives. The Regional Board will likely consider technical and economic feasibility when adopting the TMDL Implementation Plans. The Implementation Plans will utilize an adaptive management approach.

Although salt is listed as a constituent impairing the Salton Sea, the Regional Board, through its total dissolved solids (TDS) water quality objective for the Salton Sea, recognized that due to the “difficulty and predicted costliness of achieving stabilization of the Salton Sea, it is unreasonable for the Regional Board to assume responsibility for implementation of this objective.” It is CRWQCB – CRBR’s position that restoration of the Sea with respect to salt cannot be achieved through the TMDL process alone.

The CRWQCB – CRBR has identified quality limited waters including the New River, Alamo River, Imperial Valley Drains, Salton Sea, Palo Verde Outfall Drain, and Coachella Valley Stormwater Channel. The Salton Sea Watershed has also been identified as a priority watershed. CRWQCB is currently in the process of establishing TMDLs for these waters, as listed in Table 2.7-2. A TMDL implementation plan that is economically reasonable and technically feasible will be developed as part of this process. The long-term goal of the TMDL process will be to improve the quality of waters flowing into the Sea.

Table 2.7-2
Timeline for TMDLs

Waterbody	Priority	Pollutant	Start Date	Completion Date
New River	High	Silt	1998	2002
		Bacteria	1998	2005
		Nutrients	2002	2010
		Pesticides	2002	2013
		VOCs	2007	2013
Alamo River	High	Silt	1998	2000
		Selenium	2000	2010
		Pesticides	2002	2011
Imperial Valley Drains	High	Silt	1998	2000
		Selenium	2000	2010
		Pesticides	2005	2011
Salton Sea	Medium	Silt	1998	2001
		Selenium	2002	2007
		Nutrients	2002	2010
Palo Verde Outfall Drain	Medium	Bacteria	2005	2011
Coachella Valley Stormwater Channel	Low	Bacteria	2005	2011

2.7.6 Mexicali Wastewater System Improvements

Untreated or partially treated wastewater from Mexicali, Mexico, currently is discharged into the New River, which flows north into the United States and ultimately empties into the Salton Sea. The United States and Mexico, through the International Boundary Water Commission (IBWC), are planning short- and long-term improvements to the Mexicali wastewater system. These improvements include, among others, rehabilitating and expanding the Mexicali I wastewater treatment plant and constructing a Mexicali II wastewater treatment plant. The purpose of these improvements is to improve sanitation in Mexicali and to improve the quality of water discharged to the New River. After improvements, Mexicali may opt to redirect some or all of the treated wastewater for uses south of the border instead of discharging to the New River, potentially affecting the quantity of inflows to the Salton Sea.

2.7.7 West Mojave Coordinated Management Plan

The West Mojave Coordinated Management Plan is a comprehensive, interagency planning effort for conserving biological resources in the West Mojave region. In 1992, agencies within the West Mojave planning area established a multi-agency partnership to prepare this plan. This partnership includes five military installations in the region, three federal land management agencies, four state agencies, four counties, a water district, and 11 cities and towns.

The goal of the West Mojave planning process is to develop a cost-effective and efficient strategy for the planning area to recover listed species, to minimize the need to list species in the future, and to provide for community growth and resource utilization. The plan will benefit land users, land management agencies, and regulatory agencies by providing a streamlined permit process, by defining consistent mitigation and compensation obligations, and by reducing the need for biological surveys in certain areas, project-specific incidental take permits, and the uncertainty related to requirements for long-term species and habitat conservation. Management alternatives are being developed, and a draft habitat conservation plan (HCP) is scheduled for public distribution in 1999 (BLM 1997).

2.7.8 Coachella Valley Multiple Species Habitat Conservation Plan

This project entails the development of a multiple species HCP with the goals of protecting species of concern while improving the regulatory processes guiding species management. The HCP would enable incidental take permits to be issued for a variety of both listed and unlisted species that occur in the plan area. The planning area covers approximately 1,950 square miles in the Coachella Valley and the surrounding mountains of Riverside County and is being developed by the Coachella Valley Mountains Conservancy. Cooperating agencies also include the National Park Service (NPS), the Natural Resources Conservation Service (NRCS), the USFWS, the US Forest Service (USFS), the Bureau of Land Management (BLM), the CDFG, California Department of Parks and Recreation (CDPR), Riverside County, as well as private landowners and organizations. Scheduled completion of the project is early 2000.

2.7.9 Northern and Eastern Colorado Desert Coordinated Ecosystem Management Plan

The Northern and Eastern Colorado Desert Coordinated Ecosystem Management Plan is a multi-agency management plan for a wide range of habitats and species of concern. The planning area is approximately 5.5 million acres northeast of the Salton Sea. The project has two main goals. The first is to review the current land use plan, given the 1990 listing of the desert tortoise, which mandates new decisions on ground prescription proposals and land use. This includes each of the recovery units in the northern Colorado Desert, the eastern Colorado Desert, and the eastern half of Joshua Tree National Park. The second goal is to expand the planning effort to include other species and habitats of concern. Approximately 30 wildlife species and 50 plant species are included.

BLM is the lead agency for plan development, with cooperation from NPS, the US Marine Corps (USMC), USGS, USFWS, CDFG, Imperial County, and Riverside County. The management plan will become a binding plan for BLM, NPS, and the USMC gunnery range. Data gathering and analyses have been completed, and the plan is being finalized.

2.7.10 Lower Colorado River Desert Region Plan

This project addresses water and air quality issues related to approximately 700,000 acres of irrigated cropland in the Imperial and Coachella valleys of Imperial and Riverside counties. The project goals include the following:

- Reducing salinity levels in the soil and reducing soil compaction and stratification;
- Reducing nitrate and pesticide levels in drain waters entering the Salton Sea;

- Reducing the amount of nitrates leached into the ground water;
- Reducing the amount of pesticides in runoff and drain water;
- Reducing PM_{10} levels during the critical periods; and
- Development and implementation of TMDLs

NRCS is the lead agency for the project, with cooperation from private landholders, Native American groups, IID, and the Bard Resource Conservation District. The project is scheduled to be completed in early 2002.

2.7.11 Colorado River Basin Watershed Management Initiative

This basin-wide management initiative is an internal strategic planning mechanism aimed at identifying and prioritizing water quality issues in the Region. The initiative includes identifying actions that need to be taken to address water quality issues, and estimating the funding required to complete those actions. The Region's Watershed Management Initiative Chapter is updated annually. It is considered to be a 5-year horizon planning document to guide Regional Board efforts, to communicate water quality issues to management, and to provide interested parties with information regarding Regional Board activities.

