Salton Sea

SPECIES CONSERVATION HABITAT PROJECT

Final Environmental Impact Statement/Environmental Impact Report

U.S. Army Corps of Engineers Application No. SPL-2010-00142-LLC
State Clearinghouse No. 2010061062

July 2013

US Army Corps Of Engineers®

CALIFORNIA natural resources AGENCY

PREPARED FOR
California Natural Resources Agency by the California Department of Water Resources and Department of Fish and Wildlife

Salton Sea Species Conservation Habitat Project
Final Environmental Impact Statement/Environmental Impact Report

U.S. Army Corps of Engineers
California Natural Resources Agency

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SECTION 1

INTRODUCTION

This Final Environmental Impact Statement/Environmental Impact Report (Final EIS/EIR) for the Salton Sea Species Conservation Habitat Project (SCH Project) consists of the following components:

- The Draft EIS/EIR issued in August 2011, as revised in Section 3 of this Final EIS/EIR.
- Comments on the Draft EIS/EIR.
- Responses to those comments.
- Identification of the U.S. Army Corps of Engineers (Corps) preferred alternative.
- Jurisdictional Delineation Report for the Salton Sea Species Conservation Habitat Project.
- Draft 404(b)(1) Alternatives Analysis for the Salton Sea Species Conservation Habitat Project.
- Mitigation, Monitoring, and Reporting Program.

1.1 PUBLIC REVIEW PROCESS

The public comment period for the Draft EIS began on August 19, 2011 with a Notice of Availability published in the Federal Register 76(161): 51956-51957 (FR Doc No: 2011-21239). The public comment period for the Draft EIR began on August 17, 2011 with a Notice of Availability and Notice of Completion provided to the State Clearinghouse. A Notice of Availability also was filed with Imperial County and published in *The Desert Sun* and *Imperial Valley Press*. The public comment period closed on October 17, 2011.

Fifteen CDs of the Draft EIS/EIR and 15 copies of the Executive Summary were provided to the State Clearinghouse for distribution to state agencies. Approximately 35 hard copies of the Draft EIS/EIR (which each included a CD) were distributed, as were approximately 340 additional CDs. The Notice of Availability was sent to approximately 1,100 additional agencies, tribes, organizations, and individuals.

The Draft EIS/EIR was available for public review at the California Department of Water Resources (DWR) SCH Project website (http://www.water.ca.gov/saltonsea/). In addition, copies of the Draft EIS/EIR were available for public review at the U.S. Army Corps of Engineers (Corps) office in Carlsbad and at the California Department of Fish and Wildlife[1] (DFW) office in Bermuda Dunes. It also was available for review at libraries in Brawley, Calipatria, Imperial, El Centro, Salton City, Mecca, and Coachella.

The Corps and the California Natural Resources Agency jointly conducted a series of public hearings to receive comments on the SCH Project Draft EIS/EIR. These were held on September 14, 2011 in both Calipatria and Brawley and on September 15, 2011 in Palm Desert. Both verbal and written comments were accepted during these hearings. Comment letters or electronic comments were received from 32 agencies, organizations, corporations, and individuals.

[1] When the Draft EIS/EIR was issued, the Department of Fish and Wildlife was known as the Department of Fish and Game. Its name was changed to the Department of Fish and Wildlife on January 1, 2013; hence, this is the name used in the Final EIS/EIR.

1.2 NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE STEPS

The Corps will circulate the Final EIS for at least 30 days prior to making a decision on its preferred alternative/least environmentally damaging practicable alternative (LEDPA). Specifically, it will be provided to Federal agencies with jurisdiction by law or special expertise, environmental regulatory agencies, those requesting copies, and those who submitted substantive comments on the Draft EIS. The Corps will file the Final EIS with the U.S. Environmental Protection Agency's (USEPA's) Office of Federal Activities and with the Corps Headquarters, and both the USEPA and Corps Headquarters will publish a notice of availability in the Federal Register indicating the release of the Final EIS. The 30-day time period for public review is measured from the date of publication in the Federal Register. After the 30-day comment period, the Corps will prepare a Record of Decision outlining the Corp's final determination on the LEDPA and the justification for that determination.

1.3 CALIFORNIA ENVIRONMENTAL QUALITY ACT COMPLIANCE STEPS

To certify the Final EIR, the California Natural Resources Agency must find that it has been completed in compliance with the California Environmental Quality Act (CEQA). Findings of Fact regarding significant impacts of implementing the SCH Project and a Statement of Overriding Considerations for any significant, unavoidable environmental impacts also must be issued. As required by CEQA (Public Resources Code, Division 13, section 21092.5), a proposed written response will be provided to public agencies that commented on the Draft EIS/EIR at least 10 days prior to certifying the Final EIR. If the Natural Resources Agency certifies the EIR and approves the SCH Project, a Notice of Determination will be filed with Imperial County and the State Clearinghouse.

1.4 RESPONSES TO COMMENTS

The Council on Environmental Quality's Regulations for Implementing the National Environmental Policy Act (NEPA) (section 1503.4a) requires that an agency preparing a Final EIS shall assess and consider comments both individually and collectively, and shall respond by one or more of the means listed below, stating its response in the final statement. Possible responses follow:

1. Modify alternatives, including the proposed action.
2. Develop and evaluate alternatives not previously given serious consideration by the agency.
3. Supplement, improve, or modify its analyses.
4. Make factual corrections.
5. Explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response.

All substantive comments received on the draft statement (or summaries thereof where the response has been exceptionally voluminous) should be attached to the final statement whether or not the comment is thought to merit individual discussion by the agency in the text of the statement.

If changes in response to comments are minor and are confined to the responses described in paragraphs (a)(4) and (5) of this section, agencies may write them on errata sheets and attach them to the statement instead of rewriting the draft statement. In such cases, only the comments, the responses, and the changes, and not the final statement, need be circulated (section 1502.19). The entire document with a new cover sheet shall be filed as the final statement (Section 1506.9).

If a number of comments are identical or very similar, agencies may group the comments and prepare a single answer for each group.

CEQA requires lead agencies to respond to significant environmental points raised in the review and consultation process (CEQA Guidelines section 15132). All comments received during the public comment period are responded to in this Final EIS/EIR. The range of possible responses includes explanation of the alternatives and analyses, making factual corrections, and explaining why comments do not warrant further agency response. When there has been significant public response, CEQA allows the lead agency to summarize or consolidate similar comments, as long as all substantive issues are represented.

1.5 CORPS' PREFERRED ALTERNATIVE/LEDPA

The Council on Environmental Quality's Regulations for Implementing NEPA, section 1505.2(b), require that, in cases where an EIS has been prepared, the Record of Decision must identify all alternatives that were considered, ". . . specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA section 101. Ordinarily, this designation means the alternative that causes the least damage to the biological and physical environment; the designation also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. Additionally, the USEPA's Section 404(b)(1) Guidelines require the Corps to issue a permit only for the LEDPA, which is the most practicable alternative that would result in the least damage to aquatic resources and is not contrary to the public interest. Therefore, the LEDPA will be the Corps' preferred alternative. (Refer to Attachment 3, which includes the draft 404(b)(1) Alternatives Analysis, for additional discussion of the reasons for selecting the LEDPA.)

The Project alternatives considered in the Draft EIS/EIR are as follows:

- **Alternative 1 – New River, Gravity Diversion + Cascading Ponds[2]:** 3,130 acres of ponds constructed on either side of the New River (East New and West New), upstream gravity diversion of river water, and independent and cascading pond units.
- **Alternative 2 – New River, Pumped Diversion:** 2,670 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped river diversion at the SCH ponds, and independent ponds.
- **Alternative 3 – New River, Pumped Diversion + Cascading Ponds:** 3,770 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped diversion of river water, and independent ponds extended to include Far West New and cascading pond units.
- **Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond:** 2,290 acres of ponds constructed on the north side of the Alamo River (Morton Bay), gravity river diversion upstream of the SCH ponds, with independent ponds and a cascading pond unit.
- **Alternative 5 – Alamo River, Pumped Diversion:** 2,080 acres of ponds constructed on the north side of the Alamo River (Morton Bay and Wister Beach), pumped river diversion at the SCH ponds, and independent pond units.
- **Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds:** 2,940 acres of ponds constructed on the north side of the Alamo River (Morton Bay, Wister Beach), pumped river diversion at the SCH ponds with independent and cascading pond units.

The Corps has identified Alternative 3, New River, Pumped Diversion + Cascading Ponds as its preferred alternative/LEDPA.

1.6 FINAL EIS/EIR ORGANIZATION

The Final EIS/EIR is organized into the following sections:

[2] All of the alternatives include independent ponds; thus, the name of the alternative reflects those ponds that also include cascading ponds.

- **Section 1, Introduction**. This section introduces the elements comprising the Final EIS/EIR, describes the public review process for the Draft EIS/EIR, describes NEPA and CEQA steps required to finalize and approve the EIS/EIR (including requirements for responding to comments), and describes the Corps' preferred alternative/LEDPA.
- **Section 2, Comments and Responses**. This section includes a list of persons, organizations, and public agencies submitting comments on the Draft EIS/EIR, master responses to multiple comments on similar topics, and a table including the text of the comments received and responses to those comments.
- **Section 3, Edits to the Draft EIS/EIR**. This section presents changes to the Draft EIS/EIR.
- **Section 4, References and Acronyms Used in the Final EIS/EIR.** This includes references that were cited in the responses to comments and acronyms used in the Final EIS/EIR.
- **Attachment 1, Written and Verbal Comments on the Draft EIS/EIR.** This section includes all written comments on the Draft EIS/EIR and transcripts of the public hearings. Each comment has been numbered to correspond to the numbers included in the comment and response table (Section 2.3).
- **Attachment 2, Jurisdictional Delineation Report for the Salton Sea Species Conservation Habitat Project.** This is the Corps-verified report prepared to identify and delineate jurisdictional wetlands and waterways located at the Alternative 3 site that are subject to the regulatory jurisdiction of the Corps pursuant to section 404 of the Clean Water Act.
- **Attachment 3, Draft 404(b)(1) Alternatives Analysis for the Salton Sea Species Conservation Habitat Project**. This is the alternatives analysis conducted to comply with the Clean Water Act section 404(b)(1) guidelines.
- **Attachment 4, Mitigation, Monitoring, and Reporting Program**. The Mitigation, Monitoring, and Reporting Program has been prepared to ensure that all required mitigation measures are implemented and completed according to schedule and maintained in a satisfactory manner during Project construction and operations.
- **Attachment 5, Draft EIS/EIR Appendices D and G**. The content of these files is the same as in the Draft EIS/EIR, but they have been included due to issues affecting the readability of the files included as part of the Draft EIS/EIR.

RESPONSES TO COMMENTS

2.1 LIST OF THOSE SUBMITTING COMMENTS ON THE DRAFT EIS/EIR

The following is a list of those Federal, state, and local agencies; organizations and corporations, and individuals who provided written or verbal comments in response to the Draft EIS/EIR.

Federal Agencies

- Federal Emergency Management Agency (FEMA)
- International Boundary and Water Commission (IBWC)
- Bureau of Reclamation (BOR)
- Office of Environmental Policy and Compliance (OECP)
- U.S. Environmental Protection Agency (EPA)

State Agencies

- California Native American Heritage Commission (NAHC)
- California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR)
- California Department of Toxic Substances Control (DTSC)
- California Regional Water Quality Control Board (RWQCB)
- California State Lands Commission (CSLC)

Local Agencies

- Imperial County Board of Supervisors (ICBOS)
- Coachella Valley Water District (CVWD)
- Imperial Irrigation District (IID)
- San Diego County Water Authority (SDCWA)
- Imperial County Air Pollution Control District (ICAPCD)
- Salton Sea Authority (SSA)

Organizations and Corporations

- Solar Power & Water
- Imperial County Farm Bureau
- CalEnergy
- Pacific Institute
- San Diego Audubon Society

- Defenders of Wildlife
- Center for Biological Diversity

Individuals[1]

- Paul Wertlake, MD
- Steve Boland
- M. Ryan
- Ruth Niswander
- James Eric Freedner
- Chris Cockcroft
- Jack M. Feliz
- Jeff Geraci
- Patrick J. Maloney
- Don Hedgepeth
- Mike Morgan
- Dave Van Cleef
- Bruce Wilcox
- Chris Schoneman
- Frank Bailey
- Daniel Santian
- Andy Horn
- Larry Grogan
- Ted Martin
- Dale Grayson
- Chris Bogart
- John Cariotis
- Carrie Berman
- Leo Borunda
- Mohammed Wasif
- Paul Norman
- Linda Beal
- Kathy Cronemeier
- Margit Chiraco Reshay

[1] Some of these individuals represent agencies and provided verbal comments at the public hearings.

- Amari Cariotis
- Candace Weber
- Peter Nelson

2.2 MASTER RESPONSES TO COMMENTS

The following master responses are provided to address similar comments on a given topic.

2.2.1 Master Response 1, Selected Fish Species

A number of commenters raised questions about the species of fish that are being considered for use in the SCH ponds, either expressing concern about the potential for adverse impacts on desert pupfish or suggesting the use of other fish, such as striped mullet. Other commenters asked whether other fish species were being considered.

Fish species for introduction into the SCH ponds were selected through evaluation of many species that are readily available (DFG 2011). Initially, 35 species were identified and evaluated for the following criteria:

1. Tolerance of low dissolved oxygen.
2. Tolerance of high and low temperatures likely to be present in the SCH ponds (for all life stages).
3. Food habitats (feed on lower trophic levels such as detritus, algae, and invertebrates).
4. Reproductive requirements and limiting factors (habitat structure, water quality, etc.).
5. Salinity tolerance of all life stages.
6. Potential effects on desert pupfish (competition for food or habitat, predation, etc.).

Based on these criteria, the five species in the Draft EIS/EIR (Table 3.4-3) were selected to provide some diversity and to test which would have the best survival and productivity under variable conditions. Monitoring and adaptive management will be needed to evaluate the fish used and possibly recommend addition of other species if needed. Information on species to evaluate was obtained from published literature and fish experts in DFW, as well as from the consultant team that prepared the Draft EIS/EIR.

A small amount of piscivory has been documented for both species of tilapia and the sailfin molly (Martin and Saiki 2009; Caskey et al. 2007), some of which may be related to lack of other food sources at the Salton Sea in recent years. The SCH ponds are expected to provide adequate forage for all fish species so that piscivory would be negligible.

The non-native tilapia and sailfin molly are all currently present at the Salton Sea and have adapted to conditions there. The desert pupfish also co-exists with these species. Striped mullet were considered, but their upper thermal tolerance (24°C) is not high enough, and their lower dissolved oxygen threshold of 5 ppm is not low enough to make them good candidates for the SCH ponds. In addition, most of their population's biomass would be tied up in adult fish, which are too large for birds to prey upon.

2.2.2 Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration

A number of comments addressed the need for restoration of the entire Salton Sea and possible ways of achieving this. Another comment focused on the relationship of the SCH Project to Early Start Habitat, as defined in the Salton Sea Ecosystem Restoration Program Programmatic EIR (PEIR) (DWR and DFG 2007).

A response to comments regarding restoration of the entire Salton Sea is not required under CEQA or NEPA because the comments do not raise a significant environmental issue (CEQA Guidelines section

15088; 40 CFR section 1503.4). Such comments will be included as part of the record and made available to decision makers prior to a final decision on the proposed project. Nonetheless, in an effort to provide as much information as possible, the Lead Agencies respond to such comments below.

The SCH Project's goals and objectives/purpose and need are described in Section 1.3. As discussed on page 1-4, lines 11-14, the SCH Project's CEQA goals are two-fold: (1) develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and (2) develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process.

More specifically, the SCH Project's purpose under Goal 1 is to provide in-kind replacement for near-term habitat losses. The Project's target species are those piscivorous bird species that use the Salton Sea and that are dependent on shallow saline habitat for essential habitat requirements and the viability of a significant portion of their population (page 1-4, lines 18-21). Therefore, the SCH Project is intended to replace only a portion of the habitat that eventually will be lost as the salinity level increases and the Sea recedes. It is not intended to restore the entire Salton Sea.

The SCH Project's second goal (page 1-5, lines 28-36) is to serve as a proof of concept for the restoration of shallow water habitat that supports fish and wildlife currently dependent upon the Salton Sea. The information obtained would be used to measure Project effectiveness, to refine operations and management of the ponds, to reduce uncertainties about key issues, and to inform subsequent stages of habitat restoration at the Salton Sea. Although the SCH Project is not intended to restore the entire Salton Sea, information obtained through its monitoring and adaptive management program could be used to inform future restoration efforts. The relationship of the SCH Project to the Salton Sea Ecosystem Restoration Program, which is intended to restore the entire Salton Sea, is discussed in Section 1.6.1. This section correctly notes that the SCH Project is *consistent with* the description of Early Start Habitat identified in the PEIR (emphasis added) (page 1-8, lines 27-28). It is not Early Start Habitat per se, which is a part of the Salton Sea Ecosystem Restoration Program. As noted on page 1-8, lines 16-18, the California Legislature has not taken any action to approve or provide funding for any alternative for restoration of the Salton Sea ecosystem.

2.2.3 Master Response 3, Project Scope

Certain comments indicated that the Project goals were not clearly defined in the context of an unstable baseline and historic condition, as well as the future conditions at the Salton Sea, and also addressed the need to focus on species other than piscivorous birds.

The SCH Project's goals and objectives/purpose and need are described in Section 1.3. The goals and accompanying objectives are clearly defined and take into consideration the historic value of the Salton Sea, as well as likely future conditions, which are described in Section 1.2, Background. The SCH Project is not intended to replicate existing or historic conditions at the Salton Sea, however, which would exceed the requirements established by California Fish and Game Code section 2932(b). As discussed on page 1-4, lines 8-14, under Fish and Game Code section 2932(b), the California Legislature appropriated funds for the purpose of implementing conservation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including adaptive management measures. Therefore, under CEQA the SCH Project's goals are two-fold: (1) develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and (2) develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process (page 1-4, lines 11-12).

The following assumptions were used in determining which fish and wildlife species are dependent on the Salton Sea:

- Riparian habitat is located primarily along the three rivers draining into the Sea and species using that habitat are not dependent on the Sea.

- Freshwater marshes are primarily manmade in upland areas, and species that use these habitats are not dependent on the Sea.
- Fish in the drains (other than desert pupfish) are not dependent on the Sea.
- Only species of fish and birds that used the Sea in 2004, as identified in the Salton Sea Ecosystem Restoration Program PEIR, are considered for dependence on the Sea. (2004 was the year that the above-referenced legislation was passed.)
- Invertebrate species that are currently present or were present in the marine phase are considered important for the fish and birds dependent on the Sea.
- By definition, aquatic species are dependent on the Sea.

As discussed on page 1-4, lines 5-8, the most serious and immediate threat to the Salton Sea ecosystem is the loss of fishery resources that support piscivorous birds. The birds that feed on invertebrates have more options and resources, because the invertebrate fauna has a wider range of salinity tolerances. Piscivorous birds, on the other hand, are at risk of decline. Therefore, the SCH Project focuses on the limited resources available for piscivorous birds and aquatic species. The SCH Project already includes a broad range of salinities and habitat features, which would incidentally benefit other species, such as shorebirds. Expanding the range of salinities beyond what is proposed or increasing the list of targeted species would exceed the legislative mandate and is beyond the scope of this Project.

2.2.4 Master Response 4, Project Funding

Multiple commenters questioned the source of funding, how much money was currently available, what additional funds might be obtained, whether the alternatives could be scaled back if full funding were not available, how this would affect the impact analysis in the EIS/EIR, and what would happen if funding disappeared. Another commenter compared the ongoing funding obligation for the SCH Project to that of the Quantification Settlement Agreement (QSA), stating that the QSA was deemed unconstitutional based on the State’s ongoing funding obligations. It also was requested that the design reflect that the Project would be part of a series of likely future restoration projects and that sufficient monitoring and data collection be funded to inform future proposals.

A response to comments regarding Project funding is not required under CEQA or NEPA because the comments do not raise a significant environmental issue (CEQA Guidelines section 15088; 40 CFR section 1503.4). Such comments will be included as part of the record and made available to decision makers prior to a final decision on the proposed project. Nonetheless, in an effort to provide as much information as possible, the Lead Agencies respond to such comments below.

As part of the QSA, the state Legislature passed Fish and Game Code Section 2930 et seq., which established the Salton Sea Restoration Fund (SSRF). The SSRF is administered by the director of the DFW. The SSRF is to be used for (1) environmental and engineering studies related to the restoration of the Salton Sea and protection of the fish and wildlife dependent on the sea; (2) implementation of conservation measures necessary to protect the fish and wildlife species dependent on the sea, including adaptive management measures; (3) implementation of the preferred Salton Sea restoration alternative; and (4) administrative, technical, and public outreach costs related to the development and the selection of the preferred Salton Sea restoration alternative (Fish and Game Code section 2932). The SCH Project is one of the projects to be funded by the SSRF.

There are currently two primary sources of funds for the SSRF: (1) Proposition 84 funds relating to the Salton Sea and (2) funds from water agencies involved in the QSA (Coachella Valley Water District [CVWD], Imperial Irrigation District [IID], and San Diego County Water Authority [SDCWA]). Funds from Proposition 84 are designated for construction of the SCH Project. Funds from the water agencies are designated for operations and maintenance of the SCH Project, including the monitoring and adaptive management process. Table 2-1 outlines the funds that have been allocated, expended, and encumbered, and those that are remaining.

Table 2-1 Salton Sea Restoration Program Funding History Totals

Source	Total Allocation	Total Expended	Total Encumbered	Funds Remaining
Salton Sea Restoration Fund[1]	30,000,000	6,243,969	11,282	23,744,749
Proposition 84	45,355,000	5,610,964	8,404,589	31,339,447
Proposition 50[2]	22,000,000	20,163,747	423,184	1,413,069
Total	$97,355,000	$32,018,680	$8,839,055	$56,497,265

1. Salton Sea Restoration Fund contributions from local water agencies.

2. All Proposition 50 funds received from DWR were reimbursements from the Wildlife Conservation Board through two interagency agreements: $20 million in 2003 and $2 million in 2012.

All funds in the SSRF must be appropriated by the state Legislature. The California Natural Resources Agency will be asking for the remainder of the funds for SCH Project construction, operations, and maintenance, but the appropriations process is a rigorous one, and the results are not guaranteed.

The appropriated funds would be used to build as much habitat as feasible, although it is possible that the entire acreage evaluated in the Draft EIS/EIR may not be able to be constructed; the cost estimates are being refined as the design process continues. (Refer to Master Response 5, Project Costs.) If additional funds became available through another source, these potentially could be used to augment the funds discussed above and expand the amount of habitat that could be constructed. In no case would the amount of habitat constructed exceed that analyzed in the Draft EIS/EIR without additional environmental review. If less habitat was constructed than analyzed in the Draft EIS/EIR, the beneficial and adverse impacts would be lessened accordingly.

As discussed on page 2-10, lines 28-35, the proof-of-concept period would last for approximately 10 years after completion of construction (until 2025). After the proof-of-concept period, the Project would be operated until the end of the 75-year period covered by the QSA (2078) or until funding were no longer available. Funds would need to be appropriated annually by the Legislature, as they are for other State-funded facilities, such as beaches and parks. Thus, the SCH Project is not an infinite project that would place ongoing obligations on the State. Note also that on December 7, 2011, the Court of Appeal issued its ruling that reversed the trial court ruling and remanded the cases to the trial court for further proceedings. On June 4, 2013, the trial court issued its order upholding the validation of the QSA and related agreements. The QSA remains valid, pending other appeals or court rulings, if any.

2.2.5 Master Response 5, Project Costs

A number of commenters asked that information on Project costs for construction, operations, and maintenance be provided.

A response to comments regarding Project costs is not required under CEQA or NEPA because the comments do not raise a significant environmental issue (CEQA Guidelines section 15088; 40 CFR section 1503.4). Such comments will be included as part of the record and made available to decision makers prior to a final decision on the proposed project. Nonetheless, in an effort to provide as much information as possible, the Lead Agencies respond to such comments below.

Cost information was not included in the Draft EIS/EIR because it is not required by either CEQA or NEPA. Preliminary cost information was developed as part of the 35 percent design, but is subject to change once more detailed information is available regarding site-specific conditions, including topography and geotechnical conditions. If the SCH Project is approved by the lead agencies, the project design for the selected alternative will become more detailed based on additional engineering, hydrology, soils, and permitting requirements. Through this process, the design would gain additional specificity and costs can be fine-tuned. Operational costs also would be refined. For example, costs for power would be determined through negotiations with IID, which have not yet been conducted. If needed, the design of the final project would be modified, so that Project cost matches the available budget (refer to Master Response 4, Project Funding). The Project would not be larger than analyzed in the Draft EIS/EIR; therefore, impacts would not increase.

As discussed on page 1-15, lines 4-11, cost is a factor considered by the Corps in determining whether an alternative is practicable. This is included in the analysis performed to comply with the U.S. Environmental Protection Agency section 404(b)(1) Guidelines, which require the Corps to issue a permit only for the "least environmentally damaging practicable alternative" (LEDPA). Information on costs is considered, as appropriate, in the 404(b)(1) analysis (Attachment 3).

2.2.6 Master Response 6, Water Rights

Some commenters expressed concerns about whether a reliable water supply can be found for the SCH Project's duration. As discussed in the Draft EIS/EIR, the proposed water sources for the Project include either the brackish New or Alamo rivers (depending on the alternative) and the Salton Sea (Section 2.4.1.7, pages 2-15 through 2-16). IID asserts a right to return flows into the New and Alamo rivers, but the amount is not quantified. IID has stated no objection to diverting return flow water for the SCH Project and has indicated it would cooperate with the Natural Resources Agency on its need for a reliable water supply. The Metropolitan Water District of Southern California (Metropolitan) filed applications in 1997 seeking a water right on both rivers but has not pursued projects that would establish a need for a permit for either water source; nor has the State Water Resources Control Board acted on the applications (page 2-4, lines 16-19).

The Natural Resources Agency has not sought an application with the State Water Resources Control Board for a water right on either river, primarily to avoid potential protracted disputes with current applicants over priority to the water supply, which could inevitably delay the Project. Rather, the Natural Resources Agency would likely negotiate with Metropolitan and, if necessary, IID to reach a mutually acceptable agreement that would ensure an adequate water supply for the duration of the SCH Project. The Natural Resources Agency is currently unaware of other potential impediments to obtaining an adequate water supply for the Project. Metropolitan has not indicated that it would object to the Natural Resources Agency's seeking a water supply from either river in discussions to date.

2.2.7 Master Response 7, Operations and Adaptive Management

Several commenters suggested parameters to be tested during Project operations, including water quality parameters, chemical constituents, and residence times, and one commenter requested that the EIS/EIR review a broad range of construction techniques, management strategies, habitat types, salinities, and target species. Several comments suggested including at least some freshwater cells in the ponds. Another comment suggested that an adaptive management approach be adopted to allow for some flexibility should the proposed remedies regarding selenium risk fail to have the desired effects. This commenter also suggested including a discussion of the utility of providing mitigation wetlands to offset any documented Project effects.

The SCH ponds are intended to be operated in a manner that would both provide a partial in-kind replacement for some habitat losses and answer key questions regarding shallow water habitat restoration (Appendix D, Project Operations). Operations would have to balance habitat requirements necessary to achieve Project objectives against competing constraints such as environmental limitations, compatibility with adjacent land uses and habitat values, and consistency with the IID Habitat Conservation Plan / Natural Communities Conservation Plan. Decisions necessary to strike this balance and meet the objectives would be made within an adaptive management framework.

Because uncertainties remain about habitat function and biological responses at the ponds, the SCH Project is being designed with a range of operational scenarios (Appendix D, Project Operations) to evaluate the effectiveness of different management actions. Operation of these experimental ponds would attempt to meet Project objectives given certain constraints of physical conditions, water quality, and climate (i.e., temperature, wind). SCH Project operations would be constrained by the physical characteristics of the ponds (e.g., depth, area, and bottom profile). Certain conditions could be modified as needed, within some range of conditions, by adjusting salinity, volume, and residence time of the water within the ponds; fish species stocked in the ponds; and physical cover elements. The range identified for operational variables was designed to "bookend" the analysis and provide information to decision makers.

Depending on the specific alternative and pond design selected, the habitat would be composed of a few to several individual ponds. This design would allow the operators to try different combinations of storage, salinity, and residence times to investigate how these factors could be adjusted to provide the best conditions for fish and birds. Different operational scenarios would be tested during the proof-of-concept phase, the first 10 years of project operation (to approximately 2025). After the proof-of-concept phase, pond variables would be managed to produce the best habitat for fish and wildlife dependent on the Salton Sea.

Several commenters recommended the following adjustments to the operating ranges for salinity and residence time:

- Include some freshwater ponds – This was suggested to allow research into selenium pathways and wildlife response and to improve understanding of a wider range of restoration techniques for future Salton Sea restoration. The proposed initial operating range of salinity would typically be 20-40 ppt. Freshwater conditions were not included in the initial operating scenarios in order to minimize potential negative effects (e.g., mosquito vectors, selenium loading, emergent vegetation that facilitates selenium bioaccumulation, and freshwater fish that could prey on pupfish). The adaptive management framework of the SCH Project does support testing different experimental operating scenarios, including varying salinity beyond this range, although those effects have not been fully evaluated in this document. Future management could consider freshwater cells, but additional environmental analysis would be required at that time. The monitoring program would include selenium monitoring to allow detection of adverse responses, and operations could be adjusted accordingly.
- Allow longer residence time to reduce water demands – The initial operating range of residence time of water in the ponds is 2-32 weeks. This bounds the likely operating conditions, acknowledges variable environmental conditions that can affect water quality, and provides flexibility to balance pumping costs. Operational decisions would not be rigidly tied to a set number of days of residence time; rather, they would be informed and guided by monitoring data in order to meet habitat and water quality goals.

Key indicators of physical, chemical, and biological attributes of that habitat would be monitored to determine the effects of different operational scenarios, and any adjustments would be implemented as needed in accordance with the SCH monitoring and adaptive management framework (Appendix E).

As discussed in Appendix E, page E-4, lines 20-29, key monitoring elements would include the following:

- Physical Habitat – flow rate, depth, wetted area, islands, snags, submerged vegetation, and other habitat elements.
- Water Quality – salinity, temperature, dissolved oxygen, nutrients.
- Aquatic Biota – algae, plankton, invertebrates, fish community (species, distribution, abundance), desert pupfish.

- Birds – species, abundance and distribution, use of habitat features, breeding and nesting, sick or dead birds.
- Contaminants – selenium concentrations in water, sediment, bird eggs, and other biota (invertebrates, fish).

Some parameters would be amenable to operational adjustment within the physical bounds of the constructed ponds (i.e., water depth; flow rate, residence time, and water source blending for salinity and selenium management), while other parameters (water temperature, dissolved oxygen) would be driven more by uncontrollable variables (i.e., air temperature, wind mixing). Because the SCH Project has not reached final design or construction, this document does not include the detailed protocols and site-specific sampling design necessary for actual implementation. A more detailed monitoring plan and decision-making process will be developed should the SCH Project be constructed.

2.2.8 Master Response 8, Compatibility with Geothermal Development

Comments related to geothermal development focused on avoidance of the Known Geothermal Resource Area (KGRA), the need for the SCH Project to be compatible with and not restrict access to future geothermal development, and the need for continued coordination between the SCH Project team and geothermal developers. One comment requested that the EIS/EIR acknowledge that the future or current presence of sensitive species in the SCH areas would not preclude geothermal development activity. Another indicated a belief that the SCH Project previously had committed to providing causeways that could support geothermal equipment and would allow access to geothermal facilities, and another indicated that the State might seek funds for the SCH Project from geothermal developers.

The importance of geothermal resources in the Project area is recognized in multiple sections of the Draft EIS/EIR, including, but not limited to, Section 2.4.1.25, Project Compatibility with other Potential Future Land Uses; Section 3.8, Geology, Soils, and Minerals; and Section 3.13, Land Use. The relationship of the SCH alternative sites to the KGRA is shown on Figure 3.13-3, Existing Land Uses near the New and Alamo Rivers. As discussed on page 7-3, lines 37-40, the presence of geothermal resources was one of the factors used in eliminating sites near the Alamo River in selecting the State's preferred alternative ("The Alamo River area also is in a Known Geothermal Resource Area and known geothermal resources diminish west of the New River. Although the SCH Project would not preclude geothermal development, the New River area is considered preferable because the potential for conflicts with geothermal development companies would be minimized.")

Because of the desire of the SCH agencies to minimize conflicts with the development of this resource, five meetings were held with geothermal development companies and/or IID in order to address potential conflicts during development of the Draft EIS/EIR (refer to Table 6-2). Based on these meetings, the project description (Section 2.4.1.25) explicitly states that the SCH Project would be designed and operated to be compatible with other geothermal projects in the area and notes that the SCH ponds and berms could be adapted, as needed, to accommodate future geothermal facilities such as well pads and access roads. Additional specificity cannot be provided at this time given the lack of approved plans for future development; however, a general description of the types of facilities expected to be constructed is included in Section 3.13.3.5, Future Land Uses in the Study Area, on page 3.13-9, lines 21-33. Consideration also would be given to minimizing the potential for conflict with future geothermal development as the design proceeds. This would be accomplished through ongoing coordination with IID and geothermal development companies, as well as specific provisions established through the lease agreement with IID for use of its land.

Certain comments raise issues that are outside the scope of the Draft EIS/EIR. Page 2-22, lines 25-31 correctly notes that modifications to the SCH Project to accommodate the potential future development would be the responsibility of the geothermal developers, and the impacts of such development are outside the scope of this EIS/EIR. It is not the responsibility of the SCH Project to create berms and other facilities that are adequate to support future development that is part of another project and beyond what is required for the SCH Project, nor could State funds designated for Salton Sea restoration be used for such a purpose (refer also to Master Response 4, Project Funding for additional detail regarding funding sources; note that funds are not being sought from private entities). Additionally, the Draft EIS/EIR focuses on impacts specific to the construction and operation of the SCH Project; it is not the role of this document to provide assurances that the presence of special-status species would not preclude future geothermal activity. Rather, this is more appropriately handled through a process such as IID's Habitat Conservation Plan/Natural Communities Conservation Plan, which is specifically intended to address the impacts of covered activities on such species.

2.3 OTHER COMMENTS AND RESPONSES

Table 2-2, Comments and Responses includes the text of all comments received on the Draft EIS/EIR. The comments were reproduced as written and may contain grammatical and spelling errors. Responses are provided for each comment raising significant environmental issues. A response to comments that do not raise a significant environmental issue is not required under CEQA or NEPA (CEQA Guidelines section 15088; 40 CFR section 1503.4). Such comments will be included as part of the record and made available to decision makers prior to a final decision on the proposed project. Nonetheless, responses have been provided to all comments in the interest of fully addressing public concerns and providing as much information as possible. The section, page, and line numbers referenced in the responses to comments are from the Draft EIS/EIR.

Table 2-2 Comments on the Draft EIS/EIR and Responses

Name	Com. No.	Comment	Response/Issues
		Federal Agencies	
FEMA	FEMA-1	Please review the current effective Flood Insurance Rate Maps (FIRMs) for the County of Imperial (Community Number 060065), Maps revised September 26, 2008. Please note that the County of Imperial, California is a participant in the National Flood Insurance Program (NFIP).The minimum, basic NFIP floodplain management building requirements are described in Vol.44 Code of Federal Regulations (44 CFR), Sections 59 through 65. A summary of these NFIP floodplain management building requirements are as follows: All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map. If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any *development* must not increase base flood elevation levels. The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials. A hydrologic and hydraulic analysis must be performed <u>*prior*</u> to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways. Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/fbrms.shtm.	The Flood Insurance Rate Map for the Project area was reviewed, and it is discussed on page 3.11-13, lines 6-12. The Zone A delineation does not list flood elevations, and therefore, the depth of flooding cannot be addressed. One definition of Zone A is shallow (less than 1 foot) flooding. The potential for an office trailer to be placed on the Project site is addressed on page 3.11-34. Placement of this trailer would have to conform to the Imperial County floodplain ordinance, including elevation of the floor of the trailer, tie-downs, and flood-proofing of utilities. Other Project features such as berms, pipelines, and pumping facilities are not habitable structures and, therefore, are not subject to floodplain regulations for finished floor. The riverine pumping facilities would be elevated on a platform above the river bank and therefore would be more than 1 foot above native ground. No text revisions are required.
FEMA	FEMA-2	Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The Imperial County floodplain manager can be reached by calling Brian Donley, Building Official, at (760) 482-4311.	Prior to construction, Imperial County would be contacted to incorporate the County floodplain regulations for placement of the office trailer on the Project site. No text revisions are required

Name	Com. No.	Comment	Response/Issues
Gilbert Anaya (International Boundary & Water Commission)	IBWC-1	The United States Section, International Boundary and Water Commission (USIBWC) has reviewed the draft EIS/EIR regarding the restoration of shallow water habitat through creation of shallow ponds using a blend of New or Alamo River water and Salton Sea water and does not have any comments or concerns at this time. The proposed action is not anticipated to have any impacts to projects or resources of the USIBWC.	The lack of comments by the United States International Boundary Commission is noted.
Bureau of Reclamation	BOR-1	Reclamation is supportive of the Project and appreciates opportunity to participate as a cooperating agency in the development of the EIS/EIR	Reclamation's support of the SCH Project is noted.
Bureau of Reclamation	BOR-2	Section 3.13-11, lines 27-35, discuss potential uses of land that will become exposed at the Salton Sea in the future. Please clarify that uses of Reclamation land would be designated in accordance with the Agency's authorities, regulations, and policies.	This text has been clarified to indicate that in the case of Federal lands, the proposed uses would be consistent with the management authority of the Federal agency that is assigned management responsibility of the parcel.
Office of Environmental Policy & Compliance	OEPC-1	Throughout the document the Programmatic Environmental Impact Report (DWR and DFG 2007) is cited as the source of information for findings, data, or statements of fact. Citing the PEIS rather than the original sources makes it much more difficult for the reader to evaluate the information. We suggest that the final EIS reference the original source of information where possible.	The Final EIS/EIR does not replicate the Draft EIS/EIR text. It only includes changes required to clarify or correct text. The Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report (PEIR) was the source of information on a number of topics and is correctly cited; therefore, no text revisions are required.
Office of Environmental Policy & Compliance	OEPC-2	The document establishes a framework for developing a salinity gradient system of shallow impoundments (Sections 1.3 and 1.6.1) similar to those developed by the U.S. Bureau of Reclamation and U.S. Geological Survey. There are differences; this document describes attempts to develop a system capable of supporting an array fish to provide forage for fish eating birds, but in most respects the systems are similar in form and function.	The concept of impoundments is similar, but there are key differences in design (e.g., greater maximum depth in SCH ponds) and likely subsequent function. No text revisions are required.
Office of Environmental Policy & Compliance	OEPC-3	The premise set forth in some sections of this document is also articulated in and supported by Miles et al. (2009), which predates Sickman et al. 2011, and establishes the rationale for mixing and blending sources of water, establishes a robust dataset for the ecological risk assessment, and articulates the role of salinity management in reducing selenium risk and vector control. We suggest that the final EIS reference Miles et al. (2009) in section 1.6.1, and describe the theory underlying the project. The theory is documented in Miles et al. (2009) pages 3 & 4.	The Draft EIS/EIR references Miles et al. 2009 extensively (e.g., Sections 1, 3.4, and 3.11), in addition to Sickman et al. 2011 (e.g., Sections 3.4, 3.10, and 3.11), which reviewed the literature for this project-specific analysis. No additional discussion is required.
Office of Environmental Policy & Compliance	OEPC-4	SECTION 3.4 The document states that the principal reason for SCH development is to produce fish to support a bird community that relies on fish as a foraging base; however, the document contains minimal discussion of the maintenance of a self-sustaining population of fish. Data on the effects of selenium (Anderson, 2009) and evidence from the Reclamation/USGS ponds that desert pupfish will prosper	Sufficient information is included in the Draft EIS/EIR to allow for a thorough assessment of the impacts of the SCH Project, including the effects of selenium. As required by NEPA (40 CFR section 1502.2) and CEQA (CEQA Guidelines sections 15143 and 15147), EISs and EIRs are intended to be concise documents that focus primarily on the significant impacts of the Project, rather than on the factors that contribute to the maintenance of a self-sustaining

Name	Com. No.	Comment	Response/Issues
		at certain ponds and environmental conditions are not addressed. Additional analysis is needed to describe how desert pupfish will coexist with the many non-native fish species anticipated for use in SCH, and of how the primary project fish, tilapia, will deal with the potential reproductive effects of selenium at a higher rate of exposure than in the Salton Sea or the rivers and drains. We suggest that the authors review the data and information presented in the following references for possible inclusion in the final EIS. References on population-level effects of selenium ▪ Anderson, TW. 2009. Avian use and selenium risks evaluated at a constructed saline habitat complex at the Salton Sea, California. MS Thesis, San Diego State University. ▪ Hamilton, SJ. 2004. Review of selenium toxicity in the aquatic food chain. Sci .Tot. Env. 326: 1–31. 4ug/g whole body - impaired growth and survival ▪ Cumbie, PM, SL Van Horn, 1978. Selenium accumulation associated with fish mortality and reproductive failure. Proceedings of Annual Conference of Southeastern Assoc. Fish Wildlife Agencies; 32 pp.612 –624. ▪ Hamilton, SJ, KJ Buhl, FA Bullard, SF McDonald. 1996. Evaluation of toxicity to larval razorback sucker of selenium-laden food organisms from Ouray NWR on the Green River, Utah. National Biological Service, Yankton, SD, Final Report to the Recovery Implementation Program for the Endangered Fishes of the Colorado River Basin, Denver. ▪ Hamilton, SJ, KJ Buhl, FA Bullard, EE Little. 2000. Chronic toxicity and hazard assessment of an inorganic mixture simulating irrigation drain water to razorback sucker and bony tail. Environ Toxicol. 15:48 –64. ▪ Hamilton, SJ, RT Muth, B Waddell , TW May. 2000. Hazard assessment of selenium and other trace elements in wild larval razorback sucker from the Green River, Utah. Ecotoxicol. Envion. Safety 45(2):132-147. ▪ Harris, T. 1986. The selenium question. Defenders. March–April 1986:10 – 20. ▪ Lemly, AD. 1997. A teratogenic deformity index for evaluating impacts of selenium on fish populations. Ecotoxicol. Environ. Safety 37:259 –266. frequency of malformations in centrarchids – 10% freq at 30 ug/g whole fish tissue. ▪ Lemly, AD, HM Ohlendorf. 2002. Regulatory implications of using constructed wetlands to treat selenium-laden wastewater. Ecotoxicol. Environ. Safety. 52:46 –56. ▪ Saiki, MK, RS Ogle. 1995. Evidence of impaired reproduction by western mosquito fish inhabiting seleniferous agricultural drain water. Trans. Am.	population of fish. Nevertheless, the Draft EIS/EIR contains adequate information on the process that would be used to monitor the ponds and modify conditions as needed. As discussed on page 2-10, lines 28-32, the experimental SCH ponds are being designed to be operated as a proof-of-concept project. Production of a fish population would be evaluated through monitoring and adaptive management because changes in environmental variables that affect fish production are not easily predictable (refer to Section 2.4.4 and Appendix E for additional details regarding the monitoring and adaptive management aspects of the Project). Concentrations of selenium in fish expected in the ponds were modeled for a range of SCH operations scenarios (Appendix I, Table I-5, page I-17; Sickman et al. 2011). Expected concentrations of selenium in fish (Section I.3, Table I-5, page I-17) would be greater than some protective standards but similar to existing levels observed in Alamo and New River and similar or lower than levels observed in the Salton Sea and agricultural drainages (Section I.3, Table I-3, page I-11; page I-12, lines 4-9). Saiki et al. 2010 noted that fish in the IID drains had elevated selenium levels but did not appear to be adversely affected (Section I.3, page I-12, lines 7-9). These details are now repeated from Appendix I in Section 3.4.4. Fish tissue concentrations would be monitored as part of the project in order to adapt operations. The Draft EIS/EIR acknowledges that pupfish would likely be present in the SCH ponds and that water quality conditions in the ponds should be favorable for pupfish (refer to Impact BIO-1a in Section 3.4, Biological Resources). As discussed on page 1-5, lines 9-15, one of the objectives of the SCH Project is to minimize adverse effects on desert pupfish, and one of the means of achieving this objective is to select fish that currently share pupfish habitat. Additionally, the selected fish species were carefully evaluated for potential adverse effects on pupfish in addition to other factors, such as diversity and different tolerances of temperature and dissolved oxygen. Further analysis of the effects of the targeted fish on pupfish is not required.