The Salton Sea Transboundary Watershed was designated as a Category 1 (priority) Watershed under California's 1998 Unified Watershed Assessment (UWA). The California UWA was developed and implemented in response to the Clean Water Action Plan. The UWA was a collaborative process between the State and EPA and was developed to guide allocation of new federal resources for watershed protection.

2.7.12 Coachella Valley/Salton Sea Nonpoint Source Project

The Whitewater River conveys flow from wastewater plant discharge, agricultural drainage, and rainfall to the Salton Sea, which may present serious threats to wildlife and recreation in the area. This project is an integrated program to address the environmental problems of nonpoint source pollution in the Salton Sea and Whitewater River. The lead agency for this action is the Morongo Consortium of Coachella Valley Tribal Bands.

Project objectives are as follows:

- Promote the restoration of impaired beneficial uses of water resources;
- Develop and implement ground water protection measures;
- Develop partnerships with stakeholders in the watershed in a cooperative water quality monitoring effort;
- Construct wetlands test cells for treating agricultural drainage water with aquatic vegetation before it discharges to the Salton Sea;
- Make data generated under this project accessible to the general public;

- Implement Best Management Practices (BMPs) for controlling nonpoint source pollution; and
- Increase public awareness and participation in pollution prevention.

2.7.13 Coachella Valley Water Management Plan

This project plan would guide water management in the Coachella Valley through 2015. Water management strategies that address such issues as groundwater depletion may increase runoff to the Salton Sea by 50,000 to 60,000 af/yr by the end of the planning period. The Plan, and an EIR analyzing the potential environmental effects, are being developed by the Coachella Valley Water District.

2.7.14 Mesquite Regional Landfill

A Class III sanitary landfill is proposed on approximately 4,245 acres of land on and adjacent to the Mesquite Gold Mine and Ore Processing Facility northeast of Glamis in eastern Imperial County. Municipal solid waste from Southern California would be hauled to the proposed landfill by railroad. The estimated daily number of trains that would be required would be one train during Year 1 and up to 5 trains after Year 7. An estimated total of 268 long-term operations-related direct jobs would be created by the proposed project. The proposed landfill would be constructed and operated to meet all federal, state, and county standards regarding design, construction, and operation of a landfill. These include lining requirements, landfill gas and leachate recovery monitoring requirements, and closure requirements.

A draft EIS/EIR has been prepared to address the potential impacts and mitigation measures for constructing and operating the proposed Mesquite Regional Landfill project. The BLM is the lead agency for the purpose of complying with the requirements of NEPA, and Imperial County is the lead agency for the purpose of complying with the requirements of CEQA. Because BLM policy prohibits the establishment of new landfills on BLM-managed public lands, the applicant would have to acquire 1,750 acres of federal land through an exchange of privately owned land for the on-site federal land managed by the BLM. The privately owned land proposed for exchange includes the surface and subsurface rights of approximately 2,240 acres of land in the Santa Rosa Mountains Natural Scenic Area (SRMNSA) and near Chuckwala Bench Area of Critical Environmental Concern (ACEC).

2.7.15 Newmont Gold Company's Expansion of the Mesquite (Gold Field) Gold Mine

The proposed expansion of the Mesquite Gold Mine northeast of Glamis in eastern Imperial County includes expansion of several facilities, including extensions of the Big Chief Open Pit Mine and the Rainbow Open Pit Mine, expansion of Out-of-Pit overburden/interburden stockpile areas, construction of additional heap leach facilities, and construction of ancillary facilities, such as access roads and storm water diversion channels. Stormwater diversion channels will be constructed, and existing drainages within the project site will be modified.

2.7.16 Gateway of the Americas Specific Plan as the New Port of Entry

The Gateway of the Americas Specific Plan Area ("Gateway") is a master-planned industrial and commercial complex consisting of approximately 1,775 acres owned by private parties, as well as federal, state, and local agencies. The planning area is adjacent to the International Boundary, approximately six miles east of Calexico, and surrounds the new 87-acre International Port of Entry (POE) on the US side of the border. The Gateway would provide a broad array of industrial, commercial, and transportation-related services, as well as retail shopping, business offices, and lodging that would be required throughout the area as a result of the traffic that will be generated by the POE. The area is bounded on the west by the Ash Canal, on the north by a line parallel to the centerline of State Route 98, on the east by the Alamo River, and on the south by the northern right-of-way of the All American Canal. A specific plan has been completed for the project.

2.7.17 Heber Wastewater Treatment System Project

The Heber Wastewater Treatment Project involves expanding and upgrading the current wastewater facility in Heber, located approximately five miles north of the US/Mexican border in Imperial County. Discharge from the facility is into an agricultural drain that eventually flows into the Alamo River and ultimately the Salton Sea. Modifications would permit treating additional capacity and adding a disinfection facility.

2.7.18 Drain Water Quality Improvement Plan—Imperial Irrigation District

The project objectives are to protect the beneficial uses of waterbodies receiving agricultural drainage flows and to improve the water quality of the New River, the Alamo River, and the Salton Sea by establishing baseline water quality goals in the IID service area, by pinpointing pollution sources, and by implementing BMPs. The plan is being implemented by IID, with assistance from NRCS, USBR, USGS, and the Imperial Resource Conservation District.

2.7.19 Dos Palmas Habitat Restoration/Enhancement

This project is managing approximately 20,000 acres of nature preserve near the town of North Shore, on the northeast shore of the Salton Sea. The purposes of the project are as follows:

- Provide refuge for endangered species;
- Provide public recreation and educational opportunities; and
- Manage the watershed on an ecosystem basis to provide for natural functioning of processes.

An interdisciplinary team has developed a restoration plan, and components of the plan, including modifying 25 acres of wetland to create habitat for endangered species and a tamarisk removal program, have been implemented. BLM is the lead agency for this action.

2.7.20 Caltrans: Route 86 Expressway Mitigation

Caltrans is performing three types of mitigation along Route 86 in Riverside County. These include the following:

- Restoring 112 acres of alkali sink scrub habitat;
- Reconstructing 18.5 acres of wetlands; and
- Creating 20 acres of Desert pupfish habitat.

The last two mitigation measures have been completed, while the first is scheduled to be completed within the next two to three years.

2.7.21 Coachella Valley National Wildlife Refuge—Salt Cedar Removal

This project involves eradicating salt cedar (tamarisk) to restore 3,000 acres of habitat for the federally listed threatened Coachella Valley fringe-toed lizard. The project lead is the Coachella Valley Mountains Conservancy.

2.7.22 Lewis Drain Treatment Facility

The project involves constructing treatment facilities for agricultural drainage to reduce the selenium concentration in subsurface drainage water (tile water) and to explore reuse possibilities for agricultural surface water runoff. Tile runoff is diverted to a subsurface treatment pond where anaerobic activity would deplete the selenium concentration. Surface water runoff would be collected in a shallow pond to facilitate nutrient and pesticide removal. The project, undertaken by IID and USBR, is scheduled for completion in mid-2001.