Name	Com. No.	Comment	Response/Issues
		Fish. Soc. 124:578 –587. Concentrations way higher than SCH – 340-390 mg/l in water and >100 ug/g fish tissue (cited in Hamilton 2004) Presentations on Pupfish ▪ Keeney D, Sharon, Walker T, Michael, Thomas E, Valerie, Crayon J, John. Removal of a desert pupfish Cyprinodon macularius population from temporary ponds at the Salton Sea Presented to Desert Fish Council. Moab, Utah. November 2010. ▪ Keeney Sharon and John J. Crayon. Removal of a desert pupfish population from temporary ponds at the Salton Sea. Western Section The Wildlife Society. Riverside, CA. Feb 2011. ▪ Saiki, Michael K., Martin, Barbara M., Anderson, Thomas W. Unusual Dominance by Desert Pupfish in a Shallow Experimental Pond System Within the Salton Sea Basin Presented to Desert Fish Council, Moab, Utah. November 2010.	
Office of Environmental Policy & Compliance	OEPC-5	Page 3.4-14: The document provides a good description of the sequence of actions undertaken by DFG in introducing non-native sport fish to the Salton Sea. However, the document does not mention that the Desert Pupfish Recovery Plan (1993) indicates that the introduction of non-native sport fish precipitated a decline and endangerment of the Desert Pupfish.	Page 3.4-26, lines 26-28 mention the effects of sport fish on desert pupfish in the Salton Sea. Fish proposed for introduction into the SCH ponds (Table 3.4-3), however, do not include the piscivorous non-native sport fish (orangemouth corvina and Gulf croaker) that were previously introduced into the Salton Sea but are no longer present. Therefore, the decline of desert pupfish as a result of their presence is not relevant to the analysis included in the Draft EIS/EIR, and no text revisions are required.
Office of Environmental Policy & Compliance	OEPC-6	We suggest the final EIS include a discussion of the status of the Desert pupfish (see page 3.4-26) that addresses potential impacts, adverse or beneficial, to the Desert Pupfish related to interaction with other fish species. Evidence collected by the USGS in 2010 indicated that salinity gradient ponds, similar to those proposed by this plan, will benefit the Desert Pupfish. Specifically, an estimated 1 million Desert Pupfish were recovered and relocated prior to closure of the Reclamation/USGS experimental ponds. (See Presentations on Pupfish)	Page 3.4-26 of the Draft EIS/EIR, lines 10-12, discusses the status of desert pupfish. Although the SCH Project is not specifically designed for desert pupfish, the Draft EIS/EIR acknowledges that they would likely persist in the SCH ponds (page 3.4-35, line 32) and may even flourish, as at the USGS ponds. As discussed on page 1-7, lines 16-20 and page 3.4-15, lines 24-26, the fish species selected for inclusion in the ponds would be those that are currently present, or have been present in the past, and that have the least potential for adverse effects on desert pupfish. Because desert pupfish are already exposed to these species, their presence in the ponds would not constitute an impact of the SCH Project, and no text revisions are required.
Office of Environmental Policy & Compliance	OEPC-7	Page 3.4-16: We suggest the final EIS include the multi-year analysis of waterfowl counts for the Salton Sea region, including some shoreline habitats, provided in Barnum and Johnson (2004). Anderson (2009) also provides a wealth of species count data, nest fate date related to selenium, and site specific habitat use information for a variety of species in the Reclamation/USGS pond system all of which are directly applicable to the SCH project and might be incorporated in the final EIS.	The data evaluated for the SCH Project were from the U.S. Fish and Wildlife Service (USFWS) waterbird point counts, which were multi-year point counts that were specifically selected to apply to the Project locations and not to the entire Sea. The most current USFWS counts are from 2010. The comment's reference to Anderson (2009) should be Anderson (2008). This reference was reviewed with respect to description of nesting substrate. Successes and failures of the experimental ponds, as documented by Anderson, were incorporated into the

Name	Com. No.	Comment	Response/Issues
		Barnum, DA, and S Johnson. 2004. The Salton Sea as important waterfowl habitat in the Pacific Flyway. Studies in Avian Biol. 27:100-105.	design of the SCH Project. No text revisions are required.
Office of Environmental Policy & Compliance	OEPC-8	Page 3.4-50: The section on disease does not address the role of selenium in immune system dysfunction and how this may play a role in disease outbreaks. We suggest this section be revised and enhanced in the final EIS. References that might provide additional information are: Albers, PH., DE Green, and CJ Sanderson. 1996. Diagnostic criteria for selenium toxicosis in aquatic birds: dietary exposure, tissue concentrations, and macroscopic effects. J. Wildl. Dis., 32:468-485. Fairbrother, A, and J Fowles 1990. Subchronic effects of sodium selenite and selenomethionineon several immune functions in mallards. Arch. Environ. Contam. Toxicol. 19:836-844. Lemly, AD. 1993. Metabolic stress during winter increases the toxicity of selenium to fish. Aquatic Toxicol. 27:133-158. Larsen, CT., FW Pierson, and WB Gross. 1977. Effect of dietary selenium on the response of stressed and unstressed chickens to Escherichia coli challenge and antigen. Bio1. Trace. Elem. Res. 58: 169- 176. Wang, C., RT Lovell, and PH Klesius. 1997. Response to Edwardsiella ictaluri challenge by channel catfish fed organic and inorganic sources of selenium. J. Aquat. Anim. Health, 9: 172-179. Whiteley, PL., and TM Yuill. 1989. Immune function and disease resistance of waterfowl using evaporation pond systems in the southern San Joaquin Valley, California, 1986-89. Final Report to the U.S. Fish and Wildlife Service, National Wildlife Health Research Center, Madison, WI. 202 p.	The analysis appropriately focused on the significant impacts of the SCH Project. Expected selenium levels in fish would exceed some protective standards, but would be similar to levels observed at the Sea, Alamo estuary, and IID drains. Thus, conditions would be similar to those that already occur. Fish tissue concentrations would be monitored as part of the Project in order to adapt operations. Selenium in the egg is the most sensitive measure for evaluating hazards for birds (Skorupa and Ohlendorf 1991, as cited in Ohlendorf and Heinz 2011). The analytical approach used for modeling selenium concentrations in bird eggs is appropriate and adequate. Evidence from other habitats at the Salton Sea (e.g., the U.S. Geological Survey (USGS) and Reclamation Saline Habitat Ponds) have not reported selenium toxicosis or reduced hatchability (Anderson 2008, Miles et al. 2009). Bird egg concentrations would be monitored in order to adapt operations. A brief review of the literature provided did not change the analysis. Some papers discussed the *value* of selenium-supplemented feed to *support* immune response in farmed catfish and chickens. Another was for different, more stressful conditions than expected at SCH (much colder [4 degrees Celsius, or C] and longer [6 months]). Heinz and Fitzgerald (1993) also failed to find a link between mortality and selenium concentrations in adult mallards fed selenium-supplemented feed. No text revisions are required.
Office of Environmental Policy & Compliance	OEPC-9	Page 3.4-50: The document includes a discussion of selenium effects, but the discussion is limited to embryo mortality and impaired reproduction. There may be a potential synergistic effect of low levels of selenium and disease outbreak due to immune system dysfunction. We suggest the final EIS include a discussion of the link between selenium burden and compromised immune system functioning. (see <u>References on population-level effects of selenium</u>)	The discussion under Section 3.4.4.3, No Action Alternative, was modified to include additional text on fish toxicity and an expanded explanation of why bird eggs were used as the endpoint rather than look at sublethal toxicity. Additional discussion was also added to Impact BIO-5b, explaining that while selenium concentrations in fish tissue in ponds operated at salinities of 20 to 35 ppt would exceed a protective standard, this would be similar to or less than existing levels at the Salton Sea and rivers.
Office of Environmental Policy & Compliance	OEPC-10	Page I-3, Section I.1: The report by Sickman et al. (2011) used Miles et al. (2009) as a principal source of data and employed a selenium model developed by USGS (Presser and Louma, 2010). Although the model doesn't provide good approximations, project decisions were made on the basis of Appendix I. We suggest that the final EIS include appropriate caveats about the reliability of the Sickman model. We suggest that these caveats be documented in the main document so the readers	The application and limitations of the model are discussed in the conclusions of Appendix I, as well as in the body of the Draft EIS/EIR. The model estimates using Miles et al. data are greater than observed values when tested, and thus this is a conservative estimator of risk (Section I.3.4, page I-19, lines 11-20; Section 3.4, Impact BIO-5b, page 3.4-49, lines 37-44). This approach was discussed in expert workshops, and drafts of Sickman et al. (2011) and Appendix I were reviewed by several experts, including USGS staff. This approach and the

Name	Com. No.	Comment	Response/Issues
		are aware of the importance of this effort in the decision process.	results are reasonable and sufficient to support our conclusions; no text revisions are required.
Office of Environmental Policy & Compliance	OEPC-11	Page I-20, Section I.4.1, Lines 36 & 37: The document states "The first pond where sediment would settle out is likely to have the highest concentrations of selenium 37 (Miles et al. 2009)". This is an incorrect conclusion attributed to the Miles et al. 2009. The selenium risk has little to do with sediment deposition and is based on the greater rate of primary productivity associated with the lower salinity water typically observed in the first of a series of salinity gradient ponds. The increased primary productivity, relative to the downstream ponds, is responsible for the uptake of selenium from the water and sediments whereupon much of the selenium is then deposited back to the sediments or consumed in the food chain. We suggest that the statement be corrected.	Both pathways and mechanisms are applicable to the SCH ponds: (1) physical transport into the ponds of selenium in water and on sediment and particulate matter and (2) uptake of selenium by primary producers within the ponds. Appendix I, section I.4.1 has been revised to provide a more suitable attribution.
Office of Environmental Policy & Compliance	OEPC-12	Pages I-19 to 20, Section I.4.1: We applaud the extensive analysis of selenium risk; however, the strategy is limited to the use of salinity gradients. We agree that this is expected to move the system in the right direction, but if the system fails to produce the anticipated results, there is no alternative plan. For example, this document implies that if birds use the initial ponds too much, or breed there, then a system of bird deterrence will be deployed. Unfortunately, this strategy has failed to prevent bird use and damages at other selenium contaminated environments in California. We suggest that an adaptive management approach be adopted to allow for some flexibility should the proposed remedies fail to have the desired effects. This approach could consider the utility of approaches under consideration and the decision/determination points at which they will be deployed, the decision making responsibilities, and the criteria upon which those decisions would be made. We also suggest the final EIS include a discussion of the utility of providing mitigation wetlands using uncontaminated sources of water to offset any documented project effects.	As discussed in Section 2.4.4, Monitoring and Adaptive Management and in greater detail in Appendix E, Monitoring and Adaptive Management Framework, an adaptive management approach would be used in order to promote flexible decision-making that can be adjusted as new and improved information becomes available about outcomes of management actions and other events. This would apply to strategies related to selenium risk (refer to Section E.3.3. Elements of Monitoring Plan), in addition to other issues, and elements similar to those suggested in this comment would be included as part of the adaptive management plan. Please refer to Appendix E for additional detail regarding the elements of the adaptive management plan. Because the SCH Project would create a net increase in habitat in the face of ongoing and expected habitat loss in the absence of the Project, no mitigation wetlands would be required for these habitat ponds. No text revisions are required.
Office of Environmental Policy & Compliance	OEPC-13	Pages I-11 to 12, Section I.3.1: The discussion of selenium and effects on fish species is limited, especially the discussion and analysis of tilapia, the primary fish the document is counting on to supply forage to fish eating birds. We suggest that the discussion of tilapia be expanded.	Selenium levels modeled for the fish of the SCH ponds would potentially be above levels of concern; however, they would not be above levels currently existing in the Salton Sea, Alamo River estuary, or IID drains. The conclusions of the effects analysis would not be altered by an expanded discussion of the selenium effects on fish species, and no text revisions are required.
Office of Environmental Policy &	OEPC-14	Page I-12, Section I.3.4, line 11: The document states "Selenium's most substantial effects occur in bird embryos, such as reduced hatching success and teratogenesis." This statement is not	Selenium levels in fish currently existing at the Salton Sea already exceed protective standards. Expected concentrations of selenium in fish (Section I.3, Table I-5, page I-17) would exceed some protective standards but would be similar to existing levels observed in the New and Alamo rivers and similar or

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Compliance		necessarily true. Selenium's effects can be observed throughout the ecosystem. Within the life cycle of a bird, the most obvious and noticeable effect is on the avian embryo. However, there are numerous examples available in the scientific literature in which selenium has caused massive reproductive failure among fish and decimated or completely eliminated fish from selenium-contaminated environments. We suggest the final EIS clarify the statement.	lower than levels observed in the Salton Sea and agricultural drainages (Section I.3, Table I-3, page I-11; page I-12, lines 4-9). Saiki et al. 2010 noted that fish in the IID drains had elevated selenium levels but did not appear to be adversely affected (Section I.3, page I-12, lines 7-9). At these predicted levels, the SCH Project would not be expected to cause massive reproductive failure or completely eliminate the fish. Selenium levels in the ponds would be monitored through adaptive management. The text in Section 3.4 (Section 3.4.4.3 and Impact BIO-5b) has been clarified to include fish information from Appendix I.
Office of Environmental Policy & Compliance	OEPC-15	Page I-19, Section I.3.4, lines 6 & 10: The premise is not based on salinity per se, and the interpretation is that the relationship is to salinity rather than to selenium concentration in the various sources of water. The Salton Sea type of water has overall lower concentrations of selenium than the rivers. Achieving target salinity requires less of the relatively higher source of selenium to blend with the Salton Sea water, thus presenting a lower concentration of selenium. The true relationship for selenium concentration in the blended water ponds will be one of relative volume of water from different sources, not salinity directly. We suggest the final EIS include text to clarify this point.	The referenced text has been clarified to indicate that salinity per se does not affect selenium chemistry, but rather is either (1) a correlate of blending source waters or (2) a suppressor of vegetative growth.
Office of Environmental Policy & Compliance	OEPC-16	Page I-12, Section I.3.4, line 34: Anderson (2009) documents other species of birds that breed at the ponds and can be expected to utilize SCH. However, we have no record of Brown pelicans breeding at or near the ponds and records of any recent nesting by this species are more than a decade old and few in numbers. Our understanding of the historical data for breeding birds in the Salton Sea Ecosystem is that there are very limited records of any breeding by California Brown pelicans. We suggest that the document be revised accordingly.	Although brown pelicans have not been known to nest at the Salton Sea since an unsuccessful nesting attempt in 1997 (Molina and Sturm 2004), the potential for brown pelicans to nest at the SCH Project sites was correctly identified. The referenced text and that on page 3.4-29, line 6 has been revised to indicate that nesting by brown pelicans occurred in the past.
Office of Environmental Policy & Compliance	OEPC-17	Page I-18, Section I.3.3, Lines 11 & 12: This section addresses only the selenium risk to migratory birds as a result of egg impairment. We suggest that the final EIS include information on the risk to birds that are now exposed to impounded waters in a habitat type that previously has not existed at the Salton Sea.	The appendix does include information from impounded habitats that recently existed at the Salton Sea, namely, the Reclamation/USGS ponds (Table I-7, page I-18). No text revisions are required.
Environmental Protection Agency	EPA-1	Since the DEIS does not identify a preferred alternative, we have rated each alternative, pursuant to EPA's Policy and Procedures for the Review of Federal Actions Impacting the Environment. Our rating, the same for each alternative, is Lack of Objections (please see the enclosed "Summary of EPA Rating Definitions"). EPA supports the project purpose –developing a range of aquatic 'habitats to support fish and wildlife species dependent on the Salton Sea. As the	The U.S. Environmental Protection Agency's support for the SCH Project is noted. The Final EIS/EIR includes the jurisdictional delineation in Attachment 2. Please note that the action alternatives would create between 2,080 and 3,770 acres of ponds.

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		Draft Environmental Impact Statement (DEIS) explains, the Salton Sea habitat is being lost to increasing salinity and decreasing Sea elevation. The action alternatives would create 2,080 to 3,370 acres of aquatic habitat ponds intended to serve as a proof-of concept for an even larger restoration effort. We recommend that the FEIS include the jurisdictional delineation. We have also enclosed detailed comments on water quality impacts, farmland impacts, and alternatives.	
Environmental Protection Agency	EPA-2	Section 404, Clean Water Act Permitting The project would restore shallow water habitat lost due to the Salton Sea's ever-increasing hypersalinity and reduced area, as the Sea recedes. Construction of the proposed project may impact up to 24 acres and temporarily impact up to 1,760 acres of waters of the U.S. (p. 3.4-58); however, the jurisdictional delineation has not been verified by the Army Corps. Recommendation: The FEIS should include the findings of the Corps-verified jurisdictional delineation.	The Final EIS/EIR includes the jurisdictional delineation in Attachment 2.
Environmental Protection Agency	EPA-3	Changing Water Management Practices The DEIS discusses water quality in Section 3.11. It provides contaminant concentrations and water quality parameters in Table 3.11-5, Comparison of Water Quality Objectives with Current Conditions (2004-2010 Mean Annual). The DEIS also states that "Inflow to the Sea from the Imperial Valley is projected to continue to decline from the current annual average of 1,029,620 afy [acre-feet per year] to 723,940 afy (with adjustment for the Quantification Settlement Agreement [QSA]) by 2020 (DWR and DFG 2007)." (p. 3.11-7) This will occur about the same time as the Imperial Irrigation District fallowing program also ends in 2018. The DEIS does not clarify the potential for these changes to alter phosphorus, nitrogen and pesticide concentrations in the New and Alamo Rivers. Recommendation: The FEIS should discuss expected changes to water quality based on changing water management practices, and the potential for these changes affect the project's success.	Changing water quality in the rivers is not an impact of the SCH Project and thus is not the focus of the analysis in the Draft EIS/EIR. This is a proof-of-concept project, and changes in water quality are among the variables that would be monitored as part of the monitoring and adaptive management plan that would be implemented (Section 2.4.4). No text revisions are required.
Environmental Protection Agency	EPA-4	Contingency Planning The proposed project would provide habitat for both fish and invertebrate species, which in turn would provide forage for bird species dependent on the Salton Sea Ecosystem. The project is designed as a "proof-of-concept" project for a period of ten years, in which several project features, characteristics, and operations could be tested under an adaptive management framework. This allows operators to try different combinations of storage, salinity, and residence times to investigate how these factors could be adjusted to provide the best conditions for fish and birds presently and to inform future restoration (p. 2-10). The DEIS acknowledges the funding uncertainty of the project by stating (p. 2-	Decommissioning is discussed in Section 2.4.8. The SCH Project is planned to last until approximately 2078. At the end of this period, or when funds are no longer available to operate the Project, the SCH facilities would be decommissioned. This would require breaching the berms, removing the pumping plants and diversion structures, and filling in the sedimentation basin. A specific plan would be developed prior to decommissioning to determine the most appropriate way to accomplish this and would be subject to additional environmental review. Preparing a Contingency Plan as described in the comment is not feasible. Water would be needed to maintain habitat, but pumping would be required to divert

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		10): "The proof-of-concept period would last for approximately 10 years after completion of construction (until 2025). By that time, managers would have had time to identify those management practices that best meet the Project goals. After the proof-of-concept period, the Project would be operated until the end of the 75-year period covered by the QSA (2078) or until funding were no longer available." Recommendation: The FEIS should include a Contingency Plan, should operation and management funding terminate. This Contingency Plan should provide for project modifications (e.g., breach of berms) to maximize habitat acreage and function if the project site is no longer managed and provided with an adequate water supply to maintain existing habitat.	water from the rivers as under the current Project. Because the rivers are incised and the water surface elevation is lower than that of the surrounding areas, even if the berms were breached, water would continue to flow down the river toward the Salton Sea, as it currently does, rather than enter the ponds. Once the SCH Project was terminated, however, no funds would be available to operate or maintain the pumps, and they are planned for removal. Even assuming that the pumps were not removed and could be operated periodically, diverting water from the rivers without blending it with saline water would increase risks from selenium. Moreover, operating the pumps only periodically would result in a very long residence time, which would result in poor water quality that would not support aquatic or avian species. No text revisions are required.
Environment-al Protection Agency	EPA-5	Pond Seepage Appendix C discusses pond seepage as a concern for berm stability. In the construction of New River Wetlands Demonstration Project, seepage from beneath the ponds exceeded evaporation[1]. Initially, some of the ponds in the proposed project are likely to be in direct contact with groundwater, substantially limiting seepage, but this is not true for ponds further from the shore; Additionally, as the level of the Salton Sea declines to -258 feet below mean sea level in 2077 (p. 2-9), the entire pond complex will be well above the water table. Mitigation measures, such as geosynthetic liners or low permeability soil layers, can readily prevent seepage. Recommendation: .The FEIS should discuss the relative significance of pond seepage and consider mitigation if appropriate. [1] Selenium in the New River and an Evaluation of Human Health Risk Reduction by the Brawley and Imperial Constructed Wedlands Demonstration Project (W-06-3), Richard M. Gersberg, San Diego State University, see: http://scerpfiles.orgiconcmgtJdoc_fileslW_06_3.pdf	The seepage from the SCH ponds would be different than experienced upstream at the New River Wetlands Demonstration Project because the soils present in the Sea are different than those of the farmland upstream. Based on the soil survey of the area, the soils at the Sea are considered Poorly Drained, while the soils upstream near the basin range from Poorly Drained to Well Drained. At the Sea, the hydrologic soil type is D, whereas upstream the Hydrologic Type also includes A-type soils with an ability to transmit water that ranges from Moderately High to Very High (Zimmerman 1981). Therefore, based on the soil types that are present, seepage would be less of a concern at the SCH ponds than at the New River Wetlands Demonstration Project. Seepage has been planned for in the SCH Project design, however, and additional mitigation is not required. Measures such as a bentonite slurry wall or other impervious liner in the berms would be considered in the final design as measures to control seepage. Seepage also has been accounted for in the Draft EIS/EIR as one of several losses and gains to the SCH ponds. The preliminary design includes an interception ditch on the landward side to collect seepage from the ponds and return it to the Sea (refer to Section 2.4.1.17). On the Sea side of the berms, seepage would flow to the Sea. By collecting seepage and routing it away from the berms, the interception ditch would prevent seepage from accumulating at the base of the berms. Seepage also has been accounted for in the analysis of water diversion impacts, which considered the amount of water needed to replace the water in storage in a pond plus the water to replace evaporation. Replacing the water in storage would be accomplished through direct releases to the Sea and seepage through the berms and pond bottom. Therefore, the diversion rates presented in Section 3.11 include water needed to replace direct releases, seepage, and evaporation. No text revisions are required.

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Environmental Protection Agency	EPA-6	Project Maintenance The DEIS describes vegetation removal from the sedimentation basin, interception ditch and around the river pump station (p. D-23), but does not describe vegetation removal from the Species Conservation Habitat (SCH) ponds. The lack of any vegetation description for the SCH ponds leads us to assume no vegetation is planned there, however, a variety of invasive species are likely to inhabit the ponds over time. Recommendation: The FEIS should describe and budget for vegetation removal from the SCH ponds.	The ponds would be managed with a minimum salinity of 20 parts per thousand (ppt), which would inhibit growth of vegetation. This is currently observed at the Sea. The vegetation that is colonizing the playa is in areas located away from the Sea and under the influence of river or drain water (brackish water). Vegetation is not present in the high saline areas. Monitoring as part of the adaptive management plan would identify any invasive plant species that colonized the ponds, however, and eradication or control methods would be implemented as needed. This was clarified in Section 2.4.5, Maintenance and Emergency Repairs.
Environmental Protection Agency	EPA-7	The DEIS considered the loss of 37 acres of farmland, in Impact AG-2 (permanent conversion of a small amount of farmland to nonagricultural use), less than significant for alternatives 1 and 4. Alternatives 1 and 4 convey water from the Alamo and New Rivers by gravity diversion, rather than by pumping and pipes. The next section, Impact AG-3, apparently considered the same impact significant, because the land would permanently convert Williamson Act contract land to nonagricultural use. In clarifying the significant impact, the DEIS offered the following explanation (p.3.2-10): The Williamson Act provides financial incentives to encourage the retention of agricultural land. As discussed under Impact AG-2, the conversion of 60 acres of agricultural land [the measure of significance for AG-2] would negligible in relation to the amount of land that is currently farmed and fallowed in the Imperial Valley. However, the conversion of land under Williamson Act contracts prior to the nonrenewal termination date would require the payment of cancellation fees (personal communication, A. Havens 2011). This impact would be significant when compared to both the existing environmental setting and No Action Alternative. The basis for the significance rating appears to be the payment of cancellation fees, rather than the project's environmental impacts. We also note that alternatives that include the fee payment may represent an overall project savings, when lower energy costs are also considered. Recommendation: The PEIS should clarify the entity that would need to make the fee payment, for converting Williamson Act land, and explain why this impact would be significant.	The loss of Williamson Act land was considered significant because the Act is specifically intended to provide financial incentives to preserve agricultural land, and the conversion of land under Williamson Act contracts would result in an environmental impact that conflicted with the Act's intent. The text has been revised to address this change. Any fees required for this loss would be paid by the Natural Resources Agency. The comment regarding costs of the Project alternatives is noted. No text revisions are required.
Environmental Protection Agency	EPA-8	The Department of Natural Resources selected Alternative 3 as the California Environmental Policy Act preferred alternative, "because it would provide greater long-term benefits by restoring the greatest amount of habitat, while minimizing environmental impacts to the extent feasible." (p. ES-21) Section 2.2 and Appendix B describe the development of the project alternatives; however, these sections do not clarify the reason for pond sizes associated with each alternative. If maximization of habitat is a primary criterion for selection of the preferred	Section 2.2, Alternatives Development and Appendix B, Alternatives Development Process discuss the Exclusionary Criteria and Evaluative Criteria used to formulate the pond sizes and locations. The pond sizes were based on a pond water surface elevation of -228 feet mean sea level (msl) and a maximum depth to the downstream toe of the exterior berm of 6 feet (a ground elevation of -234 feet msl). The size of the ponds was based on the area available assuming an exterior berm with a toe elevation of -234 feet. The SCH alternatives were

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		alternative by the Army Corps, which EPA supports, the document should provide an explanation for limiting pond size associated with alternatives at the same river. For example, do specific factors (topography or project costs) prevent construction of ponds similar to alternative 3, using gravity diversion? Recommendation: The FEIS should discuss constraints on the pond size associated with each alternative.	developed to use the available playa above -234 feet, while providing a range of options that included different pond sizes and methods of water delivery. This approach resulted in a base amount of acreage for either the New River or Alamo River sites (the base amount differs between the two sites because of local topography of the playas). Additional acreage was added to this base amount for the other alternatives by adding cascading ponds that moved the storage further into the Sea by using a water surface lower than -228 msl, or additional playa (New Far West or Wister Beach). The purpose of using different acreage configurations at each site was to bracket the possible configurations of playa and berm locations, thereby describing the full range of SCH sizes. No text revisions are necessary.
		State Agencies	
Native American Heritage Commission	NAHC-1	This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law. State law also addresses the freedom of Native American Religious Expression in Public Resources Code §5097.9.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).
Native American Heritage Commission	NAHC-2	The California Environmental Quality Act (CEQA –CA Public Resources Code 210 0-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. The NAHC Sacred Lands File (SLF) search resulted as follows: Native American cultural resources were identified within one-half mile of the area of potential effect (APE) where the New River empties into the Salton Sea, but not where the Alamo River flows into the sea. Also, the absence of recorded Native American cultural resources does not preclude their existence.	This comment is consistent with the analysis conducted for the Draft EIS/EIR. The results of the NAHC sacred lands search performed for the SCH Project are discussed in Section 3.5, Cultural Resources, and it was determined that no such sites would be affected by the Project. The impact analysis also states, "The Project would be located in an archaeologically sensitive area, however, and construction activities could encounter cultural resources or human remains associated with the area's historical occupation by both Native Americans and Euroamericans. Such impacts on those resources could be significant under significance criteria 1, 2, 3, 4, and/or 5." c
Native American Heritage Commission	NAHC-3	The NAHC "Sacred Sites,' as defined by the Native American Heritage Commission and the California Legislature in California Public Resources Code §§5097.94(a) and 5097.96. Items in the NAHC Sacred Lands Inventory are confidential and exempt from the Public Records Act pursuant to California Government Code §6254 (r).	The results of the sacred lands inventory are being treated as confidential under the SCH Project. No text revisions are required.

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Native American Heritage Commission	NAHC-4	We strongly urge that you make contact with the list of Native American Contacts on the attached list of Native American contacts, to see if your proposed project might impact Native American cultural resources and to obtain their recommendations concerning the proposed project. Pursuant to CA Public Resources Code §5097.95, the NAHC requests that the Native American consulting parties be provide pertinent project information. Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). Pursuant to CA Public Resources Code §5097.95, the NAHC requests that pertinent project information be provided consulting tribal parties.	Letters were sent to each of the Native American contacts originally provided by the Native American Heritage Commission (NAHC). These letters are included in Appendix L. On October 13, 2011, additional letters were sent to those contacts provided by the NAHC that were not included in the original list, including Keeny Escalanti, President, Fort Yuma Quechan Indian Nation; Mary Ann Green, Chairperson, Augustine Band of Cahuilla Mission Indians; Judy Stapp, Director of Cultural Affairs, Cabazon Band of Mission Indians; and Ernest Morreo, Torres Martinez Desert Cahuilla Indian Tribe. No responses have been received from these additional contacts. No text revisions are required.
Native American Heritage Commission	NAHC-5	The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and Section 2183.2 that requires documentation, data recovery of cultural resources.	This recommendation is noted and is consistent with the mitigation identified in MM CR-1: Prepare and implement a survey plan and an inadvertent discovery plan, included in Section 3.5, Cultural Resources. The measure states that "resources considered significant would be avoided or subject to a data recovery program." The mitigation measure further indicates that the data recovery program would be designed in consultation with appropriate state (i.e., Office of Historic Preservation) and Federal agencies). No text revisions are required.
Native American Heritage Commission	NAHC-6	Furthermore, the NAHC is of the opinion that the current project remains under the jurisdiction of the statutes and regulations of the National Environmental Policy Act (e.g. NEPA; 42 U.S.C. 4321-43351). Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA and Section 106 and 4 (f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f)(2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq*. and NAGPRA (25U.S.C.3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landcapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 1317 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.'	The analysis included in the Draft EIS/EIR is consistent with NEPA and the regulatory requirements indicated in this comment. Consultation with Native American tribes also is being conducted in a manner that meets all applicable regulatory requirements. No text revisions are required.
Native American Heritage Commission	NAHC-7	Confidentiality of "historic properties of religious and cultural significance" should also be considered as protected by California Government Code §6254(r) and may also be protected under Section 304 of the NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious	The analysis included in the Draft EIS/EIR is consistent with the confidentiality requirements specified in this comment. No text revisions are required.

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		Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APEs and possibility threatened by proposed project activity.	
Native American Heritage Commission	NAHC-8	Furthermore, Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than 'dedicated cemetery'.	Mitigation Measure (MM) CR-1, Prepare and implement a survey plan and an inadvertent discovery plan, outlines procedures to be followed in the event that cultural resources and human remains are discovered, includes provisions for accidentally discovered archeological resources during construction, consistent with the regulations specified in this comment. No text revisions are required.
Native American Heritage Commission	NAHC-9	To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects.	Representatives of the Torres Martinez Tribe have been invited to quarterly stakeholder meetings, and the tribes identified by the NAHC have received periodic newsletters advising them of the Project's progress. They also have received notices of all public meetings, including scoping meetings (one of which was held on the Torres Martinez Reservation) and meetings to provide comments on the Draft EIS/EIR, in addition to the tribal consultation letters sent by the Corps. No scoping comments or comments on the Draft EIS/EIR were received from any tribal entities, nor were any substantive comments received in response to the tribal consultation being conducted as part of the Section 106 process. As discussed in Section 6.2.3, the only responses have been a general statement of support for the Project and request for clarification of the location of the SCH Project in relation to Obsidian Butte from the Quechan Tribe and a statement that the Cocopah Indian Tribe has no comments at this time. No text revisions are required.
Dept. of Conservation	DOGGR-1	On behalf of the Division, I have included a letter that comments on the Project. I have also included a map scan that helps illustrate what we have found.	This comment is noted. No text revisions are required.
Dept. of Conservation	DOGGR-2	In addition, on page 308 – line 39-40, there is a mention that CalEnergy is operating a zinc extraction plant. I believe that they used to have a zinc extraction facility, but do not currently operate one now.	The reference to the CalEnergy zinc extraction plant has been removed from the referenced text since it was confirmed that the plant has ceased to operate.
Dept. of Conservation	DOGGR-3	There may be a potential risk of construction near plugged and abandoned wells. According the Division's database, eleven plugged and abandoned shallow temperature gradient wells are located in or near the area of the proposed project that may require plugging to present standards if the wells are exposed or the present abandonment plugs are altered. The attached map shows the approximate location of these wells. In addition, the geothermal well, "Westmorland" 47 (API # 025-90105), was not plugged and abandoned before being submerged. It will require plugging when sea level recedes and the well is exposed. This office must be contacted to obtain information on the requirements for approval to perform any remedial operations on these wells.	Section 2 has been clarified to indicate that prior to construction, DOGGR records about the location of the wells will be reviewed, and any wells present in the construction area will be identified in the field and marked to avoid contact by construction activities. Additionally, DOGGR will be contracted to obtain information on the requirements for approval to perform any remedial operations on these wells.

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Dept. of Toxic Substances Control	DTSC-1	Based on the review of the submitted document DTSC has no further comments.	The lack of comments is noted.
California Regional Water Quality Control Board	RWQCB-1	I wish to call your attention to an enclosed agenda item from the September 15, 2011 meeting of the State of California CRWQCB, CRBR. The Board enforces water quality standards for the 110 El Centro Generating Station in returning cooling water to a canal which flows into the Salton Sea. This cooling water would average 700,000 gallons per day of potential fresh water for the Salton Sea. However, because it is cheaper IID has chosen to use deep well injection of the cooling water thereby avoiding any cleanup costs and forever losing that water for the Salton Sea. The Water Quality Board has no jurisdiction over that decision and there were no noted comments from either State or Fish and Game or Fish and Wildlife. EPA limited its comments to technical well drilling issues. The vital freshwater needs of the Salton Sea appeared to not appear in this process I and I suspect this disconnect is not singular in occurrence. The State of California needs to have an active engaged role to keep fresh water flowing into the Sea!	This is not a comment on the SCH Project, nor does it raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). No text revisions are required.
State Lands Commission	CSLC-1	The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust. As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such	The need for a lease from CSLC is acknowledged in Sections 1.9.3, 1.10, 3.13.2.1, and 6.1.2.4 for those alternatives that would require the use of APN 020-010-030. These sections and Figure 1-2 were modified to address the area that is the east ½ of the northeast ¼ of Section 16, Township 11 South, Range 13 East, San Bernardino Meridian (APN 020-010-040). These sections acknowledge that any soil removed from this parcel under Alternatives 5 or 6 would require a lease from CSLC.

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		boundaries may not be readily apparent from present day site inspections. Based on CLSC staff's review of the Project and as outlined in the CSLC letter dated August 22, 2011(enclosed): ▪ The proposed Project may include lands within which the State has reserved mineral interests[1] and ▪ Two of the Alamo River alternatives are located within lands acquired by the CSLC from the Imperial Irrigation District (IID) under sovereign land exchange SLL 10: 40 acres described as assessor's parcel number (APN) 020-010-030. The IID has reserved certain rights-of-way and easements. Should the Project involve dredging on lands within which the State has reserved mineral interests, a lease from CSLC may be required. Should the Project incorporate Alamo River alternatives 4 and 6, including APN 020-010-030, a lease from CSLC would be required. [1]Please be advised that the Alamo River Alternatives will be located within lands the State acquired and patented as School Lands, all minerals reserved on the East ½ of the Northeast ¼ of Section 16, Township 11 South, Range 13 East, San Bernardino Meridian. Any movement or removal of a portion of the mineral estate may require a CSLC lease or permit.	
State Lands Commission	CSLC-2	<u>Dredging, Excavation, or Placement of Structures</u> The draft EIS/EIR states that "Project construction …would include some actions likely to involve dredging, excavation, or placement of structures in Waters of the United States, including wetlands" (p. 6-2), and "…a hydraulic dredge would be used to provide greater depth to borrow channels or create new channels through areas with soft soils. Soils removed as dredge spoils would be placed either within the Project footprint or outside of the exterior berm in the Sea" (p. 2-15). Although the draft EIS/EIR estimates over 1,800 hours of dredging time during the two-year construction schedule, it does not appear to include an estimate of the quantity of dredged spoils that may be generated by the Project, and provides only vague information about where the spoils would be placed. In order to determine CSLC jurisdiction relative to lands within which the State has reserved mineral interests, CSLC staff requests that the EIS/EIR include more specific information regarding proposed dredging activities (e.g., location of dredging, quantity of spoils generated and where the dredged spoils would be placed). Any construction activity which would occur on sovereign lands under CSLC jurisdiction (i.e., APN 020-010-030) such as dredging, excavation, building of new berms[3], modifications to existing berms, or bank protection (e.g., placement of riprap or other materials) would require a lease from the CSLC.	Section 2.4.1.1, Basic Design Considerations, states that "*The ground surface within the SCH ponds would be excavated (with a balance between cut and fill) to acquire material to build the berms and habitat islands.* Figures 2-6 through 2-11 show conceptual layouts of the SCH ponds, including berm locations. The specific locations of islands have not yet been determined, but *all pond construction would occur within the footprint shown in these figures*" (emphasis added). Section 1.9.3 indicates that the use of Parcel 010-020-030 under Alternatives 4 and 6 would require a lease agreement with the CSLC. The comment regarding the ongoing presence of the parking/staging area, pond, berms, and islands at the Salton Sea Shallow Habitat Pilot Project is noted. These features would be considered as part of the final design if Alternatives 4 or 6 were selected for implementation. No text revisions are required.

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		[3] On February 9, 2006, a five year lease (PRC 8665.9) was issued to the Bureau of Reclamation for the construction of a parking/staging area and creation, use and maintenance of a pond, less than two feet deep, and four islands for the purpose of providing an area for bird nesting in connection with the Salton Sea Shallow Habitat Pilot Project. Upon completion of the project, all equipment was to be removed and the constructed berms and islands were to remain in place as requested by IID. Aerial photos of the vicinity indicate that the prior parking/staging area, pond, berms and islands are still in place on the parcel. This project is also referenced in section 1.6.3 in the EIS/EIR (p. 1-9).	
State Lands Commission	CSLC-3	It should be noted that all decisions on lease issuance and Public Trust consistency of leases and proposed uses of sovereign lands are made only by the three-member panel of Commissioners, not by CSLC staff or other agencies; as such, the statement on page 6-9 of the EIS/EIR that the Project falls "within the definition of uses consistent with the Public Trust Doctrine" should be clarified or removed.	The referenced text was modified as indicated.
State Lands Commission	CSLC-4	<u>Greenhouse Gas (GHG) Emissions</u> The EIS/EIR would benefit from a more clear presentation of a specific measure or metric against which the Project's impacts are measured to determine significance. As presented, the EIS/EIR only discusses the GHG significance thresholds in very general terms that limit the CSLC's ability to compare the Project's incremental change to the baseline against a readily identified, measureable threshold. As such, it is difficult to draw the logical link, using substantial evidence, between the incremental change to the environment and the ultimate "less than significant impact" and "no mitigation required" conclusions for GHGs. Notwithstanding the statement in the EIS/EIR that Project-related construction emissions are well under the 25,000 metric tons of carbon dioxide equivalents (CO2e) that would trigger reporting for "major facilities" (EIS/EIR p. 3.9-12), which is not held out in the EIS/EIR as the document's stated significance threshold, CSLC staff suggests that the potential to generate the equivalent of up to 6,650 metric tons of CO2e per year (under Alternative 3) for the duration of Project construction could be considered a significant impact that requires mitigation absent a more clearly articulated threshold. If the EIS/EIR concludes that no feasible mitigation is available, then the EIS/EIR should state that the impact is significant and unavoidable.	The discussion in Section 3.9, Greenhouse Gas Emissions/Climate Changes has been modified to more clearly state the justification for the significance determination, although the conclusions remain unchanged. As discussed on page 3.9-11, lines 24-26, no quantitative GHG thresholds of significance that would apply to the Project have been established at the Federal, state, or local levels. Under both NEPA and CEQA, lead agencies are given the discretion to establish their own qualitative thresholds. The Council on Environmental Quality's [CEQ] Draft National Environmental Policy Act Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (CEQ 2010) indicates that in an agency's analysis of direct effects, it would be appropriate to: (1) quantify cumulative emissions over the life of the project; (2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and (3) *qualitatively* discuss the link between such GHG emissions and climate change (emphasis added). Section 15064.4(a)(2) of the CEQA Guidelines also gives a lead agency the discretion to determine, in the context of a particular project, whether to rely on a qualitative analysis or performance-based standards. Therefore, in the absence of a quantitative threshold of significance, the lead agencies for the SCH Project have developed a multi-pronged, qualitative approach that takes into consideration factors such as: ▪ Consistency or potential for conflict with plans to reduce GHG emissions. ▪ Relative amounts of GHG emissions, taking into consideration whether the amount of emissions is small compared to the 25,000 $MTCO_2e$ reporting threshold for AB 32. The CEQ also references the 25,000 $MTCO_2e$ threshold, not as an indicator of a threshold of significant effects, but rather

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			as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs (refer to Section 3.9.2.1). The 7,000 $MTCO_2e$ annual threshold of significance suggested by the California Air Resources Board draft guidance in 2008 also is used as a guideline. ▪ Potential to contribute to a lower carbon future and energy efficiency. As discussed under Impact GHG-2, the Project would not conflict with plans to reduce GHG emissions. As discussed on page 3.9-12, at 5,800 tonnes of CO_2e over the 2-year construction period, the annual construction emissions for Alternative 1 are well under the annual 25,000 $MTCO_2e$ reporting threshold. They also are well under the draft annual 7,000 $MTCO_2e$ threshold. This conclusion is applicable to all Project alternatives. (Note that the 6,650 tonnes referenced in the comment are total emissions that would occur over a 2-year period and are not annual emissions.) To provide additional perspective, if the 6,650 tonnes of total construction emissions were amortized over the approximately 64-year Project duration, they would be approximately 52 $MTCO_2e$ per year. (The Sacramento Metropolitan Air Quality Management District [2011] has identified amortization as an appropriate method of analyzing short-term construction emissions.) Direct annual emissions of GHG during operations would be minor. Alternative 3, the alternative that would generate the most emissions, would result in about 103 tonnes of direct emissions annually. Combined direct and indirect emissions would be about 3,120 annually. This, too, is well under the 25,000 $MTCO_2e$ reporting threshold and the draft 7,000 $MTCO_2e$ threshold. The Project has been designed to be energy-efficient. Only electric pumps would be used during operations, in order to minimize direct emissions. Power to supply the Project would be provided by IID, which is adding more renewable energy sources into its resource mix in order to meet regulatory requirements (IID 2010). Thus, indirect emissions would be expected to decrease over time. Additionally, as indicated on page 3.9-15, the Project would comply with best management practices that are intended to reduce GHG emissions during construction, operations, and maintenance to the extent feasible (refer to Section 2.4.7 for a description of these practices). Using these best management practices would contribute to energy efficiency.
State Lands Commission	CSLC-5	CSLC staff also requests that the EIS/EIR reanalyze the appropriateness of the conclusion that the cumulative impacts to global climate change, from Project construction and operation, are less than significant and that no mitigation is required.	As indicated on page 3.9-11, lines 20-24, the environmental effects of GHG emissions from this Project are addressed as cumulative impacts. Please refer to the response to CLSC-4 regarding the significance determination. No additional text revisions are required

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State Lands Commission	CSLC-6	Mitigation Measure (MM) CR-1 (p. 3.5-11) requires preparation and implementation of a survey plan and an inadvertent discovery plan. The measure states that resources considered significant would be avoided or subject to a data recovery program. The data recovery program would be designed in consultation with appropriate state (i.e., Office of Historic Preservation) and Federal agencies and include excavation of an archaeological site to recover any buried artifacts or other data. Please note that the Agency should also consult with the CSLC in the event that any cultural resources are discovered on sovereign lands under the jurisdiction of the CSLC (i.e., APN 020-010-030). Any archaeological site or historic resource remaining on State lands for more than 50 years is presumed to be significant.	The California Natural Resources Agency would consult with the California State Lands Commission should any cultural resources be encountered on sovereign lands under its jurisdiction. The preferred alternative, however, does not require disturbance to APN 020-010-030. No text revisions are required.
State Lands Commission	CSLC-7	Mitigation Monitoring and Reporting Program (MMRP) Upon adoption of the EIS/EIR, the Agency should provide a MMRP pursuant to State CEQA Guidelines section 15074, subdivision (d). The MMRP should include methods for coordination, timing for implementation of mitigation measures and list all parties and/or state and federal agencies, in addition to the Agency, responsible for ensuring compliance and enforcement through permit conditions, agreements or other measures during construction and management of the Project.	A Mitigation Monitoring and Reporting Program is included as Attachment 4 to the Final EIS/EIR.
		Local/Regional Agencies	
Imperial Irrigation District	IID-1	1. IID is supportive of implementing the SCH project and believes this is a reasonable first step in restoration at the Salton Sea.	IID's support of the SCH Project is noted.
Imperial Irrigation District	IID-2	2. In a number of places, the document mentions applications filed by the Metropolitan District of Southern California (Metropolitan) with the State Water Resources Control Board (SWRCB) to appropriate water from the New and Alamo Rivers for use by Metropolitan. It also notes that no action has been taken on these applications because the required environmental analysis has not been done. The document should state that IID has the right to the use of water from agricultural return flows from the IID service area. If Metropolitan were to proceed with its applications, IID and others would have the right to protest the application. The quantity of agricultural drain flow in a given year is directly related to how much water is used in irrigation in the first instance. Water orders vary greatly, depending upon many factors, including the economy, weather conditions, rainfall, types of crops grown, etc., which in turn means that the drain flow varies greatly, so it would not be a particularly reliable source of water for a potable water supplier.	Please refer to Master Response 6, Water Rights.

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Imperial Irrigation District	IID-3	3. Subsection 1-3 CEQA Project Goals and Objectives/NEPA Purpose and Need: Discussion of the Quantification Settlement Agreement (QSA) states IID is required to provide conserved water to the Salton Sea to mitigate the effects of transfer on salinity until 2017. IID requests that this be updated to reflect that IID and San Diego County Water Authority will file a petition with SWRCB requesting that mitigation water to the Salton Sea stop at the end of 2013 and a higher functional value and longer lasting mitigation be substituted for the mitigation water in the form of habitat creation similar to that proposed by California Department of Fish and Game's (CDFG) SCH.	The referenced text has been modified as indicated in the comment.
Imperial Irrigation District	IID-4	Subsection 1.10 Required Permits and Consultations, Page 1-12: Discussion should include IID approval of use of agricultural return flows in Alamo and New Rivers.	The referenced text has been modified as indicated.
Imperial Irrigation District	IID-5	4. IID believes that the proposed SCH should be built in areas outside of the Salton Sea Known Geothermal Resource Area (KGRA), which is essentially the areas immediately east of the New River, continuing east past the Alamo River and through the Morton Bay area, and/or the County of Imperial Geothermal Overlay. If alternatives are implemented within the KGRA, specific easements or other provisions for geothermal activity should be established prior to implementation of the alternative. IID believes that geothermal development and habitat creation/ management are compatible and both need to be considered equally in the implementation of the SCH.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Imperial Irrigation District	IID-6	5. The proposed SCH project should be designed and located so as to minimize loss of active or potential agricultural land and to minimize loss of production on agricultural land during the construction and operation of the project.	The only alternatives requiring the use of agricultural land would be those involving gravity diversion (Alternatives 1 and 4). The preferred alternative (Alternative 3) was selected, in part, to minimize impacts on agricultural land during construction and operation. As discussed in Section 2.4.1.23, for all alternatives, if easements from private owners were required, the easement would be structured so as to not preclude the continued use of the property by the landowner. The land in the easement would be disturbed during construction but then would be returned to the preexisting condition after construction, except at the sites of permanent facilities, such as pump stations, diversion works, and pipeline access manholes. Thus, all alternatives would be structured to minimize impacts on agricultural land. No text revisions are required.
Imperial Irrigation District	IID-7	6. IID suggests that some fresh water cells should be included in the SCH. This would allow for additional research into fresh water selenium pathways and perhaps help to develop better risk assessment criteria for freshwater systems around the Salton Sea.	Please refer to Master Response 7, Operations and Adaptive Management.
Imperial Irrigation	IID-8	7. Page 2-4, Subsection 2.2.1 Exclusionary Criteria, 1. Available Water Rights, Lines 13-19: IID has the right to the use of all agricultural return flows from IID's	The referenced text has been modified as indicated.

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District		service area (which is the majority of the flows in the New and Alamo Rivers). Furthermore, the document should state that IID has the right to the use of all water from its agricultural return flows and that the SCH Project must obtain IID's permission to use the return flow.	
Imperial Irrigation District	IID-9	8. Page 2.10, Subsection 2.3.2.3 Pupfish Connectivity, Lines 3-15: Implementation of any of the alternatives (except no action) will require coordination with IID to identify the most efficient methods for drain connectivity. IID and the state SCH team have coordinated during the design and preparation of the Draft EIS/EIR and IID recommends that the coordination continue during the final design and implementation stages of the project. IID would suggest that an IID representative be included in the final planning, design and construction coordination meetings for the project.	The Project team will continue coordinating with IID to identify and address these issues. IID will be a reviewer of the final plans, as indicated in the revised text of Section 1.10, Required Permits and Consultations.
Imperial Irrigation District	IID-10	9. Page 2-13, Subsection 2.4.1.3 Berms, Lines 32-40: In keeping with the idea of the initial ponds being a pilot project to inform later designs and habitat creation, IID suggests incorporating some geotube barriers in the design to evaluate their effectiveness and the logistics of their installation.	Geotubes were discussed on page 2-13, lines 32-40 and could be examined as part of the final design based on the results of the analysis of the local soils. No text revisions are required.
Imperial Irrigation District	IID-11	10. Pages 2-15 and 2-16, Subsection 2.4.1.7 Water Supply, Lines 40-44 and 1-5, respectively: Again in keeping with the pilot project concept, IID suggests that the state evaluate various salinity conditions and how that salinity concentration impacts other area wildlife.	Please refer to Master Response 7, Operations and Adaptive Management.
Imperial Irrigation District	IID-12	11. Page 2-16, Subsection 2.4.1.10 River Diversion Gravity Diversion Structure, Lines 27-35: As has been discussed in the preliminary design meetings and public workshops, any water control structures in the river channels should be designed to avoid or mitigate for impacts to IID and farmer irrigation infrastructure (including tail and tile water discharges). This appears to be the case, based on the discussion in the Draft EIS/EIR, but IID would request a review of the final design plans to verify. In general, IID supports pipeline delivery systems over open channels because of the reduced footprint required for pipelines (thus reducing the loss of additional agricultural land and production).	As indicated, the Project's water control structures in the river channels are being designed to avoid impacts on IID and farmer irrigation infrastructure (including tail and tile water discharges). The Project team will continue coordinating with IID as the design progresses, and IID will review the final plans. As discussed in Appendix B, Alternatives Development, an open channel was eliminated during the initial screening phase and was not included in the alternatives carried forward for detailed analysis. No text revisions are required.
Imperial Irrigation District	IID-13	12. Page 2-17, Subsection 2.4.1.15 Power Supply, Lines 31-38: See item no. 17.	Please refer to the response to IID-18.
Imperial Irrigation District	IID-14	13. Page 2-19, Subsection 2.4.1.17 Interception Ditch/Local Drainage, Lines 14-30: The SCH team has coordinated with IID in the planning and preparation of the Draft EIS/EIR regarding drainage issues and IID recommends that coordination should continue to address stormwater and agricultural drainage potentially impacted by the project and the pupfish connectivity issue. *See item*	The Project team will continue coordinating with IID to identify and address these issues. IID will reviewer the final plans. No text revisions are required.