2.7.23 Peach/Pampas Watershed Study

The Peach/Pampas Watershed Study was instituted to quantify the improvement of water quality in agricultural drains within a 3,000-acre watershed in Imperial County, following implementation of BMPs to reduce sediment load. Preproject data of sediment transport off individual fields and at a drain discharge point was collected. Sediment reduction BMPs will be implemented and post-project data will be compiled to estimate a reduction in sediment load. IID is the lead agency for this project, with cooperation from NRCS and private landholders. The project is scheduled for completion in the near term.

2.7.24 Duck Club Evaporative Ponds

This project diverts water from several drainage systems into ten evaporation ponds in order to deplete nutrients, pesticides, and selenium. The ponds are sampled at the inlet and outlet to determine the water quality impacts of the ponds and appropriate management techniques. Selenium levels in the water have decreased. IID is the lead agency for this project, with cooperation from Reclamation and private landholders. This action began in 1995 and is ongoing.

2.7.25 Brawley, California Wetlands Project

The long-term goal of this project is to find a cost-effective and reliable water quality treatment that will have local and statewide impact on agricultural drain pollution. The short-term goal is to improve impaired agriculture drain water quality so it can meet and support water quality objectives and designated beneficial uses. IID is the lead agency for this 3-yr study, which is supported by a single congressional appropriation with no secure long-term funding. The project is to be completed in late 2002.

Low-cost wetland technology will be tested as to its efficacy in treating agricultural drainage water and water in the New River. The wetlands are being designed to provide sediment removal and detention time for the treatment of nutrients and selenium. The level of removal is yet to be determined; however, it is believed that some level of treatment will occur. Two project sites are being considered—a 68-acre site in Imperial to treat drain water from the Rice 3 drain flowing into the New River and a seven-acre site in Brawley to treat New River water. The Brawley site will include diversion to a 7-acre wetland facility that will provide sediment removal and detention time for nutrients and selenium depletion. The data generated will assist in determining the total maximum daily load (TMDL) for silt development by providing a pilot study of silt reduction. Data also will be collected for TMDLs for selenium, pesticides, and nutrients.

2.7.26 Whitewater River Flood Control Project

The US Army Corps of Engineers, in partnership with the Coachella Valley Water District, is evaluating alternative measures for accomplishing flood protection within the Whitewater River basin. The project has the dual objectives of flood control and environmental preservation. A reconnaissance study was conducted in 1992, and a feasibility study is being prepared.

2.7.27 Colorado River Basin Salinity Control Program

This action, pursuant to the 1974 Colorado River Basin Salinity Control Act, Public Law 93-320, as amended, provides for the construction, operation, and maintenance of projects in the Colorado River Basin to control the salinity of water delivered to Mexico. A wide range of salinity control actions have been undertaken in the Colorado River basin as part of this program. These actions include construction of a desalting plant at Yuma, Arizona, lining of the Coachella Canal, development of a protective well field along the US/Mexico border, a replacement flow study, a salinity control program on BLM land, a voluntary on-farm salinity control program by USDA, and a program for funding basin-wide salinity control projects through competitive bid. This action is implemented by a variety of stakeholders and actions are coordinated by an interagency group, the Colorado River Basin Salinity Control Forum.

2.8 Regulatory Framework and Mitigation Monitoring

The Salton Sea Restoration Project will operate within the framework of a number of regulations designed to protect the environment. The regulatory requirements include water quality standards, water rights issues, biological resource protection, air quality standards, cultural resource protection, Indian Trust Assets, and public trust. A variety of permits will be required to conform to these regulatory requirements. In addition, a monitoring and reporting plan will be implemented to ensure that restoration actions conform to the regulatory requirements and perform as expected and that mitigation measured are applied appropriately. The most important of the regulatory requirements are summarized in Chapter 9, which also includes overviews of the permitting requirements and the mitigation monitoring and reporting plan.

2.9 SUMMARY COMPARISON OF THE ENVIRONMENTAL CONSEQUENCES

2.9.1 Phase 1 Alternatives

A summary of the environmental consequences of Phase 1 actions is provided in Table 2.9-1. All action alternatives would provide long-term beneficial effects to the aquatic and the avian habitat at the Sea. Other benefits could include socioeconomic recovery of the area. Some potentially significant adverse impacts have also been identified. Probably the greatest of these effects would be the visual impacts and loss of desert habitat associated with the ESS facilities that are part of alternatives 2, 3 and 4. In addition, for the evaporation ponds that are part of alternatives 1 and 4, concerns include release of brine material in the event of a dike failure, possible effects on birds that try to feed on fish in the highly saline ponds, Native American resource impacts, and the ultimate fate of salts that accumulate in the ponds.