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		no. 8 regarding IID representative on the design/implementation team.	
Imperial Irrigation District	IID-15	14. Page 2-20, Subsection 2.4.19 Bird Habitat Features, Lines 1-25: IID supports the multiple habitat approach to the SCH. We also support the state's plan to use these cells, not only as functional habitat, but as a pilot project to inform future projects and operations regarding selenium and salinity concentrations in fish and avian habitat areas. IID would like to continue the science partnership that the state has developed with various academic organizations, tribal entities, private firms, state and federal wildlife, water and land use agencies and the IID that has proved so successful in the development of this plan and the advancement of other restoration, reclamation and mitigation projects around the Salton Sea.	IID's support for the project is noted. The Project team will continue coordinating with IID to identify and address issues related to the referenced partnerships. No text revisions are required.
Imperial Irrigation District	IID-16	15. Page 2-21, Subsection 2.4.1.23 Land Acquisition, Lines 26-28: IID and the state design team have had preliminary discussions regarding property acquisition and the IID Board has passed a resolution in support of the concept of the SCH project, conditioned on the design not precluding or significantly inhibiting other land uses. It is very important to the IID that the SCH project be compatible with geothermal energy resources and continued agricultural production either through selective location or design/permitting criteria. Final disposition of any IID-owned land will require IID Board approval.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Imperial Irrigation District	IID-17	16. Page 2-22, Subsection 2.4.1.25 Project Compatibility with other Potential Future Land Uses – Geothermal, Lines 10-31: IID appreciates that the SCH team consulted with IID and the geothermal development groups during the project development. There should be additional coordination during the final design and implementation to assure that geothermal development activity is adequately recognized as a compatible land use and that potential future development in the vicinity of the SCH is not significantly curtailed by the project.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Imperial Irrigation District	IID-18	17. Page 2-25, Subsection 2.4.2.9 Power Line Construction, Lines 7-14: IID Energy will require coordination review and approval of any power line construction that will be incorporated into the IID distribution system.	The text has been modified as indicated.
Imperial Irrigation District	IID-19	18. Section 3.2 Agricultural Resources: *See item no. 33 on recoverable farmland.*	Please refer to the response to IID-34.
Imperial Irrigation District	IID-20	19. Pages 3.3-23 to 3.3-26, Subsection 3.3.4 Air Quality: IID has, or is in the process of, implementing the measures included in the Quantification Settlement Agreement Implementation section of the Draft EIS/EIR. Access restrictions have been implemented and IID continues to coordinate with Imperial County and other land owners on gating specific areas. Several years ago the Joint Powers Authority (JPA) and the State of California partnered to implement	The referenced text has been modified as indicated in the comment.

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		six air stations around the Salton Sea to gather data for the QSA mitigation requirements and to provide data to the state's Salton Sea Ecosystem Restoration project. The JPA funded the installation and operation of six stations that monitor metrological and particulate matter data around the Salton Sea. As part of that plan the state would add gaseous monitoring equipment to the stations at a later date, subject to available state funding. The stations have been in operation, collecting metrological and particulate matter data for several years. The JPA has also funded several pilot projects at the Salton Sea. These projects include sheet flow flooding of several areas to evaluate potential vegetation enhancement and inundation of the playa as dust emission controls. Additional projects, including the application of surfactant products to the exposed playa are also underway. Several pilot projects to evaluate other land uses for exposed playa, such as solar energy generation, reclaimed agricultural, shallow water habitat are in the planning stages. IID also plans to implement more traditional control measures such as wind barriers.	
Imperial Irrigation District	IID-21	20. Section 3.4 Biological Resources: The river deltas are recognized in the QSA draft Habitat Conservation Plan (HCP) and related permits as high value habitat for bird species. Any diversions from the river channels should be managed so as to prevent any reduction in habitat value within the reaches of the river delta.	As the Salton Sea recedes, the river deltas and associated riparian habitat will change considerably regardless of whether the SCH Project is implemented. The deltas will extend (move away from the existing shoreline) across the exposed Sea bed fairly rapidly in response to the receding Sea irrespective of Project implementation. The amount of vegetation that colonizes the margins of the river/delta on the exposed Sea bed will depend on the amount of sediment deposited, salinity of the sediment (including the Sea bed), and time. Dredging to maintain flow through the deltas and big storm events will continue to change the deltas more than the SCH Project would. Diversion of water for the SCH Project would reduce the volume of water flowing through the delta, but would not eliminate the delta or adjacent habitat at the river mouth of the selected site. The river would still flow into the Sea, but some of the water would be diverted into the SCH ponds along with some of the sediment carried by river flow. The remaining sediment would continue to be deposited in the Sea so that the existing delta formation process would continue beyond the SCH ponds. Habitat at these ponds would partially offset the loss of delta habitat that will occur under No Action. Habitat for nesting bird colonies (large trees) would remain where it is due to high groundwater levels maintained by the adjacent SCH ponds. The interface between the river and the Sea, however, will move seaward (not due to the Project), and the reduced river flow (due to the Project) would reduce the size of the mixing zone in the Sea. Thus, habitat value of the delta at the selected site will change unrelated to the SCH Project (other river deltas would not be affected by the SCH Project). Riverine aquatic habitat would remain downstream of the Project diversion, just with less water, and riparian habitat would remain at its

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			current location with gradual extension along the river margins as the river extends across the exposed Sea bed. The size of the mixing zone where the river enters the Sea would decrease due to the lower flow after water diversion for the SCH ponds. Thus, no additional measures are required to manage diversions from the river channels in order to prevent any reduction in habitat value within the reaches of the river deltas. No text revisions are required.
Imperial Irrigation District	IID-22	21. Page 3.4-30, Subsection 3.4.42 Resources Thresholds of Significance, Lines 34–38: While IID's Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) is not approved; IID has been operating under the requirements of the draft plan. We believe that the SCH project should be compatible with the requirements that IID has been operating under since the completion of the draft HCP and related authorizations and documents.	IID's belief that the SCH project should be compatible with the requirements that IID has been operating under since the completion of the draft HCP and related authorizations and documents is noted. No text revisions are required.
Imperial Irrigation District	IID-23	22. Section 3.6.1 Energy Consumption: Based on the projected inflows into the SCH system, energy consumption may be very high. IID requests that the hydrologic and water balance data and models be reviewed by IID and others to verify flow rates. Until this verification is completed it is difficult to comment on proposed energy consumption rates for pumping.	The Project team will continue coordinating with IID to identify and address these issues, and IID will review the final plans. The hydrologic analysis has been reviewed with IID and submitted for internal use by IID.
Imperial Irrigation District	IID-24	23. Section 3.11 Hydrology and Water Quality general comment: IID requests access to the hydrologic model and data used in the evaluation of future Salton Sea water elevations and salinity concentrations. This data is necessary to further evaluate the analysis presented and compare it to other existing Salton Sea hydrologic models.	The hydrologic analysis has been reviewed with IID and submitted for internal use by IID. Based on discussions with IID, the impact analysis in Section 3.11, Hydrology and Water Quality was revised to reflect the projected Sea elevation and salinity under the CEQA Baseline established in the Salton Sea Ecosystem Restoration Program PEIR. The analysis contained in the Draft EIS/EIR used the Variability Conditions Inflow, which assumes lower future inflows to the Sea than assumed under the CEQA Baseline and thus presented a worst-case scenario. The conclusions remained unchanged.
Imperial Irrigation District	IID-25	24. Page 3.11-3, Subsection 3.11.2.1 Water Rights, Lines 3-12: IID has the right to the use of all return agricultural flows in the Alamo and New rivers that come from its service area. *See item no. 7.*	The text has been modified as indicated in the comment.
Imperial Irrigation District	IID-26	25. Page 3.11-3, Subsection 3.11.2.2 Salton Sea and Agricultural Drainage, Lines 19-20: The Salton Sea has also been declared a permanent flowage easement for IID and the Coachella Valley Water District in December, 2000 as part of the Torres Martinez Desert Cahuilla Indians Claims Settlement (Pub. L. 106-568,114 Stat.2906. See 25 U.S.C. && 1778 a (6); 1778e (a), (b)).	The text has been modified as indicated in the comment.
Imperial Irrigation District	IID-27	26. Page 3.11-7, Subsection 3.11.2.5 Surface Water Hydrology-Salton Sea, Lines 8-9: Reduction in water orders from farmers during the last 10 years, reduced flows from Mexico and lower precipitation have also contributed to the	The text has been modified as indicated in the comment.

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		decline in flows in the New and Alamo Rivers.	
Imperial Irrigation District	IID-28	27. Page 3.11-11, Subsection 3.11.2.5 Surface Water Hydrology, Lines 30-32: Please verify accuracy of claim that 10 percent is agricultural drain water.	The text has been clarified to indicate that agricultural drainage from the Imperial Valley *directly* to the Sea comprises about 10 percent of total Imperial Valley contribution to the Sea's inflow.
Imperial Irrigation District	IID-29	28. Pages 3.11-21 to 3.11-30, Subsection 3.11.3.1 Surface Water Hydrology Impact Analysis Methodology: It appears that the flow rates for inflow to the cells is high. IID would like to review the modeling data to further evaluate the flow rates suggested in the document. IID suggests that resident time be evaluated as part of the operation of the SCH cells. A water quality and biological monitoring program could also be implemented to evaluate the habitat parameters under different resident times. If, based on the water quality and habitat evaluations, longer resident times are supported; it could mean a reduction in operation costs and water use.	The Project team will continue coordinating with IID to identify and address these issues, and IID will review the final plans. The pond residence time would be evaluated as part of the adaptive management plan for the SCH Project. Biological and physical monitoring also is included in the adaptive management plan so operations can be modified in response to biological conditions. The flow rates were calculated as part of the Draft EIS/EIR and are based on the amount of water needed to replace the volume of pond water within the specified residence time plus the amount of evaporation. No text revisions are required.
Imperial Irrigation District	IID-30	29. Pages 3.11-30 and 3.11-31, Subsection 3.11.3.2 Thresholds of Significance, Lines 42-44 and 1-3, respectively: Excavation of sediment ponds 15-20 feet below existing ground surface may intercept localized water tables and may experience soil liquefaction making excavation difficult. Even with dewatering this may be difficult.	This comment is noted; were an alternative selected that required excavation of an upstream sedimentation basin (which is not part of the State's preferred alternative identified in the Draft EIS/EIR), additional, detailed geotechnical and groundwater studies would be conducted. These investigations would examine the soil profile, soil strength, and other geotechnical properties of the soil. In addition, a licensed geotechnical engineer would prepare excavation plans for the construction of the basin. Site-specific requirements could include temporary dewatering using pumped wells or well points to avoid running sands and/or slope instability. Permanent slope stabilization measures may include over-excavating the slopes and replacing them with a compacted fill buttress that incorporates a graded-filter-protected internal drain. No text revisions are required.
Imperial Irrigation District	IID-31	30. Page 3.11-35, Subsection 3.11.3.3 No Action Alternative, Lines 22-28: Some of the current projections for inflows from Mexico are much less than those noted in the Draft EIS/EIR. Reuse of New River water in Mexico may significantly reduce inflow volumes in future years.	The inflow projections used were derived from the Salton Sea Ecosystem Restoration Program PEIR and are based on the assumption of declining inflows to the Sea. As discussed in the response to IID-24, the analysis has been updated to reflect the PEIR's CEQA Baseline. Projections of future inflows are uncertain and this uncertainty was identified in the PEIR with the development of two baseline conditions. Impacts have been assessed under both of these baseline conditions, and the impacts of the SCH Project were found to be less than significant. No text revisions are required.
Imperial Irrigation District	IID-32	31. Page 3.13-9, Subsection 3.13.3.5 Future Land Use in the Study Area - Geothermal Energy Production, Line 27: The well pads could include multiple well heads with directional boring under the surrounding SCH areas.	The text has been modified as indicated in the comment.
Imperial Irrigation	IID-33	32. Page 3.13-16, Subsection 3.13.4.4 Alternative 1 – New River Gravity Diversion – Cascading Ponds, Lines 16-27: The planned SCH should include	Please refer to Master Response 8, Compatibility with Geothermal Development.

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District		provisions that establish and preserve access for geothermal activity after suitable habitat is established in the ponds. Given that the ponds are designed to support multiple species, including some that are protected or otherwise recognized under state or federal regulation and guidelines, there should be some acknowledgement that the future or current presence of those species in the SCH areas will not preclude geothermal development activity. Note: this comment applies to all of the alternatives.	
Imperial Irrigation District	IID-34	33. Page 3.19-7, Subsection 3.19.3.3 No Action Alternative, Lines 22-30: Some areas along the western shoreline of the Salton Sea (Elmore Ranch area) contain more well drained soils than the river delta areas and may be reclaimed as farmland without the installation of tile lines (thus eliminating or reducing the need for ground surface to be 6-7 feet above water level). Additionally, IID and local farmers are investigating the potential for reclamation of these soils without excessive leeching (with repeated deep tillage of the soil to promote aeration). Most of these areas are well to the west of any of the alternatives presented, but some reclaimed areas may be identified within the river deltas. IID agrees that reclamation of farmland within the area of the proposed alternatives is speculative.	The text has been modified as indicated in the comment. IID's agreement that reclamation of farmland within the area of the proposed alternatives is speculative is noted.
Imperial Irrigation District	IID-35	34. Pages D-4 and D-5, Section D.2.6 Agricultural Drain Interception Ditch, Lines 39-42 and 1-2, respectively: Activities conducted by IID in the interception ditches would be subject to the requirements of the HCP and related permits and authorizations. As with other IID maintained drains, IID would have the final decisions on the maintenance conducted (subject to the provisions of the HCP and related documents).	The text has been modified as indicated in the comment.
Imperial Irrigation District	IID-36	35. Page D-6, Section D.3.2 Salinity of Stored Water: IID agrees with the concept of testing different salinities under various conditions to more closely evaluate selenium concentrations. We also believe the evaluation should include some cells that are irrigated with only drain water (no Salton Sea water mix) to evaluate selenium concentrations, track bioaccumulation and how that might affect individuals and overall species populations. This field experiment would help inform the selenium Ecological Risk Modeling reported in Appendix I.	Please refer to Master Response 7, Operations and Adaptive Management.
Imperial Irrigation District	IID-37	36. Page D-9, Section D.3.4 Residence Time: IID supports evaluating residence time in the SCH cells. Longer resident times could maintain habitat functional values, manage salinity and reduce pumping costs for replacement water. This might require a more intensive water quality monitoring program. IID suggests that residence time be tied to water quality or habitat quality instead of a set number of days. *See item no. 28.*	Please refer to Master Response 7, Operations and Adaptive Management.
Imperial	IID-38	37. Pages D-14 and D-15, Section D.4 Possible Operational Scenarios: IID would	Please refer to Master Response 7, Operations and Adaptive Management.

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Irrigation District		suggest reducing the lower limit on the salinity operational variable to 10 ppt or less in at least one cell to evaluate selenium concentrations and potential bioaccumulation. With a robust monitoring program any potential affects to wildlife could be identified early and the salinity range increased if required. Appendix I Selenium Management Strategies	
Imperial Irrigation District	IID-39	38. IID suggests that some fresh water (agricultural drain water) cells be incorporated into the SCH habitat to further evaluate the potential risks to wildlife associated with freshwater systems.	Please refer to Master Response 7, Operations and Adaptive Management.
Imperial Irrigation District	IID-40	39. IID lands with geothermal resources may not be available for this project.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Imperial Irrigation District	IID-41	40. The proponent may not use IID's canal or drain banks to access the project sites.	The SCH Project does not require the use of IID's canal or drain banks to access Project sites.
Imperial Irrigation District	IID-42	41. If any additional crossings or modification to the existing ones are needed, then the applicant will be responsible for the cost of these improvements and IID will design and construct them.	Such issues would be coordinated with IID as the Project design proceeds. No text revisions are required.
Imperial Irrigation District	IID-43	42. Fences should be installed at the boundary of IID's right-of-way for safety and allow access for IID operation and maintenance activities.	Such issues would be coordinated with IID as the Project design proceeds. No text revisions are required.
Imperial Irrigation District	IID-44	44. Any construction or operation on IID property or within its existing and proposed right of way or easements will require an encroachment permit, including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities. A copy of the encroachment permit application is included in the IID's *Developer Project Guide 2008*. The guide can be accessed at the following web site: http://www.iid.com/Modules/ShowDocument.aspx?documentid=2328. Also, instructions for the completion of encroachment applications can be found at http://www.iid.com/Modules/ShowDocument.aspx?documentid=2335. The IID Real Estate Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits.	The text has been modified as indicated in the comment.
Imperial Irrigation District	IID-45	45. Any new, relocated, upgraded or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction	New facilities known to be needed for the SCH Project were included in the impact analysis, although a new discussion of impacts of the power lines on birds was added to Section 3.4, and Section 3.1, Aesthetics (Impact AES-3) was clarified to indicate that Project facilities include power lines. Prior conversations with IID indicated that adequate power would be available to the Project and did

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		and/or upgrade of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully mitigated. Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.	not raise the need for new substations. The design team will continue to coordinate with IID regarding the availability of 3-phase power lines that could accept the projected load. These power facilities are within the area of impact discussed in the Draft EIS/EIR. It is acknowledged that the Natural Resources Agency would be responsible for changes to IID facilities directly resulting from the SCH Project.
San Diego County Water Authority	SDCWA-1	On June 25, 2007, the California Resources Agency certified a Final Program Environmental Impact Report for the Salton Sea Ecosystem Restoration Program that identified a preferred alternative for restoring the Sea. The Water Authority participated as a member of the Advisory Committee that assisted in the preparation of the PEIR and preferred alternative. Disappointingly, the State has taken no further action to implement restoration despite repeated requests by various public agencies and other concerned organizations. The proposed SCH project is very similar to the Saline Habitat Complexes described in the Ecosystem Restoration Program FPEIR and provides the first meaningful State contribution to Sea restoration.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
San Diego County Water Authority	SDCWA-2	The Water Authority concurs with the two stated project goals: 1) develop a range of aquatic habitat that will support fish and wildlife species dependent on the Sea, and 2) develop and refine information needed to successfully manage the SCH through an adaptive management process. Because the SCH is intended to evaluate various approaches for shallow water habitat restoration, it is important that the project be designed and implemented to test multiple hypotheses related to water quantity/quality and establishing appropriate habitat for target species.	The SDCWA's support for the SCH Project's goals is noted.
San Diego County Water Authority	SDCWA-3	1. The selected alternative should be located to avoid areas with high potential for geothermal development. Maximum development of renewable energy sources is important to combating climate change and can be an important economic benefit to the Imperial Valley. Significant geothermal resources exist in and around the Sea. As the Sea recedes, renewable energy development along a newly exposed shoreline could help reduce wind-blown dust, thus lowering projected particulate emissions and preventing further air quality degradation.	Please refer to Master Response 8, Compatibility with Geothermal Development.
San Diego County Water Authority	SDCWA-4	2. The selected alternative should minimize adverse effects on existing agricultural lands, both during construction and long-term operation, to ensure minimal impacts to the local economy.	Please refer to the response to IID-6.
San Diego County Water Authority	SDCWA-5	3. The design and operation of the selected alternative should include elements that allow testing of various water quality parameters, such as salinity, temperature, dissolved oxygen, as well as chemical constituents such as selenium. An appropriate design would ensure that any potential relationships	Please refer to Master Response 7, Operations and Adaptive Management.

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		between physical, chemical and biological criteria could be evaluated.	
San Diego County Water Authority	SDCWA-6	4. The selected alternative should include elements to provide for desert pupfish connectivity. The dispersal routes for the various desert pupfish populations found in the New and Alamo Rivers and agricultural drains must be maintained.	Pupfish connectivity would be maintained by the interception ditch that would collect drain water and SCH seepage and convey the water to the Sea. The interception ditch would link the existing drains with the Sea to maintain connectivity.
San Diego County Water Authority	SDCWA-7	5. Final design of the selected alternative should account for the variability of water flows to the Sea expected in various models. The propose primary source of water for the SCH, agricultural drain flows, are highly variable and dependent on the amount and type of agricultural activity at any given time.	The flow of both the New and Alamo rivers is composed primarily of agricultural return flows (drainage flows). The variability of the drainage flows throughout the year is reflected in the flow pattern described for both rivers and illustrated in Figures 3.11-4 and 3.11-5. The proposed diversions are compared to these flows in Tables 3.11-8 and 3.11-9 and Figures 3.11-7 and 3.11-8 to display the relative impact of the Project on these variable return flows. In addition, the return flows are anticipated to decline in the future as crop patterns and applied water change. This is described in Section 3.11 and is incorporated in the impact assessment by using the PEIR CEQA Baseline for the assessment (refer also to the response to IID-24). No additional text revisions are required.
San Diego County Water Authority	SDCWA-8	6. The identified preferred alternative involves pumping rather than gravity flow. Additional detail on cost benefit should be included in the FEIR to justify this highly engineered and potentially costly solution. Less intensively managed systems (e.g., gravity flow systems) typically more easily approximate natural habitats. Permanent conversion of limited agricultural land for the sedimentation basins may be justified if it results in a substantial lifetime cost savings and provides a greater probability of achieving project goals.	Please refer to Master Response 5, Project Costs. Regarding the less intensively managed systems, the upstream sediment basins have problems that are more extensive than the conversion of agricultural land. Please see response to comment IID-30. Additionally, apart from environmental considerations, the development of a several-mile pipeline would potentially require easements from numerous landowners, which could cause extensive schedule delays, defeating the purpose of the project, and could potentially render the pipeline infeasible if willing owners were not available. No text revisions are required.
San Diego County Water Authority	SDCWA-9	7. The selected alternative should not adversely affect implementation of mitigation measures for the Quantification Settlement Agreement and Imperial Irrigation District Water Conservation and Transfer Projects. The Imperial Irrigation District, in partnership with the Water Authority and others, is currently implementing various mitigation measures approved as part of these projects. Close coordination with the Imperial Irrigation District may avoid conflict and identify opportunities for synergy between the projects.	This comment is noted. The SCH team will continue to coordinate with IID to avoid conflicts and look for opportunities for synergy. No text revisions are required.
Imperial County Air Pollution Control District	ICAPCD-1	1. The Draft EIR/EIS states that the project is intended to be funded under a legislative appropriation made pursuant to Fish and Game Code section 2932, subdivision (b). This law established the Salton Sea Restoration Fund for implementing the preferred alternative for restoring the Salton Sea. The Draft EIS/EIR needs to provide a full explanation of how this project affects and implements the Salton Sea restoration preferred alternatives identified by the Federal government, the State, and the Salton Sea Authority. Further, the Draft	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion. Fish and Game Code section 2932 establishes the Salton Sea Restoration Fund and lists how that fund can be spent. Section 2932.3 describes how a portion of the funds (the Proposition 84 funds) deposited into the Salton Sea Restoration Fund can be spent. Section 2932, subdivision (b) is quoted in the Draft EIS/EIR,

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		EIR/EIS misquotes Section 2932, subdivision b, which states: "Implementation of conversation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including adaptive management measurements pursuant to Section 2081.7". The omitted reference to Section 2081.7 is important because subdivision b is for the implementation of conservation measures for the invalidated Quantification Settlement Agreement (QSA). The Draft EIR/EIS fails to disclose how this project relates to the invalidated QSA and its relationship to the promised, but never completed, Salton Sea Habitat Conservation Strategy that was to mitigate impacts to 96 species.	page 1-4, lines 8-11. On February 11, 2010, the Sacramento County Superior Court issued a judgment in the QSA case. Enforcement of that judgment was stayed pending disposition of the appeal that was filed in the Third Appellate District. On December 7, 2011, the appellate court issued its ruling that reversed the trial court ruling and remanded the cases to the trial court for further proceedings. On June 4, 2013, the trial court issued its order upholding the validation of the QSA and related agreements. The QSA remains valid, pending other appeals or court rulings, if any.
Imperial County Air Pollution Control District	ICAPCD-2	2. Section 2081.7 also refers to the sale of the 800,000 acre feet of water, initially intended for delivery to the Salton Sea to mitigate impacts of the QSA, instead to Metropolitan Water District (MWD), and sale of yet an additional 800,000 acre feet (for a total of 1.6 million acre feet of water in addition to the other QSA water transfers from the Imperial Valley). DWR is responsible for any environmental impacts related to use or transfer of that water. On September 13, 2011, Imperial Irrigation District (110) adopted a resolution stating its intent to seek a modification to the SWRCB Order WRO 2002-0013 to cease delivering the Salton Sea's mitigation water, presumably to sell the water to MWD instead of delivering it to the Salton Sea as provided by Section 2081.7. According to its May 10, 2011 report, MWD expects to have a surplus of 1.07 maf of water this year and its water storage to be at an "all-time high" of 2.6 maf by the end of this year. If this project will facilitate in any way the transfer of the Salton Sea's mitigation water and/or the other 800,000 acre feet of water, then the project description is incorrect, and the impacts of the reductions in water inflow to the Salton Sea as a result of Section 2081.7 must be analyzed and further mitigation needs to be identified. There has never been a CEQA or NEPA analysis performed for the selling of this 1.6 million acre feet of water to MWD. These changes would be significant and require re-circulation of the draft document.	The sale of water referred to in Fish and Game Code section 2081.7 is not part of the proposed project, and therefore, the impacts from the sale of that water are not analyzed. Section 2.2.2 of the Draft EIS/EIR describes in detail how potential project components were developed, and how six conceptual action alternatives were developed. The alternatives development process is also described in Appendix B. No text revisions are required.
Imperial County Air Pollution Control District	ICAPCD-3	3. The "no action" alternative improperly assumes the landowners are entirely responsible for mitigating emissions from the exposed Salton Sea's shoreline between the pre-QSA baseline of-228 to -235 feet msl. A -7 foot msl difference results in approximately 16,000-acres of exposed area playa. This assumption ignores the contributions of the QSA to the declining Salton Sea elevation level. There is no explanation of the mitigation measures the project proponents expect the landowners to implement, how the measures will be funded, or how the project proponents intend to ensure the three landowners implement the measures. Since one of the project proponents is also one of the landowners (federal government), the Army Corps of Engineers should commit to implement the necessary air quality mitigation on federally-owned land.	The description of the No Action Alternative is based on the Salton Sea Ecosystem Restoration Program PEIR, which includes implementation of the QSA and its changes to inflows as part of the No Action scenario. The detail requested in this comment is not appropriate for a discussion of No Action, which is not the subject of the Draft EIS/EIR. Asking the Corps to commit to implementing the necessary air quality mitigation on federally owned land is not appropriate since the referenced impacts are not impacts of the SCH Project, which would have a beneficial impact on dust emissions (refer to Section 3.3, Air Quality, Impact AQ-2). No text revisions are required.

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Imperial County Air Pollution Control District	ICAPCD-4	4. The "no action" alternative wrongly assumes that the QSA and associated mitigation the parties agreed to as part of the QSA will be implemented, including that the QSA parties will mitigate air quality impacts between -235 and -248 feet msl. These assumptions are incorrect because the Sacramento Superior Court has invalidated 12 of the QSA contracts, and legal challenges to the IID-SDCWA water transfer EIR/EIS and QSA PEIR are pending in state court. The invalidation of the QSA Joint Powers Authority (QSA-JPA) contract also means that the QSA-related mitigation is unfunded and there is no assurance it will be implemented. Therefore, the reliance on the QAS and the QSA environmental documents results in this project's impacts being underestimated and insufficient mitigation required.	The No Action Alternative is intended to reflect existing conditions (those present at the time the Notice of Intent and Notice of Preparation were issued), plus changes that are reasonably expected to occur in the foreseeable future (Draft EIS/EIR, Section 2.3; CEQA Guidelines section 15126.6(e)(2)). On February 11, 2010, the Sacramento County Superior Court issued a judgment in the QSA case. Enforcement of that judgment was stayed pending disposition of the appeal that was filed in the Third Appellate District. On December 7, 2011, the appellate court issued its ruling that reversed the trial court ruling and remanded the cases to the trial court for further proceedings. On June 4, 2013, the trial court issued its order upholding the validation of the QSA and related agreements. The QSA remains valid, pending other appeals or court rulings, if any. The lead agencies have analyzed a No Action Alternative that addresses potential impacts if the project does not go forward, but the lead agencies are not required to speculate about the outcome of a legal process that could yield many different outcomes. No text revisions are required.
Imperial County Air Pollution Control District	ICAPCD-5	5. The Draft EIR/EIS assumes that air quality impacts will be mitigated by the four-step air quality mitigation that is in the IID-SDCWA water transfer EIR/EIS and to which the Air District has previously expressed to the State and QSA parties is inadequate, and which remains under legal challenge. The 4-Step Plan is an ill-defined "wish list" focused on studying the problem instead of committing to actual mitigation that will reduce air quality impacts. The mitigation also relies on the Air District's adoption of an air pollution credit trading program to generate PM10 ERCs that it has not agreed to do and without any assessment of the feasibility of such a program, impacts to the economy, or whether there are sufficient sources that could reduce emissions in lieu of reducing emissions at the Salton Sea.	This comment focuses on mitigation that would be implemented as part of the No Action Alternative. This is not mitigation that would be required as part of the SCH Project. No text revisions are required.
Imperial County Air Pollution Control District	ICAPCD-6	6. The Draft EIR/EIS adopts the flawed baseline approach from the QSA EIR/EIS and PEIR EIS assuming that the Sea will decline to -258.2 feet msl and its salinity will be 272 ppt. The baseline is the actual conditions at the time the notice of preparation is issued, which is reported in the Draft EIR/EIS to be -231 feet msl and 51 ppt salinity for the Salton Sea. The impacts are improperly measured from the -258.2 feet msl instead of -231 feet msl and from 272 ppt instead of 51 ppt. The California Supreme Court in Cmtys. for a Better Env't v. S. Coast Air Quality Mgmt. Oist., (2010) 48 Cal.4th 310 has rejected the baseline approach used in this document because it misleads the public as to the reality of the impacts and subverts full consideration of the actual environmental impacts.	Please refer to Section 3.0.2, CEQA and NEPA Baselines. As indicated in this discussion, the analysis correctly compares impacts for CEQA purposes to the conditions existing at the time the Notice of Preparation was issued. It also compares impacts to the No Action Alternative in compliance with NEPA requirements. No text revisions are required.
Imperial County Air Pollution	ICAPCD-7	7. The Draft EIR/EIS states that the project will be operated until the end of the 75-year period covered by the QSA or until funding is no longer available. The project duration is uncertain because the QSA has been invalidated and without	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).

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Control District		a valid QSA-JPA there is no funding for the mitigation assumed in this document.	On February 11, 2010, the Sacramento County Superior Court issued a judgment in the QSA case. Enforcement of that judgment was stayed pending disposition of the appeal that was filed in the Third Appellate District. On December 7, 2011, the appellate court issued its ruling that reversed the trial court ruling and remanded the cases to the trial court for further proceedings. On June 4, 2013, the trial court issued its order upholding the validation of the QSA and related agreements. The QSA remains valid, pending other appeals or court rulings, if any. The lead agencies have analyzed a No Action Alternative that addresses potential impacts if the project does not go forward, but the lead agencies are not required to speculate about the outcome of a legal process that could yield many different outcomes.
Imperial County Air Pollution Control District	ICAPCD-8	1. (Executive Summary) ES1.9, line 3, pg ES-7 This sentence states, "Additionally, the Imperial County Air Pollution Control District would require preparation of a Fugitive Dust Control Plan under Regulation VIII, Fugitive Dust Rules (800-806)". The Air District would like to mention that a Dust Control Plan (DCP) must be developed for the construction phase. In addition, a second DCP must be developed for the operational phase.	The text has been modified as indicated in the comment.
Imperial County Air Pollution Control District	ICAPCD-9	2. (Introduction) Section -1.10 Required Permits and Consultations. line 23. pg 1-12 Same recommended changes as comment number 1.	The text has been modified as indicated in the comment.
Imperial County Air Pollution Control District	ICAPCD-10	3. (Alternatives) Section -2.4.2 Construction. line 1. pg 2-23 This section describes the construction process that would be necessary to construct the ponds as well as the equipment that will be required. It is important to note that equipment such as power generators, emergency generators, sandblasters, or other type of machinery with 50 horse-powers or greater requires an Air District permit, or must have a statewide PERP registration operated within PERP guidelines. Please contact the Air District Engineering Department for further assistance.	The text of the Executive Summary (page ES-7), Introduction (Section 1.10, Required Permits and Consultations), and Air Quality (Section 3.3.2.4, Portable Equipment Registration Program) has been revised to address this comment.
Imperial County Air Pollution Control District	ICAPCD-11	4. (Alternatives) Section 2.4.7 -Best Management Practices. line 24. pg 2-27 This sentence states "Additionally, the Project would comply with the Imperial County Air Pollution Control District's Regulation VIII rules for dust control (general requirements, construction and earthmoving activities, bulk materials, open areas, and conservation management practices), which is required for all projects". It is important to note that the project will also be subject to the requirements of Rule 803 -Carry-Out and Track-Out as well as Rule 805 -Paved and Unpaved Roads. These Rules are an integral part of Regulation VIII.	The text has been modified as indicated in the comment.
Imperial	ICAPCD-12	5. (Air Quality) Section 3.3.1 -Introduction. line 14. pg 3.3-1 This sentence	The text has been modified as indicated in the comment.

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County Air Pollution Control District		states, "ICAPCD oversees Calexico, Imperial County, and the Imperial Valley in the southeastern Basin, which is where the Project would be located". The Air District would like to point out that the agency oversees the entire geographical area within Imperial County and not just specifically Calexico, therefore it is requested that this change is made to this section.	
Imperial County Air Pollution Control District	ICAPCD-13	6. (Air Quality) Section 3.3.2.2 -Federal Regulations. lines 17 thru 20. pg 3.3-5 This sentence states, "As discussed in Section 3.3.4.5, Attainment Status Designations, Imperial County is designated moderate nonattainment for the Federal 8-hour 0, NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as serious nonattainment area for 24-hour Federal PM_{10} and $PM_{2.5}$. While it is true that Imperial County is a serious non-attainment for PM_{10} it is not for $PM_{2.5}$.	The text has been modified as indicated in the comment.
Imperial County Air Pollution Control District	ICAPCD-14	7. (Air Quality) Section 3.3.2.4 -Portable Equipment Registration Program. line 32. pg 3.3-7 This sentence states, "Once registered in PERP, engines and equipment units may operate throughout the state of California without the need to obtain individual permits from local air districts". The Air District would like to point out that although this statement is correct, the engine is not considered portable if it resides in the same location for more than 12 months. This also means that any engine such as a back-up or stand-by engine, that replaces engine(s) at a location, and is intended to perform the same or similar function as the engine(s) being replaced, will be included in calculating the consecutive time period. Therefore, if the construction phase does take over a year and the equipment is expected to be at the site for over a year. the equipment must be permitted by the Air District.	The text has been modified as indicated in the comment.
Imperial County Air Pollution Control District	ICAPCD-15	8. (Air Quality) Section 3.3.3.5 -Attainment Status Designations. line 7 thru 10. pg 3.3-17 This sentence states, "As part of USEPA's final ruling, a Reasonably Available Control Technology (RACT) demonstration was also required. RACT's are emission control technologies that are economically and technically feasible. In compliance with the requirements, ICAPCD released the 2009 Reasonable Available Control Technology (RACT) State Implementation Plan" The Air District must clarify that the RACT SIP was developed as part of the Ozone Attainment demonstration and has nothing to do with US.EPA's PM_{10} Serious Non-Attainment Designation therefore this section has to be either revised or deleted.	The text has been modified as indicated in the comment.
Imperial County Air Pollution Control District	ICAPCD-16	9. (Air Quality) Section 3.3.3.5 -Attainment Status Designations. line 28 thru 30. pg. 3.3-17 This section states. "In August 2009, ICAPCD released the 2009 Imperial County State Implementation Plan for Particulate Matter Less than 10 Microns in Aerodynamic Diameter (ICAPCD 2009). This document presents the SIP for PM_{10} on ICAPCD's behalf'. It is important to note that the PM_{10} SIP has	The text has been modified as indicated in the comment.

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		yet to be approved by the California Air Resources Board (CARB) or US.EPA.	
Imperial County Air Pollution Control District	ICAPCD-17	10. (Air Quality) Section 3.3.4.1-Impact Analysis Methodology. line 12 thru 14. pg. 3.3-20 This sentence states, "Extending the schedule longer than 2 years would not affect the air quality analysis because it is based on maximum daily emissions (pounds per day) and total emissions (tons), which would remain relatively unchanged". The Air District believes this statement needs further clarification for the following reasons. If construction is delayed for an unknown reason and construction equipment usage and activities stop completely, then there are no emissions being created. However, once construction resumes, construction equipment usage and activities must not go over the daily proposed equipment usage scheduled or activity scheduled that is used in this analysis to calculate daily emissions, otherwise this would increase the daily emissions. Furthermore, if an unforeseen problem with soil movement or any other construction activity was to occur prompting an increase in the construction fleet mix or related construction activities for any day, it would also increase the daily emission production. The construction manager should ensure that this does not occur by off-setting the usage of other construction equipment or activities on those days. This comment must be addressed in this section as well as any other section(s) in the EIS/EIR.	The air quality analysis was based on the best information available regarding equipment usage, although it also is conservative, assuming that most equipment would operate 8 hours a day, although dredges could operate up to 20 hours a day. There is currently no reason to assume that construction would be delayed; however, if it were, there is also no reason to assume that the equipment mix and hours of usage would be different than analyzed. For example, under State contracting guidelines, overtime would only be allowed if it were specifically built into the contract, and given budget constraints, it is unlikely that this would occur. Thus, a changed construction scenario is speculative and does not require analysis. No text revisions are required.
Imperial County Air Pollution Control District	ICAPCD-18	11. (Air Quality) Section 3.3.4.5 -Alternative 1-New River. Gravity Diversion + Cascading Ponds. line 28 thru 30. This sentence states "Peak daily NOx and fugitive PM_{10} emissions from on and off-site sources during construction would exceed ICAPCD's thresholds, which would be a significant impact when compared to both the existing environmental setting and the No Action Alternative". Although this statement is referring to Alternative 1, the Air District noticed that the Preferred Alternative (Alternative 3) also exceeds the NOx and PM_{10} Air District thresholds. Therefore in order to help reduce or eliminate construction impacts, the project is required to implement standard, discretionary and enhanced mitigation measures for construction equipment and fugitive PM_{10}. These measures are found in Section 7.1 of the Air District's CEQA Air Quality Handbook. Furthermore, the project will also be subject to the Air District's Policy 5 which requires the mitigation of NOx and PM_{10} emissions exceeding the CEQA threshold. Attached is a copy of the Air District's Policy 5 for your review.	The referenced text was modified to address this comment.
Imperial County Air Pollution Control District	ICAPCD-19	12. (Air Quality) Section 3.3.4.5 -Alternative 1 -New River, Gravity Diversion + Cascading Ponds, line 8, pg 33-34 This sentences states, Water exposed soil with adequate frequency for continued moist soil (at least twice daily and indicated by soil and air conditions). The Air District would like to clarify that Rule 801-Construction and Earthmoving Activities, requires the application of water or chemical stabilization at the sites to limit Visible Dust Emissions (VDE) to 20%	The referenced text was modified to address this comment.

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<tr><th>Name</th><th>Com. No.</th><th>Comment</th><th>Response/Issues</th></tr>
<tr><td></td><td></td><td>opacity at all times, therefore watering more than twice a day may be necessary to not exceed the opacity limit.</td><td></td></tr>
<tr><td>Imperial County Air Pollution Control District</td><td>ICAPCD-20</td><td>13. (Air Quality) Section 3.3.5 -General Conformity, line 35 thru 37, pg, 3.3-39 This sentence states, "Imperial County is designated nonattainment for the Federal 8-hour ozone NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as nonattainment area for 24-hour Federal PM_{10} and $PM_{2.5}$. The Air District would like to clarify that the Imperial County is currently classified as a "moderate" non- attainment area of the 1997 8-hour Ozone NAAQS. The Imperial County is designated as "serious" non-attainment area for PM_{10} and non-attainment for $PM_{2.5}$.</td><td>The referenced text was modified to address this comment.</td></tr>
<tr><td>Imperial County Air Pollution Control District</td><td>ICAPCD-21</td><td>14. (Air Quality) Section 3.3.5 -General Conformity, line 20, pg, 3.3-40 The word "revision" should be changed to "revising".</td><td>The referenced text was modified to address this comment.</td></tr>
<tr><td>Imperial County Air Pollution Control District</td><td>ICAPCD-22</td><td>15. (Air Quality) Section 3.3.5 -General Conformity, line 4 thru 6, pg, 3.3-43 This paragraph states, "Ozone is tentatively in attainment pending certification of 2008 monitoring data, until any future USEPA determination to the contrary". The Air District would like to clarify that all Ozone data up to 2010 has been validated and US.EPA had determined that the Imperial County has and continues to attain the 1997 8-hour NAAQS for Ozone.</td><td>The referenced text was modified to address this comment.</td></tr>
<tr><td>Imperial County Air Pollution Control District</td><td>ICAPCD-23</td><td>16. (Air Quality/Greenhouse Gases Documentation) Appendix G-2, Table G-3 Please explain why the proposed equipment list only accounts for 1 (one) water truck for the construction phase of this project. If the project is intended to take place in over 3,770 acres and as per the analysis, watering will take place at a minimum of twice per day, it is difficult to suppose one water truck will be able to accomplish such task. In addition, please explain why the manager trip/day is only..5 and the foreman, equipment operator and laborers at .33 per/day.</td><td>The entire Project site would not require watering throughout construction; instead, watering would only be required at the immediate construction area, and this could be handled with a single truck. The trips referenced in the comment assume that workers would carpool. As discussed in Section 2.4.7, Best Management Practices, the Project would implement a number of measures to reduce emissions from fuel combustion and work activities, including promoting riding sharing among construction workers or providing shuttle service to the Project site. No text revisions are required.</td></tr>
<tr><td>Imperial County Air Pollution Control District</td><td>ICAPCD-24</td><td>17, (Air Quality/Greenhouse Gases Documentation) Appendix G-2, Table G-10 and Table G-12 The Air District noticed that a 95% emission reduction control is being applied to the Off-road Dust Emissions as well as Maintenance Off-road Dust. Please explain where the emission reduction factor derived from. The analysis indicates that water will be applied at a minimum of twice per day in the construction area however this does not constitute a 95% reduction. As per AP42, Section 13.2.2 Unpaved Roads, application of water emissions reductions thru watering requires the evaluation of several factors (e.g. vehicle weight, temperature, ground moisture content) and therefore such an evaluation must be completed before applying such emission reduction.</td><td>The 95 percent emission reduction was obtained from AP-42, Figure 13.2.2-2, where achieving a soil moisture content of 20 percent correlates to a 95 percent reduction (see below).
<table>
<tr><th colspan="3">AP-42 Figure 13.2.2-2</th></tr>
<tr><td colspan="2">Moisture (M)</td><td>Control</td></tr>
<tr><td>percent</td><td>ratio</td><td>%</td></tr>
<tr><td>20</td><td>5.00</td><td>95.00%</td></tr>
</table>
In addition to percent moisture content (M), the following variables are</td></tr>
</table>

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			incorporated into to the emission estimation technique (EET Code G) for unpaved road dust per AP-42 Section 13.2.2: s = silt content, percent 9 percent average geometric mean (from AP-42 Tables 11.9-3; 13.2.2-1; 13.2.4-1) W = average vehicle weight Light Duty = 3 tons average (loaded) Medium Duty = 8 tons average (loaded) Heavy Duty = 30 tons average (loaded 40 tons, unloaded 20 tons) S = mean vehicle speed 5 mph for watering trucks 20 mph for graded dirt/gravel roads (watered) P = Number of wet days over 0.01 in precipitation for averaging period (from AP-42 Figure 13.2.1-2) P = 20 days/year for Low Deserts Precipitation correction (PC) = (365-P)/365 for annual average Note: precipitation correction not used (PC = 1) for worst case day calculations Therefore, the unpaved road dust EET does take into account the variables of vehicle weight, temperature (season), and ground moisture content. The EET also incorporates variables for soil silt content, vehicle speed, and annual rainy days. Note that MM AQ-1: Implement fugitive PM_{10} control measures includes the following : ▪ Water exposed soil with adequate frequency for continued moist soil so that visible dust emissions would be limited to 20 percent opacity for dust emissions at all times (as indicated by soil and air conditions). Note also that the best management practices included as part of the project description in Section 2.4.7, includes the following: ▪ Additionally, the Project would comply with the Imperial County Air Pollution Control District's Regulation VIII rules for dust control (general requirements, construction and earthmoving activities, bulk materials, open areas, and conservation management practices), which are required for all projects. The construction phase Dust Control Plan would require water to be applied as often as necessary to unpaved roads used by the Project, two or more time per

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			day, to maintain sufficient moisture to nearly eliminate fugitive dust generation from vehicle traffic and to limit visible dust emissions to 20 percent opacity. Since construction is planned during the hottest months of the year, the frequency of water application would be increased as needed. No text revisions are required.
Imperial County Air Pollution Control District	ICAPCD-25	In Summary, all standard mitigation measures and discretionary mitigation measures for fugitive PM_{10} emissions. Both standard mitigation and enhanced measures for construction combustion equipment should be applied as well. The project will also be subject to Policy #5 to mitigate the NOx and PM_{10} emissions above the Air District's CEQA threshold.	The referenced text was modified to address this comment. Note that mitigation measures MM AQ-1 and MM AQ-2 would be implemented by the SCH Project in addition to those measures that are required for all projects by the ICAPCD (refer to page 3.3-34, lines 15-16).
Imperial County Air Pollution Control District	ICAPCD-26	In Closing, please provide the revised or additional analysis based on the comments above for the APCD to review.	The responses to comments and revised text will be provided to the Imperial County Air Pollution Control District at least 10 days before the Final EIR is certified by the California Natural Resources Agency.
Salton Sea Authority	SSA-1	The Salton Sea Authority appreciates the opportunity to review the Draft EIR for the Species Conservation Habitat (SCH). We applaud the State for moving forward with this project and we support the overall goals of the program. The EIR presents a careful analysis of the issues and a reasonable set of alternatives.	The Salton Sea Authority's support of the project is noted.
Salton Sea Authority	SSA-2	1. Non-Interference with Agricultural Drainage. Final designs should be coordinated with IID to avoid interference with agricultural drainage.	The Project team will continue coordinating with IID to avoid interference with agricultural drainage. No text revisions are required.
Salton Sea Authority	SSA-3	2. Ownership and Easements. Likewise, land ownership and easement issues need to be coordinated with IID.	The Project team will continue coordinating with IID regarding land ownership and easement issues. No text revisions are required.
Salton Sea Authority	SSA-4	3. Known Geothermal Resource Area (KGRA). The Authority is concerned that some of the alternatives may cause interference with access to geothermal resources. Based on our understanding of the location of the KGRA, we believe the alternative areas west of the mouth New River would be acceptable and would not interfere with potential future geothermal energy production. In areas where the footprints of the alternatives overlay the KGRA, access for geothermal energy production should be considered and may be needed as a mitigation for potential loss of an energy resource if access is not allowed.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Salton Sea Authority	SSA-5	4. Selenium and Freshwater Habitats. Selenium data presented in Appendix I suggests that there is only a slight difference between the selenium levels in the south end of the Sea and those in the New River. In fact, the Amrhein and Smith (2011) data from 2010 shows a mean selenium level in the New River of 1.8 µg/L compared the mean level in the Salton Sea near shore area of 2.46 µg/L.	The differences in the slightly lower selenium levels measured by Amrhein and Smith ([2011], based on one-time measurement in summer 2010) compared to values measured by Reclamation (C. Holdren, USBR, unpublished data) and USGS (Miles et al. 2009) are recognized. The Reclamation and USGS datasets were relied upon because the values were fairly consistent over a longer time period (Reclamation measured quarterly 2004-2010, USGS measured twice a

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			year Fall 2006-Fall 2008) and are considered appropriate data sources. The impact analysis is conservative and adequate. No text revisions are required.
Salton Sea Authority	SSA-6	4. Selenium and Freshwater Habitats. The Salton Sea Authority recommends that the State consider having at least some freshwater cells in the SCH design. This would provide an excellent opportunity for further research on freshwater habitats in the area. Considering the potential expenditure on this project, it would be a great loss of opportunity not to include some freshwater habitat.	Please refer to Master Response 7, Operations and Adaptive Management.
Salton Sea Authority	SSA-7	5. Flow Rates and Residence Times. The flow rates for various residence times presented on page 3.11-22 and on Table 3.11-7 on pages 3.11-23 and 3.11-24 are very high. An example is discussed in the text on page 3.11-22 for Alternative 3 (the State's preferred alternative) with a target salinity of 20 ppt and a residence time of two weeks. To achieve these conditions, a flow rate from the New River of 313 cfs (202 MGD or 227,000 AFY) would be required and 163 cfs (105 MGD or 118,000 AFY) of salt water would need to be pumped from the Sea. What will happen if the flows in the river cannot support these large withdrawals? How will the flow in the river be affected by such large diversions?	The residence time is the amount of time needed to turn over the water stored in the ponds. The diversion rate was calculated as the storage volume divided by the residence time. The total diversion rate is the diversion rate needed to turn over the pond plus the amount of water needed to replace evaporation losses. If the flow in the river is not sufficient to support a given discharge, then the adaptive management plan would allow pond conditions to change in response to the available water; additionally, Section 2.4.1.7 was modified to indicate that while the available water supplies currently appear to be adequate to supply the SCH ponds as proposed, the size of the ponds could be reduced in the future if available water supplies were reduced. The impact analysis, however, considered that flows would decrease in the future because of reduced drain water. In addition, under Alternative 3, the diversion would occur at the downstream end of the irrigated agriculture, and the water would be returned about 1 mile downstream at the river mouth. Under this alternative, the reduction in flow because of the diversion would occur in a levied section of New River that flows through the Sea. Revisions to Section 3.4.4.4, Alternative 1 discuss effects of reduced flow in that section of the river on biological resources. No downstream users along the river are present, let alone affected.
Salton Sea Authority	SSA-8	In 2005, the Salton Sea Authority developed cost estimates for low head pumping stations using Bureau of Reclamation costs factors. Based on these factors in 2005 dollars, a 200 MGD pumping plant could cost about $8 million and have annual operating, maintenance, energy and repair (OMER) costs of $440,000. A 100 MGD pumping station could cost about $5 million and have annual OMER of $370,000. Therefore, in 2005 dollars, the combined cost for pumping is estimated at $13 million in capital cost and $810,000 in annual OMER. Even with the longest residence times, the Authority believes the two pumping stations could have a combined cost of $5 million and annual OMER costs of over $500,000.	The costs associated with delivering water to the Project site and maintaining a water surface elevation of -228 would be substantial for either pumping or gravity-flow options. The pumping alternatives would have costs associated with the capital cost of the pumps and electrical connection and O&M costs associated with energy and pump maintenance. The gravity diversion would have capital costs associated with constructing the pipeline (excavation, pipe, repair of drains, land acquisition for the sedimentation basin, and easements) and operations and maintenance costs associated with clearing sediment, and repairing local drainage facilities. The costs developed by SSA, like the costs developed for this EIS/EIR, are preliminary and subject to refinement as more information is available. The refined project costs would be developed during the final design, and the Project would be scaled according to the available funds; thus, cost would not

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			render this aspect of the Project infeasible. Previous work performed by Reclamation and others would be considered, in addition to the current capital costs for physical features used in the SCH Project. The Salton Sea Authority's comment will be considered by decision makers, but the developed costs are sufficient for analysis in this EIS/EIR. No text revisions are required.
Salton Sea Authority	SSA-9	The Salton Sea Authority suggests that the gravity flow system would be better to avoid large capital and OMER costs. In addition it may be possible to have salt water mix in the lower cells by gravity using a gates that could be opened and closed as needed or by using porous dikes.	The Salton Sea Authority's opinion regarding gravity flow is noted (refer to the response to SSA-8). Gravity flow was analyzed, and impacts were presented in the Draft EIS/EIR; alternatives using this feature were eliminated from consideration as the State's preferred alternative for the reasons described in Section 7, Summary Comparison of Alternatives. The final design would consider all relevant project features considered in the Draft EIS/EIR. As currently proposed, gravity-controlled water control structures would connect the ponds with each other and the Sea (Figures 2-3 and 2-4). No text revisions are required.
Salton Sea Authority	SSA-10	If the system requires large annual OMER outlays, how will they be funded? Will a fund be established to continue OMER funding in perpetuity?	Please refer to Master Response 4, Project Funding.
Salton Sea Authority	SSA-11	6. Budget. Please provide the latest budget estimate for the project.	Please refer to Master Response 5, Project Costs.
Salton Sea Authority	SSA-12	While the Salton Sea Authority appreciates that the State is moving forward with the SCH Project, we remain concerned that there seems to be little progress toward a larger solution for the Sea.	This comment is noted; concerns regarding the progress toward a larger solution for the Sea do not address the issues discussed in the SCH Project's Draft EIS/EIR, and no text revisions are required. Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Salton Sea Authority	SSA-13	In addition, we are frustrated by the slow pace that the State is taking in the Financial Assistance Program which has been presented at several stakeholder meetings and continues to run behind each schedule that has been presented.	This is a comment on the Financial Assistance Program, not the SCH Project Draft EIS/EIR. The State presented the draft Financial Assistance Program Guidelines to stakeholders and other interested parties in early January. Progress on finalizing the draft Guidelines has been frustrated by staffing changes. No text revisions are required.
County of Imperial Board of Supervisors	ICBOS-1	As you may be aware, Imperial County is the second-largest geothermal energy producing county in the nation. This industry sector is a vitally important part of our economy and provides hundreds of well-paying jobs and other economic benefits to our county and its residents. Furthermore, it is generally recognized that our county and the Salton Sea area in particular, is the location of the largest known undeveloped geothermal resource in the nation. As California moves forward aggressively to meet its renewable energy targets in the coming years,	Please refer to Master Response 8, Compatibility with Geothermal Development.

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		we anticipate that additional geothermal production facilities will be constructed, providing even more jobs and benefits to our area and the state. We therefore view with some anxiety, any proposal that might threaten the ability of geothermal industry to fully access the vital resources located within in this area.	
County of Imperial Board of Supervisors	ICBOS-2	As can be readily discerned from the attached map, the project boundaries for all six alternatives identified in the DEIS/R lie either entirely or partially within the Salton Sea Known Geothermal Resource Area (KGRA) as established by the State of California Department of Conservation Division of Oil, Gas and Geothermal Resources (DOGGR). In fact, Alternatives 4, 5 & 6 overlie a part of the KGRA that is suspected of being one of the most promising locations for future development. We therefore strongly oppose any future consideration of Alternatives 4, 5 or 6 as the location for the SCH project.	Please refer to Master Response 8, Compatibility with Geothermal Development.
County of Imperial Board of Supervisors	ICBOS-3	The other sites (Alternatives 1, 2 & 3) though less problematic, still contain significant potential for conflict with geothermal activity, especially in the area north and east of the mouth of the New River. We understand that the construction of the SCH is proposed to be completed in phases over a several year period. We therefore recommend that any construction phasing of Alternatives 1, 2, or 3 be accomplished in a manner to avoid that area east of the river until such time in the future when further exploration and analysis of the potential for geothermal development in that area can be more fully assessed. Additionally, specific provisions and/or easements to accommodate geothermal activity should be developed prior to the implementation of any of the alternatives being considered. The County believes that geothermal development and habitat creation can be compatible if both are considered equally in the development of the SCH project.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Coachella Valley Water District	CVWD-1	1. There are at least two competing alternatives for the overall restoration of the Salton Sea. There were separate plans that were developed by the State of California and the Salton Sea Authority. The Legislature of the State of California has not acted to select a preferred alternative. CVWD supports the Salton Sea Authority's plan. The proposed SCH Project is characterized in the DEIS/DEIR as a stand-alone project with two stated goals: 1) develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and 2) develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process. However, on the State of California, Department of Water Resources website it states: *"The release of this study is an important step in a phased approach to ecosystem restoration in the Salton Sea, " said Secretary for Natural Resources, John Laird "This early start habitat will help maintain necessary habitat for the wildlife in the Salton Sea and will complement future restoration efforts."*	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.

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		That statement seems to indicate that Secretary Laird sees this project as the Early Start Habitat project described in the State Plan. It appears that the State may be circumventing the Legislature by beginning implementation of the State Plan for the restoration of the Salton Sea without proper public discourse; the DEIS/DEIR is presenting a portion of a larger project in a piece-meal fashion that appears to conflict with environmental law.	
Coachella Valley Water District	CVWD-2	2. On September 13, 2011, the Imperial Irrigation District (IID) Board resolved to ask the California State Water Resources Control Board (SWRCB) to allow it to stop putting Quantification Settlement Agreement (QSA) mitigation water into the Salton Sea, thereby setting the stage to sell nearly 400,000 or 500,000 acre-feet of additional water to coastal communities. How would that action affect the proposed SCH project, either positively or negatively, as Secretary Laird described this project, not as species conservation habitat, but as Early Start habitat? How would that action affect any future projects, positively or negatively?	Please refer to the response to ICAPCD-2.
Coachella Valley Water District	CVWD-3	3. The DEIS/DEIR describes a project that will have operation and maintenance requirements after completion of construction, as well as, adaptive management requirements. Although not stated in the DEIS/DEIR, it has been stated in public meetings and on the State of California, Department of Water Resources website that construction of this project is to use Proposition 84 (Chapter 5) funding, and the ongoing maintenance and adaptive management would be funded using the Salton Sea Mitigation Fund consisting of funds paid by the water agencies pursuant to the requirements of the QSA. This appears to indicate that the State is planning to use a finite revenue stream (the QSA-based Salton Sea Mitigation Fund) to fund infinite, ongoing operations, maintenance and adaptive management. Once these funds are expended, this appears to place obligations on the State similar to the obligations the State assumed under the QSA, causing the QSA to be deemed unconstitutional.	Please refer to Master Response 4, Project Funding.
Coachella Valley Water District	CVWD-4	4. Section 3.4: DEIS/DEIR states that SCH Project is designed to support fish species that provide a forage base for piscivorous birds and that the fish proposed for introduction to the SCH are currently, or have in the recent past, been introduced to the Salton Sea. It is well known that the desert pupfish *(Cyprinadan macularius),* a southwestern species whose original range in portions of Arizona, California, and northern Mexico, has been greatly curtailed by proliferation of non-native fish species. CVWD is concerned that the fish species known to impair desert pupfish survival is being considered as the forage base in the SCH Project. Several researchers (e.g., Schoenherr, 1981x; Steinhart, 1990; Moyle, 2002) have suggested predation on eggs, juveniles, and adults, and competition for food and space as possible ways that the hybrid Mozambique tilapia *(Oreachromis mossambica* by *0. uroleriis),* redbelly tilapia	Please refer to Master Response 1, Selected Fish Species.

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		(Tilapia zillii), sailfin molly *(Poecilia latipinna),* and other non-native species can adversely affect populations of desert pupfish.	
Coachella Valley Water District	CVWD-5	The project should consider the use of Striped Mullet *(Mugil cephalus linnaeus).* This species has been associated with the Salton Sea on and off since the formation of the sea. They were also stocked in the Salton Sea in the late 1940's and 1950's. This species is not known for predating on desert pupfish, its eggs or the fry; however, it is a detritus eater and may compete with the pupfish on that scale. These mullet are tolerant of high salinity water and freshwater alike, form large schools in shallow water and were typically found at the mouths of the Alamo and New Rivers. They are a prime forage fish for piscivorous birds and may be a more appropriate species to consider for the SCH Project.	Please refer to Master Response 1, Selected Fish Species.
Coachella Valley Water District	CVWD-6	5. Section 3.11.2.1: This paragraph describes water rights held by IID and Metropolitan Water District of Southern California for diversions from Salton Sea tributaries, but fails to identify similar diversion water rights held by CVWD. CVWD maintains water rights for diversions from Salton Sea tributaries which include appropriative rights described in SWRCB Permit Nos. 536 and 3011. In addition, CVWD maintains appropriative water rights for Colorado River water covered by SWRCB Permit No. 7650 and used to irrigate lands within CVWD's irrigation service area and has submitted a water right application to divert agricultural return flows from the Coachella Valley Storm water Channel and agricultural drains tributary to the Salton Sea.	The referenced section only addresses those water rights that have a direct bearing on the SCH alternatives considered in detail in the Draft EIS/EIR. These alternatives do not require the use of water for which CVWD maintains water rights. No text revisions are required.
Coachella Valley Water District	CVWD-7	6. Tables 3.11-8 and 3.11-9. These tables provide values representing the percentage of the New River and Alamo River flows needed to supply the SCH to meet several alternative salinity targets and pond residence times. While not stated in the DEIS/DEIR, it appears these percentages are based on historical flows measured at USGS gages for the periods 1944-2010 and 1960-20 I 0 for the New River and Alamo River, respectively .CVWD is concerned that these historical now measurements may not provide an accurate representation of future flows in the New River and Alamo River and may underestimate the impact of diversions needed for the proposed SCH.	The comparisons found in Tables 3.11-8 and 3.11-9 were based on the historic average flows in the rivers. In the future, as agricultural drainage continues to decline, the diversion as a percentage of river flow will increase. As seen in these tables, the diversion percentage that was analyzed varies from less than 5 percent to about 50 percent, depending on the residence time and the salinity of the pond. The operations and adaptive management plans would manage the diversion and modify operations as appropriate to remain in the range discussed in the Draft EIS/EIR. No text revisions are required.
Coachella Valley Water District	CVWD-8	7. SCH project costs. CVWD is unable to locate a summary of the projected SCH costs in the DEIS/DEIR. Estimates for both the total capital costs and annualized operations and maintenance costs per acre would be useful for evaluating the impact of the proposed SCH project.	Please refer to Master Response 5, Project Costs.
		Organizations/Corporations	
Solar Power & Water	SP&W-1-1	We, Solar Power & Water Inc. submitted a plan to the Secretary of the Interior, the Commissioner of Reclamation, the Chairman of California Water Resources,	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.

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		and the California Financial Office. http://www.solarpowerandwater.com/assets/Salton%20plan2%20and%20opinions.pdf If you are not thoroughly versed in our plan, shame on you. Our plan would maintain the Salton Sea full size at 228 feet below sea level. In so doing, the proposed SCH ponds would all be flooded. Our plan might also lead to the elimination of the QSA. The SCH is dependent on funding; our produces income, and is better in all respects. Study it and learn why.	
Solar Power & Water	SP&W-1-2	Far superior than any of your six alternatives is the plan by Solar Power&Water Inc. to remediate the entire Sea. See http://www.solarpowerandwater.com/assets/Salton%20plan2%20and%20opinions.pdf	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Imperial County Farm Bureau	ICFB-1	A lack of O&M costs being reported or costs to construct the various projects are a major concern to the Imperial County Farm Bureau.	Please refer to Master Response 5, Project Costs.
Imperial County Farm Bureau	ICFB-2	Are the fish grown in the acreage of ponds sufficient to feed all the fish eating birds, in particular, the cormorants? Have you studied yield in pounds per acre of fish and possible pounds of fish that could be consumed by the bird population?	The goal of the SCH project is to partially offset habitat losses, but it cannot fully replace that habitat, nor do the project goals make that guarantee. As discussed in Section 3.4.4.4, Impact BIO-5C, the number of fish expected would be considerably less than the Sea currently provides and therefore would support a smaller population of piscivorous fish. No attempt has been made to calculate fish yield of the ponds. This would be monitored as part of the adaptive management of the ponds. No text revisions are required.
Imperial County Farm Bureau	ICFB-3	High concentrations of birds in the ponds may lead to the higher bird populations in the vicinity of nearby Willey Reservoir, using that reservoir for loafing and fresh water. Their feces could very well increase the E. coli counts in the irrigation water to the point where leafy green vegetables could not be used for irrigation. A very high proportion of the acres around the New River produce leafy green vegetables as well as broccoli, cauliflower, celery, melons, and sweet corn because of the warm micro-climate created by the Salton Sea. 15% to as high as 35% of the water used to grow these crops is pumped from the Willey Reservoir and mixed with water of Vail Main canal. The threat of E. coli counts in the irrigation water as a result of this project directly affects agriculture and must be mitigated.	As discussed in Section 3.19, Socioeconomics (Impact SOC-7), the concentration of birds near the SCH Project ponds is not expected to increase beyond current levels. Thus, E. coli counts in irrigation water are not expected to increase as a result of the SCH Project, and no text revisions are required.
Imperial County Farm Bureau	ICFB-4	1. Available Water Rights Does the State have a water right or the right to take the water from the New or Alamo Rivers for this project? MWD has filed for the rights to use the water. Will this all end up being a MWD project with MWD getting mitigation credits and trading the New and Alamo River water for	Please refer to Master Response 6, Water Rights.

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		Colorado River water? Will the state have to buy this water from MWD?	
Imperial County Farm Bureau	ICFB-5	2. Available Land Have there been any discussions with IID regarding the use of their land for this project? Will the land be leased on a long term basis or purchased? How will IID be indemnified from damage, loss, or injury as a result of this project? Who will be liable for any damages caused by the project, particularly if the project is a long term lease from IID? These are important issues that need further clarification.	As discussed in Section 2.4.1.27, the land where the SCH ponds would be located is owned by IID and would be leased from IID for the Project's duration, with the exception of the land at the Wister Beach SCH pond, which is owned by a number of private parties. The issues raised in this comment regarding indemnification and liability will continue to be coordinated with IID as part of the lease; these are not environmental issues that require analysis in the EIS/EIR. The Natural Resources Agency would be the project owner and would be responsible for any damage that may result from this project. No text revisions are required.
Imperial County Farm Bureau	ICFB-6	3. Adequate Water Supply There appears to be an adequate water supply for the near future, however in 25 years flows from the Alamo and New Rivers will be diminished considerably and the amount of brackish water needed for projects of this size many not be available. Recent discussions by participants of the Imperial Integrated Regional Water Management Plan have suggested IID drain water might be used for cooling purposes for future geothermal plants. This could affect the quantity of water ultimately flowing to the Salton Sea in the New and Alamo Rivers.	Please refer to the response to SSA-7 for a discussion of future water supplies. It is assumed that IID would evaluate future requests for drain water supplies in the context of the diversions necessary for the SCH Project. (Please refer to comment IID-1, which expresses IID's support for the SCH Project.) No text revisions are required.
Imperial County Farm Bureau	ICFB-7	2.3.1 Actions that Could Affect Inflows to the Salton Sea Metropolitan Water District's attempt at appropriating the New and Alamo River waters may certainly affect this project including the consequences it would have on the project and IID should they decide to continue with their appropriation claims.	Please refer to Master Response 6, Water Rights.
Imperial County Farm Bureau	ICFB-8	Page 2-9 Line 12 states that: "the average inflow to the Salton Sea will average 900,000 acre feet until 2078". The Imperial County Farm Bureau believes this assumption is flawed. This assumption assumes past history can be used to predict future inflows and does not take into consideration the changes in farming methods that will conserve water in the future including the change in cropping patterns and methods of irrigation. Inflows have already shown a rapid decline since the 2002 when the QSA was signed. According to information furnished by IID, the average four year inflow to the Salton Sea from 2002-2005 was 1,148,957 acre feet per year. The average four year inflow from 2007-2010 was 1,077,172 acre feet per year which is an average of 71,785 acre feet less per year. This includes an average of 38,062 acre feet of mitigation water being delivered to the Salton Sea per year between 2007 and 2010. During the next 25 years farmers will be tasked with finding new ways to conserve water while still providing the crops with their necessary water demand. Farm practices are already changing with more acres being irrigated every year	The figure was taken from Table H2-5 of the PEIR and reflects the total estimated inflow to the Sea from all sources between 2018 and 2077. The table was developed during the collaborative process that occurred with the PEIR and reflects declining inflows to the Sea. Please refer the response to IID-31. Also, please refer to the response to CVWD-7 regarding the adaptive management plan and the response to decreased inflow. No text revisions are required.

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		using drip and sprinkler irrigation which generate little or no surface run-off. By 2035 the Imperial County Farm Bureau estimates that that there will be very little surface run-off, if any, from the fields. The IID drains will only carry subsurface run-off. If this should become fact the estimated flow to the Salton Sea by 2035 will be closer to 500,000 acre feet a year, not 900,000 acre feet as modeled. This could mean neither river would be able to furnish the required water for this project.	
Imperial County Farm Bureau	ICFB-9	2.4.1.4 Boat Ramps A flat-bottom aluminum boat equipped with a long-shaft marsh outdrive is capable of running in extremely shallow water and even mud. The motors are also known as mud motors or backwater motors. At only 40 horsepower, at most, these boat/motor combinations are much cheaper and more cost effective to operate than an airboat and would be perfect for the SCH ponds.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).
Imperial County Farm Bureau	ICFB-10	2.4.1.7 Water Supply Does the State have a water right or the right to take the water from the New or Alamo Rivers for this project? MWD has filed for the rights to use the water. Will this all end up being a MWD project with MWD getting mitigation credits and trading the New and Alamo River water for Colorado River water? Will state have to buy this water from MWD?	Please refer to Master Response 6, Water Rights.
Imperial County Farm Bureau	ICFB-11	Section 2.0 Page 2-14 (Figure 2-4) also 2.4.1.8. Inflow/Outflow Structures Figure 2-4 shows a drawing of the precast concrete structure that will be used as a control and outlet structure for the water to move from pond to pond. These structures can only handle a small amount of water. Even the widest precast form available (48” Wide), will only allow 4.7 cubic feet per second (CFS) of water to flow through the structure with six inches going over the grade boards. In June, when evaporation is the highest, the water demand would be 253 CFS for Alternate 3. These small precast structures are fine for little duck ponds of 15 acres. They have no place in ponds exceeding hundreds of acres each. It would be better to install standard IID canal structures that allow for both an overpour and undershot. When demand is high more water could be moved through a bank of 72 inch wide control structures with jack-gates to allow for and set the appropriate undershot and overpour from the same structure.	Figure 2-14 is a general representation of the type of pre-cast structure that would be constructed in the ponds. The final size and location of these structures is a design issue and would be determined in the final plans based on flow rates and other design considerations. The representation shown in Figure 2-14 is sufficient for environmental review. No text revisions are required.
Imperial County Farm Bureau	ICFB-12	River Diversion Gravity Diversion Structure Will the gravity flow river diversion pipe lines run on both sides of the river? This will take up even more valuable farmland. Or will there be a cross-over from one side of the river to the other? If so, how will that be accomplished?	The gravity flow system proposed in Alternatives 1 and 4 would run on one side of the river. A pipe would be used to convey water from ponds on one side to the other side. The pipeline would be placed on a bridge structure to cross the river. No text revisions are required.
Imperial County Farm Bureau	ICFB-13	Brackish Water Pipeline The brackish water pipeline will disrupt farming while being installed and may very well disrupt the farm area of the individual fields it travels across to the point where the land cannot be farmed.	As discussed in Section 3.2, Agricultural Resources (Impact AG-1), the land right-of-way for the brackish water pipeline would be obtained from a willing owner. Canals and drains would be temporarily diverted during construction, and

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		Tile drainage lines below the surface of the farm fields may have to be rerouted, which may prove to be impossible because of slope requirements. Deep groundwork may not be possible because the equipment may hit the buried pipeline. Lack of subsurface tile drainage in the area of the brackish water pipeline will lead to salt buildup and deterioration of the soil making it unfit to grow winter vegetables.	potentially during maintenance, but they would be restored once construction was completed; the buried pipeline would be positioned in a way that did not impede subsurface tile drainage. Once the brackish water pipeline was installed, crops could be grown in the right-of-way. The owner would be required to grow crops that did not interfere with the pipeline; this would be negotiated as part of the easement obtained for the use of the land. The Project team would work with the landowners to minimize disruptions to agricultural practices. Please refer to page 2-25, lines 19-21, which states that alignments that conflicted with existing facilities would either be rerouted or the Project engineer would work with the facility owner to minimize the effects. Note, however, that impacts on agricultural resources are one of the reasons that gravity diversion was rejected as part of the State's preferred alternative (see page 7-3). No text revisions are required.
Imperial County Farm Bureau	ICFB-14	The last sentence states: "It is estimated that three 5-foot-diameter pipes would be needed to minimize the velocity in the brackish water pipeline (thereby minimizing head loss)." By reducing velocity in the pipelines you will also be allowing the sediment to fall out and eventually plug the pipelines.	Sediment deposition is an important consideration for the gravity line, which is why a sedimentation basin would be placed at the upstream end of the pipeline. The sedimentation basin would be designed to remove a part of the sediment in the river water. With the pumped diversion, the discharge would be under pressure and would not allow the sediment to drop out in the short pipeline between the pump and the basin.
Imperial County Farm Bureau	ICFB-15	River Diversion Pump Stations These pump stations must not block access to the Salton Sea River deltas through the river channel. The New and Alamo Rivers are the main artery to the Salton Sea for waterfowl hunters and catfishermen, both who use boats launched in the area of current gauge stations to access the sea and/or the river for fishing, hunting, and sightseeing.	The diversion would reduce the river flow from the diversion location to the river mouth where the water would be returned. This is a distance of about 1 mile with the pumped diversion and about 3 miles for the gravity diversion (see Section 2). The proportion of the river flow that would be diverted during duck hunting season is substantially less than the amount cited for the maximum diversion in June. The Project would maintain a live stream downstream of the diversion at all times and would use the operations and adaptive management plans to govern SCH operations to accomplish this objective. Any pipeline crossing of the river would be elevated to approximately 6 feet above the water level to maintain boat access in the river. Moreover, the New River, the area where boats are currently launched, is not an officially designated location; it is merely a place where vegetation has been cleared to allow small boats to be carried to the river. Such an area could readily be replicated elsewhere if needed. At the Alamo River, other obstructions already prevent access by boats. No text revisions are required.
Imperial County Farm Bureau	ICFB-16	Saline Water Supply Pump Station Has anyone studied the saltwater delivery system? Will barnacles plug up the pipeline? Where boats have been left floating in the Salton Sea at marinas they usually sink within two years because of the weight of the barnacles that rapidly grow on their hulls.	According to recent observations by DFW biologists, barnacle populations have already been in marked decline for the last few years. This is supported by expectations from the literature (Simpson and Hurlbert 1998) that predict population declines at salinities over 50 ppt, due to weakening of the barnacles'

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			tests and reduced growth rates. Thus, we do not expect to see historical levels of barnacle fouling when the Project is completed since salinity in the Salton Sea is already above 52 ppt. No text revisions are required.
Imperial County Farm Bureau	ICFB-17	Depending where the saltwater pump station is located, it may not be pumping salt water. The water exiting the New and Alamo River Deltas floats on top of the saltwater and moves counterclockwise with the current for some distance depending on the wind and current velocity before mixing with the saltwater. It is possible the saline pumps would then be pumping brackish water.	The pump station would be located based on salinity measurements, distance from the SCH ponds, and site conditions. The pump would be positioned vertically in the water column to avoid floating debris and not draw bottom sediments. No text revisions are required.
Imperial County Farm Bureau	ICFB-18	The north and northwest winds on the Salton Sea disturb and stir up the mud and sediment out to the 12 foot depth with every high wind over 15 mph. This is also where the majority of the killing hydrogen sulfide is released and red tides form during wind events. The saltwater intake will be in this area and could very well carry saline water to the SCH ponds that would kill the fish in the pond. Are there operational plans to stop saline water from entering tile drainage lines or farm fields when these events occur? That will affect the water balance of the project.	Please refer to the response to comment ICFB-17 regarding locating the saline pumps.
Imperial County Farm Bureau	ICFB-19	Are there provisions to run the salt water through a settling pond before dumping into the SCH ponds? Sea water can contain high silt loads after a wind and the silt will most definitely cause accelerated erosion to the pumps and add to the silt load entering the SCH ponds.	Settling ponds are not proposed for the saline system. The saline diversion could, however, be connected with the proposed settling ponds for river water to provide the settling suggested in the comment. This would be considered as part of the final Project design. No text revisions are required.
Imperial County Farm Bureau	ICFB-20	There is no provision noted how the saline pumps will be accessed for their required constant maintenance and replacement. A similar pumping system currently exists in the Willey Reservoir. The three pumps deliver 48 CFS to the Vail 3 heading over 3.5 miles away through a pressurized pipeline. These pumps must be pulled and transported to a repair facility on a frequent basis. They also require an automated trash rack that collects trash and aquatic weeds in the water and deposits it in a dumpster that is serviced sometimes twice a day when aquatic vegetation is heavy. In the Salton Sea currents carry floating trash dumped in the sea by the rivers, especially after large rain events or other events that increase the flow of the rivers such as mitigation water being added to the Salton Sea. There is no mention of silt or trash being a problem with the saline pumps. Access to the pumps for maintenance and hauling off the collected trash will be problematic.	The final design would include providing access by boat to the saline pump station. All available data and local knowledge would be accessed to design the site access, trash racks, and pump maintenance requirements. No text revisions are required.
Imperial County Farm Bureau	ICFB-21	Power Supply Who will be responsible for payment of power? Has anyone even figured out how much power will be needed? If alternative 3 is chosen and water for the ponds will be kept at 20 PPT with a 28 day residence time you would have to supply the power necessary to lift 172 cfs of brackish water out of the New River and pump 80 cfs of saline water from the Salton Sea. This will require a tremendous amount of horsepower. Has anyone calculated how much power this	The power needs of the Project are presented in Table 3.6-2. The power calculations are based on the estimated discharge, pipe length, head, and viscosity of the water to yield horsepower, which is then converted to power in kilowatts. Initial discussions have been underway with IID regarding power supplies, extending power lines, and tie-in to IID facilities. IID has indicated that while

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		will require or if the infrastructure will even handle that much power?	additional lines may be needed to connect existing 3-phase power with the SCH pumps, IID can supply the power to the SCH Project. No text revisions are required.
Imperial County Farm Bureau	ICFB-22	There is no mention of estimated costs for the operation and maintenance of this project, including power. This is important stuff! Why is it missing?	Please refer to Master Response 5, Project Costs.
Imperial County Farm Bureau	ICFB-23	Sedimentation Basin The planned one day retention time is only sufficient to remove the sand and heavy fraction of the silt particles. The majority of the silt particles and all of the clay particles will remain suspended and travel to the SCH ponds. The planned sedimentation basins will have very little effect on the turbidity of the river water.	The estimate of a 1-day residence time in the sedimentation basin is based on laboratory analysis of New River water samples. Turbidity was used as a measure of the suspended material in a sample and measurements were conducted over several days. That analysis showed a 95 percent reduction in turbidity in 1 day. The improvement in clarity beyond 24 hours was minimal, reflecting the fine particles still in suspension. Clay particles would remain in suspension longer, and it would be impractical to retain this water until the fine particles settled. These particles would settle in the SCH ponds, or possibly remain in suspension because of wind and wave action. Regardless, the bulk of the river particles would drop out. The deposition of river sediment can be seen in the backwater river areas, suggesting that these particles do drop out when the velocity slows. No text revisions are required.
Imperial County Farm Bureau	ICFB-24	The planned 2:1 slope of the banks of the sedimentation basin will be prone to sloughing and erosion from wind driven wave action. A buildup of muskrat populations and their holes and burrows along the shoreline, will create massive erosion and sloughing. Wave action forcing water into their burrows and dens will create a hydraulic battering ram which will quickly erode the banks. Nothing in this report shows this type of problem has been considered. The Willey Reservoir, situated on the south side of the New River near the planned New River sedimentation basin, has experienced waves that built to two feet high during strong west winds. A series of serpentine structures in the basin would reduce wind erosion.	A buildup of muskrat populations is not expected at the sedimentation basins. Muskrats feed primarily on aquatic vegetation, and as discussed in Section 2.4.1.16, Sedimentation Basin, the basin would have steep side slopes (2:1) to discourage establishment of emergent vegetation. The basin would also be excavated periodically, which would remove any vegetation that did occur. Muskrat populations also could be trapped or otherwise removed if they posed a problem. Wave and wind erosion would be prevented because of Project design elements such as riprap. The final design would determine the most effective side slope for the sedimentation basin. No text revisions are required.
Imperial County Farm Bureau	ICFB-25	The slopes of the bank should be vegetated with native saltgrass, (Distichlis spicata), prior to the initial filling of the sedimentation pond, to reduce erosion, sloughing and the establishment of noxious weeds. Saltgrass is capable of living in very harsh climates, and thrives in saline soils, and grows vigorously with brackish to saline water. The plant is also capable of transferring oxygen to its root system if the root system is submerged below the water for extended periods of time. All of these factors make native saltgrass an excellent ground cover to armor the banks of the sedimentation basin. The IID's Vegetation Management Plan promotes the growth of saltgrass to armor their canals and drain banks to reduce sloughing, reduce weed populations, and reduce silt sedimentation in its 3,000 miles of drainage ditches	This suggestion is noted. The final engineering design would develop a revegetation plan as appropriate to maintain cut slopes. Given the harsh growing environment at the site, the Project would need to operate for some time before many of the issues identified in the comment are realized and solutions are developed. The adaptive management plan also would include revegetation information to address the potential for future problems. Planting with saltgrass may be considered as an adaptive management option to reduce erosion, sloughing, and the establishment of noxious weeds. No text revisions are required.

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		and canals.	
Imperial County Farm Bureau	ICFB-26	Interception Ditch/Local Drainage (Applies to all alternatives) Sloughing in the interceptor drain could cause the drainwater to back up into the adjacent field's tile drainage lines. Who would be responsible for maintenance of these drains specifically maintaining the slope and shape of the drain banks as well as controlling unwanted vegetation? Who would pay for this maintenance?	The interception ditch design would focus on a stable bed and sides for the ditch. As stated in on page 2-19, lines 21-23, the interception ditch would be designed to prevent water from backing into the ditch. It should be noted that the drainage ditches present in the area have steep sides and are typically devoid of vegetation. IID would maintain the interception ditches in the infrequent case that they need to be maintained. No text revisions are required.
Imperial County Farm Bureau	ICFB-27	The Imperial County Farm Bureau requests the interceptor drain be planted with native saltgrass, (Distichlis spicata), to reduce erosion in the drain as well as reduce noxious weed from becoming established.	Please refer to the response to ICFB-25.
Imperial County Farm Bureau	ICFB-28	Since this drain will also be collecting salty seepage water from the SCH ponds it will increase the salinity of the water in the drains. This may affect the natural flora and fauna that reside in the IID drain system. Should the drain plug due to trash, mechanical failure, sloughing or earthquake liquefaction, the adjacent farm fields will be at risk from saltwater backing up into the field tile drainage system and causing damage to the soil and existing crops. Mitigation will be necessary and a planned and funded response program is needed should this happen.	The SCH interception ditch would be downstream of all farmland. As discussed in Section 2.4.1.7, it would be designed to prevent the Project from causing water to back up in the agricultural drains and therefore would not affect the water quality within the drains. A maintenance plan (Section 2.4.6) would address the typical and unforeseen maintenance obligations that could occur with the Project. No text revisions are required.
Imperial County Farm Bureau	ICFB-29	Aeration Drop Structures Unless properly designed the aeration drop structures may cause erosion of the berm where water drops 2-5 feet into the adjacent pond.	All necessary erosion control would be included in the final design. No text revisions are required.
Imperial County Farm Bureau	ICFB-30	Bird Habitat Features The roosting islands planned with steep sides will be subject to erosion on their north and west sides.	The shape, size, elevation, and slope of the islands would be considered in final design (refer to Section 2.4.1.19). It is understood that erosion would occur on any unprotected islands (as it currently does in the adjacent Sonny Bono Refuge). The maintenance and adaptive management plans would address this issue and recommend any corrective measures needed. No text revisions are required.
Imperial County Farm Bureau	ICFB-31	How will salt cedars and other halophytes be controlled on these and other islands planned?	Salt cedar may become established on some of the islands in the lower salinity ponds. A maintenance plan (Section 2.4.6) would address the acceptable levels of plants and methods to maintain the appropriate levels. This has been clarified in the text.
Imperial County Farm Bureau	ICFB-32	Fish Habitat Features (Swales or Channels) High winds from the west, northwest, and north will stir up large amounts of silt and clay in the ponds which will rapidly fill the swales or channels planned for the project. In addition clay, silt, dead plankton and other detritus will eventually mix with the clay and silt and add to the mix that fills the swales or channels. The swales or channels SCH ponds will quickly become repositories for easily stirred up sediment to foul the ponds	The in-pond swales would be susceptible to sloughing or material settling. The extent of such filling would be controlled by the initial size of the swales (narrow swales experience more sloughing and settling compared with wider swales). Long-term monitoring would assess the changes in the pond bed form and possible biologic changes that may result. It is possible that in a future year, the swales would need to be re-dredged. This would be addressed as part of the

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		every time a wind event greater than 15 miles per hour occurs. The newly built IID Managed Marsh has similar swales next to the berms and they are already half full of silt after only two years of operation.	maintenance plan (Section 2.4.6). No text revisions are required.
Imperial County Farm Bureau	ICFB-33	Operational Facilities Storing boats and other equipment at the Wister Headquarters is both impractical and a waste of fuel and time for ponds built in the New River Delta Area which is 27 miles away from Wister. It would be more practical to store the needed equipment in one or more lockable portable containers on site.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). This opinion will be considered when developing the final Project design.
Imperial County Farm Bureau	ICFB-34	Fish Rearing Rapid plankton growth in the ponds, fueled by high nutrient loads from the water sources, both brackish and saline, may lead to anaerobic conditions at times. The breakdown of dead plankton will reduce oxygen and cause a buildup of hydrogen sulfide that will act as a poison in the ponds as well as lower the ph and create an imbalance in the water chemistry.	This potential was acknowledged in Section 3.4, page 3.4-48, lines 18-32, and Section J.3, page J-8, lines 1-12 and lines 18-26. The Project is a proof-of-concept project that would use an adaptive management approach with monitoring to adapt operations as needed. Please refer to Master Response 7, Operations and Adaptive Management. No text revisions are required.
Imperial County Farm Bureau	ICFB-35	Should a massive fish die-off occur a plan needs to be included for the fast and efficient cleanup and disposal of the dead fish.	The potential for fish and bird die-offs to could occur was acknowledged on page 2-26, lines 16 and 17. Dead birds would be removed, but dead fish are not now cleaned up during fish die-offs, nor would they be during SCH Project operations. No text revisions are required.
Imperial County Farm Bureau	ICFB-36	Public Access The Salton Sea Delta areas have been favorite waterfowl hunting spots for over a hundred years which is evidenced by the hundreds of blinds that can be seen around the delta of all three rivers that feed the Salton Sea. The SCH pond locations will cover many of these hunting areas. These areas must remain open to waterfowl hunting as they have in the past, including access to the Salton Sea through the New and Alamo River channels. A lease clause in the IID lease with the State must specify that the area will remain open to public access for recreational purposes using gasoline powered boats in the river channels and furthermore that boats have access to the SCH ponds using electric motors. In addition, the current trails along either side of both rivers, which provide access to the delta areas, must remain open to foot, ATV, or off-road traffic.	The areas where the ponds would be located would no longer be viable for hunting as the Salton Sea recedes. Public access is discussed in Section 2.4.1.24. As discussed in on page 2-22, lines 6 and 7, waterfowl hunting may be allowed, consistent with the protection of other avian resources. Details regarding public access would be addressed in a lease agreement with IID. No text revisions are required.
Imperial County Farm Bureau	ICFB-37	Land-Based Equipment Tractor pulled or self-propelled scrapers or any other equipment with rubber tires will prove impractical in the areas around the New and Alamo Deltas. The ground is too saturated to support their weight once the top one-half to one foot of soil is removed. Long-reach excavators, working from atop the berm they are constructing may be the only practical way to construct the berms near the Sea. Any dozers or excavators used should be equipped with wide low-pressure tracks.	The SCH's Project geotechnical engineer would address these issues in the final design. Extensive sampling of the soil profile and strength characteristics have been conducted to assist in the design, and the need to use specialized equipment based on these characteristics was discussed on page 2-23, lines 14-17. No text revisions are required.
Imperial County Farm	ICFB-38	Floating Equipment There is no information discussing how the barge-mounted excavator or clamshell dredge would be launched in the sea or what precautions	The floating dredge would be launched at the nearest ramp that was accessible for the type of equipment. A strict safety plan would be developed and followed to

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Bureau		taken to protect it during high wind events and rough seas.	address the often adverse conditions that are present in the Sea. The dredge would operate in a channel that it has dug (slightly wider than the barge) rather than in the open Sea. No text revisions are required.
Imperial County Farm Bureau	ICFB-39	Pumping Plants Pumping water directly from the New or Alamo River without first running it through a settling basin will lead to premature erosion of the pump casing and impeller and failure of the pumps as evidenced at the recent pilot project at the corner of Davis and McDonald Roads where water was pumped directly from the Alamo River at the end of Garst Road and conveyed through a pipeline to the Pilot SCH ponds.	Sedimentation basins are part of each alternative discussed in the Draft EIS/EIR (refer to Section 2.4.1.16). No text revisions are required.
Imperial County Farm Bureau	ICFB-40	Interaction with Existing Facilities It is unfortunate that the authors of this EIS/EIR are unfamiliar with agriculture in the Imperial Valley. It is also unfortunate that they did not accept help and input from locals familiar with agriculture even though assistance was offered. An example of interaction with existing facilities is given that states: "If the gravity brackish water pipeline were to intersect an agricultural drain, the drain would be rerouted to bypass the work area until the brackish water pipeline was placed and the backfilled. The drain would then be restored to the pre-Project condition." This statement shows a total lack of knowledge of the IID's drain infrastructure and fails to understand that it is not a simple matter to reroute an IID drain by simply moving it. Tile drainage lines enter the IID drains at a guaranteed elevation and location in the IID drain so that brackish drainwater will not back up into the farmer's field, thus pushing the salt in the water to the surface. The only way the subsurface drain water could be rerouted would be to pump it and maintain the existing unsubmerged tile outlet elevation. It can be assumed that a brackish water pipeline eventually would have to rise above the level of the tile drainage lines and then the farm fields it is traversing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the subsurface drainage lines in half and making it near impossible to farm the field while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system.	Concerns raised by the Imperial County Farm Bureau at the meeting held on October 28, 2010 were considered in developing the Project design and evaluating the environmental impacts of the Project. Members of the Farm Bureau also were invited to participate in quarterly Stakeholder workshops held to provide updates regarding Project progress and had the opportunity to express any concerns about the Project design at that time. Concerns about the impacts of the brackish water pipeline's effects on agricultural drains were not mentioned during these meetings, but they were addressed in the Draft EIS/EIR (refer to the response to ICFB-13). No text revisions are required.
Imperial County Farm Bureau	ICFB-41	Vehicle Routes Like the previous section, this section contains faulty information and shows the person that wrote this section has never followed the routes listed. The route described to reach the New River site follows Bruchard Road, which is a very soft and sandy single lane road in places once it crosses Walker Road. Trucks seldom use this road because they easily become stuck in the sand. Bruchard Road ends at Foulds Road, which is .75 miles south of the project site. The single lane 14 foot wide road that continues north is a ditch bank easement road for IID and farmers which is not suited for truck traffic without major	The final routes would be verified in the field prior to construction, but slightly modifying the routes would not change the significance of the impacts in the document because traffic conditions are similar throughout the general area. No text revisions are required.

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		reconstruction. Trifolium Lateral 12 canal/drain runs along the west side of the road and a IID power line and farmer's field, three to four feet lower than the road, runs along the east side of the easement road. This road dead-ends at the south side of the New River which is flowing west at this point. This easement road would only access the SCH ponds to the south and west of the New River. There is no way to get to the other half of the project on the north side of the New River. For truck traffic to use this road it would have to be widened. This would require moving the existing power line, taking agricultural land out of production to widen the road, rerouting the field drains along the east side of the road, rerouting the tile drainage lines, as well as moving the two deep tile cisterns and pumps. Directions to the Alamo site are correct until you reach West Sinclair Road. The directions fail to mention that from there the trucks would travel east on Sinclair Road one mile to Garst Road and then travel 1.65 miles north to the project site.	
Imperial County Farm Bureau	ICFB-42	2.4.3 Operations Plans need to be crafted to address what to do if funding should disappear during construction or after the project is operating. Building this tremendous infrastructure and then walking away from it without a discussion of what would happen to the adjacent agriculture is not advisable.	Please refer to Master Response 4, Project Funding.
Imperial County Farm Bureau	ICFB-43	2.4.5 Mosquito Control West Nile virus thrives in the Delta areas of the Alamo and New River. From the shoreline of the Salton Sea back 50 to 300 yards, (depending on the slope of the ground), the clay that was deposited as the Salton Sea receded cracks and shrinks as it dries out leaving a web of cracks one inch wide and up to eight inches deep. These cracks then partially fill with seepage water that creates the perfect habitat for mosquitoes to breed. Treatment during construction will be expensive but necessary and may require aerial application of the proper pesticide or larvicide to gain control.	The Imperial County Health Department (personal communication, P. Johnson 2011) indicated that cracks in the substrate would not pose a problem in terms of mosquito production. No text revisions are required.
Imperial County Farm Bureau	ICFB-44	River Water Source From looking at the rough map/photograph it appears the brackish water would be diverted into a sedimentation basin just west of Lack Road on the south side of the New River and east of the IID Willey Reservoir and bordered on the south by Foulds Road. This property, currently owned by Jack Brothers, is intensively farmed to winter vegetables, primarily broccoli and cauliflower. By removing this field from agricultural production you would be reducing some of the prime farmland in the Imperial Valley that feeds the nation during the winter months. The rest of the year wheat or export hay is produced.	The impacts on farmland were acknowledged in Section 3.2, Agricultural Resources and Section 7, Summary Comparison of Alternatives, and such impacts were one of the reasons that Alternative 3, which relies on pumped diversion, was selected as the State's preferred alternative. No text revisions are required.
Imperial County Farm Bureau	ICFB-45	The buried gravity pipe lines would have to cross a deep channel (Trifolium Lateral 9 Drain), pass by Willey Reservoir on its south side because there is not enough room between the New River and the Willey Reservoir on the north side. In passing on the south side of Willey Reservoir it would be traversing three fields	Please refer to the response to ICFB-44.