2.9.2 Phase 2 Actions

Summaries of the environmental consequences of Phase 2 export actions are provided in Table 6-2. With the implementation of Phase 2 actions, program goals could be achieved except for the case where inflows are reduced to 0.8 maf/yr. In this case, it would be possible to achieve target salinity, but not target water surface elevation. Further discussion of the performance of Phase 2 alternatives is provided in Chapter 6. In general, the greatest potential for environmental impacts associated with Phase 2 actions would be in the receiving areas of the export alternatives.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Surface Water Resources					
Surface Water Elevation	Current Inflow: Elevation would increase to –224 ft msl by 2030. Reduced Inflow: Elevation would decrease below target with reduced inflows to –234 ft msl by 2030.	Current Inflow: After an initial increase to –223 ft, elevation would decrease to –229 ft msl by 2030. Reduced Inflow: Elevation would decrease below target with reduced inflows to –237 ft msl by 2030.	Current Inflow: After initial rise to –226 ft, elevation would decrease to target level of –232 ft msl by 2030. Reduced Inflow: Elevation would decrease below target with reduced inflows to–237 ft msl by 2030.	Current Inflow: After initial rise to –225 ft, elevation would decrease to –229 ft msl by 2030. Reduced Inflow: Elevation would decrease below target with reduced inflows to –235 ft msl by 2030.	Current Inflow: After initial rise to –226 ft, elevation would decrease to target level of –232 ft msl by 2030. Reduced Inflow: Elevation would decrease below target with reduced inflows to –236 ft msl by 2030.
Surface Water Quality	Current Inflow: Salinity would increase to 53,000 mg/L by 2030. Reduced Inflow: Salinity would increase to 75,000 mg/L by 2030.	Current Inflow: Salinity would decrease to 37,000 mg/L by 2030. Reduced Inflow: Salinity would increase to 46,000 mg/L by 2030. Increased size of fresh water mixing zone at tributary outlets. Temporary water quality degradation during dike construction from dredge sediment. Potential significant water quality impacts from evaporation pond if dike failure occurs.	Current Inflow: Salinity initially would increase to 47,000 mg/L then would decrease to 45,500 mg/L by 2030. Reduced Inflow: Salinity would increase to 54,000 mg/L by 2030. Potential salinity increase from salt transport to San Felipe Creek (windblown or seepage).	Current Inflow: Salinity initially would increase to 45,000 mg/L, then would decrease to 40,000 mg/L by 2030. Reduced Inflow: Salinity would increase to 47,000 mg/L by 2030. Increased size of fresh water mixing zone at tributary outlets. Temporary water quality degradation during dike construction from dredge sediment. Potential significant water quality impacts from evaporation pond if dike failure occurs.	Current Inflow: Salinity initially would increase to 45,000 mg/L, then would decrease to 41,000 mg/L by 2030. Reduced Inflow: Salinity initially would increase to 49,000 mg/L, then would decrease to 46,000 mg/L by 2030. Increased size of fresh water mixing zone at tributary outlets. Temporary water quality degradation during dike construction from dredge sediment. Potential significant water quality impacts from evaporation pond if dike failure occurs.
Sea Circulation	Current and Reduced Inflows: Negligible change in circulation pattern due to minor increase in elevation for current conditions, and minor increase in current velocities due to shallower water for reduced inflow conditions.	Current and Reduced Inflows: Interference by pond dikes may change circulation pattern in south basin leading to local sediment deposition and scouring areas. Slightly increased velocity due to shallower Sea for reduced inflow.	Current and Reduced Inflows: Minor increase in current velocity due to decreased elevation, similar to effects under No Action with reduced inflows.	Current and Reduced Inflows: Potential local changes in circulation due to interference from pond dikes, similar to Alternative 1.	Current and Reduced Inflows: Potential local changes in circulation due to interference from pond dikes, similar to Alternative 1.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Ground Water Resources					
Ground Water Hydrology	Current and Reduced Inflows: No effects on ground water.	Current and Reduced Inflows: Ground water effects depend on Sea elevation. Rising Sea elevation would increase base level of regional aquifer. May increase drainage problems in Coachella Valley. Lowering of Sea level would have opposite effect. No effect on perched water table, such as in Imperial Valley, because water table is recharged by irrigation and artificially drained. May reduce existing adverse effects of high water table in Coachella Valley.	Current and Reduced Inflows: Same as for Alternative 1. Impacts would be related to Sea elevation.	Current and Reduced Inflows: Same as for Alternative 1. Impacts would be related to Sea elevation.	Current and Reduced Inflows: Same as for Alternative 1. Impacts would be related to Sea elevation.
Ground Water Quality	Current and Reduced Inflows: No impacts on groundwater quality	Current and Reduced Inflows: Lowering regional water table may cause temporary improvement in ground water quality by increasing flow rate and reducing residence time of salts and contaminants. Increased base level and increased salinity may increase potential for saline water intrusion close to Sea. Change in elevation of Sea would not affect perched water table in Imperial County.	Current and Reduced Inflows: Same as for Alternative 1. Impacts would be related to Sea elevation.	Current and Reduced Inflows: Same as for Alternative 1. Impacts would be related to Sea elevation.	Current and Reduced Inflows: Same as for Alternative 1. Impacts would be related to Sea elevation
Geology and Soils					
Soils and Sediments	Current Inflows: No effect. Reduced Inflows: Bottom sediments, that could contain elevated levels of some chemical constituents of concern such as heavy metals would be exposed around the perimeter of the Sea.	Current and Reduced Inflows: Bottom sediments, that could contain elevated levels of some chemical constituents of concern such as heavy metals could be exposed around the perimeter of the Sea. There would be some reworking of soils and sediments at facility sites. Standard construction practices would be used to minimize erosion.	Current and Reduced Inflows: Soil and sediment impacts would be the same as described for Alternative 1.	Current and Reduced Inflows: Soil and sediment impacts would be the same as described for Alternative 1.	Current and Reduced Inflows: Soil and sediment impacts would be the same as described for Alternative 1.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Geologic Hazards	Current and Reduced Inflows: No impacts are expected.	Current and Reduced Inflows: Facilities could be damaged by earthquakes, but repairs would be made under long-term operation and maintenance program for the project. However, if damages caused a substantial increase in Sea salinity prior to repair, the effects on the Sea environment would be unavoidable.	Current and Reduced Inflows: Geologic hazard impacts would be the same as described for Alternative 1.	Current and Reduced Inflows: Geologic hazard impacts would be the same as described for Alternative 1.	Current and Reduced Inflows: Geologic hazard impacts would be the same as described for Alternative 1.
Air Quality					
Air Quality Conditions	Current Inflows: No direct or indirect impacts on air quality conditions. Reduced Inflows: areas exposed by receding water levels would generally be expected to revegetate slowly in a manner consistent with adjacent shoreline areas, resulting in minimal potential for increased wind erosion problems. The decline in water levels would not be expected to produce significant new salt deposits around the shoreline.	Current and Reduced Inflows: Construction of ponds would result in significant fugitive dust and vehicle emissions during the construction period. Because there would be limited public access to the construction site or haul road vicinity, public exposure to high PM_{10} concentrations would be limited. The construction work force would be the major affected population.	Current and Reduced Inflows: Construction of the EES would result in fugitive dust and vehicle emissions during the construction period. Operation of the EES could result in significant salt drift downwind of the EES system during periods of strong winds.	Current and Reduced Inflows: Construction of ponds would result in significant fugitive dust and vehicle emissions during the construction period. Because there would be limited public access to the construction site or haul road vicinity, public exposure to high PM_{10} concentrations would be limited. The construction work force would be the major affected population. Operation of the EES could result in significant salt drift downwind of the EES system during periods of strong winds.	Current and Reduced Inflows: Construction of ponds would result in significant fugitive dust and vehicle emissions during the construction period. Because there would be limited public access to the construction site or haul road vicinity, public exposure to high PM_{10} concentrations would be limited. The construction work force would be the major affected population. Alternative 5 would have a lower potential for off-site salt drift impacts than the other EES system alternatives.
Air Quality Planning	Current and Reduced Inflows: No direct or indirect impacts on air quality conditions.	Current and Reduced Inflows: Emissions from on-site construction activities could require a Clean Air Act conformity review. Options for achieving compliance with the Clean Air Act conformity rule are limited. If diesel-fueled pumps are used for the evaporation ponds, they would require permits from the Imperial County Air Pollution Control District.	Current and Reduced Inflows: Emissions from on-site construction activities could require a Clean Air Act conformity review. Constructing and operating the EES system would require air quality permits. Permit conditions may include restrictions on system operation during high winds, minimum buffer area requirement, and various reporting or monitoring requirements.	Current and Reduced Inflows: Emissions from on-site construction activities could require a Clean Air Act conformity review. If diesel-fueled pumps are used for the evaporation ponds, they would require permits from the Imperial County Air Pollution Control District. Constructing and operating the EES system also would require air quality permits with possible permit conditions.	Current and Reduced Inflows: Emissions from on-site construction activities could require a Clean Air Act conformity review. If diesel-fueled pumps are used for the evaporation ponds, they would require permits from the Imperial County Air Pollution Control District. Constructing and operating the EES system also would require air quality permits with possible permit conditions.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Noise					
Noise Effects	Current and Reduced Inflows: No direct noise effects since no new noise sources would be introduced, and no increases in noise levels would occur. Potential minor indirect decrease in noise levels if the condition of the sea continued to degrade and vehicle traffic to the Sea and watercraft use on the Sea decreased.	Current and Reduced Inflows: Minor short-term local construction noise from use of heavy construction equipment, truck traffic, and dredging. Minor operational-related noise effects from additional dredging and truck hauling, cleanup and fish harvesting operations.	Current and Reduced Inflows: Minor short-term local construction noise, but less than that described for Alternative 1 because less earthmoving would be required. Minor operational-related noise effects from pump operations and heavy truck hauling, cleanup and fish harvesting operations.	Current and Reduced Inflows: Minor short-term local construction noise, greater than that described for Alternative 1 because a larger area would be disturbed. Minor operational-related noise effects from additional dredging and heavy truck hauling, cleanup and fish harvesting operations.	Current and Reduced Inflows: Minor short-term local construction noise similar to Alternative 1. Potential significant but mitigable impacts from ground-based EES system. Minor operational-related noise effects from additional dredging and heavy truck hauling, cleanup and fish harvesting operations.
Fisheries and Aquatic Ecosystems					