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		famed by Del Sol Farms. These three fields also contain prime agriculture ground and are intensely farmed to cauliflower, carrots, tomatoes, cut flowers, potatoes, lettuce, broccoli, and sweet onions to feed the nation during the winter months. The rest of the year wheat or export hay is produced. At times they are farmed to alfalfa.	
Imperial County Farm Bureau	ICFB-46	Saline Water Source (applies to all Alternatives) As the New River brackish water exits the New River Delta into the Salton Sea it floats up on top of the saltwater. Strong counter-clockwise currents immediately carry it in an easterly direction where it follows the shoreline all the way to the Alamo Delta and beyond. The floating freshwater is often found two miles or more out to sea. In other words it does not immediately mix with the saltwater. The water exiting the New River will float on top of the salt water and not mix for some time depending on wind conditions. During this period Salton Sea Currents will carry the brackish New River water to the area of the saline pump station. Where the freshwater and saltwater mix it creates what is known to locals as a scum line. Trash from the New River is concentrated at this scum line. When the scum line is viewed on sonar it shows trash stacked up from the bottom of the sea floor to the surface, trapped there by two different waters with differing specific gravities. The scum line is constantly moving, carrying the trash with it and is often in the area near the proposed saline pump intake. A system of trash racks would have to be built and maintained on a constant basis. There are no plans showing how this trash will be removed from the pump station, one out in the Salton Sea.	Please refer to the response to ICFB-17.
Imperial County Farm Bureau	ICFB-47	Hydrogen sulfide is a poison, generated by rotting algae and plankton that settles on the bottom. The hydrogen sulfide is often trapped by a thermocline and then released during wind events. Red Tides are also generated in this area. Both the hydrogen sulfide and water from the poisonous red tide will be picked up by the saline pump and transported to the pond site where it will poison the fish and invertebrates.	A possible die-off in the SCH ponds because of local pond conditions or conditions imported from the source water would be addressed in the operations and adaptive management plans. This is an impact on the Project, not an impact of the Project. No text revisions are required.
Imperial County Farm Bureau	ICFB-48	In addition, the floating freshwater carries heavy silt loads. Depending where the saltwater pump station and intake is located brackish water, heavily laden with silt will be pumped to the SCH ponds instead of saline water.	Please refer to the response to ICFB-17.
Imperial County Farm Bureau	ICFB-49	To further complicate matters, north and northwest winds on the Salton Sea disturb and stir up the mud and sediment on the bottom of the Salton Sea out to a depth of 12 feet with every high wind over 15 MPH. The saltwater intake will be in this area. Are there provisions to run the salt water through a settling pond before dumping into the SCH ponds? Sea water can contain high silt loads after a wind and most definitely will cause accelerated erosion to the pumps and	Please refer to the response to ICFB-17.

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		siltation at the SCH ponds.	
Imperial County Farm Bureau	ICFB-50	Sedimentation Basin The Draft EIS/EIR states the diverted brackish water would be retained in the sedimentation basin for one day to allow the silt to settle out. This is not sufficient time. Only the sand and heaviest fraction of silt will settle out in one day leaving the majority of the silt and clay particles in suspension.	Please refer to the response to ICFB-23.
Imperial County Farm Bureau	ICFB-51	The Draft EIS/EIR also states that a 60 acre sedimentation basin would be constructed and excavated below the ground surface to 20 feet. It is impossible to excavate much more than five feet below the surface because the weight and vibration of the equipment will create hydraulic pumping leading to liquifacton of the soil.	Please refer to the response to IID-30.
Imperial County Farm Bureau	ICFB-52	A 60 acre area excavated to 20 feet below the surface will generate 1,936,000 cubic yards of soil. The plan does not address where this amount of soil would be deposited. To put this amount of soil in proper perspective, if a dike were constructed using this large amount of spoil, and its dimensions were 100 feet wide at the base, 20 feet wide at the top, and 15 feet high, there would be enough soil to build a dike of this size over 11 miles long. Furthermore if you loaded all the truck and trailers necessary to haul this much dirt and parked them end to end they would reach from the Salton Sea to the Mississippi River near Memphis.	The final design would balance cut and fill to the extent feasible. Excavated material from the upstream sedimentation basin could be used in berm construction for both the foundation and the overlying berm. Note that the Alternative 1 exterior berm would be 23.1 miles long, and the Alternative 4 berm would be 11.8 miles long. The material could also be used to construct islands or made available to other users in the area, including other restoration projects or agricultural uses. No text revisions are required.
Imperial County Farm Bureau	ICFB-53	Conceptual Layout of Alternative 1 As currently drawn, the exterior berm in the far northeast corner of East New pond and interception drain, cuts through 15 acres of private land owned by Sea View Conservancy. The legal description of this property is: The east ½ of the southeast ¼ of section 23, township 12 south, range 12 east, San Bernardino baseline meridian. This property is part of a long term Audubon California Landowner Stewardship Project and any disturbance is forbidden.	Under Alternative 1, the land where the SCH ponds would be located is owned by IID and would be leased from IID for the Project's duration. As indicated in footnote 4 on page 2-28, the selected site would be surveyed prior to construction, and the boundaries shown on Figures 2-6 through 2-11 may be adjusted somewhat based on the results of these surveys. No text revisions are required.
Imperial County Farm Bureau	ICFB-54	River Water Source The metal bridge which crosses the New River and is used to support the diversion pipes that carry the pumped water to sediment basins on either side of the New River must remain high enough to allow boat traffic to pass underneath the structure.	The river pipeline crossings and associated support structures would be designed to allow the existing boat usage to continue. No text revisions are required.
Imperial County Farm Bureau	ICFB-55	Saline Water Source Please refer to comments made for Alternative 1.	Please see responses to comments on the location of the saline water supply (ICFB-16 through ICFB-20).
Imperial County Farm Bureau	ICFB-56	Sedimentation Basins (applies to Alternative 3 also) No information is given on how the sedimentation basin is constructed, how deep it will excavated or where the spoil will be put. Hopefully it is not similar to the sedimentation basin	The sedimentation basin in Alternatives 2 and 3 would be placed in the SCH ponds with similar base and top of berm elevations. The construction techniques and the configuration of the basin would be determined in the final design. No

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		described for Alternate 1.	text revisions are required.
Imperial County Farm Bureau	ICFB-57	Conceptual Layout of Alternative 2 As currently drawn, the exterior berm in the far northeast corner of East New pond and interception drain, cuts through 15 acres of private land owned by Sea View Conservancy. The legal description of this property is: The east ½ of the southeast ¼ of section 23, township 12 south, range 12 east, San Bernardino baseline meridian. This property is part of a long term Audubon California Landowner Stewardship Project and any disturbance is forbidden.	Please refer to the response to comment ICFB-53.
Imperial County Farm Bureau	ICFB-58	The map/photo shows no connection to the interception drain for the Trifolium Lateral 12 drain. In addition there is no information regarding the size of the interception drain, how deep it will be, or which direction the two drains flow. Has any surveying been done to determine if the interception drain can successfully intercept the IID lateral drains at the correct elevation and then be able to transport the IID drain water around the project and into the Salton Sea?	Photos in the Draft EIS/EIR are used only to orient the readers. Site-specific topographic data would be used to design the interception ditch to ensure that water in the ditch flows to the Sea. No text revisions are required.
Imperial County Farm Bureau	ICFB-59	River Water Source The metal bridge which crosses the New River and is used to support the diversion pipes that carry the pumped water to sediment basins on either side of the New River must remain high enough to allow boat traffic to pass underneath the structure.	Please refer to the response to ICFB-54.
Imperial County Farm Bureau	ICFB-60	Saline Water Source Please refer to comments made for Alternative 1.	Please refer to previous responses to comments on the saline water supply (ICFB-16 through ICFB-20).
Imperial County Farm Bureau	ICFB-61	Sedimentation Basins No information is given on how the sedimentation basins are constructed. Hopefully it is not similar to the sedimentation basin planned for Alternate 1.	Please refer to the response to ICFB-56.
Imperial County Farm Bureau	ICFB-62	Water Demand The Imperial County Farm Bureau developed a water demand model to better understand the amount of daily evaporation in the SCH ponds and therefore the amount of saline and brackish water need daily throughout the year to keep the ponds at a static level. This model is useful in determining the amount of saline and brackish water that is needed for various alternatives, various salinity of the rivers and Salton Sea, and various residence times. It shows that when salinity of the SCH ponds exceeds 28 PPT the amount of saline water required almost equals the amount of river water required.	The diversions calculated in the Draft EIS/EIR used similar relationships. No text revisions are required.
Imperial County Farm Bureau	ICFB-63	There is no mention of the amount or cost of power necessary to pump the tremendous amounts of water required or the cost of maintenance of the pumps and pump intake stations.	Please refer to Master Response 5, Project Costs, regarding the need to include information on Project costs in the Draft EIS/EIR. The cost of power would be negotiated with IID. No text revisions are required.
Imperial	ICFB-64	Pond Connectivity Without knowing the acres of each individual pond or the	Please refer to the response to ICFB-11.

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County Farm Bureau		size of the control structures it is impossible to judge whether the control structures planned for each individual pond is of sufficient size. It would be best if the control structures were wider and used jack gates like those used on the IID canal system so that the gates can be set with an undershot which will handle much more water than a control structure that uses a overpour control structure. The jack gates used by the IID can easily be set for an undershot and also be able to handle an overpour at the same time should a summer flash flood occur in the area, where dumping three inches of rain in a half hour period is not uncommon.	
Imperial County Farm Bureau	ICFB-65	Conceptual Layout of Alternative 3 As currently drawn, the exterior berm in the far northeast corner of East New pond and interception drain, cuts through 15 acres of private land owned by Sea View Conservancy. The legal description of this property is: The east ½ of the southeast ¼ of section 23, township 12 south, range 12 east, San Bernardino baseline meridian. This property is part of a long term Audubon California Landowner Stewardship Project and any disturbance is forbidden.	Please refer to the response to ICFB-53.
Imperial County Farm Bureau	ICFB-66	The map/photo shows no connection to the interception drain for the Trifolium Lateral 12 drain. In addition there is no information regarding the size of the interception drain, how deep it will be, or which direction the two drains flow. Has any surveying been done to determine if the interception drain can successfully intercept the IID lateral drains at the correct elevation and then be able to transport the IID drain water around the project and into the Salton Sea?	Please refer to the response to ICFB-58.
Imperial County Farm Bureau	ICFB-67	Aerial Backgrounds of all the Alternatives It is unfortunate that the aerial backgrounds shown for all alternatives are not current photographs. Current photographs were easily available and one local aerial photography company even offered their services to the consultant for the project but were told their services were not needed. It is very difficult to comment on the Draft EIS/EIR when the Salton Sea has evaporated numerous feet and the shoreline has receded ¼ to ½ mile than shown on the photos being used.	The photography used in the Draft EIS/EIR is recent and sufficient for background imagery. The final design would be based on surveyed topography from recent aerial LIDAR and ground surveys conducted in 2010 and 2011. No text revisions are required.
Imperial County Farm Bureau	ICFB-68	Saline Water Source (Comments apply to Alternatives 4 & 5) This plan is lacking detail but it appears the saline water will be conveyed through the old original Red Hill Marina access channel build in the 1950's. It is unclear where the pumps will be located. The plan says the pump will be located in the Sea west of Red Hill but the map/photo show it on land near Red Hill. The original channel was armored with rock and appears to still be usable if the actual channel were cleaned with a long-reach excavator and extended out into the sea to deeper water. Like the current channel, a dog-leg at the western tip of the channel would have to be included in the plan to keep silt from building up at its entrance. The channel could also be extended around Red Hill, all the way to the	The exact location and design of the saline pumps would be part of the final design process. Water would be conveyed across the river with an elevated bridge facility. No text revisions are required.

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		south side of the Garst Road Bridge on the Alamo River negating the need for a pump in the sea. There is no discussion how the saline water will be conveyed across the Alamo River to the north side to the ponds.	
Imperial County Farm Bureau	ICFB-69	As discussed earlier in this report this plan will have to address the following issues: ▪ River water, laden with trash, floating on top of the salt water at the inlet point of the channel and only brackish water entering the pumps ▪ High silt loads during wind events ▪ Hydrogen sulfide being released during high wind events and being transported to the SCH ponds ▪ Red tides forming near the channel inlet and being transported to the SCH ponds ▪ Sediment buildup in the actual channel	Please refer to the responses to ICFB-14, ICFB-20, ICFB-34, and ICFB-47.
Imperial County Farm Bureau	ICFB-70	Sedimentation Basin The location of the sedimentation basin is not well described but appears to be prime farm land owned by Brant Family Farms and currently irrigated from Vail Lateral 1. If it is built similar to the sedimentation basin described for Alternative 1 the same comments made for that project will apply here as well.	Please refer to the response to ICFB-56.
Imperial County Farm Bureau	ICFB-71	It also appears that the water will be conveyed west through the three massive pipelines from the planned sedimentation basin. The lines would have to cross the Vail 2 drain, Kalin Road (Paved), Vail 2 Canal, Vail 2A drain, Hatfield Road, Vail 2A Canal, Vail 3 drain, then turn north, following Garst Road to the south side of the Alamo River, cross the Alamo River, and finally arrive at the SCH pond location on the north side of the Alamo River. It is unclear how these pipe lines would cross the Alamo River to reach the pond site.	The precise pipeline route has not been determined. The water delivery pipeline would cross the Alamo River on a bridge structure. No text revisions are required.
Imperial County Farm Bureau	ICFB-72	The described area where the sedimentation pond and pipe line to the SCH pond site is planned is also an area that has shown tremendous subsidence in the past 25 years. IID engineers have recorded 15 inches of subsidence in the area. As a result it has become difficult to deliver the amount of water in the IID canals that they were originally designed to handle. The farmer who farms most of this area has had to re-level his property, abandon and re-install tile drainage lines, and replace his concrete lined supply ditch because of subsidence.	The final design would include geotechnical analyses of the Project features and address issues such as constructing in an area that is experiencing subsidence. No text revisions are required.
Imperial County Farm Bureau	ICFB-73	Pond Layout (Comments apply to all Alamo Projects) The location of the ponds for Alternative 4 is situated in the middle of the most active area of CO^2 vents and mud pots at the Salton Sea. If all of this CO^2 is trapped by the ponds it will lead to massive algae blooms, the reduction of dissolved oxygen, the lowering of the water's pH, and production of hydrogen sulfide, all of which will kill	The presence of CO_2 vents at the Alamo River site is an issue that must be considered in the final design of the Project should a site at the Alamo River be selected. The design should consider ponds that exclude the vents or have a low residence time that would turn over the pond water quickly to prevent the

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		any fish and invertebrates trying to be grown. In the past, natural currents carried the high concentrations of CO^2 out of the area and diluted it with the Salton Sea water.	conditions suggested in the comment. No text revisions are required.
Imperial County Farm Bureau	ICFB-74	Agricultural Drainage and Natural Runoff According to the map/photo on page 2-43 there is no provision for the IID N, O, and P Lateral Drains to exit to the Salton Sea. According to the plan, they are blocked by the project's berm and have no access to the interceptor drain.	The interception ditch in this area would be designed to connect these drains to the Sea. The plans shown in the Draft EIS/EIR are still conceptual. No text revisions are required.
Imperial County Farm Bureau	ICFB-75	IID's N, O, P, Q, R, and S Lateral drains currently empty directly into the Salton Sea. In the mid 90's when the Salton Sea reached its highest elevation and started to recede, it deposited a barnacle shoal along the shoreline east of Mullet Island. The barnacle shoal was high enough to block the drain water from the various alphabet drains that drained directly into the sea but it was very porous and drain water flowed through the barnacle shoal and into the sea. In the process though, it flushed the saltwater from the shoal and soil underneath. Eventually silt was trapped and salt cedar seeds germinated and the salt cedars rooted down, anchoring the barnacle shoal. As time went by the shoal blocked more silt and eventually the water from the alphabet drains began to pond up behind the natural berm and aquatic plants began to grow. First alkali bulrush and later cat-tails as the salt was leached out of the soil and a beautiful marsh, close to 1,000 acres in size, was formed. The interceptor drain should not disturb this marvel of nature and should be constructed to the west of the natural barnacle shoal berm.	We agree with the commenter that the marsh is an important biological resource. As presented in Section 2 of the Draft EIS/EIR (Figures 2-9, 2-10, and 2-11), Alternatives 4, 5, and 6 would not impinge upon the function of the marsh, since structures would be constructed at a lower elevation than this habitat. In the conceptual drawings, an interception ditch is shown for drains N, O, and P, which flow into Morton Bay. An interception ditch for drains Q, R, and S, which are the sources of water for this marsh, is not currently part of the Project design. Thus, the Project would avoid wetlands controlled by the barnacle shoal and adjacent marsh. The potential impacts of disturbance to sensitive species which use the marsh were discussed in Chapter 3. No text revisions are required.
Imperial County Farm Bureau	ICFB-76	Pond Location The photo/map on page 2-47 shows that the north end of the north pond at Wister Beach is on private property owned by Al & Carson Kalin. The legal description of this property is: The west ½ of section 34, township 10 south, range 13 east, San Bernardino baseline meridian. The southeast corner of this property is one mile west of the intersection of Davis and Spoony Road.	Please refer to the response to ICFB-53.
Imperial County Farm Bureau	ICFB-77	Agricultural Drainage and Natural Runoff According to the map/photo on page 2-47 there is no provision for an interceptor drain to pick up the drain water for IID Q, R, S, T, and U Lateral Drains. According to the plan, they are blocked by the project's berm. The natural freshwater wetland fed by these drains have no way to exit to the Salton Sea.	Please refer to the response to ICFB-74.
Imperial County Farm Bureau	ICFB-78	Berm Configuration The photo/map on page 2-47 shows a river berm between McDonald and Hazard Road. There is no river at that location.	It is not clear which berm is referenced in the comment, but the dashed line near Hazard Road refers to the remnant of the berm from the USGS demonstration ponds. No text revisions are required.
Imperial County Farm	ICFB-79	Saline Water Source The water exiting the Alamo River will float on top of the salt water and not mix for some time depending on wind conditions. Salton Sea	Please refer to the response to ICFB-17 and ICFB-20.

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Bureau		Currents will carry the brackish Alamo River water to the area of the pump station. Where the freshwater and saltwater mix, it creates what is known to locals as a scum line. Trash from the Alamo River is concentrated at this scum line. If the scum line is viewed on sonar it will show trash stacked up from the bottom of the sea floor to the surface. The scum line is constantly moving and it is often in the area near the saline pump intake. A system of trash racks would have to be built and maintained on a constant basis.	
Imperial County Farm Bureau	ICFB-80	This plan will have to address the following issues: ▪ Brackish Alamo river water floating on top of the salt water at the pumping platform ▪ High silt loads being picked up during wind events ▪ Hydrogen sulfide being released during high wind events and picked up by the saline pump ▪ Red tides forming near the pump inlet and being transported to the SCH ponds ▪ Maintenance of the trash racks to keep trash from entering the pump	Please refer to the responses to ICFB-14, ICFB-20, ICFB-34, and ICFB-47.
Imperial County Farm Bureau	ICFB-81	Pond Location The photo/map on page 2-51 shows that the north end of the north pond at Wister Beach covers over 100 acres of private property owned by Al & Carson Kalin. The legal description of this property is: The west ½ section 34, township 10 south, range 13 east, San Bernardino baseline meridian. The southeast corner of this property is one mile west of the intersection of Davis and Spoony Road.	Please refer to the response to ICFB-53.
Imperial County Farm Bureau	ICFB-82	Agricultural Drainage and Natural Runoff According to the map/photo on page2-51 there is no provision for an interceptor drain to pick up the drain water for IID Q, R, S, T, and U Lateral Drains or drainage from the Wister Ponds. According to the plan, they are blocked by the project's berm. The natural freshwater wetlands fed by these drains or Wister Ponds have no way to exit to the Salton Sea.	Please refer to the response to ICFB-74.
Imperial County Farm Bureau	ICFB-83	3.11.2.5 Surface Water Hydrology Salton Sea Page 3.11-7, Lines 8-10 state: "These return flows have decreased in recent time, largely because of water transfers from Imperial Valley and resulting water conservation measures." This statement is incorrect. Water conservation measures resulting from the transfers out of the Imperial Valley will not begin until 2017, therefore water conservation measures have nothing to do with the decrease of return flows.	Please refer to the response to IID-27.

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Imperial County Farm Bureau	ICFB-84	In the meantime as water is transferred out of the valley freshwater from the Colorado River is being added to the Salton Sea at the rate of 1 acre foot for every 2 acre feet transferred out of the Imperial Valley for the express purpose of stopping the Salton Sea from receding because of the water transfers. The addition of this mitigation water will end 2017 and on-farm conservation measures will supposedly take up the slack.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).
Imperial County Farm Bureau	ICFB-85	Less water is being delivered to the Salton Sea because of a long term drought, because crops are changing in the valley which require less water, and because irrigation methods of some crops are changing, resulting in no surface water and in some cases less subsurface water leaving the fields.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).
Imperial County Farm Bureau	ICFB-86	Alamo River The first sentence is incorrect. The Alamo River may have originated in the Mexicali Valley at one time, but since the All-American Canal was built in the 40's the Alamo River now originates at the south side of the All-American Canal on the eastern boundary of Calexico where a concrete control structure blocks its flow from Mexico. Any flow originating at this point is seepage from the All-American Canal. Tile drainage lines and field run-off dump into a pool at the base of the control structure and start their way towards the Salton Sea.	The text has been changed to reflect that the Alamo River begins at the All American Canal.
Imperial County Farm Bureau	ICFB-87	3.11.2.6 Surface Water Quality Sediment Page 3.11-13, last sentence. The flows listed for the New and Alamo Rivers are incorrect but the annual sediment loading is correct.	The flow numbers were reversed, but have been corrected. The average annual flow in the New River is 612 cfs and 845 cfs for the Alamo River.
Imperial County Farm Bureau	ICFB-88	3.11-18 Phosphorus Line 35 (Regarding phosphate levels in the New and Alamo Rivers) Line 35 states: "Nutrient concentrations have not decreased recently, despite TMDLs for total suspended solids and phosphorus or changes in agricultural practices (personal communication, C. Holdren Reclamation, 2010)." This statement by Chris Holdren, Reclamation, seems to contradict the monitoring done on the New and Alamo Rivers by Region 7 Regional Quality Control Board staff. SWAMP findings show tremendous reductions of phosphate loading in the New and Alamo Rivers. Shown below, are the graphs furnished by: Nadim Shukry-Zeywar, Senior Environmental Scientist TMDL Unit Chief CA Regional Water Quality Control Board Colorado River Basin Region 73-720 Fred Waring Drive, Suite 100 Palm Desert, CA 92260 SWAMP Phosphorous Data for the Alamo River and the New River	The statement has been removed. This does not change the impact analysis.

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		[Graphs included in original letter are included in Attachment 1)]	
Imperial County Farm Bureau	ICFB-89	Impacts on Agricultural Resources Of the six alternatives at the New and Alamo River Deltas, Alternatives 1 and 4 create the most negative impacts for Agriculture.	This is consistent with the conclusions of the Draft EIS/EIR. No text revisions are required.
Imperial County Farm Bureau	ICFB-90	First, the sedimentation ponds remove prime agriculture land from production in perpetuity. This is not the same as fallowing where agricultural land can easily be put back into production. In other words, the land is lost forever for producing food to feed our nation. Not only is there a loss of income to the farmer, there is also lost water sales to the IID and all the service providers that service the farmer with goods and services as well as the labor required to farm the field.	The loss of Important Farmland from construction of the upstream sedimentation basins is discussed in Section 3.2, Agricultural Resources, Impact AG-2. Land would be acquired only from a willing owner, who would be appropriately compensated. The upstream sedimentation basin would remove 60 acres of land from the more than 500,000 acres in production in Imperial County, which represents only 0.0014 percent of the average acreage of land fallowed between 2004 and 2009 (refer to Section 3.2, Agricultural Resources for additional detail). Any adverse economic impacts would be negligible. Socioeconomic benefits would result from the SCH Project, as discussed in Section 3.19, Impacts SOC-1, 2 and 3. Refer also to comment IID-1, which indicates IID's support for the SCH Project. No text revisions are required.
Imperial County Farm Bureau	ICFB-91	Secondly, the conveyance pipe lines will directly impact the farmability of agricultural land that they cross, perhaps making it impossible to farm those fields depending on their elevation.	Please refer to the response to ICFB-13.
Imperial County Farm Bureau	ICFB-92	All agricultural fields are leveled to allow surface irrigation water to flow across them ultimately ending up at the lowest point of the field. The conveyance lines may interrupt the flow of this water keeping the field from receiving water if the lines are above ground.	The brackish water pipeline would be buried, as indicated on page 2-16, lines 37-39. It would not completely surface until reaching the SCH ponds, at which point it would not be located at an agricultural field. No text revisions are required.
Imperial County Farm Bureau	ICFB-93	The majority of fields in the Imperial Valley have tile drainage lines, installed four to seven feet below the surface, to collect and remove the leached salts from the irrigation water. These underground lines are all tied together and installed at the correct slope, just like the levels of the fields, to allow the surface drain water and subsurface tile water to exit the field and into the IID drain ditch at the lowest point of the field. The conveyance lines crossing an agricultural field very well could disrupt the entire tile drainage system and make it impossible to leach salts from a portion of the field.	Please refer to the response to ICFB-13.
Imperial County Farm Bureau	ICFB-94	The third point is that Imperial Valley fields are worked up to 45 inches deep with massive rippers every year to help leach the salts down to the tile drainage lines. Any underground conveyance pipes crossing a farm field may keep the farmer from tilling his field as deep as he needs to.	Please refer to the response to ICFB-13.
Imperial County Farm	ICFB-95	As mentioned earlier in this report, the tremendous amount of soil removed from the planned sedimentation ponds would be the largest excavation of soil in agricultural history in the Imperial Valley. Absolutely no mention is made of what	Refer to the responses to ICFB-14 and 52 regarding the disposition of soil from the upstream sedimentation basin.

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Bureau		will be done with the excavated soil, almost two million cubic yards worth, or even how it is possible to dig below the five foot level without the heavy equipment becoming bogged down as liquefaction creates an unworkable excavation site. This is a major undertaking yet it is glossed over in this Draft EIS/EIR. In the description of the sedimentation basin for Alternative 4 there is even less information about the project than in the description for Alternative 1 which leaves one guessing about construction, location of the sedimentation pond or the route the pipe lines will take. Obviously there is a planned location for the two sedimentation ponds as well as a planned route for the pipe lines yet the amount of information included in the report is minimal to the point it leads one to believe it was done on purpose.	As discussed in Section 2.4.1.11, Brackish Water Pipeline, the final configuration of the brackish water pipeline would depend on topographic information, available right-of-way, and cost. The exact route that would be followed is not identified at this time because it would be dependent on the availability of land from willing owners and the ability to negotiate a lease or easement from such owners. The area in which the brackish water pipeline and associated diversion facilities could be located is shown on Figure 2-2. No text revisions are required.
Imperial County Farm Bureau	ICFB-96	Adding to these three problems is the fact that the location of both sedimentation ponds for Alternatives 1 and 4 are on land currently enrolled in the Williamson Act.	This is consistent with the conclusions of the Draft EIS/EIR. No text revisions are required.
Imperial County Farm Bureau	ICFB-97	Looking at all the major concerns listed above, the Imperial County Farm Bureau believes Alternatives 1 and 4 create significant and unavoidable impacts which may not be easily mitigated.	The issues raised by these comments were addressed in the Draft EIS/EIR, and the conclusions regarding the significance of impacts on agricultural resources remain unchanged. Such impacts were, however, factors that were considered in eliminating both Alternatives 1 and 4, which would require the construction of an upstream sedimentation basin and brackish water pipeline in agricultural areas, from consideration as the preferred alternative. No text revisions are required.
Imperial County Farm Bureau	ICFB-98	3.2.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use (less-than-significant impact). The construction and resulting conveyance pipelines would cause significant and unavoidable impact where the 220-foot right-of-way crossed producing agricultural land. The natural slope of the tile drainage systems would be disrupted. The conveyance lines would make it impossible to reroute the tile system while maintaining the correct slopes. IID drain ditches would also be affected and again the slopes and guaranteed outlet elevations for the tile system of adjoining field would be disrupted. If the buried conveyance lines crossed producing agricultural land the farmer would not be able to do the deep groundwork normally done to help leach salts downward and allow plant roots to grow unimpeded. Diverting a IID drain or tile system temporarily or permanently would be problematic. For these reasons the Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture.	Please refer to the responses to ICFB-13.
Imperial	ICFB-99	Impact AG-2: Construction of the sedimentation basin would result in the	The text was clarified to indicate that approximately 500,000 acres are in

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County Farm Bureau		permanent conversion of a small amount of Farmland to nonagricultural use (less-than-significant impact). 60 acres would be permanently lost with the construction of the sedimentation pond. This Draft EIS/EIR argues that 60 acres in minimal compared to the 5,000,000 acres in production in the Imperial Valley. There are only 473,000 acres in production in Imperial Valley, not five million acres as stated. The Draft EIS/EIR goes on to argue that the 60 acres removed from agriculture is minimal compared to the 40-50 thousand acres of farmland that is fallowed yearly in Imperil Valley. Fallowing has nothing to do with trying to justify removing 60 acres in perpetuity from farming. Fallowed ground is ground that has been brought into production, leveled, tiled, ditches installed, and farmed at one time but is no longer being farmed. Fallowed ground can easily be farmed again just by tilling the soil, planting and irrigating. The same is not true of land removed from agricultural production in perpetuity. The Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture.	production, not 5,000,000. The discussion of fallowing was used to provide additional perspective on the loss of 60 acres of farmland. A substantial amount of land is taken out of production through fallowing each year in Imperial Valley, and the number changes annually. The amount of land that would be converted as part of the SCH Project under Alternatives 1 and 4 would be not only small in relation to the total area available, but also well under the annual variation in the amount of land that is fallowed each year. The conclusion regarding the significance of the impact is unchanged, although it should be noted that the loss of Farmland was one of the factors used to eliminate Alternatives 1 and 4 from consideration as the State's preferred alternative. No text revisions are required.
Imperial County Farm Bureau	ICFB-100	3.2.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Ponds Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use (less-than-significant impact). The construction and resulting conveyance pipelines would cause significant and unavoidable impact where the 220-foot right-of-way crossed producing agricultural land. The natural slope of the tile drainage systems would be disrupted. The conveyance lines would make it impossible to reroute the tile system while maintaining the correct slopes. IID irrigation and drain ditches would also be affected and again the slopes and guaranteed outlet elevations for the tile system of adjoining field would be disrupted. If the buried conveyance lines crossed producing agricultural land the farmer would not be able to do the deep groundwork normally done to help leach salts downward and allow plant roots to grow unimpeded. Diverting an IID drain or tile system temporarily or permanently would be problematic. For these reasons the Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture.	Please refer to the response to ICFB-13.
Imperial County Farm Bureau	ICFB-101	Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use (less-than-significant impact). 37 acres would be permanently lost with the construction of the sedimentation pond. This Draft EIS/EIR argues that 37 acres in minimal compared to the 5,000,000 acres in production in the Imperial Valley. There are only 473,000 acres in production in Imperial Valley, not five million acres as stated. The Draft	Please refer to the response to ICFB-99.

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		EIS/EIR goes on to argue that the 37 acres removed from agriculture is minimal compared to the 40-50 thousand acres of farmland that is fallowed yearly in Imperil Valley. Fallowing has nothing to do with trying to justify removing 37 acres in perpetuity from farming. Fallowed ground is ground that has been brought into production, leveled, tiled, ditches installed, and farmed at one time but is no longer being farmed. Fallowed ground can easily be farmed again just by tilling the soil, planting and irrigating. The same is not true of land removed from agricultural production in perpetuity. The Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture.	
Imperial County Farm Bureau	ICFB-102	3.4.3.3 Wildlife Page 3.4-17 Lines 3-5 At the top of the page it states that the eared grebe population is the greatest in January with a peak of over 5,000 individuals. This statement is correct but the peak actually amounts to over 1 million individuals in some years and represents over 95% of the continental population according to the U.S. Fish and Wildlife Service.	The number of eared grebes found at the Salton Sea described in the Draft EIS/EIR is a subset of the Sea-wide census provided by USFWS (2010) and is restricted to the region that is in proximity to the SCH Project. Thus, the numbers reported on page 3.4-17, lines 3-5 are a subset of the number of birds that is present over the entire Salton Sea. No text revisions are required.
Imperial County Farm Bureau	ICFB-103	3.4.3.3 Wildlife Page 3.4-18 Lines 15-19 The black tern is most prevalent in July, August, and September and predominately feed on insects flying above farm fields being summer flooded to leach the salts down to the tile lines. (Al Kalin – Audubon California Imperial Valley Landowner Stewardship Program Coordinator 2009)	The prevalence of black tern in the vicinity of the SCH Project is correctly characterized in the Draft EIS/EIR. Point count data and the focused survey results from 2010 that are included in the Draft EIS/EIR reflect the occurrence of the black tern within the Project area (the shallow water adjacent to the Sea). The occurrence information does not reflect the species occurrence in or use of other areas within Imperial County (Imperial Valley farm fields). No text revisions are required.
Imperial County Farm Bureau	ICFB-104	Table 3.4.4 Special-Status Species Potentially affected by the SCH Project The potential to be present for the American peregrine falcon is high, not moderate as reported. The American peregrine falcon is a very common visitor to the New and Alamo River Delta year around. It is often found perched on the shady side of a power pole on the metal brace that braces the cross arm. Is also found perched on snags in the small bay east of the New River Delta where it feeds on waterfowl in the winter and nesting black-necked stilts in the spring and summer. Cattle egrets feeding on insects in irrigated bermudagrass fields are also a common prey for the American peregrine falcon. In the Alamo River area they are commonly seen around Obsidian Butte, Lookout Hill, Red Hill and perched on the power lines in the area, particularly along Davis Road. Again, the potential to be present is high. (Al Kalin – Audubon California Imperial Valley Landowner Stewardship Program Coordinator 2009)	The peregrine falcon was not observed during the surveys conducted for the SCH Project, and the species appears to be opportunistic in the use of the resources in the region. The literature review for the occurrence of the species indicates that it is a rare, perennial visitor that is encountered year-round, but not for breeding (Patten et al. 2003), as described in the Draft EIS/EIR. The USGS bird checklist for the Salton Sea National Wildlife Refuge describes the species abundance as "occasional" (USFWS 1993, updated 2006). Thus, while the American peregrine falcon is known to be present at the Salton Sea, it is not predictably present and forages there opportunistically. The evaluation of the species has been retained as "moderate" to reflect this unpredictable occurrence of the species. However, the analysis of impacts to this species would not change regardless of whether the potential for the species to be present is considered to be moderate or high. No text revisions are required.
Imperial County Farm Bureau	ICFB-105	The burrowing owl is a common resident of the New River Delta where it prefers to build its burrows and nest in the holes created by the large rock rip-rap used to armor the dike that separated the farmland from the Salton Sea between the New	Burrowing owls were addressed in the Draft EIS/EIR, and their presence was identified within the Project area (page 3.4-23). Impacts on burrowing owls were identified for each alternative and found to be significant, requiring the

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		River and Alamo Deltas. In some areas of the dike there are as many as three nesting pair per half mile. These owls must be inventoried and mitigated for during any construction. (Al Kalin – Audubon California Imperial Valley Landowner Stewardship Program Coordinator 2009)	implementation of Mitigation Measures BIO-2 and BIO-3. No text revisions are required.
Imperial County Farm Bureau	ICFB-106	3.11-30 Line 18 Reduce the flow in a river to the detriment of downstream water users Reducing the flow of the rivers at the pumping stations or sedimentation basins will have a substantial impact on the velocity of the river downstream and create problems with silt/sedimentation fallout thus plugging the river and backing the water up. This action will back water into agricultural drains in Alternatives 1 and 4 and possibly submerge subsurface tile outlets with guaranteed elevations. The reduction of river flow will also lead to noxious vegetation taking over the channel if it is not kept dredged out.	The sediment concentration downstream of the diversion would remain the same with and without the diversion because the diversion would remove both water and sediment. While the river flow would be decreased, the sediment load that must be transported downstream would also decrease. Based on data collected for the design, problems associated with deposition downstream of the diversion building up to the extent that it would flood upstream drain lines are not anticipated. The statement that a reduction of river flow will lead to noxious vegetation taking over the channel if it is not kept dredged out is not correct. The SCH diversion would reduce the river flow from the diversion location to the river mouth where the water would be returned. This is a distance of about 1 mile for the pumped diversion and about 3 miles for the gravity diversion (see Section 2). The Project would, however, maintain a live stream downstream of the diversion at all times; thus, vegetation would not invade the channel bottom. The water surface would decrease somewhat (the amount would vary depending on the season), but the river banks are steep in the affected area, and the amount of newly exposed land would be minimal. No text revisions are required.
Imperial County Farm Bureau	ICFB-107	3.11-30 Line 42 It is not clear what is meant by the sedimentation basin storing 6 feet of water.	The depth of water in the sedimentation basin would be about 6 feet. No text revisions are required.
Imperial County Farm Bureau	ICFB-108	3.11-31 Line 2 The last sentence states: "Because of these design elements, this criterion is not a Project impact and is not considered further." It should be considered further! Building a sedimentation basin 15-20 below adjacent field levels right next to the rivers is an impossibility given the funding and scope of this project. The surrounding water tables will not allow for it. As stated previously, the enormous size of the excavations, the dewatering necessary, the disposition of the spoil from the project, all make the project ludicrous and certainly calls attention to the credibility of those that produced this draft document.	The criterion in question is whether the SCH Project would "raise the elevation of water in the IID drains, resulting in the backup of water into on-farm drains." As discussed on page 3.11-31, lines 31-44 and page 3.11-32, lines 1-3, the Project would not. Please refer to the responses to ICFB-14 and ICFB-52 regarding the feasibility of constructing the upstream sedimentation basin. No text revisions are required.
Imperial County Farm Bureau	ICFB-109	3.19.1.2 Commodity Specific Food Safety Guidelines for the Production and Harvest of Lettuce and Leafy Greens High concentrations of birds in the ponds may lead to the higher bird populations in the vicinity of nearby Willey Reservoir, using that reservoir for loafing and fresh	Please refer to the response to ICFB-3.

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		water. Their feces could very well increase the E. Coli counts in the irrigation water to the point where this irrigation water could cause leafy green vegetables to be rejected by the marketing order. A very high proportion of the acres around the New River produce leafy green vegetables as well as broccoli, cauliflower, celery, melons, and sweet corn because of the warm micro-climate created by the Salton Sea. 15% to as high as 35% of the water used to grow these crops is pumped from the Willey Reservoir and mixed with water of the Vail Main canal. A very large portion of the fields irrigated by Vail Laterals 1 through 7 off the Vail Main produce leafy green vegetables. The threat of high E. Coli counts in the irrigation water as a result of this project directly affects agriculture and must be mitigated.	
Imperial County Farm Bureau	ICFB-110	Affected Environment, Impacts, and Mitigation Measures 3.19.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact) It is doubtful that this project would generate many jobs for local workers. Although Table 3.19-2 shows a pool of 4,700 available construction workers it is doubtful very many are qualified to operate heavy machinery which is where the majority of help is needed. Currently the work on the third phase of the Brawley By-Pass has required hundreds of trucks to haul fill dirt for the road and overpass. The majority of these trucks being used have out of county names on their doors. One can only assume the same will be true during construction of this project and very few from Imperial Valley will be employed.	As discussed in Section 3.19.3.1, it was assumed that heavy equipment would likely be brought in from the San Diego area, and some specialized equipment, such as clamshell derricks, tractor scraper units, and excavators, could come from either the San Francisco Bay Area or the Sacramento area. It is reasonable to assume that more generalized construction jobs would come from the local area, which has a large labor pool. No text revisions are required.
Imperial County Farm Bureau	ICFB-111	Impact SOC-5: The SCH Project would result in the temporary loss of agriculture revenue due to construction and maintenance activities in the water pipeline right-of-way (less-than-significant impact). The loss to agriculture, with the construction of the sedimentation pond and pipe line would not be temporary.	Please refer to the responses to ICFB-90.
Imperial County Farm Bureau	ICFB-112	Impact SOC-6: Pipeline construction would require the temporary disruption of Agricultural drains and canals (less-than-significant impact). As stated earlier, it can be assumed that the brackish water pipelines eventually would have to rise above the level of the tile drainage lines and eventually the farm fields they are crossing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the subsurface drainage lines in half and making it near impossible to farm the field while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system. The loss of farmland in perpetuity means the loss of tax revenue to the county,	Please refer to the response to ICFB-13 and ICFB-90.

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		loss of revenue to farmers, as well as agricultural service providers such as seed companies, fertilizer companies, pesticide companies, tractor companies, hardware stores, custom harvesters including hay and grain, and just as importantly the loss of income from the sale of water and loss to laborers. Water sales help pay for the maintenance of canals and drains that service the area near the proposed sedimentation pond and brackish water pipeline. There appears to be no impact noted for the loss of farm land and how that affects the local economy in an area that prides itself in feeding the nation.	
Imperial County Farm Bureau	ICFB-113	3.19.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Ponds Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact) It is doubtful that this project would generate many jobs for local workers. Although Table 3.19-2 shows a pool of 4,700 available construction workers it is doubtful very many are qualified to operate heavy machinery which is where the majority of help is needed. Currently the work on the third phase of the Brawley By-Pass has required hundreds of trucks to haul fill dirt for the road and overpass. The majority of these trucks being used have out of county names on their doors. One can only assume the same will be true during construction of this project and very few from Imperial Valley will be employed.	Please refer to the responses to ICFB-110.
Imperial County Farm Bureau	ICFB-114	Impact SOC-5: The SCH Project would result in the temporary loss of agriculture revenue due to construction and maintenance activities in the water pipeline right-of-way (less-than-significant impact). The loss to agriculture, with the construction of the sedimentation pond and pipe line would not be temporary.	Please refer to the responses to ICFB-90.
Imperial County Farm Bureau	ICFB-115	As stated earlier, it can be assumed that the brackish water pipelines eventually would have to rise above the level of the tile drainage lines and eventually the farm fields they are crossing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the subsurface drainage lines in half and making it near impossible to farm the field while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system.	Please refer to the response to ICFB-13.
Imperial County Farm Bureau	ICFB-116	Impact SOC-6: Pipeline construction would require the temporary disruption of Agricultural drains and canals (less-than-significant impact). As stated earlier, it can be assumed that the brackish water pipelines eventually would have to rise above the level of the tile drainage lines and eventually the farm fields they are crossing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the	Please refer to the response to ICFB-13.

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		subsurface drainage lines in half and making it near impossible to farm the field while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system.	
Imperial County Farm Bureau	ICFB-117	As noted for Alternative 1 there appears to be no impact noted for the loss of farm land and how that affects the local economy in an area that prides itself in feeding the nation.	Please refer to the response to ICFB-90.
Imperial County Farm Bureau	ICFB-118	The loss of farmland in perpetuity means the loss of tax revenue to the county, loss of revenue to farmers, as well as agricultural service providers such as seed companies, fertilizer companies, pesticide companies, tractor companies, hardware stores, custom harvesters including hay and grain, and just as importantly the loss of income from the sale of water. Water sales help pay for the maintenance of canals and drains that service the area near the proposed sedimentation pond and brackish water pipeline.	Please refer to the response to ICFB-90.
Imperial County Farm Bureau	ICFB-119	Figure 3.20-3 Road Network around the New River At 2.4.2.11 it was pointed out that the access route to Alternatives 1, 2, and 3 were incorrect. Figure 3.20-3 shows a map with an entirely different route to access Alternative 1, 2, and 3 and it too is incorrect. The map shows the route leaving Highway 78/86 at McNearny Road. This is impossible since McNearny Road does not connect to Highway 78/86.	Please refer to the response to ICFB-41.
Imperial County Farm Bureau	ICFB-120	In addition, there is no mention of traffic impact to the proposed construction site for the sedimentation basin or the mitigation measures needed.	The sedimentation basins associated with Alternatives 2, 3, 5, and 6 would be adjacent to the ponds. As discussed in Section 2.4.2.4, Construction Staging Areas, staging areas located outside the public right-of-way would be established near the upstream diversion under Alternatives 1 and 4 through easements with the landowner. A limited number of trips would be required to access the upstream staging area and would rely on sparsely traveled local roads. No mitigation measures would be required. No text revisions are required.
Imperial County Farm Bureau	ICFB-121	3.20.3.7 Alternate 4 – Alamo River, Gravity Diversion + Cascading Ponds The construction of the sedimentation basin and multiple pipe lines are not even mentioned or considered. There is nothing discussed regarding the movement of hundreds of thousands of cubic yards of soil and where the spoil would be put. In addition there will be miles of pipe lines that will pose serious impacts during construction as well as after construction since the pipe lines would be crossing ag land, ag tile drainage systems, private canals and drains, IID canals and drains, county roads and geothermal pipe lines.	Section 3.20 addresses transportation impacts from construction and operations in conformance with the significance thresholds established by the CEQA Guidelines. Such impacts were addressed in detail in Section 3.20.3.4, under Alternative 1 and the impacts of other alternatives were described in relation to those that would occur under Alternative 1. Impact TRAN-1 addresses impacts from increased vehicular traffic in general, Impact TRAN-2 addresses impacts from pipeline construction, and Impact TRAN-3 addresses impacts on emergency services. Constructing the sedimentation basin, which would be located either immediately adjacent to the ponds or on agricultural land, would not have additional impacts. Soils would not be disposed of in an area that would affect traffic. Other impacts from construction are discussed in their respective sections (e.g., 3.2, Agricultural Resources; 3.11, Hydrology and Water Quality; 3.13, Land

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			Use; and 3.19, Socioeconomics). No text revisions are required.
Imperial County Farm Bureau	ICFB-122	4.3.6 Energy Consumption Line 42 – How does this project produce electrical energy as stated?	The statement referred to electrical power generated by other projects considered in the cumulative impact analysis, not the SCH Project. No text revisions are required.
Imperial County Farm Bureau	ICFB-123	Line 44 – States diesel powered pumps will be used to deliver saline water to the projects. Everywhere else in the Draft EIS/EIR it talks about electrical pumps being used. The efficiency of the saline pump will be low if the three pumps used on the Willey Reservoir are any indication and would create a significant impact in the operational and management costs of the project. Diesel pumps also generate great quantities of air pollution.	The referenced text was corrected to indicate that the pumps would be powered by electricity.
CalEnergy	CE-1	CalEnergy owns and operates ten existing geothermal electricity generating plants within the Salton Sea Known Geothermal Resource Area (SSKGRA) located in the vicinity of the southern shore of the Salton Sea. These facilities provide 342 megawatts (MWs) of reliable low-cost base-load renewable power. CalEnergy's current development plan of an additional 470 MWs of generating facilities at the Salton Sea will help California meet its Renewable Portfolio Standards (RPS) goals of 33% by 2020.	This comment is noted. This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). No text revisions are required.
CalEnergy	CE-2	CalEnergy generally supports the Agencies' initiative to develop the Species Conservation Habitat (SCH) projects to restore shallow water habitat lost due to the ongoing increasing salinity and receding shoreline of the Salton Sea. While these projects will be a significant first step to provide habitat for both fish and bird species dependent on the fragile Salton Sea ecosystem; these projects overlap in part with the valuable known geothermal resource that also occupies the southern shore of the Salton Sea. If built as proposed, these ponds would restrict and possibly deny access to the geothermal reservoir and thus deeply hamper and even in some cases eliminate future development of renewable geothermal energy.	CalEnergy's general support for the SCH Project is noted. Please refer to Master Response 8, Compatibility with Geothermal Development. As indicated in this master response, the lead agencies intend to work cooperatively with geothermal development companies to minimize conflicts with future development. The commenter does not provide any evidence, nor was evidence provided at the meetings held with geothermal development companies and IID that statement that the proposed ponds would restrict or possibly deny access to the geothermal reservoir, either hampering or eliminating future development of renewable geothermal energy. No text revisions are required.
CalEnergy	CE-3	A review of the draft EIS/EIR document identifies and acknowledges the existence of the SSKGRA; however, the EIS/EIR contains no detailed discussion or supporting documentation of limits of the SSKGRA. Nor does the draft EIS/EIR discuss the published limits of the Salton Sea geothermal reservoir. Both these outlines should have been overlay on the proposed Alternatives. To that end we offer Figures 1, 2 and 3. Figure 1 shows the limits of the SSKGRA, as defined by the United States Geological Survey, and the two proposed EIR/EIS SCH project sites associated with the New and Alamo Rivers. Figures 2 and show the proposed limits of the Salton Sea geothermal reservoir overlaid on the EIR/EIS SCH project sites.	The limits of the Salton Sea KGRA, overlaid by the six Project alternatives, were shown on Figure 3.13-3. The outline of the Salton Sea Shallow Thermal Anomaly has been added to this figure, although this does not affect the conclusions of the EIS/EIR. Sufficient information is included in Sections 3.13.3.4 and 3.13.3.5 regarding geothermal energy production to support the impact analysis.

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CalEnergy	CE-4	Figure 1 displays the limits of the SSKGRA, which is approximately 136 square miles in size and covers most of the southern area of the Salton Sea, both on and off shore. The limits of the SSKGRA overlap on about one-half of the proposed New River SCH sites (Alternatives 1-3) and all of the proposed Alamo River SCH sites (Alternatives 4-6). Figure 1 further shows the proposed limits of the Salton Sea geothermal reservoir, as estimated by shallow thermal gradients (modified from figure 6 in Hulen, Kaspereit, Norton, Osborn, and Pulka, 2002, Refined Conceptual Modeling and a New Resource Estimate for the Salton Sea Geothermal Field, Imperial Valley, California, Geothermal Resources Council Transactions, Vol 26, p. 29-36). A copy of the reference paper is provided as attached to these comments. The proposed limits of the geothermal reservoir is about 34 square miles and is currently the best estimate of where the existing and potential limit of the Salton Sea geothermal reservoir.	Please refer to the response to CE-3.
CalEnergy	CE-5	Figures 2 and 3 are a more detailed display of the limits of the Salton Sea geothermal reservoir overlain on the two proposed EIR/EIS SCH project sites. Specifically note how all but a small part of the most eastern-portion of the New River SCH Alternatives 1-3 area is within this boundary, whereas virtually all of the Alamo River SCH alternatives are within the geothermal resource estimate. CalEnergy believes that this type of analysis should have been included in the EIR/EIS to give the stakeholders a clear view of how the proposed alternatives will impact development of renewable geothermal energy. CalEnergy notes that the draft EIS/EIR lacks any of the supporting documentation which detailed the discussions and input from the geothermal industry operators in and around the Salton Sea geothermal field. In addition, there is no discussion of how the alternatives, placed in the middle of the projected geothermal field and on land under lease for geothermal development, were designed to accommodate expected impacts typically associated with development, construction, and operation of a geothermal power plant that would now be adjacent to a SCH. The deficiency is improper and should be rectified.	Please refer to Master Response 8, Compatibility with Geothermal Development. Most of the proposed pond sites associated with Alternatives 1-3 would be outside of the KGRA; the rectangular shape outlined in red is merely the area in which facilities such as water pipeline associated with the gravity diversion for Alternatives 1 and 4, power lines, and temporary staging areas would be located. As indicated in Figure 3, provided by CalEnergy, and the revised Figure 3.13-3, virtually all of the Alternatives 1-3 pond sites are outside of the geothermal reservoir. No text revisions are required.
CalEnergy	CE-6	Specifically, CalEnergy will not support and will object to any habitat designed, proposed or permitted associated with the Alamo River area. Of the six alternative habitats presented; Alternatives 4, 5, and 6 are associated with the Alamo River. These proposed Alternatives are located predominately on Imperial	Please refer to Master Response 8, Compatibility with Geothermal Development. As indicated, it is the intent of the SCH agencies to work cooperatively with IID and geothermal development companies to minimize the potential for conflicts with future geothermal development, and based on multiple meetings with these

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		Irrigation District (IID) mineral and surface interest lands where CalEnergy has a current and active geothermal mineral lease. CalEnergy is working with the IID to develop these lands for renewable geothermal energy, as outlined in the lease. The SCH Alternatives 4-6 would greatly hamper or even halt our ability to develop renewable energy from these lands. Even if SCH projects were proposed and permitted but never constructed in the Alamo River area, the very existence of permits could, in the eyes of regulatory and financial agencies, throw into doubt that any overlapping geothermal development could exist in the same area.	entities, no unavoidable areas of incompatibility were identified. The comment that “the SCH Alternatives 4-6 would greatly hamper or even halt our ability to develop renewable energy from these lands” and concerns about permitting, but not constructing the SCH Project at the Alamo River are not supported by substantial evidence. As discussed in Master Response 8, however, the presence of geothermal resources was one of the factors used in eliminating sites near the Alamo River in selecting the State’s preferred alternative. No text revisions are required.
CalEnergy	CE-7	Due to these likely adverse impacts on the development of renewable energy in the Alamo River area, CalEnergy proposes insertion to the EIS/EIR report that there is to be a moratorium of thirty years, from 2011 to 2041, before any habitat project is built within the limits of the Salton Sea geothermal field (as defined by Hulen and others, 2002) and specifically in the Alamo River area.	Such a moratorium is not supported by the impact analysis, which concludes that the SCH Project (all alternatives) would be designed to minimize conflicts with future geothermal development and that such an impact would be less than significant. The State’s preferred alternative does not include constructing habitat in the Alamo River area. As shown on the revised Figure 3.13-3, only a small portion of Alternatives 1-3 is within the limits of the geothermal field.
CalEnergy	CE-8	The eastern-most portions of Alternatives 1, 2, and 3 also may impact CalEnergy’s and the IID’s ability to utilize the renewable resource. The eastern-most portion encroaches on the boundary of CalEnergy’s existing field operations and our offshore expansion. CalEnergy would support a modified version of Alternatives 1, 2, and 3 if the habitats were scaled back to only occupy the shoreline west of the New River. It is CalEnergy’s understanding that the Natural Resources Agency’s preferred Alternative 3 is proposed to be phased construction and that the initial pond would satisfy this “west of the New River” concept. In addition, it was discussed at the Palm Desert meeting on September 15, 2011, that current funding in place would cover the construction costs of this initial pond and that any further phases would seek significant additional funding.	Please refer to Master Response 8, Compatibility with Geothermal Development. The SCH Project is not a phased project. It is proof-of-concept project that is intended to test concepts that could inform future restoration efforts should funding become available. Funds are not available for larger restoration projects at this time. No text revisions are required.
CalEnergy	CE-9	While CalEnergy will support a modified preferred Alternative 3 habitat, we are concerned that implementation of the permitting process of all the alternative sites will create unnecessary regulatory/permitting barriers associated with the future development of the SSKGRA. Therefore, as previously discussed, CalEnergy requests that any permitting effort should only include the preferred Alternative 3, modified to exclude SCH east of the New River.	Permit applications only are submitted for the State’s preferred alternative (Alternative 3), not for all of the alternative sites. The permit applications use the configuration shown in this EIS/EIR, which shows the area of maximum impact, but the decision makers will consider this comment before approving the SCH Project and proceeding with the final design. No text revisions are required.
CalEnergy	CE-10	Finally, an opportunity for project sponsors to participate in the continued phased development of Alternative 3 to provide impact mitigation has been overlooked. Presently, in the draft EIS/EIR there is no administrative mechanism available for project sponsors to take advantage of this type of “in lieu” of mitigation. Nor is there an administrative mechanism for mitigation “banking”. Any permitting of the preferred Alternative 3 should require a clearly defined administrative mechanism for both “in lieu” mitigation and “banking”.	The SCH Project is not being developed as mitigation for other projects, including future projects. As discussed on page 1-4, lines 8-14, the California Legislature appropriated funds for the purpose of implementing “conservation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including adaptive management measurements” (California Fish and Game Code section 2932(b)). The SCH Project, therefore, is a restoration project proposed by the Natural Resources Agency in order to (1) develop a range of aquatic habitats

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			that will support fish and wildlife species dependent on the Salton Sea; and (2) develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process. The State is not creating an in-lieu fee program or mitigation bank, nor would the SCH Project be implemented in phases.
CalEnergy	CE-11	CalEnergy commends the California Natural Resources Agency, U.S. Army Corps of Engineers, Department of Fish and Game, and Department of Water Resources staffs in their efforts to take this initial step and stands ready to support this process by participating in stakeholder initiatives as necessary.	CalEnergy's offer of support is noted; as indicated in Master Response 8, should the SCH Project be approved, the design would continue to be coordinated with IID and geothermal development companies, as well as through specific provisions established through the lease agreement with IID for use of its land.
Pacific Institute	PI-1	The proposed SCH project is the most recent incarnation of the PEIR's Period 1 'early start habitat.' We strongly support the construction of such shallow pond habitat. This current project DEIR comes more than four years after the completion of the PEIR; it is long overdue.	The Pacific Institute's support for the SCH Project is noted.
Pacific Institute	PI-2	1. We strongly support the construction of shallow pond habitat around the Salton Sea. Unfortunately, the DEIR provides insufficient information for us to determine whether the proposed project will work as intended. Aside from uncertainty as to whether legal rights to divert water from the New or Alamo river can be secured for the project, the DEIR does not assure us that the proposed project will produce fish in sufficient numbers to provide an adequate forage base for piscivorous birds – the project's stated purpose. Neither the description of the alternatives, nor the subsequent environmental analyses, nor any of the appendices include information on projected fish production rates or harvest rates. Section 3.4 states that fish and invertebrates may suffer from seasonal or even daily mortality, due to low concentrations of dissolved oxygen (DO) and low temperatures, but does not offer any estimates of the magnitude of these mortality events or describe how this periodic mortality will affect the overall ability of the project to meet its goals. Section 2.0 describes the alternatives' structure but not their operation or ability to achieve their stated function. Although the Reclamation/USGS pilot ponds unintentionally produced very high numbers of desert pupfish, they were small shallow ponds that may not have been representative of conditions at the deeper, larger SCH project. In any case, the comparison between the pilot ponds and the proposed project should have been made explicitly in the DEIR. The function of the ponds, including steps that might need to be taken to improve DO concentrations and avoid lowering winter water temperatures below the tolerance of tilapia (threats noted on p. 3.4-48), should be clearly described in the alternatives section. Simply deferring such decisions to future adaptive management is insufficient assurance that these potential fatal flaws can be overcome and limited Salton Sea funds spent on a	The Pacific Institute's support for the construction of shallow ponds is noted. Please refer to Master Response 6, Water Rights regarding the legality of the SCH Project's right to divert water from these rivers. Sufficient information is included in the Draft EIS/EIR to allow a thorough assessment of the impacts of the SCH Project. As required by NEPA (40 CFR section 1502.2) and CEQA (CEQA Guidelines sections 15143 and 15147), EISs and EIRs are intended to be concise documents that focus primarily on the significant impacts of the Project. As discussed in Section 2.4, Features Common to all Alternatives, the SCH Project is a proof-of-concept project that is intended to test several project features, characteristics, and operations under an adaptive management framework. The proof-of-concept period would last for approximately 10 years after completion of construction (until 2025). By that time, managers would have had time to identify those management practices that best meet the Project goals. The Draft EIS/EIR does not claim to know how to best operate the SCH ponds at this time. This would be determined through the monitoring and adaptive management process. Nevertheless, the Draft EIS/EIR contains adequate information on the process that would be used to monitor the ponds and modify conditions as needed. As discussed on page 2-10, lines 28-32, the experimental SCH ponds are being designed to be operated as a proof-of-concept project. Production of a fish population would be evaluated through monitoring and adaptive management because changes in environmental variables that affect fish production are not easily predictable (refer to Section 2.4.4 and Appendix E for additional details regarding the monitoring and adaptive management aspects of the Project).

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		project that might not achieve its stated goals.	Fish production rates or harvest rates have not been included because they are not known, and an EIS/EIR is not required to speculate. Similarly, the magnitude of fish and bird die-offs, which might occur, cannot be estimated. If they did occur, this would provide information that could be used to manage the ponds in a different way. This is consistent with Goal 2, which is "develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process." Operations are outlined in Section 2.4.3, and Appendix D provides examples of the range of operations for the SCH Project. The Reclamation/USGS ponds are introduced in Section 1.6, Development of the Salton Sea Species Conservation Habitat Project. As discussed on page 1-8, lines 7-8, the concept of SCH evolved from the ideas and concepts developed through this and other projects. The Reclamation/USGS ponds were a source of information for the development of the SCH Project, but it is not the focus of the Draft EIS/EIR, and an explicit comparison between the pilot ponds and the SCH Project is not required. No text revisions are required.
Pacific Institute	PI-3	2. The DEIR neglects to provide any information on costs. How much would it cost to construct each alternative? What are the projected annual operations & maintenance costs of each alternative?	Please refer to Master Response 5, Project Costs.
Pacific Institute	PI-4	How much money is currently available? What additional funds might be obtained? Can the alternatives be scaled back, if full funding is not available? How will this affect the adverse and beneficial impacts analyses?	Please refer to Master Response 4, Project Funding. The alternatives could be scaled back if full funding were not available. Impacts, both adverse and beneficial, would be reduced were this to occur.
Pacific Institute	PI-5	3. The selection of Alternative 3 as the preferred alternative appears to be pre-decisional, both because of the criteria used to justify the decision (e.g., because it is the largest alternative) and especially because the agencies apparently are already in the 75% design phase for this alternative, even before the comment period has closed and well before the agencies have had the opportunity to review public comments.	The commenter states that the Draft EIS/EIR's characterization of Alternative 3 as the "preferred alternative" is inappropriately "pre-decisional" under CEQA due to: (1) the criteria that the commenter asserts the Natural Resources Agency used to justify the alleged conclusion; and (2) the amount of design work that has been completed. A. The Natural Resources Agency Relied Upon Appropriate Criteria for its Preliminary Identification of Alternative 3 as a Preferred Alternative. As an initial matter, commenter mischaracterizes the basis for the Natural Resources Agency's identification of Alternative 3 as its preferred alternative at the outside of environmental review. The commenter asserts that the sole basis for the Natural Resources Agency's identification of Alternative 3 as the preferred alternative is that Alternative 3 "is the largest alternative." In fact, the Draft EIS/EIR's Executive Summary sets forth the reasons for the Natural Resources Agency's initial identification of Alternative 3 as the preferred alternative. Those reasons include the Natural Resources Agency's preliminary theory at the outset

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			of the environmental review process that Alternative 3 would provide greater long-term benefits by restoring the greatest amount of habitat, while minimizing environmental impacts to the extent feasible. See Draft EIS/EIR at ES-21. The environmental analysis thus far confirms the Natural Resources Agency's preliminary hypothesis. Of the Project alternatives, those that would require gravity diversion of water from the New or Alamo rivers (Alternatives 1 and 4, respectively) were not considered environmentally superior because construction of the sedimentation basin would result in the permanent loss of Important Farmland and the potential conversion of land under Williamson Act contracts to nonagricultural use, which would be a significant impact. These impacts would not occur under the alternatives requiring pumped diversion (Alternatives 2, 3, 5, and 6) because the sedimentation basins would be located within the footprint of the SCH ponds, which would not be constructed on farmland. Of Alternatives 2, 3, 5, and 6, those located at the Alamo River (Alternatives 5 and 6) were not considered environmentally superior for a variety of reasons. Alamo River water includes higher levels of selenium than that of the New River. Although impacts from selenium would be less than significant, selenium would have adverse effects on wildlife, and lower levels would be preferable within the SCH ponds. Similarly, the Alamo River area is more geologically active than the New River area (mud pots are present adjacent to and within the Project area east of the Alamo River in Morton Bay), which could lead to an increased risk of berm failure. Although this impact is not considered significant, it would not be desirable and would result in temporary, but adverse impacts on SCH pond operation. The Alamo River area also is in a KGRA and known geothermal resources diminish west of the New River. Although the SCH Project would not preclude geothermal development, the New River area is considered preferable because the potential for conflicts with geothermal development companies would be minimized. Thus, Alternatives 5 and 6 were, and continue to be, eliminated from consideration as the environmentally superior alternative. Alternatives 2 and 3 would be located at the New River and would restore 2,670 and 3,770 acres of habitat respectively. Alternative 3 would cause somewhat greater impacts during construction (and indirect air emissions during operations), but it would have greater long-term benefits because more habitat would be restored. The long-term benefits would offset the short-term, incremental increase in construction impacts (and incremental increases in power demand), and thus, Alternative 3 was, and continues to be, considered the environmentally preferable/environmentally superior alternative, which in turn provided the foundation for the Natural Resources Agency's identification of Alternative 3 as its preferred alternative. B. The Natural Resources Agency Properly Identified Its Preferred

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			Alternative as the Agency Embarked Upon the Environmental Review, Engineering, and Budgeting Processes Without Foreclosing Consideration of Other Alternatives. The Natural Resources Agency's identification of a preferred alternative at the outset of environmental review properly disclosed the Natural Resources Agency's perspective at that point in the planning and decision-making process. Under CEQA, the critical question is whether, considering all the circumstances, the Natural Resources Agency has committed itself to the project so as to effectively preclude any alternatives or mitigation measures that CEQA would otherwise require to be considered, including the alternative of not going forward with the project. Here, the 75 percent preliminary design work to which commenter refers does not foreclose consideration of any of the alternatives. The preliminary design work was for an alternative up to – not limited to - 3,770 acres. The 75 percent design work has generated multiple berm designs in response to variable soil types and geotechnical conditions. These soil types would need to be accommodated at all the sites, just in different proportions at each site. The 75 percent design work also included soil samples at both the New River and Alamo River sites. Moreover, it remains entirely possible that at the close of environmental review, engineering, budget processes, the Natural Resources Agency could end up selecting the "no project" alternative. With the exception of the "no project" alternative," the financing for any of the alternatives remains uncertain and subject to approvals of budget change proposals and appropriations. Before final approval of the proposed project, the Army Corps of Engineers must complete its jurisdictional delineation of wetlands at all of the sites. In addition, negotiations with IID to access land for the project must be completed before the project can go forward. No text revisions are required.
Pacific Institute	PI-6	4. The preferred alternative could divert more than 50% of the total historic flow of the New River during June, the peak evaporation month. Aside from the fact that future New River flows will be significantly lower in the future, due to water transfers and water conservation efforts in the Imperial Valley and further reductions in flows from Mexico, diverting more than half of the river's flow raises many questions. In addition to the immediate environmental impacts (to the river and riparian corridor downstream and to the estuary formed at the river's mouth), this diversion suggests that a maximum of 7,000 acres of shallow habitat could be constructed near the New River, and perhaps 10,000 acres near the Alamo River, given the volume of water available during June. If this is accurate, what does it say about long-term mitigation strategies for the Salton Sea? Would it be permissible to divert the entire flow of the New River to deliver water to	Please refer to the response to SSA-7. The State's preferred alternative does not represent the maximum amount of habitat possible, but rather the maximum at the New River site above the -234 foot contour. The operations and adaptive management plans would identify the diversion strategies during the year to make best use of the available water while minimizing the in-river impacts. That is why the Project does not propose to divert the entire flow of the New River (or the Alamo River), nor would the Project seek such a diversion. The comments regarding the maximum number of acres that could be constructed and long-term mitigation strategies are not substantive comments

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		constructed habitat? Or does the preferred alternative represent, in effect, the maximum amount of constructed habitat feasible near the New River?	that address significant environmental issues evaluated in the Draft EIS/EIR, and no text revisions are required.
Pacific Institute	PI-7	We strongly support the construction of shallow habitat pond complexes at the Salton Sea. However, the DEIR does not provide sufficient information to determine whether the preferred project would be an effective use of limited Salton Sea funds. More and better information is needed.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).
Pacific Institute	PI-8	The DEIR should review a broad range of construction techniques, management strategies, habitat types, salinities, and target species. It would be a waste of time and money to test one limited concept, when it is clear that the Sea will require a portfolio of restoration strategies and techniques.	Please refer to Master Responses 3, Project Scope and 7, Operations and Adaptive Management regarding the range of management strategies, habitat types, salinities, and target species. Construction techniques would be selected to be most feasible and cost effective in achieving project design. As discussed on page 2-23, lines 13-17, the soils lack the structural capability to support construction equipment, and specialized equipment would be needed. No text revisions are required.
Pacific Institute	PI-9	The DEIR should clearly and explicitly define what is meant by "restoration" for this project, given the absence of a stable baseline or historic condition.	The Project goals and objectives are detailed in Section 1, CEQA Project Goals and Objectives/NEPA Purpose and Need. The SCH Project does not seek to restore conditions to a specific point in time; rather, it is intended to provide in-kind replacement for near-term habitat losses (refer to page 1-4, line 18). No text revisions are required.
Pacific Institute	PI-10	ES-1: 28 "The Salton Sea is currently a hypersaline ecosystem (about 51 ppt)" Slide 5 of the Public Comment Meeting Presentation posted on the Salton Sea program webpage at http://www.water.ca.gov/saltonsea/docs/081711DEIS_EIRcomment_meeting.pptx states that the salinity is 53 ppt. Note that both of these values are wrong: at brackish and higher salinities, g/L TDS (as reported by C. Holdren) are not interchangeable with ppt TDS. The reported salinity of the Sea, at 51.8 g/L, converts to roughly 49.3 ppt, not >50 ppt.	The referenced text from the Draft EIS/EIR appropriately describes conditions as they existed when the Notice of Intent and Notice of Preparation were published. The Salton Sea is a dynamic environment, however, and conditions had changed by the time the public comment meeting was held; the slide in question was intended to demonstrate the need for the SCH Project and showed the salinity level that existed at the time of the meeting in relation to future conditions, including the point at which tilapia are no longer expected to survive. Regardless, the descriptions of salinity are a fair approximation of the status of the waters at the Salton Sea, and the minor discrepancy in units (49.3 ppt versus 51 ppt) does not change the impact analysis or conclusions. The Salton Sea is currently hypersaline, is more saline than in the past, and will continue to become saltier in the future. No text revisions are required.
Pacific Institute	PI-11	ES-1: 29-31 "Without restoration, declining inflows in future years will result in the Sea's ecosystem collapse due to increasing salinity (expected to exceed 60 ppt by 2018, which is too saline to support fish)" This statement contains the following errors: 1) the premise that there is any possibility of "restoration" of the Salton Sea as a whole is demonstrably false (and has yet to be defined in this document);	The referenced statement is true–without restoration, the Salton Sea will collapse due to increasing salinity. The statement does not address the feasibility of restoring the Sea, nor is there a requirement in this instance to define what restoration of the Sea might entail. The Draft EIS/EIR appropriately focuses on the impacts of the SCH Project, not restoration of the entire Salton Sea. No text revisions are required.

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		2) the Court's invalidation of the Quantification Settlement Agreement (QSA) and the current appeal of that decision mean that the water transfer and future mitigation water deliveries remain uncertain; and	Please refer to ICAPCD-1.
		3) categorical determinations of the salinity tolerance of the fish in the Sea have been wrong for more than 40 years and should not be made here. Desert pupfish have demonstrated salinity tolerance well in excess of 60 ppt. Table 3.4-3 notes that the most prevalent species of tilapia in the Sea has a salinity tolerance of 65 ppt.	Based on the best information available, it is believed that 60 ppt will be too saline to support fish. While desert pupfish larvae can survive up to 90 ppt in laboratories, adults and eggs cannot based on observations in the wild. The 65 ppt threshold references survival rates under certain temperature and water quality conditions based on laboratory studies. Conditions in the Salton Sea include additional stressors, such as parasites, which could contribute to their decline. Regardless of the exact threshold, however, salinity, in combination with other factors, will eventually reach the point at which fish will not be able to survive. No text revisions are required.
Pacific Institute	PI-12	ES-1: 35-39 "Piscivorous birds, on the other hand, are at risk of decline. To address this immediate need, the California Legislature appropriated funds for the purpose of implementing "conservation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including adaptive management measurements (California Fish and Game Code section 2932(b))" The agencies' exclusive reliance on legislation passed in 2003, and their continued refusal to acknowledge SB 187, enacted in 2008, creating California Fish and Game Code section 2932.3, baffles us. For reasons unclear, the agencies ignore California Fish and Game Code section 2932.3 and California Fish and Game Code sections 2940 et seq. This failure to recognize existing state law must be corrected. The agencies' selective interpretation of legislative intent, while refusing to follow the clear legislative direction made explicit in California Fish and Game Code section 2932.3 and California Fish and Game Code sections 2940 et seq., suggests pre-decisional actions and a clear lack of administrative and legislative oversight. In SB 187 (enacted 2008), the Legislature finds "The Salton Sea is considered a globally important bird area because of its astounding diversity of bird species, with more than 400 species, the second highest count in the nation, and the very large populations of some species that rely on it for habitat."	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). Fish and Game Code section 2932 establishes the Salton Sea Restoration Fund and lists how that fund can be spent. Section 2932.3 describes how a portion of the funds (the Proposition 84 funds) deposited into the Salton Sea Restoration Fund can be spent. It is acknowledged that the Salton Sea Restoration Council has been created by statute; however, the Council has not been assembled, and members have not been assigned or designated.
Pacific Institute	PI-13	The legislature did not direct the agencies to focus exclusively on piscivorous birds; instead, it highlights the importance of the Sea to the full range of bird species that use it. As the Sea continues to decline and if water transfers continue, it will rapidly transition through salinities tolerable to invertebrates to concentrations too high for any macro invertebrates. To meet the clear intent of the Legislature, the agencies may soon need to plan projects that produce the	Please refer to Master Response 3, Project Scope.

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		large numbers of invertebrates needed to sustain the astounding diversity of bird species found at the Sea. Narrowly assuming – as the Agencies do – that fish habitat can supply the full range of invertebrates found at the Sea will preclude higher salinity habitats that generate extremely high invertebrate numbers, as was demonstrated at the Reclamation/USGS pilot ponds. This proposed Project offers the opportunity to do a true proof of concept, with cascading ponds managed to a broad range of salinities, offering guidance for the much larger habitat projects that will be needed in the future. The very narrow focus on piscivorous birds ignores the broader intent of the Legislature and limits the value of the proposed Project to inform future efforts. This project should be expanded to encompass a broader range of salinities and target species, consistent with the explicit legislative findings in SB 187.	
Pacific Institute	PI-14	ES-2: 4-5 “Goal 1: Develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea.” The goal should be rewritten to be consistent with the explicit project purpose, or the proposed project should be expanded to satisfy the goal. Currently, the proposed project fails to meet this goal. A more appropriate goal, consistent with the alternatives described in the draft, would be: “Goal 1: Develop aquatic habitats that will support fish and piscivorous birds dependent on the Salton Sea.” The project does not develop a range of aquatic habitats and is clearly not intended to support the full range of wildlife species dependent on the Salton Sea (despite the legislative language to that effect): it is explicitly focused on fish and piscivorous birds, as shown by the various objectives that follow this goal.	Please refer to Master Response 3, Project Scope. The goal does not state develop a *full* range of all possible aquatic habitats, nor was the SCH Project obligated or intended to meet that particular interpretation. The objectives provide further detail that is consistent within the goal. A range of habitat conditions would be present within and among the ponds and over time, depending on operations and topography of the selected alternative. This would include a gradient of depths from shallow areas to deeper toward the sea, swales or channels, and islands for roosting or nesting by birds. Construction of these features would be within the physical constraints of the selected alternative site (e.g., geotechnical stability, topography). No text revisions are required.
Pacific Institute	PI-15	ES-22: 18-21 “The Corps has yet to identify its preferred alternative. The draft section 404(b)(1) alternatives analysis will be completed and included in the Final EIS/EIR. Based on this analysis, the Corps will choose the least environmentally damaging practicable alternative as the Corps’ preferred alternative, which will be subject to public comment.” We look forward to the opportunity to comment on the “practicable” alternative, defined on p. ES-7: 27-28 as “The factors that influence whether an alternative is practicable include cost, logistics, technology, and the ability of the alternative to achieve the overall project purpose.” Unfortunately, the current DEIR does not include any information on cost, and does not offer a credible assessment of the ability of any of the listed alternatives to achieve the overall project purpose.	Please refer to Master Response 5, Project Costs regarding cost issues. Regarding the comment that the Draft EIS/EIR does not offer a credible assessment of the ability of the listed alternatives to achieve the project purpose, note that the SCH Project’s CEQA goals are two-fold: (1) develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and (2) develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process (refer to page 1-4, lines 11-14). The conceptual alternatives included in the Draft EIS/EIR were based on the best information currently available, and the Project design would continue to be refined as new information is provided in order to provide suitable habitat for fish and wildlife. Other information would be needed, however, and in order to fulfill Goal 2, different operational scenarios would be tested during the proof-of-concept phase, the first 10 years of project operation (to approximately 2025) (refer to page 2-10, lines 28-32). After the proof-of-concept phase, pond variables would be managed to produce the best habitat for

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			fish and wildlife dependent on the Salton Sea. Thus, the Draft EIS/EIR does not claim to have all information needed to successfully manage the SCH ponds at this time. This would be developed during the adaptive management and monitoring program. No text revisions are required.
Pacific Institute	PI-16	ES-8: 23 "Alternative 3 is the Natural Resources Agency's preferred alternative." For reasons described in the following, we find the Agency's preferred alternative to be flawed and unacceptable, primarily because of conflicts with existing and planned constructed habitat efforts. Instead, a modified version of Alternative 4 should be the preferred alternative. Further, the selection of Alternative 3 as the preferred alternative appears to be pre-decisional, both because of the criteria used to justify the decision (e.g., because it is the largest alternative) and especially because the agencies apparently are already in the 75% design phase for this alternative, even before the comment period has closed and well before the agencies have had the opportunity to review public comments.	As discussed on page 2-26, lines 17-21, DWR and DFW are working in close coordination with USFWS staff at the Sonny Bono Salton Sea National Wildlife Refuge to avoid any conflicts between the SCH Project and restoration projects being considered by the Refuge. Refer also to the discussion on page 2-22, lines 32-44. Refer to the response to PI-26 for additional discussion of other restoration projects. Alternative 4 was rejected as the environmentally superior alternative/preferred alternative for a number of reasons, as discussed in Section 7, and the commenter has not provided substantial evidence indicating that it is environmentally superior/environmentally preferred (refer to Section 7.3, Environmentally Preferable/Environmentally Superior Alternative for a discussion of Federal and state requirements.) The selection of Alternative 3 is not pre-decisional, as discussed in the response to PI-5. No text revisions are required.
Pacific Institute	PI-17	ES-13 "Impact EN-1: Pumping would require power for the duration of the Project." This Table should distinguish between baseline power needs of all project alternatives, versus additional energy needed by those alternatives that would also pump river water for delivery to the ponds.	The total power needs of each of the Project alternatives are presented in Table 3.6-2. There is no justification for distinguishing between baseline power needs and power needed for those alternatives that would pump river water. No text revisions are required.
Pacific Institute	PI-18	ES-16 "Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses." The preferred alternative directly conflicts with the stated interest of farmers near the west side of the New River delta to reclaim and farm exposed lakebed, as noted in "Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use."	Impact SOC-4 concludes, in part, that there is uncertainty regarding whether any of the exposed land would be reclaimed for agricultural purposes. Please refer to IID-34, in which IID agrees that reclamation of farmland within the area of the proposed alternatives is speculative. Thus, reclamation of land in the vicinity of ponds for agricultural use is not considered a future planned use. No text revisions are required.
Pacific Institute	PI-19	ES-19: 10-13 "In general, those alternatives with greater acreage would have greater benefits to resources such as biological resources, aesthetics, recreation, and socioeconomics, but also would result in greater impacts on air emissions,	Please refer to the response to EPA-8 and Master Response 5, Project Costs.

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		energy demand, transportation impacts, and demand for public services." This statement assumes that the alternatives will be fully funded and constructed to the full acreage described. This neglects funding limitations. An appropriate comparison would describe acreage that could be constructed with unencumbered funds currently existing in the Salton Sea Restoration Fund. Otherwise, any of the six alternatives could be expanded on paper to show greater benefit, even if there are not sufficient funds to construct it as designed.	
Pacific Institute	PI-20	ES-21: 13-31 The suggestion that Alternative 3 is superior because it is the largest is disingenuous, given that insufficient funds exist to build it as described, and given that any of the other alternatives could have as easily been expanded to be the largest such project, at least on paper. Unless the agencies mean to suggest that the proposed project is the only habitat they intend to construct at the Salton Sea, the reasoning in this referenced paragraph suggests that the agencies will only construct habitat near the New River, since the Alamo River sites have higher selenium loadings and are less geologically stable. As proof of concept, the Project should be constructed at the more challenging site, rather than attempting to test methods and practices at the least challenging site available. A modified version of Alternative 4, which offers the best test of future conditions and parameters for habitat construction at the Sea, should be the preferred alternative.	Section 7.3, Environmentally Preferable/Environmentally Superior Alternative explains why sites at the Alamo River were eliminated from consideration as the environmentally preferable/environmentally superior alternative, as well as why sites requiring gravity diversion were eliminated. Of the two remaining alternatives (Alternatives 2 and 3), Alternative 3 offered the potential to create the most habitat. Therefore, the suggestion that selection of Alternative 3 is disingenuous is not supported by substantial evidence. Moreover, the CEQA Guidelines section 15021(a) states that CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible and that: (1) In regulating public or private activities, agencies are required to give major consideration to preventing environmental damage. (2) A public agency should not approve a project as proposed if there are feasible alternatives or mitigation measures available that would substantially lessen any significant effects that the project would have on the environment. Therefore, constructing the SCH Project at a site that would result in greater environmental impacts, such as would occur under Alternative 4, is not consistent with the CEQA Guidelines, nor is it desirable to construct at an even more challenging site with limited funds. Additionally, the Corps can only permit the LEDPA. The Section 404(b)(1) guidelines specify that no discharge of dredged or fill material may be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impacts on the aquatic ecosystem, as long as the alternative does not have other significant adverse environmental consequences. Please refer to the Draft 404(b)(1) alternatives analysis, included in Attachment 3, which evaluates the practicability of each alternative. No text revisions are required.
Pacific Institute	PI-21	ES-21: 39-41 "The Natural Resources Agency has identified Alternative 3 as the preferred alternative because it would provide greater long-term benefits by restoring the greatest amount of habitat, while minimizing environmental impacts to the extent feasible."	Please refer to the response to PI-20.

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		As noted above, this is a misleading basis for determining the preferred alternative, since insufficient funds exist to build the alternative to its designed extent, as acknowledged by the agencies themselves. Would limited funding reduce the size of each of the alternatives by the same percentage? The DEIR does not provide sufficient information to make this determination, since it does not provide general or itemized cost estimates. That is, given the Agency's own stated criterion, it is quite possible that one of the other alternatives would result in more habitat and greater long-term benefits when constructed with available funds. The DEIR should offer specific cost estimates and describe the relative benefits that may be realized with available funds, to offer a more realistic comparison between the alternatives.	
Pacific Institute	PI-22	1-3: 22-23 "The Quantification Settlement Agreement (QSA) is one of the factors contributing to declining inflows to the Salton Sea." This statement appears to be inconsistent with the State's own filings in the referenced QSA litigation, which generally states that the delivery of mitigation water offsets the impacts of the water transfer, so that the QSA is not one of the factors contributing to declining inflows to the Salton Sea.	The referenced statement is correct. Page 1-3, lines 33-35 explains: "IID is required to provide conserved water to the Sea to mitigate the effects of the transfer on salinity until 2017. After 2017, however, the Sea's salinity is expected to exceed the tolerance limit for fish and, thus, mitigation for effects on salinity ceases at that time." The provision of mitigation water is linked to biological impacts. Once IID stops contributing mitigation (after salinity is expected to exceed the tolerance limit for fish water), inflows will decrease rapidly. The resulting changes on Sea elevation and salinity are shown in Figures 3.11-9 and 3.11-10. No text revisions are required.
Pacific Institute	PI-23	1-3 fn. 1 "One of those agreements, the QSA/Joint Powers Authority Creation and Funding Agreement, was invalidated on January 10, 2009 in Sacramento County Superior Court on constitutional grounds" This is wrong. On December 10, 2009, the Superior Court invalidated 12 of the 13 agreements. Note also that the QSA refers to more than just this one agreement, as noted on line 28 on this same page.	Please refer to the response to ICAPCD-1.
Pacific Institute	PI-24	2-4: 25-28. Adequate Water Supply "(this water is lost to evaporation and does not include water that is circulated in the ponds to maintain salt balance or discharged to the Sea to flush ponds)" As noted in the parenthesis above, the "stated adequate water supply" is in fact not an adequate water supply, which must include the volume of water flowing through the ponds. Each alternative should have a clear water budget that includes peak daily water supply requirements, showing evaporation, surface outflow, and projected inflow requirements for each pond. These water requirements must be identified to correctly size diversion and pumping infrastructure, as well as the size of release gates.	The citation in the comment references a discussion that addresses evaporation losses. The full water supply is detailed in Section 3.11, Hydrology and Water Quality. Table 3.11-7 describes the annual diversion rates, and Table 3.11-9 describes the needed water supply in the peak month, including the circulation amount and the evaporation (as a function of the river flow). No text revisions are required.
Pacific Institute	PI-25	2-6: 17-20 "the portion of the alternatives that included Red Hill Bay was eliminated because the United States Fish and Wildlife Service (USFWS) has	This comment is noted. No text revisions are required.

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		plans to develop shallow water habitat in this area as part of the Sonny Bono Salton Sea National Wildlife Refuge (NWR)." Thank you for not siting alternatives at Red Hill Bay, avoiding duplication of USFWS planned habitat in that area.	
Pacific Institute	PI-26	2-6: 20-21 "The USFWS also has a planned restoration project at the New River, and DWR and DFG are working in close coordination with NWR staff to avoid any conflicts between the two projects." This section ignores the joint, on-going IID/USFWS effort that has re-opened a culvert linking the New River to exposed playa to the immediate east of the New River delta. This effort has re-wet exposed playa, providing hundreds of acres of valuable shorebird habitat, with the additional and notable benefit of covering playa that had contributed large amounts of dust to the area. This joint effort, and its benefits, should be clearly described in the draft document. The preferred alternative would eliminate the habitat created by the on-going IID/USFWS effort, reducing the net habitat benefit of the proposed action. The possibility that the scaled-down version of Alternative 3, due to funding limitations, may only replace the existing and planned shallow habitat east of the New River means that agencies might well spend more than million to replace habitat that already exists. This would be a colossal waste of public funds.	As Chris Schoneman, Project Leader at the Sonny Bono Salton Sea National Wildlife Refuge Complex indicated at the April 12, 2011 Stakeholder's meeting in response to this same issue, the referenced habitat was intended to be temporary due to concerns about selenium. This is why the Refuge is proceeding with the new shallow water habitat project at Morton Bay. The Refuge has indicated that they have no objections to constructing SCH ponds as proposed, and the SCH agencies are coordinating closely with Refuge staff to avoid any conflicts. No text revisions are required.
Pacific Institute	PI-27	2-11: 2.4.1.3 Berms It does not appear that geotubes are being considered for the berms, only as barriers on the outboard side of the berms. Why not?	Please refer to the response to comment IID-10. Geotubes are mentioned on page 2-13, including the need to verify the usefulness of geotubes in this application. The final design would consider all appropriate construction techniques using the latest geotechnical data for the soils of the site. No text revisions are required.
Pacific Institute	PI-28	2-17: 2.4.1.13 Saline Water Supply Pump Station Salton Sea water typically is very turbid – will there be some kind of filtration or treatment associated with pumping such water into the ponds? If the pumps draw water from near the sediments, they run the risk of extracting anoxic water, possibly with high concentrations of hydrogen sulfide, posing a risk to life in the SCH ponds. In the near term, the pumps will be fouled by barnacles and other marine life. As the Sea's salinity increases, corrosion will a constant concern, requiring frequent maintenance and replacement. Have these costs been considered?	The saline water can be settled in the sedimentation ponds for the pumped diversion alternatives. Because of the smaller diversion volumes of the saline diversion, if needed, an independent settling pond could be included within the SCH pond footprint. Please refer to the response to ICFB-16 regarding barnacles. Costs are addressed in Master Response 5, Project Costs. No text revisions are required.
Pacific Institute	PI-29	2-22: 2.4.1.25 Project Compatibility with other Potential Future Land Uses The DEIR appropriately describes compatibility with potential geothermal development, but ignores the existing and potential habitat created atop exposed playa east of the New River delta.	Please refer to the response to PI-26.
Pacific	PI-30	This section also fails to acknowledge potential reclamation of agricultural land to the west of the New River, noted elsewhere as "Impact SOC-4: Pond creation	Please refer to the response to PI-18.