Lower Trophic Levels	Current Inflow: Significant impacts due to salinity increases. Potential loss of rotifer, copepod and barnacle populations, significantly changing the invertebrate population dynamics. Reduced Inflow: In addition to impacts described above, would likely cause an initial increase in polychaete density followed by a rapid decline as salinities continue to rise.	Current Inflow: Significant and mitigable short-term impacts during construction from effect of increased turbidity, accelerated local eutrophication, oxygen depletion, food chain impacts, and introduction of trace elements. Minor adverse impact from decrease in available habitat as a result of the evaporation ponds. Overall beneficial impacts, as the evaporation ponds would stabilize salinity levels and control the elevation of the Sea. Long-term beneficial effect on barnacles as the creation of dikes would provide new substrate for habitat. Reduced Inflow: Same as described above with additional habitat loss due to reduced Sea elevation.	Current Inflow: Minor short-term impacts during construction. Long term beneficial impacts due to control of salinity levels and Sea elevation stabilization. Reduced Inflow: Minor short term impacts during construction. Salinity levels will take longer to stabilize (compared with current inflow) and may result in a loss of rotifer, copepod, and barnacles during Phase 1.	Current Inflow: Same impacts as described for Alternatives 1 and 2. Reduced Inflow: Same as described above with additional habitat loss due to reduced Sea elevation.	Current Inflow: Same impacts as described for Alternatives 1 and 2. Reduced Inflow: Same as described above with additional habitat loss due to reduced Sea elevation.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Fish	Current Inflow: Significant negative impacts due to the salinity increase. Loss of sport fish species; corvina, sargo, and possibly croaker. In addition there will be a significant change in the invertebrate populations which make up the food base. Reduced Inflow: In addition to the impacts described above, increased salinities may result in the loss of tilapia and possibly desert pupfish populations.	Current Inflow: Significant and mitigable short-term impacts during construction from disturbance of seasonal patterns (i.e. spawning) if construction activities interfere with breeding of fish species. Minor impact from decrease in available habitat as a result of the evaporation ponds. Overall long-term beneficial impacts, as the evaporation ponds would stabilize salinity levels and control the elevation of the sea. Reduced Inflow: Same as described above with additional habitat loss due to reduced Sea elevation.	Current Inflow: Minor short-term impact during construction. Long-term beneficial impacts due to control of salinity levels and Sea level stabilization. Reduced Inflow: Minor short-term impacts during construction. Salinity will take longer to control and may result in loss of corvina, sargo and croaker during Phase 1. Additionally, imported flood flows may negatively impact fish populations in the Alamo River due to flushing flows.	Current Inflow: Impacts would be the same as described for Alternatives 1 and 2. Reduced Inflow: Same as described above with increased habitat loss due to reduced Sea level elevation. Additionally, imported flood flows may negatively impact fish populations in the Alamo River due to flushing flows.	Current Inflow: Same impacts as described for Alternatives 1 and 2. Reduced Inflow: Same as described for Alternative 4.
Special Status Species	Current Inflow: No significant impact to desert pupfish. Reduced Inflow: Significant negative impacts to desert pupfish populations as salinity levels increase.	Current Inflow: Significant adverse short-term impacts as construction of evaporation ponds would involve activities in shallow water corridors used for pupfish movement between drainages. These activities will be mitigated by the construction of the pupfish pond. Long-term beneficial impacts due to salinity and elevation control. Reduced Inflow: Same as described above with additional loss of shallow water corridors due to reduced elevation of the Sea.	Current Inflow: Minor short-term impact during construction. Long-term beneficial impacts due to control of salinity levels and Sea level stabilization. Reduced Inflow: Similar impacts as described above. Additionally, imported flood flows may negatively impact pupfish populations due to flushing and temporary predation.	Current Inflow: Same as those described for Alternatives 1 and 2. Reduced Inflow: Same as those described for Alternative 2.	Current Inflow: Same impacts as described for Alternatives 1 and 2. Additionally, there would be beneficial impacts from the creation of the North wetland habitat and pupfish pond, which serve to protect shallow water habitats. Reduced Inflow: Same as those described for Alternative 2.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Sport Fisheries	Current Inflows: Significant negative impacts, including loss of corvina, sargo and possibly croaker. Reduced Inflows: In addition to the impacts described above, increased salinities may result in the loss of the tilapia population thereby eliminating the sport fishery.	Current Inflow: Long-term beneficial impact to fish due to improvements in salinity levels. Reduced Inflow: Same beneficial impacts as described above. Some adverse impacts resulting from the loss of habitat due to reduced Sea elevation.	Current Inflow: Minor short-term impact during construction. Long-term beneficial impacts due to the control of salinity level and Sea level stabilization. Reduced Inflow: Control of salinity will take longer than described under current inflow conditions. Consequently, corvina, sargo and croaker may be lost during phase 1 due to increased salinity levels.	Current Inflow: Same impacts as described for Alternatives 1 and 2. Reduced Inflow: Same impacts as described for Alternative 1.	Current Inflow: Same impacts as described for Alternatives 1 and 2. Reduced Inflow: Same impacts as described for Alternative 1.
Avian Resources					
Bird Species	Current Inflow: Significant and unmitigable avian resource impacts would occur due to increased salinity. Reduced Inflow: Significant and unmitigable avian resource impacts would occur due to increased salinity. In addition the Sea level would be lowered causing a loss of nearshore habitat and exposing Mullet Island to predation.	Current Inflow: Significant and mitigable impacts during construction from direct loss of avian habitat. Significant beneficial impacts to aquatic avian species with reduced salinity levels in the Sea. Addition impacts would occur if species try to feed on fish in the highly saline evaporation ponds. and losses to nearshore habitat from lowered lake level. Potential beneficial effects if reduced salinity would prevent loss of prey base for these species. Reduced Inflow: Impacts similar to current inflows except losses to nearshore habitat would be less.	Current Inflow: Significant and unmitigable impacts to upland avian species from loss of 7,500 acres of desert habitat used for foraging and nesting, exposure to highly toxic waters, collision with spray towers, and salt encrustation. Small loss of nearshore habitat due to lowered Sea elevation Long-term beneficial effects for avian species dependent on the Salton Sea aquatic ecosystem by improving salinity levels and water quality. Reduced Inflow: Similar to above but with little loss of nearshore habitat and greater beneficial impacts due to reduced salinity.	Current and Reduced Inflows: Impacts would the similar as those described for both alternatives 1 and 2.	Current Inflow: Significant unmitigable impacts to upland avian species from a loss of 600 acres of nearshore habitat and loss of habitat due to construction activities. Addition impacts would occur if species try to feed on fish in the highly saline evaporation ponds. Significant beneficial impacts would result from reduced salinity. Reduced Inflow: Similar to above for Current Inflows.
Special Status Species	Current and Reduced Inflows: Impacts would the same as those described above for bird species	Current and Reduced Inflows: Impacts would the same as those described above for bird species.	Current and Reduced Inflows: Impacts would the same as those described above for bird species.	Current and Reduced Inflows: Impacts would the same as those described above for bird species.	Current and Reduced Inflows: Impacts would the same as those described above for bird species.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Vegetation and Wildlife					
Plant Commun-ities	Current Inflow: Loss of approximately 348 acres of wetlands from increased salinity. Reduced Inflow: Losses of wetlands would be increased by increased salinities and lower Sea level.	Current Inflow: Minor adverse impact to wetlands due to construction, operations and possible circulation changes. Reduced Inflows: Similar to above for current inflows.	Current Inflow: Loss of 7,500 acres of desert habitat and associated vegetation would result in significant and unmitigable impacts on vegetation and wildlife. Impacts would result from direct loss of plants, local wildlife species that depend on habitat for food, cover, and reproduction, and resultant loss of prey base for predator species. Long -term benefits of improved salinity levels and water quality to wetland vegetation. Reduced Inflow: Similar to above for current inflow.	Current and Reduced Inflows: Impacts would be similar to those described for Alternatives 1 and 2.	Current Inflow: Significant and unmitigable impacts to nearshore habitat by the lower Sea level. Mitigable impacts to upland habitat would result from construction activities and the construction of the haul road. Beneficial impacts to wildlife species dependent on the Sea would result from lower salinity levels. Reduced Inflow: Similar to above for current conditions but with little loss of nearshore habitat.
Special Status Species	Current Inflow: Potential impacts to California black rail due to loss of habitat. Reduced Inflow: Increased loss of California Black rail habitat.	Current and Reduced Inflows: No impact to special status species.	Current and Reduced Inflows: Loss of 7,500 acres of desert habitat and associated vegetation would result in significant and unmitigable impacts on vegetation and wildlife.	Current and Reduced Inflows: Impacts would be similar to those described for Alternative 1 and 2.	Current and Reduced Inflows: No impacts to special status species.
Sensitive Habitats	Current Inflow: Loss of Wetlands due to increased salinity. Reduced Inflow: Greater loss of wetlands due to higher salinity levels and lower lake levels over current inflow conditions.	Current and Reduced Inflows: Minor adverse impacts to wetlands due to construction, operations and possible circulation changes..	Current and Reduced Inflows: Similar to Alternative 1.	Current and Reduced Inflows: : Similar to Alternative 1.	Current and Reduced Inflows: : Similar to Alternative 1.
Sensitive Plants	Current and Reduced Inflows: No impact to sensitive plants.	Current and Reduced Inflows: No impact on sensitive plants.	Current and Reduced Inflows: Loss of 7,500 acres of desert habitat and associated vegetation could have a significant and unmitigable impact on sensitive plants.	Current and Reduced Inflows: Impacts would be similar to those described for Alternative 2.	Current and Reduced Inflows: Impacts would be similar to those described for Alternative 2.
Socioeconomics					
Regional Econ.	Current and Reduced Inflows: Deterioration in water quality and the eventual loss of wildlife would cause adverse effects from a decline in recreational use and related commercial activities, reduced employment, and reduced property values.	Current and Reduced Inflows: Employment during the construction phase would generate negligible to slightly beneficial effects on employment and wages. Increased recreational use of the Sea would spur associated commercial and residential development.	Current and Reduced Inflows: Effects would be similar to those described under Alternative 1.	Current and Reduced Inflows: Effects would be similar to those described under Alternative 1.	Current and Reduced Inflows: Effects would be similar to those described under Alternative 1.
Public Finance	Current and Reduced Inflows: No impact on public finances	Current and Reduced Inflows: Any increased need for public services	Current and Reduced Inflows: Effects would be similar to those	Current and Reduced Inflows: Effects would be similar to those	Current and Reduced Inflows: Effects would be similar to those

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
	would be expected.	would be offset by increases in local tax revenues from project-related spending.	described under Alternative 1.	described under Alternative 1.	described under Alternative 1.
Demo-graphics and Housing	Current and Reduced Inflows: No impact on demographics or housing would be expected.	Current and Reduced Inflows: Construction would have a negligible effect on area population and housing as much of the construction workforce is expected to come from outside the area and require temporary housing.	Current and Reduced Inflows: Effects would be similar to those described under Alternative 1.	Current and Reduced Inflows: Effects would be similar to those described under Alternative 1.	Current and Reduced Inflows: Effects would be similar to those described under Alternative 1.
Land Use and Planning					
Local Land Use Plans and Policies	Current Inflow: No conflict with local land use plans and policies. No impact to urban land uses. Reduced Inflow: Significant and unmitigable impact would occur as a result of decreased Sea level and consequent changes in land use patterns.	Current inflows: No significant conflict with local land use plans and policies. Urban land use patterns and economic viability could improve if restoration activities are successful, a beneficial effect.. Construction activities would not be compatible with prescribed military use at the Salton Sea Test Base, but would not be a significant effect.. Commercial and industrial land use patterns and economic viability could improve if restoration activities are successful, a beneficial effect. Reduced Inflow: Effects would be similar to those described under the No Action Alternative.	Current inflows: The EES would be inconsistent with permitted uses in the area, and given the scale and industrial nature of this facility, would result in a significant and unmitigable impact. Effects on urban land uses would be similar to those described under Alternative 1. Reduced Inflow: Additional significant and unmitigable impact similar to that described under the No Action Alternative.	Current inflow: The EES would be inconsistent with permitted uses in the area, and given the scale and industrial nature of this facility, would result in a significant and unmitigable impact. Reduced Inflow: Additional significant and unmitigable impact similar to that described under the No Action Alternative.	Current inflow: The EES would be inconsistent with permitted uses in the area, and given the scale and industrial nature of this facility, would result in a significant and unmitigable impact. Reduced Inflow: Additional significant and unmitigable impact similar to that described under the No Action Alternative.
Agricultural Land Resources					
Ag. Land Use	Current and Reduced Inflows: No effects on agricultural land use.	Current and Reduced Inflows: No effects on agricultural land use.	Current and Reduced Inflows: Less than significant impacts to agricultural land use.	Current and Reduced Inflows: Less than significant impacts to agricultural land use.	Current and Reduced Inflows: Less than significant impacts to agricultural land use.
Ag. Econ.	Current and Reduced Inflows: No effects on agricultural economics.	Current and Reduced Inflows: No effects on agricultural economics.	Current and Reduced Inflows: No effects on agricultural economics.	Current and Reduced Inflows: No effects on agricultural economics.	Current and Reduced Inflows: No effects on agricultural economics.
Recreational Resources					
Local and Regional Rec-reation	Current and Reduced Inflows: Increased salinity levels and unstable elevation would have a significant adverse impact on recreational resources.	Current and Reduced Inflows: Less than significant effect from loss of Sea used for boating and other water-based uses and loss of wildlife viewing opportunities. Short-term less than significant construction effects on recreation uses. Possible indirect negative impact to recreation	Current and Reduced Inflows: Moderately significant impacts to land-based recreation access and facilities and water-based recreational facilities and operations. Possible indirect negative impact to recreation experience resulting from aesthetic degradation. Potential	Current and Reduced Inflows: Possible indirect negative impact to recreation experience resulting from aesthetic degradation along State Route 86. Short-term less than significant construction effects on land-based recreation uses. Potential long-term beneficial effects for	Current and Reduced Inflows: Impacts would be the same as those described for both Alternatives 1 and 3.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
		experience resulting from aesthetic degradation along shoreline. Potential long-term beneficial effects for boating and water access facilities and overall recreation interests.	long-term beneficial effects for boating and water access facilities and overall recreation interests.	boating and water access facilities and overall recreation interests.	
Visual Resources and Odors					
Visual Resources	Current Inflow: No significant visual impacts. Reduced Inflow: Significant visual impacts would be expected, having a moderate to strong visual contrast with the surrounding landscape.	Current Inflow: Significant and unmitigable visual impacts during construction to viewers in Salton City and Desert Shores, as well as motorists driving SR 86. Both significant and less then significant visual impacts during facility operations to viewers in Salton City, Desert Shores, and driving SR 86. Reduced Inflow: Less then significant visual impacts are expected during construction to viewers in Red Hill Marina, SR 111, and Torres Martinez Reservation. Significant visual impacts to viewers in Red Hill Marina. Less then significant visual impacts will occur for motorists on SR 111 and residents of the Torres Martinez Reservation.	Current Inflow: Less than significant visual impacts during construction. Significant visual impacts during facility operations to residents in Lark Spa, Fountain of Youth, visitors to the Dos Palmas Reserve, and motorists driving along SR 111 and SR 86. Reduced Inflow: Impacts related to construction activities are similar to those discussed under Alt. 1 reduced inflow conditions. Views of the EES facility would not be substantially different from the Current Inflow scenario.	Current Inflow: Both construction and facility impacts would be similar to those discussed in Alternatives 1 and 3. Reduced Inflow: Impacts would be similar to those discussed in Alternative 1 and 2 reduced inflow conditions.	Current Inflow: Both construction and facility impacts would be similar to those discussed in Alternatives 1 and 3. Reduced Inflow: Impacts for both construction and facility operations would be similar to Alternative 1 reduced inflow.
Odors	Current and Reduced Inflows: May result in an increase in noxious odors if current flows cause an increase in conditions that produce odors.	Current Inflow: Temporary odors expected while dredging sludge materials. More permanent odors could result if ponds generate algal blooms, but would be partially offset by fewer algal blooms, fish kills, and avian kills in the Sea. Operation of a fish processing plant could result in significant odor problems but could be mitigated with control technology. Reduced Inflow: Potential increase in noxious odors if reduced flows in the Sea cause conditions that produce an increase in odors.	Current Inflow: Beneficial effect if reduced salinity levels result in fewer algal blooms, fish kills, and avian kills. Impacts and potential mitigation measures for a fish processing plant would be the same as discussed under Alternative 1. Operation of a fish processing plant could result in significant odor problems but could be mitigated with control technology. Reduced Inflow: Potential increase in noxious odors if reduced flows in the Sea cause conditions that produce an increase in odors.	Current Inflow: Temporary odors expected while dredging sludge materials. More permanent odors could result if ponds generate algal blooms, but would be partially offset by fewer algal blooms, fish kills, and avian kills in the Sea. Operation of a fish processing plant could result in significant odor problems but could be mitigated with control technology. Reduced Inflow: Potential increase in noxious odors if reduced flows in the Sea cause conditions that produce an increase in odors.	Current Inflow: Temporary odors expected while dredging sludge materials. More permanent odors could result if ponds generate algal blooms, but would be partially offset by fewer algal blooms, fish kills, and avian kills in the Sea. Operation of a fish processing plant could result in significant odor problems but could be mitigated with control technology. Reduced Inflow: Potential increase in noxious odors if reduced flows in the Sea cause conditions that produce an increase in odors.