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Institute		would preclude the reclamation of exposed playa for agricultural use."	
Pacific Institute	PI-31	2-25: 42 "Several permanent employees would be required to manage the ponds." Since jobs are the catchword of the moment and a key to increasing support for the project, it would be useful to clarify the exact number of permanent employees associated with each alternative.	The precise number has not been determined at this time, but as indicated, only several would be required. Citing an exact number of employees would not change the impact analysis and is not needed. No text revisions are required.
Pacific Institute	PI-32	2-28: 36-27 "The basin would be 60 acres and be excavated below ground surface to approximately 20 feet." Is it possible to excavate 20 feet below the land surface immediately adjacent to the Salton Sea, such as shown in Figure 2-7? Why would a sedimentation basin of this size be necessary? What is the maximum daily river water requirement for the SCH ponds? There appear to be some significant errors in calculation here, leading to a staggering amount of excavation. Simply converting 60 acres at 20 feet deep yields more than 1.9 million cubic yards of material. This is clearly infeasible: strip-mining equipment, which operates at a comparable scale, would quickly sink into the soft soils near the Salton Sea. This scale of excavation is simply not feasible near the Salton Sea. Building such a deep basin near the river would also create a drain for the river itself, as well as surrounding land. Nor is it clear that there is sufficient head between such a deep hole and the nearby ponds, unless the basin were filled, which would raise the water table and interfere with adjacent farming operations. Or is the intent to line the sediment basin? If that is the case, why does it need to be so deep?	The sedimentation basin of the pumped diversion alternatives would not be constructed 20 feet below the ground. The referenced configuration was described for the gravity diversion alternatives and would be required because of the incised river at that location. Please see the response to IID-30 regarding the feasibility of constructing the upstream sedimentation basin. The basin for the pumped diversion would be located in the footprint of the SCH ponds and would have similar conditions as the adjacent SCH ponds. The final basin size would be determined from the size of the diversion determined in the operations plan. Table 3.11-7 discusses the range of potential diversions required to meet the residence time and evaporation water needs. The gravity diversion ponds would be located about 3 miles upstream of the SCH ponds to provide the necessary head for water to flow to the SCH. The basin is not proposed to be lined. The need for the basin to be 20 feet below the ground surface is explained on page 2-19, lines 1-5, and relates to the elevation of the river and need for gravity flow. Note that gravity diversion, with its accompanying upstream sedimentation basin, was not selected as part of the State's preferred alternative (see Section 7). No text revisions are required.
Pacific Institute	PI-33	2-41: 8 River Water Source We suggest that Alternative 4 be modified to locate a river pump station immediately adjacent to the project site, as shown for Alternatives 5 & 6. This would eliminate the need for an upstream sedimentation basin and 3.5 miles of pipeline, and could be managed conjunctively with the river water source for the USFWS project at Red Hill Bay. This would also avoid the Williamson Act challenges associated with the current configuration. This modified version of Alternative 4 would be similar to Alternatives 5 & 6, but with a cascading pond and less habitat along Wister Beach.	This suggestion is noted. As discussed on page 7-3, lines 29-41, sites at the Alamo River were not selected for the preferred alternative due to greater impacts associated with selenium, geologic activity, and geothermal resources. No text revisions are required.
Pacific Institute	PI-34	3.2-4: 35 (and 3.2-9: 22 and other locations) "With over 5,000,000 acres of harvested commodities" should be "With over 500,000 acres … "	The referenced text has been clarified.
Pacific Institute	PI-35	3.3 Air Quality Do the temporary negative impacts of SCH construction outweigh the long-term beneficial impacts of reducing fugitive dust emissions? How are these countervailing impacts measured and balanced under NEPA/CEQA?	The analysis in Section 3.3, Air Quality did not attempt to compare these two different types of impacts, nor is this required under NEPA and CEQA as part of such a section. Such factors were considered in identifying the environmentally

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			preferable/environmentally superior alternative, however, as discussed on page 7-3, lines 42-47. No text revisions are required.
Pacific Institute	PI-36	3.4-48: 22-27 "The lower thermal and DO tolerances for fish may be exceeded under certain environmental conditions, but not necessarily at the same time, resulting in fish kills that reduce the population size in the ponds where this phenomenon occurs. The lower DO tolerance for some benthic invertebrate species that provide food for fish may also be exceeded at times in some locations, primarily in the deeper portions of some ponds. The duration of such events is expected to be short with rapid recovery of the fish and invertebrate populations." The above paragraph provides insufficient information on the threat posed by poor water quality in the SCH. The survival of fish in the ponds, in sufficient numbers to provide a forage base for piscivorous birds, is the explicit goal of the project. It is fundamental to the success of the proposed project. The DEIR provides insufficient information to assess whether the project will achieve this goal. The DEIR should clearly state: 1) under what environmental conditions would "lower thermal and DO tolerances for fish" be exceeded, and how often this would occur; 2) under what conditions would DO tolerances for benthic invertebrates by exceeded, and how often this would occur; 3) the basis for the assertion that fish and invertebrate populations would recover rapidly. Is this a fatal flaw in the pond design? Will periodic fluxes in DO, as well as seasonal decreases in temperature, exterminate the forage species the ponds are designed to support? If so, the project will fail to achieve its objectives and must be redesigned. The DEIR fails to provide sufficient information to answer these questions. Has water quality in the ponds been modeled as part of the pond design? It is not sufficient simply to state that "The Project is designed to test various pond designs with monitoring to determine what works best to meet the Project goals and objectives" (3.4-48: 31-32) if there is a reasonable suspicion that none of the pond designs will protect water quality sufficiently to maintain invertebrate and fish populations. P. 3.11-43 of the DEIR states that "periods of anoxia both daily (near dawn due to respiration of all organisms present) and seasonally (especially in spring and fall)" will impair the ponds, suggesting that model has in fact been constructed and run, and that more information exists than is presented on p. 3.4-48. Although Appendix J describes a Fish Tolerance study, this study was very poorly designed and not very relevant to the proposed project. According to the description, the "cold" temperature tested by the Fish Tolerance study was 52-61 °F (J-9: 13). However, Appendix D notes that water temperatures at the SCH are expected to fall below 50 °F (D-5: 18-20). A relevant Fish Tolerance study would examine fish tolerance at a range of temperatures below 50 °F. Despite this	Please refer to the response to PI-2 regarding the purpose and focus of the SCH Project and the response to ICFB-2. Also refer to Master Response 7, Operations and Adaptive Management. The SCH is an experimental, proof-of-concept project. The EIS/EIR focuses on the Project alternatives' potential impacts on the environment, not the performance of the experimental ponds, which would be monitored and adjusted following an adaptive management approach. The SCH experimental ponds have been designed to provide aquatic habitat within the constraints of the physical site (i.e., elevation and topography) and the challenging environmental conditions currently existing at the Salton Sea, such as climate and eutrophic conditions. Temperatures are outside the Project's ability to control, but operations would be adjusted where possible to ameliorate some of the effects (e.g., use lower salinity to reduce cold stress [Section D3.2, pg D-6, lines 12-15]). Invertebrates should recover, as evidenced by colonization of the Reclamation/USGS ponds without any inoculation. As much modeling was performed as is reasonable in order to support the hypotheses used to develop the SCH concepts. Water quality modeling conducted by the University of California at Riverside (UCR) highlighted some issues to monitor as the ponds would be operated (e.g., temperature, salinity, and dissolved oxygen). However, this simple, one-dimensional model was not meant to be a perfect depiction of reality. While it highlighted some issues to inform design of pond and operations, it could not capture spatial heterogeneity and would not be appropriate to use as a definitive predictor of pond conditions. Further details clarifying tilapia tolerance and temperature have been incorporated in Appendix D (Operations) and Appendix J (Special Studies [e.g., fish tolerance study and hydrologic modeling]). Conditions at the experimental ponds would be monitored to determine whether dissolved oxygen and temperature pose problems for fish. The availability of river flow for the SCH ponds was evaluated in Section 3.11.3. The flow in month(s) of minimum flows was described for New River (December median 521 cfs, 90th percentile 423 cfs, pg. 3.11-7, lines 36-38) and Alamo River (January median 630 cfs, 90th percentile 443 cfs, pg 3.11-11, lines 16-20). This flow is sufficient to support the diversion rates for the SCH ponds in the winter, a period of minimum evaporation losses, even at lower salinity levels (mean diversion rates for different operations and alternatives, Table 3.11-8). Section 3.11.3 also evaluated the availability of New River and Alamo River flows to meet periods of peak diversions: in summer (highest evaporation) for operations of

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		study, we still do not know the expected mortality of fish in the ponds. The Fish Tolerance study suggests lowering the salinity of the ponds during the coldest months, to reduce stress for the fish and improve their survival rates. However, these coldest months are also the period when New and Alamo river flows are at their lowest levels. The DEIR does not appear to evaluate the availability of river flow during these months.	short duration residence time (2 weeks) *and* lower salinity (20 ppt) (Table 3.11-9). No text revisions are required.
Pacific Institute	PI-37	3.6-1: 6-9 "The equipment and vehicles used during construction and maintenance would be the minimum needed to perform the required work, and fuel would not be used in a wasteful manner. Therefore, fuel consumption and electrical demand during construction is not addressed in this section." While it's comforting to know that fuel would not be used in a wasteful manner, this is not sufficient information for the reader to determine the total energy consumption associated with construction of the proposed project. Given the very large amount of excavation and dredging associated with the described alternatives (including more than 1.9 million cubic yards of excavation just for the sediment basins), presumably a very large amount of fuel will be required, even if it is used efficiently. This section should be re-written to describe and assess the actual amounts of energy consumed for construction. In fact, Table G-1 notes that the preferred alternative would require an estimated 644,000 gallons of diesel fuel, just for on-road activities (off-road activities, such as excavation and dredging, would require additional fuel). It would be useful to include relevant information from the appendices in the analyses sections.	The significance threshold in this section (page 3.6-4, lines 27-28 addresses whether "impacts on energy consumption would be significant if the Project alternatives would result in the inefficient, wasteful, or unnecessary consumption of energy." The mere volume of fuel consumption is not an indicator of whether it would be used in a manner that was inefficient, wasteful, or unnecessary. The SCH Project includes best management practices (Section 2.4.7) that are intended to reduce air emissions, thereby also ensuring that fuel is not used in an inefficient, wasteful, or unnecessary manner. No text revisions are required.
Pacific Institute	PI-38	3.6-6: 13-15 "The seawater pump would lose efficiency over time because of the hypersaline water being pumped, but would be maintained as appropriate to reduce fouling and would be replaced when needed." Please provide estimates on how frequently the seawater pumps would need to be replaced, and the associated costs of maintenance and replacement.	This information does not have a bearing on the environmental impacts of the Project alternatives. The replacement rate of the saline pumps is unknown and will be addressed in the maintenance plan developed for the Project.
Pacific Institute	PI-39	Table 3.9-3 and Table 3.9-5 These two tables indicate that the construction of the preferred alternative would generate roughly twice the amount of greenhouse gas emissions of alternatives 4 or 5 (6,650 metric tons of CO2e versus 3,400 and 3,057 metric tons of CO2e, respectively), and that operation of the pumps for the preferred alternative would generate at least double the greenhouse gas emissions of alternatives 4 or 5, every year. That is, over a 60-year lifespan, the preferred alternative would generate at least 99,000 metric tons of CO2e more than either alternative 4 or 5.	This comment is noted; GHG emissions were only one of the factors considered in the selection of the preferred alternative. Each alternative performs better for some metrics and not as strongly for others, and the selection of the preferred alternative was made by evaluating the full range of benefits and impacts of the alternatives. The conclusions in the Draft EIS/EIR are unchanged.
Pacific Institute	PI-40	3.11-15: 8-10 and Table 3.11-5 This table and text includes a conversion error. At brackish and higher salinities, g/L TDS are not interchangeable with ppt TDS. The reported salinity of the Sea, at 51.8 g/L, converts to roughly 49.3 ppt, not 52	Please refer to the response to PI-10.

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		ppt. Note also that 35 g/L is not the same as 35 ppt.	
Pacific Institute	PI-41	3.11-25: 23-25 "For the peak evaporation month (June), the reduction downstream of the diversion would range from 7 percent to 56 percent for the New River and 4 percent to 28 percent of the Alamo River flow." Diverting more than 50% of the flow of the New River would be a significant impact, with measurable adverse effects on the riparian corridor and delta.	A 50 percent reduction in river flow is a worst-case scenario and not the average scenario. A reduction in river flow would affect primarily non-native aquatic species by reducing the volume and structure (e.g., water depth) of habitat available downstream of the diversion location. The river delta and associated estuary will move seaward with and without the Project as the Sea recedes, but the reduced river inflow would reduce the size of the estuary (mixing zone). Habitat for nesting bird colonies (large trees) will remain where it is due to high groundwater levels maintained by the adjacent SCH ponds. The amount of riparian vegetation that colonizes the margin of the river on the exposed seabed would depend on a number of factors with amount of water being only one of them. The discussion in Impact BIO-5b on page 3.4-48 for Alternative 1 has been expanded to address effects of water diversion on aquatic and adjacent riparian species and concludes that these impacts are less than significant. This analysis also applies to the other alternatives. No text revisions are required.
Pacific Institute	PI-42	3.11-30: 28-30 "The reduction in river flow due to the SCH Project would not adversely affect downstream water users, and this issue is not addressed further in this section. Impacts on biological resources from the reduction in flow are addressed in Section 3.4, Biological Resources." Presumably, a >50% reduction in river flow would adversely affect downstream biological resources, both within the riparian corridor itself and in the estuary. Note that these impacts are not, in fact, addressed in Section 3.4, which instead focuses on impacts from construction and maintenance, but ignores the potentially significant adverse effects associated with a >50% reduction in river flow.	For the pumped diversion alternatives, water diversion would not affect any downstream users because none are present downstream of the diversion location. For the gravity feed alternatives, less than 50 percent of the river flow would be diverted, leaving adequate water for downstream users. Also, please refer to the discussion under IID-21. No text revisions are required.
Pacific Institute	PI-43	Appendix D. The spacing of the text suggests an error occurred when converting the document to a pdf, making it difficult to read. Please proofread the document before public release.	We apologize for any inconvenience. Corrected files are included in Attachment 5 of the Final EIS/EIR.
Pacific Institute	PI-44	Table G-7. Note that the values listed under the CO2 column did not convert properly in the pdf – many of these are not legible.	We apologize for any inconvenience. Corrected files are included in Attachment 3 of the Final EIS/EIR.
San Diego Audubon Society	SDAS-1	We believe that the U.S. Army Corps of Engineers (ACOE) and California Natural Resources Agency (NRA) have done a fine job of preparing a conservation plan that goes to great lengths to provide for the preservation of habitat for piscivorous sea birds, so that they will continue to forage and reproduce in the area, long after the Salton Sea is no longer able to support fish, due primarily to projected increases in salinity. The impacts of the proposed project to piscivorous fish are well supported in the DEIS/DEIR; however, we believe that it falls far short in addressing impacts to shorebirds, including the Western Snow Plover	The San Diego Audubon Society's support of the SCH Project is noted. Impacts of the SCH Project on shorebirds, however, are analyzed appropriately. Impacts of the SCH Project on the interior population of the western snowy plover were addressed (for example, refer to Table 3.4.4 and the discussion on pages 3.4-37 and 3.4-38). The increase in salinity and receding shoreline referenced in this comment will occur regardless of whether the SCH Project is implemented and are not a result of the Project. Effects of these habitat changes on shorebirds, therefore, are not analyzed as impacts of the SCH Project alternatives, although

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		(*Charadrius alexandrinus nivosus*), which was listed by the U.S. Fish and Wildlife Service as threatened in 1993 (USFWS 2011). The Western Snowy Plover and other shorebird species are directly dependent on shoreline habitats of the Salton Sea that are used as breeding habitat and also support macroinvertebrates, which presumably could also be affected by the anticipated increase in salinity and receding shoreline that would occur in any of the proposed alternatives in the DEIS/DEIR. This important wildlife resource of the Salton Sea is given very superficial treatment in the DEID/DEIR, seemingly because the six action alternatives in the SCH are all very similar in form and function and are primarily oriented toward conserving piscivorous seabird habitat. The result is that the DEIS/DEIR demonstrates positive direct, indirect, and cumulative impacts for piscivorous seabirds, while any such impacts to shorebirds are minor and were arrived at incidentally. Potentially adverse indirect impacts to shorebirds in the form of eventual lost foraging and nesting habitat and food resources appear to have been overlooked as well.	they are described under the No Action Alternative (Section 3.4.4.3). As discussed in Section 1.3 and in Master Response 3, Project Scope, the goal of the SCH Project is to provide fish for piscivorous birds and not invertebrates for shorebirds since the former resource will be gone long before the invertebrates used by shorebirds will change substantially. The SCH Project would not result in the potential for adverse indirect impacts on shorebirds from lost foraging and nesting habitat and food resources. Rather, although they are not specifically designed for shorebird foraging, the SCH ponds would produce invertebrates that could be used by these birds. No text revisions are required.
San Diego Audubon Society	SDAS-2	The Salton Sea is widely recognized as an important shorebird breeding and overwintering site. According to Avifauna of Salton Sea: Abundance, Distribution, and Annual Phenology (Shuford, et al. 2000): *Shorebird totals at the Salton Sea in some years have exceeded 100,000 individuals in both spring and fall (PRBO and R. McKernan unpubl. data). Regional comparisons indicate the Salton Sea is one of only eight sites in the interior of western North America that holds over 10,000 shorebirds in fall and one of five such sites in spring (PRBO unpubl. data). In terms of overall shorebird numbers, the Salton Sea is the most important area in the Intermountain and Desert region of the West in spring and the second most important, after Great Salt Lake, in fall. Shorebird populations at the Salton Sea from 1989 to 1995 averaged 24,000 in December, 90,000 in April, and about 85,000 individuals in August. Shorebird surveys in 1999 provided additional documentation for these patterns and added a total of about 70,000 shorebirds in November, a month for which prior thorough surveys were lacking. Surveys in 1999 confirmed that the Salton Sea supports the largest population of wintering Snowy Plovers in the interior of western North America (Shuford et al. 1995) and is one of a handful of key breeding areas in the interior of California (Page et al. 1991). Surveys in 1999 indicate the Imperial Valley is even more important than previously recognized for the Mountain Plover, as it held about 30% to 38% of the species' entire population of 8000 to 10,000 birds (Anonymous 1999).*	Page 3.4-16 describes the importance of the Salton Sea Basin for waterbirds, including shorebirds. The general description is then focused on species most likely to be affected by the SCH Project. The additional information regarding shorebird abundances provided in this comment is not necessary to support the impact analysis in the document. The mountain plover and interior western snowy plover are addressed in Section 3.4.3.4, Special-Status Species (see Table 3.4-4 and page 3.4-27). The SCH Project would not affect mountain plovers, and this species is not discussed in detail. No text revisions are required.
San Diego Audubon Society	SDAS-3	The six action alternatives call for the construction of impoundments that would be supplied with brackish water from either the Alamo or New River with hypersaline water added from the Salton Sea in order to maintain an optimal range of salinity. The impoundments would be stocked with fish in order to	Please refer to Master Response 3, Project Scope. Impact BIO-1 addresses the SCH Project's impacts on western snowy plovers (significant for construction) and mountain plovers (less than significant). Impact BIO-5a and 5b addresses impacts on common birds, including shorebirds. No

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		provide forage for piscivorous birds. Islands would be constructed as colonial nesting areas for terns, and smaller islands would be constructed to serve as roosting areas for other piscivorous species such as cormorants and pelicans. These impoundments would feature deep and shallow water habitats to serve the foraging activities of a range of piscivorous bird species. No features of the impoundments were considered to provide nesting or foraging habitats for shorebirds, including the Western Snowy Plover. Although some shorebirds would undoubtedly use these habitats for roosting areas and possibly some limited foraging, the presence of large predatory birds including gulls and ravens and the lack of critical nesting attributes will not provide suitable nesting habitat for shorebirds and in particular the Western Snowy Plover, who's nesting habitat requirements are well documented. The DEIS/DEIR states in section 3.4 in Table 3.4.4 that the western snowy plover: *Nests primarily in flat open areas, with sandy or saline substrates; less commonly in salt pans, dredged spoil disposal sites, dry salt ponds, and levees. Occurs year-round at the Salton Sea (Shuford and Gardali 2008). The Programmatic Environmental Impact Report (DWR and DFG 2007) noted this species uses the Salton Sea for breeding and wintering. Surveys estimated 221 breeding adults at the Sea in 1999 (Shuford and Gardali 2008).* Likewise, foraging habitats and food resources for Western Snowy Plovers and other shorebirds in the form of macroinvertebrates were not adequately addressed. According to the *Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (Charadrius alexandrinus nivosus) Volume 1 Recovery Plan* (USFWS 2007) pp17: *Western Snowy Plovers forage on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone, in dry sand areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons. They sometimes probe for prey in the sand and pick insects from low-growing plants…Opportunities for foraging are directly dependent on salinity levels. Specifically, salt ponds of medium salinity seem to provide the best quality foraging habitat.*	text revisions are required.
San Diego Audubon Society	SDAS-4	Regarding construction of the proposed impoundments, the DEIS/DEIR states in Section 3.4 pp37 *"Pond construction (primarily the berm on the landward side of the ponds) would cause a small loss of foraging habitat for the western snowy plover, but other foraging habitat would remain outside the Project footprint."* While this is true for the period during and immediately following project implementation, it does not consider the eventual fate of the Salton Sea, which is expected to retreat seaward, all the while increasing in salinity. The DEIS/DEIR uses the retreating shoreline as a rationale for calling project impacts to potential foraging habitats of the Western Snowy Plover temporary, but does not address	Impacts on western snowy plover resulting from increased salinity levels are not impacts of the SCH Project; rather, they are impacts that would occur regardless of whether the SCH Project was implemented. Such impacts are addressed under Section 3.4.4.3, No Action Alternative. No text revisions are required.

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		any impacts to the Western Snowy Plover once the salinity levels increase to the point that they no longer support the present assemblages of invertebrates and the inevitable loss of the lake and therefore, most of, or all shoreline habitat.	
San Diego Audubon Society	SDAS-5	The DEIS/DEIR clearly states the projected acreages of agricultural lands covered under Williamson Act contracts that would be affected, but does not to any meaningful extent provide any estimated impacts of agricultural land conversions to any wildlife, including birds. Agricultural lands are relied upon for foraging and/or nesting by many birds species. Bird use of agricultural lands is of course dependent on the ecology of bird species as well as the crops that are grown and other management practices. Many shorebirds benefit from agricultural lands that are periodically flooded and provide macroinvertebrates. Waterfowl, especially geese benefit from tall grasses that provide nest concealment and from waste grain after harvesting. Western Meadowlarks (Sturnella neglecta) often nest in grass fields and Savannah Sparrows (*Passerculus sandwichensis)* commonly use these habitats during winter, particularly where there are windrows or other forms of cover.	Minimal impacts on wildlife would result from the limited conversion of agriculture land that would occur as a result of Alternatives 1 and 4 (60 acres out of approximately 500,000 acres in the Imperial Valley); no permanent conversion would occur under the other project alternatives. Additionally, please note that protection for nesting birds is provided by Mitigation Measure BIO-2 (page 3.4-40), which addresses the need for a preconstruction/maintenance survey plan for bird species that could be impacted by the project. Pre-construction nesting surveys also would be conducted for birds in all habitats, including any agricultural land that would be affected by the SCH Project. No text revisions are required.
San Diego Audubon Society	SDAS-6	The final EIS/EIR (FEIS/FEIR) should include an analysis of potential changes to nesting habitats for shorebirds at the Salton Sea. The analysis should include species that are known to nest at the Salton Sea in large numbers such as the Black-bellied Plover (*Pluvialis squatarola*), Black-necked Stilt (*Himantopus mexicanus*), and American Avocet (*Recurvirostra americana*) as well as special status species, which would include the Western Snowy Plover.	Please refer to the response to SDAS-4 regarding future changes at the Salton Sea. The SCH Project would provide increased nesting habitat through the creation of nesting islands within the ponds. Nesting also would be available on the landward side of the berms. The nesting of western snowy plover is addressed on page 3.4-37 and 38. Black-bellied plovers are not known to nest at the Salton Sea (Patten et al. 2003). No text revisions are required.
San Diego Audubon Society	SDAS-7	An analysis of potential changes to wintering habitats and macroinvertebrate prey should also be included in the FEIS/FEIR. It is possible that populations of wintering shorebirds could be maintained in the future by increased reliance on adjacent farmlands (which the DEIS/DEIR states will likely increase under any proposed action alternative) and duck clubs for foraging; however, that is not discussed and should be included in the FEIS/FEIR. Impacts to other bird species that would result from the No Action Alternative as well as the alternatives that would affect the acreages and composition of farmlands should be analyzed and discussed in greater detail as well.	The potential for increased use of adjacent farmland would occur as part of the No Action Alternative (refer to page 3.4-32, lines 24-26) and not as a response to the SCH Project. As discussed under SDAS-5, the SCH Project would have minimal impacts on the use of agricultural land, and associated macroinvertebrates, as wildlife habitat. No text revisions are required.
San Diego Audubon Society	SDAS-8	New alternatives should be developed if none of the existing alternatives are determined to provide either "no impact" or beneficial impacts to the nesting and foraging activities of resident and overwintering shorebirds.	Please refer to the response to SDAS-1.
San Diego Audubon Society	SDAS-9	As a suggestion, if the SCH needs to be amended, the creation of a mix of shorebird habitats, including mudflats, permanent sandy shore, shallow water, and saltpans supporting healthy populations of invertebrate prey species would be highly beneficial for the wide range of shorebird species that depend on the	Please refer to the response to SDAS-1.

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		Salton Sea for nesting and foraging. Care should be taken to ensure that any created shorebird nesting habitats are not near perches or roosting areas for predatory birds such as gulls, crows, ravens, and raptors and that if at all possible, they are either protected from, or offer concealment from terrestrial predators such as coyotes, foxes, skunks, and raccoons.	
San Diego Audubon Society	SDAS-10	We would like to reemphasize San Diego Audubon's deep appreciation for your efforts to conserve the habitats of the Salton Sea and our willingness to provide assistance in that effort.	The San Diego Audubon Society's support for the SCH Project is noted.
Energy Source	ES-1	Having been involved with many projects at the Salton Sea over the last 35+ years there is one truism I that I find to be absolute and that is; anytime a map(s) is made such as in the case of shallow habitat at the Alamo River-Morton Bay, it will be adopted by those opposed to any energy development (solar or geothermal) in the area. The writers of this DEIS/R document will point to the various sections that this site is the premier, undeveloped geothermal resource in California and geothermal development can be compatible with SCH. Not one map or exhibit shows the 4000 to 5000 acres of potential geothermal resource development. The Resources Agency recognized the geothermal potential by reserving out this area from the development of habitat.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Energy Source	ES-2	We suggest that all early start habitat projects be conducted in the area of the New River, giving the area of the Alamo River a chance for geothermal development without the conflict of moving the proposed habitat. This would help to meet the State's goal of 30% renewable energy.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Defenders of Wildlife	DOW-1	In addition to these comments, Defenders joins in the more detailed and comprehensive comments submitted by the Pacific Institute on October 14, 2011.	This comment is noted.
Defenders of Wildlife	DOW-2	Defenders has been engaged in Salton Sea efforts for more than 8 years and served as a member of the California Resources Agency's Salton Sea Advisory Committee and has provided extensive comments and recommendation on the California Natural Resources Agency's Salton Sea Ecosystem Restoration Program Programmatic EIR. As part of that document, we endorsed Period 1 activities, including the development and construction of shallow pond habitat complexes known in the document as "early start habitat." The current proposed Salton Sea SCHP is the most recent version of this "early start habitat" and is long overdue given current conditions at the Salton Sea.	This comment is noted.
Defenders of Wildlife	DOW-3	As mentioned above, Defenders strongly supports the construction of shallow pond habitat around the Salton Sea. Unfortunately, the DEIR provides insufficient information for us to determine whether the proposed project will work as intended. First, there is no information or certainty that the state has the legal	Please refer to Master Response 6, Water Rights.

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		right to divert any amount of water from the New or Alamo Rivers for this project.	
Defenders of Wildlife	DOW-4	Second, the DEIR provides little information to show that the proposed project will produce fish in sufficient numbers to provide an adequate forage base for piscivorous birds – the project's stated purpose. For example, there is nothing in the description of the alternatives, the subsequent environmental analyses, or any of the appendices that provides information on projected fish production rates or harvest rates. Section 3.4 states that fish and invertebrates may suffer from seasonal or even daily mortality, due to low concentrations of dissolved oxygen (DO) and low temperatures, but does not offer any estimates of the magnitude of these mortality events or describe how this periodic mortality will affect the overall ability of the project to meet its goals.	Please refer to the response to PI-36 and ICFB-2.
Defenders of Wildlife	DOW-5	Third, the DEIR neglects to provide any information on costs. How much would it cost to construct each alternative? What are the projected annual operations & maintenance costs of each alternative?	Please refer to Master Response 5, Project Costs.
Defenders of Wildlife	DOW-6	How much money is currently available? What additional funds might be obtained? Can the alternatives be scaled back, if full funding is not available? How will this affect the adverse and beneficial impacts analyses? Given the fact that the state agencies have used up more than half of the bond funds for Salton Sea Restoration and the state has no funding plan in place for how to deal with its current mitigation obligations at the Sea, the issue of how any project is going to be funded is critical. Any final project should be designed to be built and operated on existing funds with the ability to be expanded if new funding is secured. Currently, that does not appear to be one of the criteria for this project.	Please refer to Master Response 4, Project Funding and the response to PI-4.
Defenders of Wildlife	DOW-7	As noted above, given that no water has been secured to operate this habitat project, determining the correct amount of water necessary to run this project is critical. According to the DEIR, the preferred alternative could divert more than 50% of the total historic flow of the New River during June, the peak evaporation month. Aside from the fact that future New River flows will be significantly lower in the future, due to water transfers and water conservation efforts in the Imperial Valley and further reductions in flows from Mexico, diverting more than half of the river's flow raises many questions. In addition to the immediate environmental impacts (to the river and riparian corridor downstream and to the estuary formed at the river's mouth), this diversion suggests that a maximum of 7,000 acres of shallow habitat could be constructed near the New River, and perhaps 10,000 acres near the Alamo River, given the volume of water available during June. If this is accurate, what does it say about long-term mitigation strategies for the Salton Sea? Would it be permissible to divert the entire flow of the New River to deliver water to constructed habitat? Or does the preferred alternative represent, in effect, the maximum amount of constructed habitat feasible near the New	Please refer to Master Response 6, Water Rights regarding water supplies. As discussed in Section 3.11.3.3, No Action Alternative, the flow in the New and Alamo rivers is declining over time. With this decrease will come the various changes in riverine and Sea habitat, including the eventual collapse of the Sea ecosystem. The SCH Project uses water from the rivers to replicate the habitat qualities that will no longer be present on the playa, thereby offsetting the lost habitat found with a declining Sea. As the river water supply declines, the SCH ponds would adapt the diversion requirements to accommodate the available water supply. The SCH is not sized to be the maximum feasible habitat but rather the habitat that can be accomplished at an elevation of -234. Additional habitat could be explored in the future with consideration of lessons learned with this project and considerations of available water. No text revisions are required.

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		River?	
Defenders of Wildlife	DOW-8	Furthermore, the selection of Alternative 3 as the preferred alternative appears to be pre-decisional, both because of the criteria used to justify the decision (e.g., because it is the largest alternative) and especially because the agencies apparently are already in the 75% design phase for this alternative as opposed to the other alternatives, even before the comment period has closed and well before the agencies have had the opportunity to review public comments.	Please see the response to PI-5.
Defenders of Wildlife	DOW-9	For the reasons described above and more fully in the comment letter submitted by the Pacific Institute, the preferred alternative is flawed. Instead, a modified version of Alternative 4 should be considered as the preferred alternative as it offers the best opportunity to test future conditions and parameters for habitat construction at the Salton Sea.	Please see the response to PI-20.
Center for Biological Diversity	CBD-1	The Center joins with and incorporates by reference herein the comments provided by Defenders of Wildlife and the Pacific Institute regarding the proposed project.	This comment is noted.
Center for Biological Diversity	CBD-2	The Center supports the overall goals of the proposal to begin the process of habitat restoration in the Salton Sea and specifically to provide early start shallow pond habitat in key areas. However, we are concerned that the DEIS/EIR fails to fully explore the impacts of the proposed project on existing habitat and species and fails to examine how the overall goals of the proposal can best be accomplished through a robust alternatives analysis.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). Please refer to the responses to CBD-3 through CBD-8 for responses to more detailed comments.
Center for Biological Diversity	CBD-3a	For example, the environmental review documents fail to explain how critical water resources will be obtained	Please see Master Response 6, Water Rights.
Center for Biological Diversity	CBD-3b	and the status of funding for the proposed project to ensure it will be completed and have the best chance to provide the needed conservation. Because the proposal is envisioned as part of a series of likely future restoration projects in the Salton Sea, it is critical to ensure that the design reflects that fact and that sufficient monitoring and data collection regarding the effect of the project is also funded so that information can be used to inform future proposals.	Please see Master Response 4, Project Funding.
Center for Biological Diversity	CBD-4	While the focus of the proposed project on restoring habitat for some species may be reasonable, that does not however excuse the DEIS/EIR from failing to fully explain the potential impacts of the proposed project on other species and habitats particularly from the proposed changes in water diversions.	Effects of proposed water diversions (not a change in diversions) were addressed in Impact BIO-5b, and that discussion has been expanded to discuss potential effects in more detail.
Center for Biological	CBD-5	The environmental documents also fail to clearly define the goals for the proposed project in the context of an unstable baseline and historic condition as	Please refer to PI-2.

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Diversity		well as the likely future conditions at the Salton Sea.	
Center for Biological Diversity	CBD-6	Given the complexity of the problem, the Center supports the development of innovative proposals to meet the short-term and long-term goals for conservation and restoration of habitat in the Salton Sea and the Center also recognizes that implementation of well designed conservation and restoration projects for the Salton Sea habitats are essential for the many species that depend on the sea for their survival.	This comment is noted.
		Individuals	
Paul Wertlake, MD	Wertlake-1	This is a simple statement by an interested and concerned person living in the Coachella Valley. An agreed plan, ONE, must be adopted. I believe it must be make a mandatory benchmark although exceedingly difficult to reach due to the diverse factors and views. The many differing views that have been proposed publicly lead to a division of effort, focus, interest and intent. Absent a single cohesive message and plan I fear failure.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Steve Boland	Boland-1	Maybe you could make a canal from the Colorado river into and out of the Salton Sea to bring in fresh water and control the level of the water for wildlife habitat. It would be a more long term solution.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
M. Ryan	Ryan-1	How disheartening to read the report sent to us re: the Salton Sea vs the army Corps of Engineers; i.e. page 3 –“the Corps will evaluate impacts on the environment”- fox in the~~n~~ hen house here! This group creates environmental disasters; 2 immediately come to mind - Idaho Teton dam, Miss. levees in N.O.LA. Spare us this group!	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).
Ruth Niswander	Niswander-1	After studying them, I really can find no reason not to accept the alternative 3, which is the preferred alternative of The Natural Resources Agency. It seems to be the best one! Thank you for sending me the alternatives.	This comment is noted.
James Eric Freedner	Freedner-1	To the extent that any waters would be added to or diverted into the Salton Sea from natural rivers or artificially-created ponds onto or over my property, I oppose the proposal and its draft environmental impact report. It appears from the plan that a greater volume of water may permanently be diverted onto my property. The EIR has not addressed the subject of impacted private land ownership in the Alamo River project. The change to my property would not be merely an "economic" one ("changing land values"), but would be a "taking" of my land without reasonable compensation therefore, in violation of the State and Federal Constitutions.	Section 2.4.1.3, Land Acquisition addresses the process by which land would be acquired. It is unclear where your land is located, but this section indicates that the land where the SCH ponds would be located is owned by IID and would be leased from IID for the Project’s duration, with the exception of the land at the Wister Beach SCH pond, which is owned by a number of private parties. In the case of private land, easements would be obtained from willing landowners only. If an easement cannot be negotiated with a landowner, the proposed facilities would be located at another site. Since land would be obtained only from a willing owner, no taking of land would occur. No text revisions are required.
James Eric Freedner	Freedner-2	As a separate concern with this project, creating fresh-water lakes and stocking them with fish would not resolve the problem of migratory birds coming into	Migratory birds are already in contact with the Salton Sea; the SCH Project is not intended to resolve any problems associated with migratory birds coming into

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		contact with saline and polluted waters of the Salton Sea itself, as they would not necessarily remain in the fresh-water ponds but would roam over the Sea. The fresh-water ponds would quickly be fouled with feathers and excrement and become themselves polluted. A similar attempt to provide refuge for birds was put into place near Malibu Surfrider Beach here in Los Angeles County. As a result, the bacteria content of the public beach increased to the point where Surfrider Beach received an "F" grade on numerous occasions as to water safety. Here, while there is apparently no swimming taking place in the Salton Sea, the added bacterial content and conveyance of foul waters would diminish from the quality and value of the Sea.	contact with the Salton Sea. While birds would defecate in and near the SCH ponds, the ponds would replace a portion of the habitat for these birds that is currently present at the Sea, but that will disappear over time. The Project is not expected to attract more birds to the Salton Sea than are currently present (refer to the discussion in Section 3.10, Impact HAZ-3 and Section 3.19, Impact SOC-7). Thus, the SCH Project would not result in increased pollution of the Salton Sea due to the presence of birds. No text revisions are required.
James Eric Freedner	Freedner-3	It would better serve the area to let the Sea dry up in the due course of nature.	This opinion is noted; it is not a comment on the SCH Project.
Chris Cockroft	Cockcroft-1	The Dept held one meeting several years ago on the plan to restore the Salton Sea. It flopped and no money was appropriated by the Legislature. Last year (June 2010) after the QSA was voided by Judge Roland Candee two very junior reps came to Palm Desert and gave an extremely vague presentation with no stenographer, (no comments were recorded) and no period for comment by the audience. This time, we--the residents of the valley in which the Sea exits--were handed this project as a "proof of concept" for restoration of the Sea. The California Legislature intended to restore the Sea, fix it, as it were. It envisioned an 8 billion dollar project. The idea went nowhere because it was deeply flawed. Now you are calling this a proof of concept, as though it will lead to many other similar projects. This project does nothing for brown pelican, Yuma clapper rail, desert pupfish, peregrine falcon, and bald eagle--all endangered and protected species that must be protected. Change the name of your project. Don't call it a proof of concept because it isn't. It establishes a few ponds to mitigate the problem.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration and Master Response 3, Project Scope. The SCH Project is a proof-of-concept project, as described in Section 2.4, Features Common to the Project Alternatives Carried Forward for Detailed Analysis. No text revisions are required.
Jack M. Feliz	Feliz-1	You are a person of vision and I hope that you will approve of my attached plan for saving the Salton Sea. Perhaps you may present this plan to the appropriate authorities and encourage its accomplishment.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Jeff Geraci	Geraci-1	*B. Amphitrite Saltonensis* was first described a sub-species in 1949 by F.L. Rogers and later retained as valid by Henry & McLaughlin in 1975. In 1992, P.T. Raimondi reaffirmed this statement after detecting differences in larval morphology and development. This unique sub-species of *B. Amphitrite Saltonensis* exists nowhere else in the world but at the Salton Sea, which leaves me baffled as to why there is no mention of preserving, protecting, or otherwise assessing the potential impacts on this isolated and unique sub-species of	The rationale for SCH Project goals is discussed in Section 1.3. Also refer to Master Response 3, Project Scope. Barnacles are not a targeted species of the SCH Project. Changes in the salinity of the Salton Sea that will adversely affect barnacle populations will occur regardless of whether the SCH Project is implemented. The SCH Project would not adversely affect barnacle populations in the Salton Sea; thus, such impacts have not been discussed. The SCH Project, although not specifically targeted for barnacles, could benefit the subspecies through a more stable water quality and at least limited attachment

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		barnacle.	habitat within the ponds. No text revisions are required.
Jeff Geraci	Geraci-2	Barnacles are filter feeders, and in high densities they can have a positive impact on water quality and water clarity, as well as the Salton Sea's food web. Barnacle colonies provide critical habitat for a variety of other benthic organisms that comprise the base of the Salton Sea's food web. As I stated, in reviewing the EIR for this project, I found that there is no mention of *B. Amphitrite Saltonensis* in the CEQA section of potential impacts; the only mention of this barnacle that I found in the EIR is in the context of shoreline composition (i.e. dead barnacle shells) and salinity. This concerns me very much, because the survival of this barnacle population will be significantly threatened by the current design of this project, as will other vital organisms found in and around the Salton Sea, yet *B. Amphitrite Saltonensis* has apparently been overlooked. I have attached my comments to this letter, for a total of 3 pages including this page. Thank you.	Please refer to the response to Geraci-1.
Jeff Geraci	Geraci-3	This concern applies to all aquatic organisms found within the Salton Sea, not just the barnacle population. As noted, this project is to be implemented in phases, and the initial phase of the project will create a relatively small waterbody as habitat, in comparison to the size of the current sea. This could present significant problems for the biota, since the response of small waterbodies to environmental stressors (e.g. pollution, temperature distribution, nutrient loading, oxygen depletion) is much faster and more severe than with larger waterbodies. With larger waterbodies, the changes are more gradual, there is more potential for dilution and dispersal, and in some cases organisms can flee to a more suitable area within the waterbody- that is not possible within a smaller waterbody such as with the proposed project design.	The SCH Project is not a phased project. It is proof-of-concept project that is intended to test concepts that could inform future restoration efforts should funding become available. Funds are not available for larger restoration projects at this time. No text revisions are required.
Jeff Geraci	Geraci-4	In addition, the change in hydrodynamics will be perhaps one of the most significant impacts of the project as a whole. The hydrodynamics of water movement within the proposed initial phase will result in enormous impacts based on the morphometry of the basin, its stratification structure, and the reduced amount of surface area exposed to the wind.	It is not clear what impacts are being referred to. Hydrodynamics of the SCH ponds will be different than at the Salton Sea, but the Project would not affect the hydrodynamics of the Sea. Considerable study has been given to how to best design the SCH Project to support targeted fish and bird species, but this is a proof-of-concept project and information gathered regarding successes and failures will be used to inform potential future projects. No text revisions are required.
Jeff Geraci	Geraci-5	Finally, suspended silts and sediments are often deadly to barnacle populations, interfering with propagation, respiration, settlement of cyprids and filter feeding. Construction and maintenance of the berms, as proposed, will have a very significant short and long term impact on barnacle colonies in terms of excessive suspended silt and sediment, and these impacts must be mitigated.	Although suspended sediments can be deadly to barnacle populations, the SCH Project site is in an area with predominantly soft substrate that does not provide attachment sites for barnacles and few to none would be present to be affected by construction activities. Furthermore, the SCH Project would affect only a small portion of the Sea's shoreline and habitat for barnacles. Therefore, no mitigation is needed. No text revisions are required.
Jeff Geraci	Geraci-6	The initial phase of the project, as proposed, is insufficient in size. There must be	The size of the SCH ponds is limited by available funding (refer to Master

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		substantial acreage added to the initial phase, as well as additional acreage designated for deep water habitat that will allow fauna to escape hostile conditions and will facilitate dilution, flow, and distribution of temperature. Deep water habitat is also crucial for maintaining much needed diversity in such a small ecosystem. There must be a substantial increase in the total volume of water of the initial phase, and the barnacle populations must be protected from the highly turbid water that would result from berm construction and maintenance.	Response 4, Project Funding). The ponds are being designed to provide habitat diversity to the extent that is practicable and consistent with the goal of supporting fish and wildlife species dependent on the Salton Sea. Barnacles are not one of the targeted species. No text revisions are required.
Jeff Geraci	Geraci-7	Barnacles require suitable substrate for settlement, which includes hard or otherwise rigid materials, preferably in close proximity to the waters surface where there is plentiful oxygen exchange and water movement. Note also that once a barnacle is settled, that settlement is permanent and it is impossible for the organism to detach and migrate should environmental conditions become unsuitable. Having said that, there is nothing noted in the EIR that suggests there will be suitable substrate for the barnacle population to even exist, let alone thrive. It is not a valid argument to assume that the barnacles will simply "find a way" to survive, given that they are sometimes considered a "nuisance" or "bio-fouling" organism; that is not good science and it is not an acceptable form of mitigation under CEQA.	Please refer to Master Response 3, Project Scope. Barnacles are not a targeted species of the SCH Project. Although the SCH ponds are not being designed specifically to support a barnacle population, some of the slope protection on the berms will likely provide hard substrata for barnacle attachment. No text revisions are required.
Jeff Geraci	Geraci-8	Mitigation measures must be implemented to ensure the survival and continuation of the sub-species *B. Amphitrite Saltonensis.* Mitigation measures must be proposed for creating suitable artificial substrate within the project, beginning with the initial phase. This substrate should be strategically located at specific depths to ensure both optimal oxygen levels and flow rates for feeding and settling. Substrate could take the form of quarried rocks situated on the proposed berms as rip-rap, or as partially submerged rock formations on the shoreline, provided the threat of high suspended solids is mitigated as well.	Please refer to the response to Geraci-5. Effects of increased salinity and receding shoreline in the Sea are not caused by the Project and do not need to be mitigated. No text revisions are required.
Jeff Geraci	Geraci-9	Impacts to the Salton Sea's barnacle population could have serious detrimental repercussions on other sea life, and therefore, those impacts must be adequately mitigated under CEQA. Barnacle colonies within the Salton Sea can be considered an "umbrella" species that provides habitat not just for itself but for other benthic fauna as well. For example, the native pileworm (*Neanthes Succinea*) is a vital food staple for fish, and for both the native bird population and seasonal birds who migrate along the pacific flyway (some of which are listed in the ESA). Barnacle colonies provide ideal habitat for many benthic organisms including pileworms, amphipods, ostracods, etc., offering both shelter and a renewable food source. Salton sea barnacle colonies host a diverse community of benthic organisms whose symbiotic relationship with other Salton Sea organisms must be protected and preserved.	As noted in responses to Geraci-5, Geraci-7, and Geraci-8, loss of barnacles in the Sea would not be caused by the SCH Project, and the proposed ponds are not being designed to specifically support barnacles and other macrofauna that have been present in the Sea. The design would provide habitat for invertebrate macrofauna that may develop given the salinity and other water quality conditions in the ponds, and it would provide forage for fish. No text revisions are required.

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Jeff Geraci	Geraci-10	There is the need to incorporate mitigation measures into the SHCP project to preserve and protect the *B. Amphitrite Saltonensis* population, including but not limited to, incorporating suitable artificial substrate and re-designing the water basins to optimize the hydrodynamics of the proposed basins.	Please refer to the response to Geraci-1 regarding the scope of the SCH Project. The SCH Project would not result in significant impacts on barnacle populations; thus, no mitigation is necessary. No text revisions are required.
Jeff Geraci	Geraci-11	As I mentioned above, this sub-species of barnacle (*B. Amphitrite Saltonensis*) was first described a sub-species in 1949 by F.L. Rogers and later retained as valid by Henry & McLaughlin in 1975. In 1992, P.T. Raimondi reaffirmed this statement after detecting differences in larval morphology and development when comparing to *B. Amphitrite Amphitrite*. This unique sub-species of *B. Amphitrite Saltonensis* exists nowhere else in the world but at the Salton Sea, and without adequate mitigation, the public could lose this unique and valuable resource.	See response to Geraci-8.
Patrick J. Maloney	Maloney-1-1	A. Correspondence with the SWRCB concerning Statements of Water Diversion and Use for Colorado River diversions germane to the water source for the Project. These statements notify the world of claims to water that may flow into the Salton Sea, which claims would be superior to any claims of third parties to the water. As the correspondence illustrates, these statements substantially predate the present Draft EIR. Attachment 1 includes: 1. Summary of Water Diversion Statement Filings 2. May 12, 2006 Osias letter to Whitney 3. May 16, 2006 Maloney letter to Whitney 4. August 30, 2006 Maloney letter to Grober 5. April 22, 2010 Virsik letter to Whitney 6. June 16, 2010 Virsik letter to Whitney 7. July 21, 2011 Virsik letter to Hoppin 8. September 22, 2011 Virsik letter to Evoy	Please refer to Master Response 6, Water Rights. Attachments to this comment letter are posted on www.water.ca.gov/saltonsea.
Patrick J. Maloney	Maloney-1-2	B. The Draft EIR relied in large part on a PEIR for a project that has not been approved by the Legislature of the State of California. (Final Programmatic Environmental Impact Report (Final PEIR) and Salton Sea Ecosystem Restoration Study 2007.) Since the Legislature has never approved any project, the time in which to challenge the PEIR has not lapsed. Public Resources Code §§ 21108, 21152, and 21167. The present Draft EIR is therefore relying on a PEIR that is untested and still subject to revision or invalidity. In addition, there are fundamental flaws with that PEIR and we have attached our comment at Chapter 8, page 137, #IG-16 (included in Attachment 1). *Note: Comment #16 was included in the Final PEIR and is reproduced here:* *However, the Consortium continues to be concerned that, in connection with the*	The Draft EIS/EIR primarily relied on the PEIR for the description of the No Action Alternative, although prior to the issuance of the Draft EIS/EIR, this information was reviewed to ensure that it was applicable. This information also was updated where needed to reflect changes that have occurred since the PEIR was issued. The Draft EIS/EIR also relied on the PEIR for certain descriptions of existing conditions, although these also were reviewed to confirm their applicability and updated as appropriate. The PEIR was prepared by DWR and DFW, two of the three agencies responsible for preparing the Draft EIS/EIR, who believe the information used in the PEIR and SCH Draft EIS/EIR to be accurate. The fact that the PEIR has not been subject to legal challenge does not invalidate the accuracy of the information that it contains. Regarding comment #IG-16, the Natural Resources Agency complied with the

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		preparation of the DPEIR, the State did not make a greater effort to hire consultants reflective of the diversity of the Imperial Valley community, which will be most impact (sic) by Salton Sea Restoration. The Consortium has made a significant effort in its hiring of its Advisors and developing its proposal and the Consortium believes it is in conformity with the spirit of the State of California on this issue as set forth in Public Utilities Code section 8283. The Consortium in its ultimate construction of this project plans to follow the spirit of Public Utilities Code section 8283. The State's behavior to date, however, does not.	State contracting requirements. The referenced section of the Public Utilities Code does not appear to apply to this study. No text revisions are required.
Patrick J. Maloney	Maloney-1-3	C. Briefs filed by the County of Imperial and others in the QSA Litigation. QSA Coordinated Civil Cases, C064293, California Court of Appeal, Third Appellate District. These briefs more thoroughly describe the issues that remain pending before the Court of Appeal. The case is scheduled for oral argument on November 21, 2011. The QSA trial court decision and the issues raised in these briefs raise questions about many of the factual assumptions on which the Draft EIR is based. Until there is resolution of these issues it makes no sense to go forward with a proposed Project. Pointedly, the PEIR recognized as much: "The discussion of Salton Sea restoration cannot take place without recognizing the Quantification Settlement Agreement (QSA) signed in 2003." Appendix H Ecosystem Restoration Study 2006, Salton Sea Ecosystem Restoration Program, p. H-1. The attached briefs include: 1. Morgan-Holtz Parties - Ronald Leimgruber and Larry Porter's Brief 2. Imperial County Air Pollution Control District's Opening Brief. 3. County of Imperial's Opening Brief 4. POWER's Opening Brief 5. Imperial County Air Pollution Control District's Reply Brief 6. County of Imperial Reply Brief 7. County of Imperial and Imperial County Air Pollution Control District's Brief in Response to Amici Curiae of Audubon California, et al. 8. Cuatro Del Mar's Combined Answer to Amicus Brief of Planning and Conservation League, et al.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). Please refer to the response to ICAPCD-1.
Patrick J. Maloney	Maloney-1-4	D. Two 2011 Resolutions from the Imperial irrigation District that raises issue about the flow into the Salton Sea. Attachments include: 1. IID Resolution 3-2011 2. IID Resolution 27-2011	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). IID Resolution 3-2011 calls on the State of California to adopt and fund a restoration alternative for the Salton Sea that includes mitigation of air impacts and preservation of habitat as the most critical components. This does not address the SCH Project. IID Resolution 27-2011 addresses IID's petition to the State Water Resources

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			Control Board to amend their existing mitigation requirements. This is not a part of the project analyzed in the Draft EIS/EIR. The lead agencies are not required to speculate about the outcome of a legal process that could yield many different outcomes.
Patrick J. Maloney	Maloney-1-5	A. The EIR drafters have not examined other projects around the country and the world to determine if it is necessary to spend ten years examining the “proof of concept.” The EIR drafters are assuming that they have to re-invent the wheel.	This is a unique project in a unique setting (e.g., in terms of soils conditions, water quality, climate extremes). The design team is using information from numerous other projects to inform the design. The operations framework has relied on, and will continue to rely on, information from other relevant studies, such as the USGS/Reclamation ponds (refer to Section 1.6, Development of the Salton Sea Species Conservation Habitat Project). Input also has been provided by Dr. Kevin Fitzsimmons (University of Arizona), a recognized expert in tilapia aquaculture in estuarine and saline environments globally, including the Salton Sea basin. The 10-year proof-of-concept period was identified to account for ample time to evaluate the numerous variables involved and to allow time to account for conditions that would occur after 2017, when IID stopped providing mitigation water to the Salton Sea. ICAPCD-1
Patrick J. Maloney	Maloney-1-6	B. The Drafters failed to consider the value of lands for agricultural purposes that would be created from the reduction of flows. Instead, the drafters assume without analysis that the “proof of concept” Project must be placed only on the sites analyzed.	The potential to reclaim land for agricultural purposes at the site of the SCH ponds was considered in the Draft EIS/EIR, but was considered speculative at this time (Section 3.19 Socioeconomics, Impact SOC-4. NEPA (section 1508.8(b)) requires that an EIS must make a good faith effort to explain the effects that are not known but are "reasonably foreseeable." Speculation is not required. The CEQA Guidelines (section 15145) also indicate that if a lead agency finds that an impact is too speculative for evaluation, it should note its conclusion and terminate discussion of the impact. As indicated in comment IID-34, IID, which is the landowner for all alternative pond sites except those involving private ownership in the Wister Beach area, has agreed that reclamation of land for agricultural purposes is speculative. The statement regarding the lack of analysis in site placement is not correct. Section 2.2 and Appendix B detail the extensive screening process that was used to identify sites and project components. The availability of a nearby, suitable water supply was a critical requirement. Sites near the Whitewater River were eliminated due to lack of adequate water supply. Use of water from agricultural drains and groundwater also was considered as water sources but eliminated for reasons described on page 2-4, lines 32-37. No text revisions are required.
Patrick J. Maloney	Maloney-2-1	We just received in this afternoon’s mail the attached letter dated 10-13-11 and enclosures and have had no opportunity to review it yet. This appears to relate to point C in our comments of the same date. If appropriate, we will forward further comments after review of this latest development. Encl. October 13, 2011 Herrema letter to Virsik Joint Petition for Modification of	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). The attachment to this comment letter is posted on www.water.ca.gov/saltonsea.