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Public Health and Environmental Hazards					
Unexplod-ed Ordnance	Current and Reduced Inflows: No effect on unexploded ordnance.	Current and Reduced Inflows: A potentially significant mitigable impact could result from disturbing unexploded ordnance during construction activities at the Salton Sea Test Base, which could endanger the safety of construction workers.	Current and Reduced Inflows: Alternative 2: no effect on unexploded ordnance. Alternative 3: same as described for Alternative 1.	Current and Reduced Inflows: Same as described for Alternative 1.	Current and Reduced Inflows: Same as described for Alternative 1.
Biological Pathogens	Current Inflow: no effect on biological pathogens. Reduced inflow: possible increase in biological pathogen levels.	Current and Reduced Inflows: possible increase in biological pathogen levels.	Current and Reduced Inflows: Same as described for Alternative 1.	Current and Reduced Inflows: Same as described for Alternative 1.	Current and Reduced Inflows: Same as described for Alternative 1.
Insect-borne Diseases	Current Inflow: slight increase in the potential for transmission of mosquito-borne diseases Reduced inflow: reduced potential for transmission of mosquito-borne diseases.	Current and Reduced Inflows: temporary increase in potential for transmission of mosquito-borne diseases followed by a sustained decrease.	Current and Reduced Inflows: reduced potential for transmission of mosquito-borne diseases.	Current and Reduced Inflows: Same as described for Alternatives 2 and 3.	Current and Reduced Inflows: Same as described for Alternatives 2 and 3.
Chemical Hazards	Current Inflow: no effect on chemical hazards. Reduced Iinflow: potential increase in the selenium health hazard for fish consumers. Potential exposure of contaminated sediments resulting from the decline in Sea level.	Current and Reduced Inflows: Construction activities could temporarily increase the concentration of selenium in the Sea, but the effect would not be significant. Less-than-significant effects from petroleum product spills. Potential increase in selenium health hazard for fish consumers. Potential exposure of contaminated sediments resulting from the decline in Sea level. Increased use of motorized watercraft would increase releases of petroleum fuels and oils.	Current and Reduced Inflows: Same as those described for Alternative 1.	Current and Reduced Inflows: Same as those described for Alternative 1.	Current and Reduced Inflows: Same as those described for Alternative 1.
Utilities and Public Services					
Utilities	Current and Reduced Inflows: No impacts are expected.	Current and Reduced Inflows: Some increased demand for local utilities; not expected to result in a significant adverse effect on local utility suppliers.	Current and Reduced Inflows: Some increased demand for local utilities; not expected to result in a significant adverse effect on local utility suppliers. For Alternative 2, high-power lines and towers would need to be relocated, a significant and mitigable impact.	Current and Reduced Inflows: Some increased demand for local utilities; not expected to result in a significant adverse effect on local utility suppliers.	Current and Reduced Inflows: Some increased demand for local utilities; not expected to result in a significant adverse effect on local utility suppliers
Public Services	Current and Reduced Inflows: No impacts	Current and Reduced Inflows: Increased delays	Current and Reduced Inflows: Temporary	Current and Reduced Inflows: Increased delays	Current and Reduced Inflows: Increased delays

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
	are expected.	on State Route 86 during construction would be a significant and potentially not mitigable impact. No significant effect on education, police service, or fire service.	delays on State Route 86 (and State Route 111 for Alternative 2) during beginning and ending of construction would be a less than significant. No significant effect on education, police service, or fire service.	on State Route 86 during construction would be a significant and potentially not mitigable impact. No significant effect on education, police service, or fire service.	on State Route 86 during construction would be a significant and potentially not mitigable impact. No significant effect on education, police service, or fire service.
Cultural and Ethnographic Resources					
Cultural and Ethno-graphic Resources	Current and Reduced Inflows: Both adverse and beneficial impacts could occur if sites considered sensitive by the Torres Martinez in the Sea are exposed; exposed resources may be subject to vandalism or looting, but also could be preserved.	Current and Reduced Inflows: Significant and mitigable impacts could occur from construction activities, dredging, and exposure of sites. Significant and not mitigable impacts are possible if construction disturbs submerged village sites that are considered sensitive by the Torres Martinez.	Current and Reduced Inflows: Significant and mitigable impacts could occur from construction activities, dredging, and exposure of sites. Significant and not mitigable impacts are possible if construction disturbs submerged village sites that are considered sensitive by the Torres Martinez. Potential mitigable impacts to archaeological sites within the Test Base site (Alternative 3).	Current and Reduced Inflows: Significant and mitigable impacts could occur from construction activities, dredging, and exposure of sites. Significant and not mitigable impacts are possible if construction disturbs submerged village sites that are considered sensitive by the Torres Martinez. Potential mitigable impacts to archaeological sites within the Test Base site.	Current and Reduced Inflows: Significant and mitigable impacts could occur from construction activities, dredging, and exposure of sites. Significant and not mitigable impacts are possible if construction disturbs submerged village sites that are considered sensitive by the Torres Martinez.
Indian Trust Assets					
Indian Trust Assets	Current and Reduced Inflows: Impacts may result from the inundation of Tribal lands from rising water levels.	Current and Reduced Inflows: Some potential benefit to tribal assets if exposed tribal lands are suitable for agriculture or other purposes, or if lower water levels result in moving public boat launches onto tribal land. Economic benefits from use of Tribal lands for borrow pits. Significant but mitigable impacts may occur if use of borrow pits or other construction activities disturb mineral, cultural or other resources considered Indian Trust Assets.	Current and Reduced Inflows: Beneficial and significant impacts would be the same as described for Alternative 1.	Current and Reduced Inflows: Beneficial and significant impacts would be the same as described for Alternative 1.	Current and Reduced Inflows: Beneficial and significant impacts would be the same as described for Alternative 1.
Paleontological Resources					
Paleo. Resources	Current and Reduced Inflows: No impacts are expected.	Current and Reduced Inflows: Significant and mitigable effects may occur if construction activities disturb important fossils within the Lake Cahuilla Formation.	Current and Reduced Inflows: Significant and mitigable effects may occur if construction activities disturb important fossils within the Borrego Formation, Brawley Formation, or Pilocene-Pleistocene Nonmarine Sedimentary Deposits.	Current and Reduced Inflows: Significant and mitigable effects may occur if construction activities disturb important fossils within the Borrego Formation, Brawley Formation, or Palm Springs Formation.	Current and Reduced Inflows: Significant and mitigable effects may occur if construction activities disturb important fossils within the Lake Cahuilla Formation, Borrego Formation, Brawley Formation, or Palm Springs Formation.
Environmental Justice					
Env. Justice	Current and Reduced Inflows: Potential job losses would disproportionately	Current and Reduced Inflows: No disproportionate adverse impacts on health or the	Current and Reduced Inflows: No disproportionate adverse impacts on health or the	Current and Reduced Inflows: No disproportionate adverse impacts on health or the	Current and Reduced Inflows: No disproportionate adverse impacts on health or the

Table 2.9-1
Summary of Potential Environmental Consequences of Phase 1 Alternatives *(continued)*

Resource	No Action	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
	impact low-income populations.	physical environment of minority or low income populations.	physical environment of minority or low income populations.	physical environment of minority or low income populations.	physical environment of minority or low income populations.