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		Revised Order WRO 2002-0013	
Don Hedgepeth	Hedgepeth-1	I think Alternative 3 is the best of the six Alternatives. Thank you for holding the meeting in Palm Desert on Sept. 15, 2011	This comment is noted.
		Public Hearings	
	Calipatria		
Mike Morgan	C-1	One question I would have, have you and this project affirmed and created a right of water for the use in this project? As you know, the New River is claimed by Metropolitan Water District and possibly the IID.	Please refer to Master Response 6, Water Rights.
Mike Morgan	C-2	I think part of an EIR you have to have a – if you're planning to use water in a project, you have to have it – you have to obtain – you have to own it. You have to be able to secure it. You can't just take it. And so I just didn't know if that was addressed yet in this project.	Please refer to Master Response 6, Water Rights.
Mike Morgan	C-3	Would the project be using Metropolitan's claimed water right than affirming their water right by putting it to beneficial use or would it be using someone else's right?	Please refer to Master Response 6, Water Rights.
Dave Van Cleef	C-4	Mine was more contextual, which is, is this the same project as Quick Start?	As discussed on page 1-8, lines 27-28, The SCH Project is consistent with the description of Early Start Habitat identified in the PEIR, but it is not the same as Early Start Habitat. No text revisions are required.
Bruce Wilcox (Imperial Irrigation District)	C-5	The IID board has already affirmed its support of this project with the board memo and we appreciate the level of coordination that we've seen from the State and from the consultant team in developing this, and we're really pleased with the progress you've made in the last year.	IID's support of the SCH Project and process is noted.
Chris Schoneman (Salton Sea National Wildlife refuge)	C-6	It would be, I think, convenient if the project was built kind of in a modular fashion so that in the future, assuming everything works out very well here and water levels continue to decline, maybe it even states this in the document, that the pumping capacity can be increased so that it can be built out further down the stream and extend the benefits of the habitat that's already out there.	The Project could be expanded in the future by adding additional area or diversion facilities. Any future expansion beyond what was analyzed in the Draft EIS/EIR will require additional environmental analysis. No text revisions are required.
	Brawley		
Frank Bailey	B-1	I think you've come up with some great ideas, but how likely are we going to find the funding to be able to complete one of these projects? I would love to see some of these wetlands habitat go in. I've been asking for something, we've been -- when they were first developing some of the projects around the sea, I was asking them why don't we do something and try to save some of this habitat.	Please refer to Master Response 4, Project Funding.

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Frank Bailey	B-2	The second question, you know, being with funding, why was the number three alternative the preferred alternative and what are we looking at? In these projects do we have the funding to do any of this?	Please refer to Master Response 4, Project Funding. The reasons why Alternative 3 was selected as the State's preferred alternative are discussed in Section 7, Summary Comparison of Alternatives. No text revisions are required.
Daniel Santian	B-3	So this is my only interest to make sure that Imperial Valley residents will be considered first for jobs.	State contracting law requires competitive bids; thus, while it is reasonable to think that a number of jobs would be filled by local workers, this cannot be guaranteed. No text revisions are required.
Andy Horn	B-4	I'm sitting back here between two geothermal developers and I'm not sure that I see a great look of comfort or haven't heard those comments, and I've talked to a number of people who still have some concerns about this project and the potential of that to interfere of prevent some maximization of geothermal energy production in that area. I know you guys are aware of it, you've got it up on the board, but I think we need to do some more assuring of the geothermal people and people that rely on income from those sources and so it's going to see that you have taken it into consideration, but I just recall back from the first meeting I went to and they said don't worry, we're going to construct causeways out there that will support heavy vehicles and they can get out there and access for drilling and maintenance and so forth of geothermal facilities, and the second time and third time we went to the meeting and they said, oh, no, we've abandoned that, it's too expensive, and the commentary was that they're going to use native soils and those soils would not support heavy equipment. And I don't know what the design criteria are today, but I think we need to add a little more dialogue.	Please refer to Master Response 8, Compatibility with Geothermal Development.
Larry Grogan (Energy Source)	B-5	One of the things that bothers me when we see these plans that come in after we've done the huge Salton Sea Authority Plan with the State as part of the QSA, I think in three volumes, is there's not one mention of that in this document. And certainly when the final preferred design was make, 4200 acres was carved out of that as an overlay or whatever it is for geothermal development because they do recognize it.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). The Salton Sea Authority's plan is separate from the State's Salton Sea Ecosystem Restoration Project and is unrelated to the SCH Project. The Ecosystem Restoration Project also is an independent project. This project, and its relationship to the SCH Project, is described in Section 1.6.1. A comment on the design of either the Salton Sea Authority's plan or the Ecosystem Restoration Project is not a comment on the SCH Project.
Larry Grogan	B-6	Somewhere in all these exhibits there should be at least some recognition of what the resource area is so that we have something five years from now when we come back and everybody in the world is saying yeah, but this is what we approved because it was preferred Alternative Number 2A and there's nothing in there about geothermal. It's in the dialogue, but this is our plan, we plan to put these dikes out there, we plan to put this well, this pond here, we're going to put this fishing pond over here. Some of those fishing ponds that you show on the area there basically right now have a surface manifestation of boiling water at the	Geothermal resources are discussed in Section 3.13, Land Use. No text revisions are required.

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		surface. This is just south of Mullet Island and you have that entire fault zone through there that I would hate to have to put any type of wildlife habitat and depend on it staying necessarily with CO_2 coming up and certainly with the possibility of hot springs coming up through that area.	
Larry Grogan	B-7	But other than that, can they be compatible, the answer is yes, but when you start putting plans with dikes, with causeways or whatever it is right now without having really a dialogue with the industry how we could develop it, then we've set ourselves up for problems in the future.	Please refer to Master Response 8, Compatibility with Geothermal Development. All of our geothermal coordination has been, and will continue to be, through IID. No text revisions are required.
Larry Grogan	B-8	As far as mitigation, let's face it. The State has almost no money to develop this thing, so you're going to be looking for someone to contribute to actually do some type of offsets. We don't mind that, but we'd like to be a part of the thing more up front before you put these lines on the map.	Project funding sources are addressed in Master Response 4, Project Funding; they do know include contributions from private entities. Please refer to Master Response 8, Compatibility with Geothermal Development for a discussion of coordination with geothermal developers. No text revisions are required.
Ted Martin	B-9	My question is why are we taking virgin land which we can make into geothermal? The wildlife preserve and state and the federal wildlife preserve, why can't we use those ponds that we already have and use that with the same thing? They're right along the Alamo River. Some of these guys know what I do for the district, but I'm not representing the district. I'm representing myself. Why can't we use the resources we already have? The ponds are there. I know these ponds need to be improved upon anyway. What is the problem with the land we already have instead of taking new land and taking this land out of production for geothermal and put it in that way?	As discussed in Section 3.13, Land Use, Impact LU-3, the SCH Project would be designed to minimize conflicts with other planned land uses, including geothermal development. The SCH Project is being designed specifically to provide fish for fish-eating (piscivorous) birds that are dependent on the Salton Sea (refer to Section 1.3 CEQA Project Goals and Objectives / NEPA Purpose and Need for additional detail), and this type of habitat is not available at the refuges in the area. No text revisions are required.
	Palm Desert		
Dale Grajcer (Ph.D. fisheries U of BC)	PD-1	I have had fish farming in this valley for 37 years and I remarked in all the meetings -- on some of the meetings, and I am surprised first about the choice of the fish which is not local, Tilapia, it's not of the American continent, it's not North American, not South American. And why we choose a fish that doesn't belong here, we should try to get them out of here. Why do we choose that fish as our model in our experimentation.	Please refer to Master Response 1, Selected Fish Species.
Dale Grajcer	PD-2	I want to also correct something. I know that you get your money not only from the federal and the state but you get a lot of money, $25 million from my water district, and that's my money, that's our money, local money, and our ratepayer has a lot to say and a lot to lose on it. You get also $25 million from IID and $25 million from San Diego. So the money is not entirely government, a lot of it is ratepayer money.	Please refer to Master Response 4, Project Funding.
Dale Grajcer	PD-3	You choose Tilapia because it happens to be around and despite the Fish and Game trying to keep them out of here. The Fish and Game then was told the Tilapia will take over any other species in the Salton Sea because they can go to	Please refer to Master Response 1, Selected Fish Species regarding the selection of tilapia. Fish experts from the Department of Fish and Wildlife were involved in making the selection of fish for the SCH ponds, and they also

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		higher salinity and lower salinity. You chose Tilapia because it can take the temperature, the high temperature, not the low, but you don't have enough people who knows fisheries. There are good schools in this country like Auburn and Alabama, Texas A & M in Texas, the Marine Institute in Maryland, and you didn't ask for any experts. Your experts are usually people from fish -- from game, not from fish and they know very little about fish. Now, we have a local fish who is a native to the Salton Sea, can take higher salinity, much higher, to 8.5, they can take the temperature a lot better than the Tilapia, and with the help of all the institutions that we have around here, we manage to eliminate forcibly out of the Salton Sea by mistake because we didn't know or people didn't know the fish travels up river then down river and is native to the Salton Sea, and we had the commercial fishery here in '42 of that abundant fish, not only that the fish is specialized in eating detritus, in other words it cleans the water.	consulted documentation by other experts in making decisions on species to select for the Project. No text revisions are required.
Dale Grajcer	PD-4	Okay. We are building ponds which are not -- if the Corps of Engineering is looking over it, engineering would be fine, but what are you going to do with it? Because I expect to have the same problem that we had always in the Salton Sea of having algae bloom. With Tilapia you have algae bloom. Without Tilapia we will have algae bloom. The only thing that might stop it is mullet. You have algae bloom, you'll have fish kills, the same as you have now, you'll have smells and you'll be sued for it. You'll have H2S, which is dangerous to people living on fish, and if you don't take care of it, those beautiful ponds that you're building are beautiful and I know the Corps of Engineer will do a beautiful job for us, but we'll have nothing but trouble. We'll have to aerate it and you don't have any provisions for it. Of course -- it -- it can be expensive because now you have to bring it back. You'll have to have hatcheries to grow mullet, fishery to start them, put them in the Salton Sea and you can save the whole Salton Sea, not only the bottom. Mullet can take 8.5 percent salt. You can look it up in the literature. I don't have to do it for you.	Please refer to Master Response 1, Selected Fish Species regarding the selection of tilapia over mullet. H_2S does not taint fish meat; it is only present in high concentrations in the absence of oxygen, which can kill fish. High nutrient concentrations in the ponds from the influent water are likely to result in plankton blooms that have the potential to result in low dissolved oxygen levels that could cause fish kills. Monitoring will be conducted to determine if this happens and under what conditions so that adaptive management can be implemented to reduce or eliminate the problem. The potential for odors to result from fish kills was addressed in Section 3.3, Impact AQ-7, and it was concluded that this impact would be less than significant. No text revisions are required.
Chris Bogart	PD-5	I would just like to say I've been trying to come to the meetings over the past two years on this process. The last meeting was very vague and it was really very not very informative and poorly handled. The one before that was just a general introduction. Intervening time between the second meeting and today there has been very little sent to us informationally in the process. I got a Corps of Engineers thing. I read the website occasionally. I would like to protest the fact that the people and the public In this community are really not being included in this to the extent that they should.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). The public outreach process has complied with all regulatory requirements and is documented in Section 6.2, Consultation and Coordination.
John Kariotis (West Shores Salton Sea	PD-6	One of the comments, I think I can answer some of the people's questions, especially Dale's. This is for fish and birds and does not affect anything in the way of what the Salton Sea Authority's plans would have done in the way of	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion).

Name	Com. No.	Comment	Response/Issues
Growth Association)		People and economic development for the Salton Sea.	
Carrie Berman	PD-7	Are there any considerations for different species of fish outside of the Tilapia?	Please refer to Master Response 1, Selected Fish Species.
Leo Borunda	PD-8	The water front is going down. Don't let that happen. Let's save the Salton Sea. Never mind all these other plans and put ponds here and ponds there and ponds over there. We don't need that. We need to save the Salton Sea. It's a beautiful body of water. I've been at the Salton Sea a little over 15 years and made over $10 million at the Salton Sea and I've got ten properties and I've got the big ranch, 152 acres of land. So the thing is that the Salton Sea is ready to help us all and do things for us, but we've got to do things for the Salton Sea, not on the basis of putting a pond here and there and pond there. That's not necessary. If we did something and gave the water rights to San Diego a long, long time ago, this is a long time, it should be argued now that that was a mistake and it should not be done, and if we can't get that, let's get water from someplace, but let's not let the Salton Sea die, please. Let's not let it die. It's a beautiful, beautiful body of water and it should not be destroyed.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Mohammed Wasif	PD-9	I think what we are doing actually right now with 3700 acres, one of the best things that can ever happen, at least let's start with something, not to try and drag this and take this miles and miles across and say we are going to do this. This is not nothing magic that we can turn around. It requires millions and millions of dollars. And the salinity, desalinization is not an easy thing because you can't do it straight away. No, two years, I think it's one of the greatest things that has ever happened.	Your support of the SCH Project is noted.
Mohammed Wasif	PD-10	I'm so glad and the engineer and gentleman who explained everything is absolutely -- you know, I'm really proud of the fact at least something is happening instead of just going on, you know, and I don't know how non-profit organization complaint.	Your support of the SCH Project is noted.
Mohammed Wasif	PD-11	But I personally feel that we must have some sort of a lottery, Salton City lottery so that the people can put some money in and raise funds, maybe five years, ten years, whatever it takes, and then use that money and then we can have, you know, exit from Salton City into the sea by having, you know, exit by huge sort of pipes, maybe five, ten pipes or something like that to the shortest distance and that would be really remarkable, but they take time.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Mohammed Wasif	PD-12	But you know, I think I personally feel that what you people are doing right now with this meeting, it's wonderful. I'm so proud of you.	Your support of the SCH Project is noted.

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Paul Norman	PD-13	There's another water source and that's the Artesian wells going to the lake. Is there anybody doing that or thinking about establishing any parameters around those for water?	The use of groundwater is addressed in Section 3.11, Hydrology and Water Quality. Page 3.11-21, lines 19-26 concludes that groundwater currently is not a viable source for the SCH Project. No text revisions are required.
Linda Beal	PD-14	Is there a different kind of fish that could do better in the sea?	Please refer to Master Response 1, Selected Fish Species.
Linda Beal	PD-15	Also, could we -- if we get so many Tilapia, they're just breeding like crazy, is there a way we could harvest Tilapia at different times that could help the sea in some way? I don't know. They could be harvested in a big way so we wouldn't have so many die-offs and things like that.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration. This appears to be a comment on conditions at the Salton Sea, not on the SCH Project. No text revisions are required.
Linda Beal	PD-16	Also, what will this project do for the rest of the sea? How will it impact the rest of the sea? I know this is going to be good for the birds to eat different fish or whatever you may have in these other little ponds and things and is there any other kind of thing besides fish that you might be raising in these ponds for the wildlife?	Restoration of the rest of the Salton Sea is not the subject of the SCH Project EIS/EIR (refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration). Impacts of the SCH Project on the Salton Sea are addressed in the Draft EIS/EIR; for example, the Project's impacts on the Salton's Sea's water quality and surface water elevation are addressed in Section 3.11, Hydrology and Water Quality. As discussed in Section 1.3, The SCH Project's target species are those piscivorous (fish-eating) bird species that use the Salton Sea and that are dependent on shallow saline habitat for essential habitat requirements and the viability of a significant portion of their population. Thus, the Project specifically intends to provide fish as a food source. As discussed in Section 1.5.3, a number of other aquatic organisms that currently comprise (or recently comprised) the food web supporting fish in the Salton Sea, such as phytoplankton, zooplankton, and benthic and water column macroinvertebrates, or other species with similar habitat functions and food-web functions, would become established or would be introduced into the SCH ponds. No text revisions are required.
Kathy Cronemeier	PD-17	I want to know what the impact of your project on the Salton Sea will be, if it will be taking down the water level and creating more air pollution because as it dries up, we know that the air pollution is going to be horrendous for the Coachella Valley.	The impacts of the SCH Project on the resources of the Salton Sea are addressed in the Draft EIS/EIR. The change in water surface elevation of the Sea that would occur under each alternative is discussed in Section 3.11, Hydrology and Water Quality under Impact HYD-1. As discussed in Section 3.3, Air Quality and Section 3.11, Hydrology and Water Quality, the SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust. Thus, the Project would have a beneficial impact on air pollution from dust emission from exposed playa. No text revisions are required.

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Margit Chiraco Reshay	PD-18	I think we ought to emphasize save the Salton Sea and not have all these little bitty things going on around it unless you can really prove to us that it's going to be a part of saving the Salton Sea. So I just really believe that we need to save that beautiful body of water. We go down there, we go around it, we enjoy looking at it, and it is indeed a visual treat for those of us in the desert and I would hate to see it go away.	Please see Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Imari Kariotis (West Shore Salton Sea Growth Association)	PD-19	Mr. Davis, I had a talk to you on the phone and so did my husband about holding a meeting on the west shores. Most of the state meetings have been on the west shores. There are several buildings you guys could have held a meeting in. Most of the people in our membership felt slighted that there wasn't one.	Please refer to the response to PD-5.
Imari Kariotis	PD-20	There hasn't been very much communication between the State and the people. Now, IID, CCWD, yes, DWR, but you haven't come to the small people and we want you guys to do that because we have ideas and you really can't do it in an hour and a half.	Please refer to the response to PD-5.
Candace Weber	PD-21	So I think the ponds are a great start. I think -- I don't know if this has been stated or not, but a big, big issue is I see with my students, who to me represent the public in general to a certain degree, is a lot of lack of information, misinformation, the belief of the myths about the Salton Sea that it's toxic, it's a wasteland. It does have a smell to it, they don't understand why. All these things that we already know about, and I don't -- I think my purpose -- my point of this is, is there some way that we or the agencies, Fish and Wildlife can partner with the local news agencies, the Desert Sun, the Nightly News, and get the correct information out there?	Your support of the SCH Project is noted. An extensive public outreach process has been followed and is outlined in Section 6.2, Consultation and Coordination. No text revisions are required.
Candace Weber	PD-22	The water transfers are a big issue for the Salton Sea, so that's why the ponds are a great way to start to figure out how to save habitat to save the whole Salton Sea. I honestly hadn't heard it's possible to save the whole sea because of the QSA and the public doesn't understand the issue of water out here in the west. The CVWD, all know there's an over-demand for the Colorado River. We just don't know. People just don't know. If you want people to get behind the Salton Sea and help push for state funding to get these plans and these ponds set, you need a public who is educated, not just the few in the room here. You know what I'm saying. So there's some way we have to partner with the public news agencies and get correct information out there and get the reporters to care about it. That's all I have to say.	This comment is noted. It is not a comment on the SCH Project. No text revisions are required.
Peter Nelson	PD-23	Tuesday the IID Board resolved to ask the State Water Board to allow it to stop putting QSA mitigation water into the sea, thereby setting the stage to sell nearly 400 or 5,000 acre feet of additional water to coastal communities.	This comment does not raise a significant environmental issue specific to the SCH Project (please refer to Section 2.3 of the Final EIS/EIR for further discussion). The IID/SDCWA petition to the State Water Resources Control

Name	Com. No.	Comment	Response/Issues
		How would that action affect this project, either positively or negatively, and as Secretary John Lehr (sic) described this project not as species conservation habitat but as Early Start habitat. How would that action affect any future projects positively or negatively?	Board to amend their existing mitigation requirements is not a part of the project analyzed in the Draft EIS/EIR. The lead agencies are not required to speculate about the outcome of a legal process that could yield many different outcomes.
Dale Grajcer	PD-24	Everybody knows or should that the Salton Sea at the moment evaporates nearly two million acre feet of water a year. That affects the climate of the whole valley. Without it, we're being exempted because we have the same conditions as Death Valley. Without it would be 130 degrees in the summer, not 120, and I don't know about -- education just to be sure, but remember that it's 2 million acre feet evaporates and that affects the temperature very heavily, both in the summer and in the winter.	This comment is noted. It is not a comment on the SCH Project. No text revisions are required.
Mohammed Wasif	PD-25	I've got to point out the federal government has got to take interest in this. We have money funds to go to Iraq, all the places in the world. We don't have money to spend in our own home. This body of water is one of the best things that can ever happen in California. So close to San Diego, so close to so many places. It could be absolutely a central beautiful area with, you know, thousands and thousands of people coming, only the water would be used. So I think somebody has got to bring the President over here and say this is a body of water we have and you know, the only thing is it's dead water. Then he would say what can we do about it. So we've got to find some way of raising funds for this area. That is the only thing I would wish the people -- and I'm very proud of the fact, but we should progress more and do it more. And right now I know China is taking interest in everything in the world. You go to Saudi Arabia, they're doing thousands of acres of land, they're doing railway, doing hundreds and thousands of things. Go to Kuwait, you go everywhere, China. Give us a bid on it to desalinize this area. Tell us about it. Then we go to the federal government.	Please refer to Master Response 4, Project Funding.
Kerry Berman (Desert Tours)	PD-26	Since the we have 4.4 billion acre feet of water coming from the Colorado River and there is an agreement with the Metropolitan Water District and the Coachella Valley Water District up until about 2035, but right now we're overdrafting the aquifer by 16 to 30 percent a year as a consequence. I would like to know what affect that's going to have on the pumping stations in creating these new water environments.	The intent and meaning of this comment are not clear. The SCH Project pumps do not use groundwater; rather, they would pump water from the Salton Sea and the New or Alamo rivers. No text revisions are required.
Leo Borunda	PD-27	…anything we can do to preserve the Salton Sea is the most important thing.	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.
Borunda	PD-28	So it's something that has been there for a long, long time and then it dried up for a while and then in 1904 up again into a beautiful body of water. Let's preserve it.	This comment is noted. It is not a comment on the SCH Project. No text revisions are required.
Bruce Wilcox	PD-29	First I want to say we support the species conservation habitat and have from the	Your support of the SCH Project is noted.

Name	Com. No.	Comment	Response/Issues
(IID)		beginning. We think it's a great start for restoration of the Salton Sea.	
Jeff Geraci* (Water Quality Control Board in Palm Desert)	PD-30	We are in approval of the project, of course.	Your support of the SCH Project is noted.
Jeff Geraci* (Water Quality Control Board in Palm Desert)	PD-31	I had a question about barnacles. I know that barnacles in high density can actually improve water quality, if not water clarity, allowing sunlight to penetrate and dry the ecosystem. I was wondering are there any mitigation efforts to preserve or protect the barnacle population which is actually a subspecies of *B. amphitrite*, which is found on the California coast because this is a unique subspecies of the barnacle that exists only in the Salton Sea. So I was wondering are you going to have any kind of tide pools or any kind of mitigation to preserve those barnacles or are we just going to let them go?	Please refer to the response to Geraci-1.
Lucinda Robson	PD-32	Are all the cities in the Coachella Valley aware of the situation with the environment if something happens to the Salton Sea and are they on board with helping save their own town and their own tourism and their own environment? And is the State aware or is the State taking care of the population in the Coachella Valley from this potential hazardous environment that could result if the Salton Sea is not saved?	Please refer to Master Response 2, Relationship to the Programmatic Environmental Impact Report and overall Salton Sea Restoration.

SECTION 3

EDITS TO THE DRAFT EIS/EIR

The following corrections and/or clarifications have been made to the Draft EIS/EIR text. These include minor corrections to improve writing clarity, typographical errors, and consistency; and corrections or clarifications in accordance with specific responses to comments, as described in Section 2.0. Revisions also include refinements to the preferred alternative that have been implemented in order to minimize the amount of disturbance required and to proceed in a more cost-effective manner, some of which are outside of the original Project footprint identified in the Draft EIS/EIR. These refinements include moving the saline pump station closer to shore or in an upland area next to the Sea at the north end of Kornbloom Road (although Section 2.4.2.6 of the Draft EIS/EIR notes that "Alternatively, the saline pumping station may be constructed at the outer perimeter of the SCH ponds"). They also include running the saline pipeline from this pump station along Kornbloom Road, West Bowles Road, and an unnamed road rather than in the Salton Sea; a segment of this pipeline also could be routed just west of Kornbloom Road along the edge of the pond site; this area was included in the Draft EIS/EIR. Saline water would be brought to the shore through a channel excavated in the sea bed. Such a channel was considered in Section 2.4.1.13 of the Draft EIS/EIR, which stated that "Another option would be to excavate a channel to bring the seawater to a pump station located closer to the Project site."

The text revisions are organized by the section, page number(s), and line number(s) that appear in the Draft EIS/EIR. Deletions are indicated by strike-through text (~~deleted text~~), and new text is indicated by underlined text (<u>new text</u>). Changes were made in the following sections and appendices:

- Section 1.0: Introduction
- Section 2.0: Alternatives
- Section 3.1: Aesthetics
- Section 3.2: Agricultural Resources
- Section 3.3: Air Quality
- Section 3.4: Biological Resources
- Section 3.8: Geology, Soils, and Minerals
- Section 3.9: Greenhouse Gas Emissions/Climate Change
- Section 3.11: Hydrology and Water Quality
- Section 3.13: Land Use
- Section 3.19: Socioeconomics
- Section 4.0: Cumulative Impacts
- Section 6.0: Compliance, Consultation, and Coordination
- Appendix D: Project Operations
- Appendix I: Selenium Management Strategies
- Appendix J: Summary of Special Studies Supporting the EIS/EIR Impact Analysis

EXECUTIVE SUMMARY

Section ES1.4 Draft Section 404(b)(1) Alternatives Analysis Basis and Overall Project Purpose, page ES-3, lines 23-24

The overall Project purpose is to develop a range of aquatic habitats along the exposed shoreline of the Salton Sea that will support fish and wildlife species dependent on the Salton Sea in Imperial County, California.

Section ES1.8.3 Cooperating, Responsible, and Trustee Agency Actions, page ES-6, line 17

Under NEPA, cooperating agencies are agencies other than the lead agency that have discretionary authority over a proposed action, jurisdiction by law, or special expertise with respect to the environmental impacts expected to result from an action. The U.S. Bureau of Reclamation is a cooperating agency for the preparation of this EIS/EIR ~~and~~ because it has special expertise related to restoration planning, as well as jurisdiction by law over lands located near the Project area. The USFWS also is a cooperating agency because portions of the ponds at the New River sites would be located on land that is part of Sonny Bono Salton Sea National Wildlife Refuge and managed by the USFWS. Lastly, the U.S. Bureau of Land Management (BLM) is a cooperating agency because it manages land within the Salton Sea that may be needed for Project facilities, access, or construction materials.

Section ES1.8.3 Cooperating, Responsible, and Trustee Agency Actions, page ES-6, lines 29-31

The California State Lands Commission (SLC) is a trustee agency, defined in section 15386 of the CEQA Guidelines as "...a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California." The SLC will use the EIS/EIR in determining whether to issue a lease agreement for impacts on the Salton Sea for any portion of the SCH Project within its jurisdiction. The SLC has determined that ~~one~~ two parcels included in the potential SCH Project sites ~~is~~ are within its jurisdiction. Parcel 020-010-030 is located within the Alternatives 4 and 6 sites, and its use would require a lease agreement with the SLC. Additionally, a portion of Alternatives 4, 5, and 6 are within Parcel 020-010-040, and its use could require a mineral lease from the SLC if any soils were removed from this parcel as part of the SCH Project.

Section ES1.9 Required Permits and Consultations, page ES-7, lines 1-6

The following permits and consultations are expected to be required:

- Federal CWA section 404 Standard Individual Permit from the Corps;
- Federal CWA section 401 water quality certification from the Colorado River Basin Regional Water Quality Control Board;
- National Historic Preservation Act section 106 consultation with State Historic Preservation Office;
- Federal Endangered Species Act section 7 consultation with the USFWS;
- California Fish and Game Code section 1602 or 1605 Streambed Alteration Agreement from DFG;
- California Endangered Species Act section 2081 Incidental Take Permit from DFG;
- SLC lease agreement for impacts on the Salton Sea for the use of parcel 020-010-030 and potential lease agreement for use of parcel 020-010-040 if soils were removed from this parcel; ~~and~~

- IID coordination and review of Project design;
- IID Board approval of the SCH Project's use of agricultural return flows in the Alamo and New rivers, the tie-in to existing 3-phase power service; and lease agreement for Project land;
- ~~IID Board approval of the SCH Project lease agreement.; and~~
- Imperial County floodplain encroachment permit for pump facilities on the river bank;
- Authority to Construct permit from the Imperial County Air Pollution Control District for all construction equipment with 50- horsepower or greater; and
- Right-of-way grant for use of BLM land.

Additionally, the Imperial County Air Pollution Control District (ICAPCD) would require preparation of separate construction phase and operations phase ~~a Fugitive~~ Dust Control Plans under Regulation VIII, Fugitive Dust Rules (800–806). Per Regulation VIII, Fugitive Dust Rule 801, these plans would be made available to the ICAPCD prior to the start of any SCH Project construction activities and written notification to the ICAPCD would be made via fax or mail within 10 days prior to commencement of any SCH Project construction activities.

Easements would be required from landowners for Project facilities during construction and operations.

Haul permits and encroachment permits may be required for the use of area roadways during construction.

Federal Standard Form 299, Application for Transportation and Utility Systems and Facilities on Federal Lands, would be required for use of any Federal parcel for Project facilities, access, or construction materials.

SECTION 1.0 INTRODUCTION

Section 1.2 Background, page 1-3, added after line 38

IID and the San Diego County Water Authority filed a petition with the State Water Resources Control Board on November 18, 2011 requesting that mitigation water to the Salton Sea stop at the end of 2013. In lieu of that requirement, the petition proposes to establish alternate habitat for Salton Sea wildlife and other resources (Notice of Petition for Change for Permit 7643 (Application 7482)).

Section 1.4 Draft Section 404(b)(1) Alternatives Analysis Basis and Overall Project Purpose, page 1-6, lines 35-36

The overall Project purpose is to develop a range of aquatic habitats along the exposed shoreline of the Salton Sea that will support fish and wildlife species dependent on the Salton Sea in Imperial County, California.

Section 1.9.3 Cooperating, Responsible, and Trustee Agency Actions, page 1-11, lines 9-11

The California State Lands Commission (SLC) is a trustee agency, defined in section 15386 of the CEQA Guidelines as "...a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California." The SLC will use the EIS/EIR in determining whether to issue a lease agreement for impacts on the Salton Sea for any portion of the SCH Project within its jurisdiction. The SLC has determined that ~~one~~ two parcels included in the potential SCH Project sites ~~is~~ are within its jurisdiction (Figure 1-2). Parcel 010-020-030~~, shown on Figure 1-2,~~ is located within the Alternatives 4 and 6 sites, and its use would require a lease agreement with the SLC. Additionally, a portion of Alternatives 4, 5, and 6 are within Parcel 020-010-040, and its use could require a mineral lease from the SLC if any soils were removed from this parcel as part of the SCH Project.

Section 1.10 Required Permits and Consultations, page 1-12, lines 21-24

The following permits and consultations are expected to be required:

- Federal CWA section 404 Standard Individual Permit from the Corps;
- Federal CWA section 401 water quality certification from the Colorado River Basin Regional Water Quality Control Board;
- National Historic Preservation Act section 106 consultation with State Historic Preservation Office;
- Federal Endangered Species Act section 7 consultation with the USFWS;
- California Fish and Game Code section 1602 or 1605 Streambed Alteration Agreement from DFG;
- California Endangered Species Act section 2081 Incidental Take Permit from DFG;
- SLC lease agreement for impacts on the Salton Sea for the use of parcel 020-010-030 and potential lease agreement for use of parcel 020-010-040 if soils were removed from this parcel;~~ and~~
- IID coordination and review of Project design;
- IID Board approval of the SCH Project's use of agricultural return flows in the Alamo and New rivers, the tie-in to existing 3-phase power service; and lease agreement for Project land;
- ~~IID Board approval of the SCH Project lease agreement.~~; and
- Imperial County floodplain encroachment permit for pump facilities on the river bank;
- Authority to Construct permit from the Imperial County Air Pollution Control District for all construction equipment with 50- horsepower or greater; and
- Right-of-way grant for use of BLM land.

Additionally, the Imperial County Air Pollution Control District (ICAPCD) would require preparation of separate construction phase and operations phase ~~a Fugitive~~ Dust Control Plans under Regulation VIII, Fugitive Dust Rules (800–806). Per Regulation VIII, Fugitive Dust Rule 801, these plans would be made available to the ICAPCD prior to the start of any SCH Project construction activities, and written notification to the ICAPCD would be made via fax or mail within 10 days prior to commencement of any SCH Project construction activities.

Easements would be required from landowners for Project facilities during construction and operations.

Haul permits and encroachment permits may be required for the use of area roadways during construction.

Federal Standard Form 299, Application for Transportation and Utility Systems and Facilities on Federal Lands, would be required for use of any Federal parcel for Project facilities, access, or construction materials.

Section 1.12 Scope and Contents of the Draft EIS/EIR, page 1-15, lines 2-3

~~Based on 33 CFR part 325, Appendix B, the appropriate scope of analysis for the Federal review of the selected action consists of the entire Project footprint.~~

The Project does not represent merely a link in a corridor-type project. The Project is water dependent, focused on restoration of aquatic habitat, and therefore, the majority of the Project footprint is within Corps' jurisdictional areas, although associated infrastructure and construction staging areas are located in adjacent upland areas. Given the overall Project purpose, the extent and varied location of the Corps' jurisdictional areas throughout the Project site, the location of the proposed Project on land that is under Federal jurisdiction, and in consideration of the Endangered Species Act issues involved, the Corps has determined that there exists enough cumulative Federal control to require the NEPA review to include analysis of environmental impacts on the upland portions of the Project site in addition to the Corps' jurisdictional areas. Therefore, the appropriate scope of analysis for the Federal review of the proposed Project consists of the entire Project footprint. In these upland areas, the Corps will evaluate impacts on the environment, alternatives, mitigation measures, and the appropriate state or local agencies with authority to implement such measures if they are outside the authority of the Corps.

SECTION 2.0 ALTERNATIVES

Section 2.2.1 Exclusionary Criteria, page 2-4, line 19

Available water rights. The Whitewater River is designated by the State Water Resources Control Board as a fully appropriated stream from the Salton Sea to the headwaters; thus, no water would be available for the SCH Project. The New and Alamo rivers are not designated as fully appropriated. Metropolitan Water District of Southern California has applications pending for appropriative rights for essentially all the available water in both New and Alamo rivers, but has not prepared the required environmental document for these water rights applications, and so the State Water Resources Control Board has not acted upon these applications. In addition, IID has asserted that it has the right to the use of all agricultural return flows within its service area, which is the majority of flows in the New and Alamo rivers, and that the SCH Project must obtain IID's consent to use these return flows.

Figure 1-2 Portion of SCH Sites under State Lands Commission Jurisdiction, page 1-13

The revised figure is on the following page.

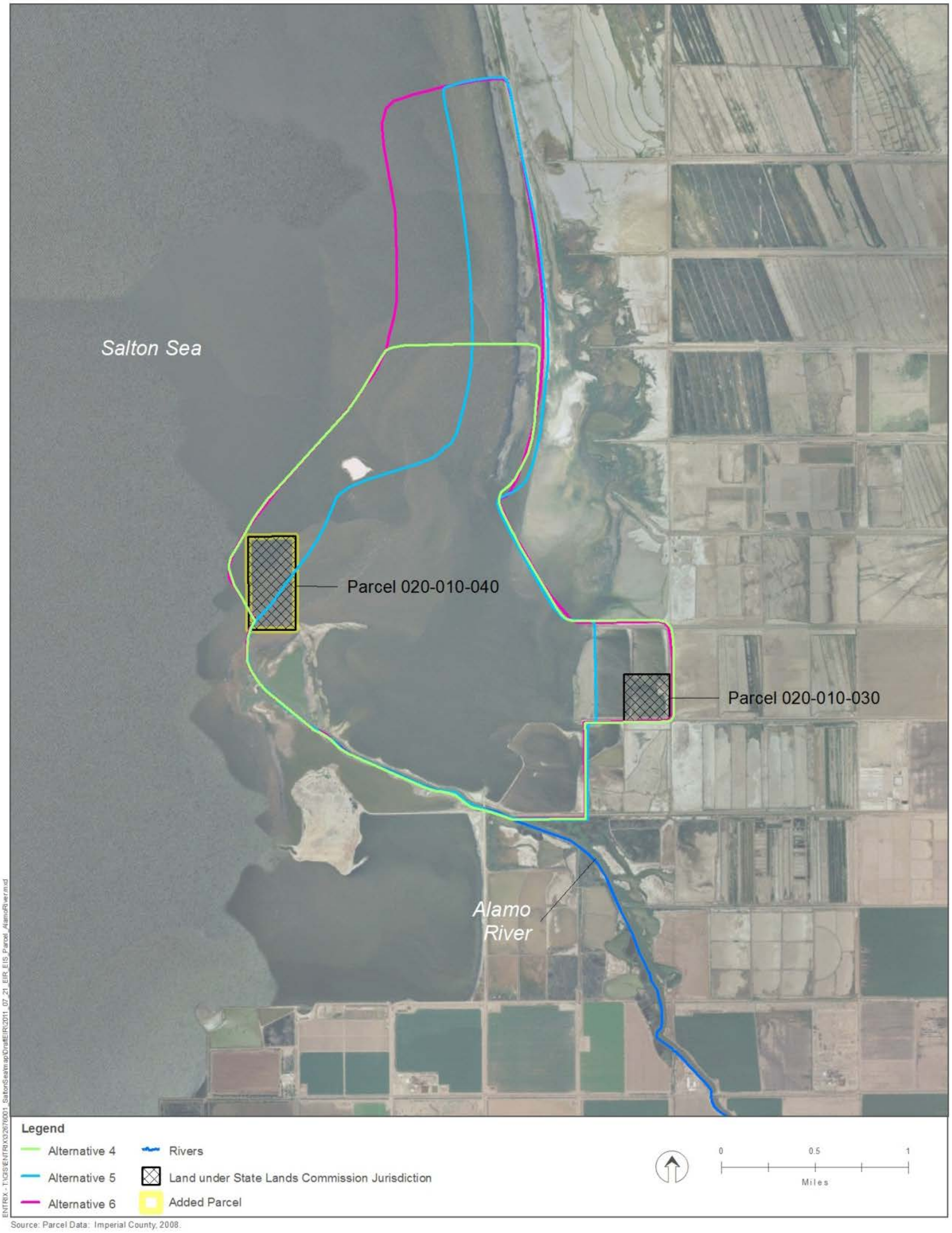


Figure 1-2 Portion of SCH Sites under State Lands Commission Jurisdiction

Figure 2-2 SCH Project Alternative Locations, page 2-8

The revised figure is on the following page.

Section 2.4.1.7 Water Supply, page 2-15, line 42

The water supply for the Project would come from the brackish New or Alamo rivers, depending on the alternative, and the Salton Sea. As discussed in Section 2.2.1, Exclusionary Criteria, these are the only feasible water supplies for the SCH Project. The available water supplies currently appear to be adequate to supply the SCH ponds as proposed; however, the size of the ponds could be reduced in the future if available water supplies were reduced. The salinity of the river water is currently about 2 parts per thousand (ppt), and water in the Sea is currently about 51 ppt. For reference, the ocean is about 35 ppt. Blending the river water and seawater in different amounts would allow for a range of salinities to be used in the ponds. Detailed modeling studies performed for this Project showed that increasing salinity through evapoconcentration (allowing the salinity to increase by evaporating the fresh water and leaving the salts behind) would not produce higher salinity ponds in a reasonable time frame (within months). The saline diversion would occur from pumps placed on a structure in or adjacent to the Sea. The river diversion would occur either by a gravity diversion from an upstream location or pumps located near the SCH ponds.

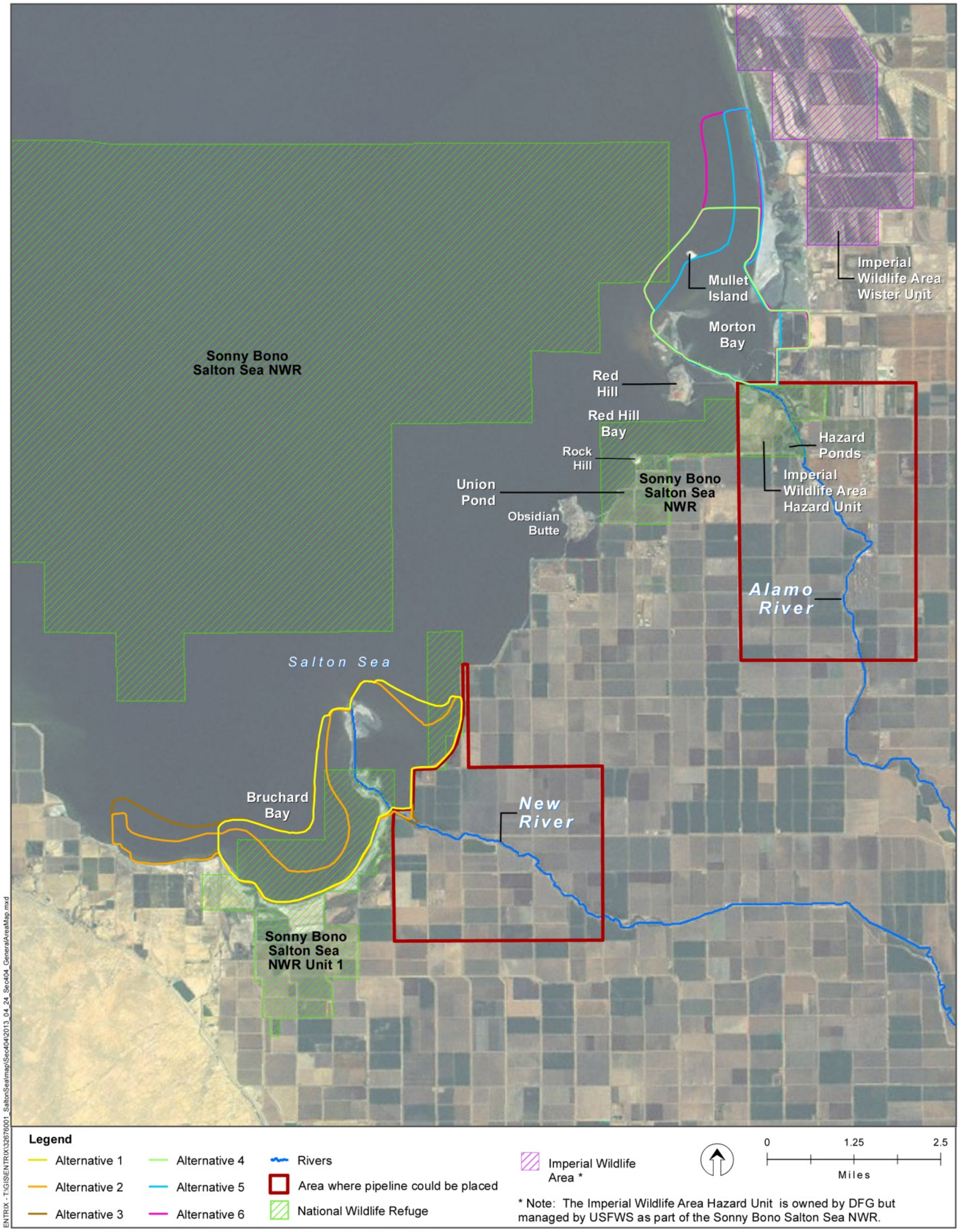
Section 2.4.1.13 Saline Water Supply Pump Station, page 2-17, lines 20-24

Saline Water Supply Pump Station

Supplying saline water to the SCH ponds to achieve the desired salinity would require pumping from the Salton Sea, which has a lower water surface than that of the SCH pond units. The pump station could be located on a platform in the Sea, which would require existing three-phase power to be brought out to the station. Pumps in a saline environment would have a limited life span because of the salinity. The pump station may have to be relocated farther out as the Sea recedes and as pumps need to be replaced for maintenance. Another option would be to excavate a channel to bring the seawater to a pump station located in the Sea closer to the Project site or on shore. This option would require less supply pipeline and a shorter run of utility lines, but would require that the channel be maintained over time~~and deepened as the Sea recedes~~. If the saline pump station were located closer to shore or onshore, the saline pipeline also could be located onshore within existing roads and/or adjacent to the ponds. Such an alignment would include running the saline pipeline from the pump station along Kornbloom Road, West Bowles Road, and an unnamed road; a segment of this pipeline also could be routed just west of Kornbloom Road along the edge of the pond site. It is important to note that as the Sea recedes, it gets progressively saltier. At some point in time seawater may not need to be used because of its hypersaline condition, and salinity may be achieved through a tailwater return system or similar process.

Section 2.4.1.15 Power Supply, page 2-17, lines 35-38

Electrical power would be needed to operate the pumps. Existing aboveground power lines operated by IID would be extended to reach the pumping plant located at the SCH ponds or in the Salton Sea; a three-phase, 480-volt aboveground system would be required at the SCH ponds while a three-phase, 480-volt underwater conduit system would be required to reach the pumping plant if it were located in the Salton Sea. At the New River, the supply line would be extended about 1.5 miles for the river pumps and about 0.5 to 1 mile for the Sea pumps. At the Alamo River, the supply line would be extended up to 1.5 miles for the river pumps and about 1 mile for the Sea pumps (Figure 2-5). Aboveground electrical power lines extended as a result of the SCH Project would be modified to prevent bird collisions and electrocutions (e.g., bird deterrents). Obtaining the power and connecting into the existing system would require coordination with IID, who would review and approve the final design, and determine the appropriate connection point for the three-phase power based on anticipated load.



Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 2-2 SCH Project Alternative Locations

Figure 2-5 Location of IID's Three-Phase Power Lines and Potential Project Extensions, page 2-18

The revised figure is on the following page.

Section 2.4.1.23 Land Acquisition, page 2-21, lines 23-27

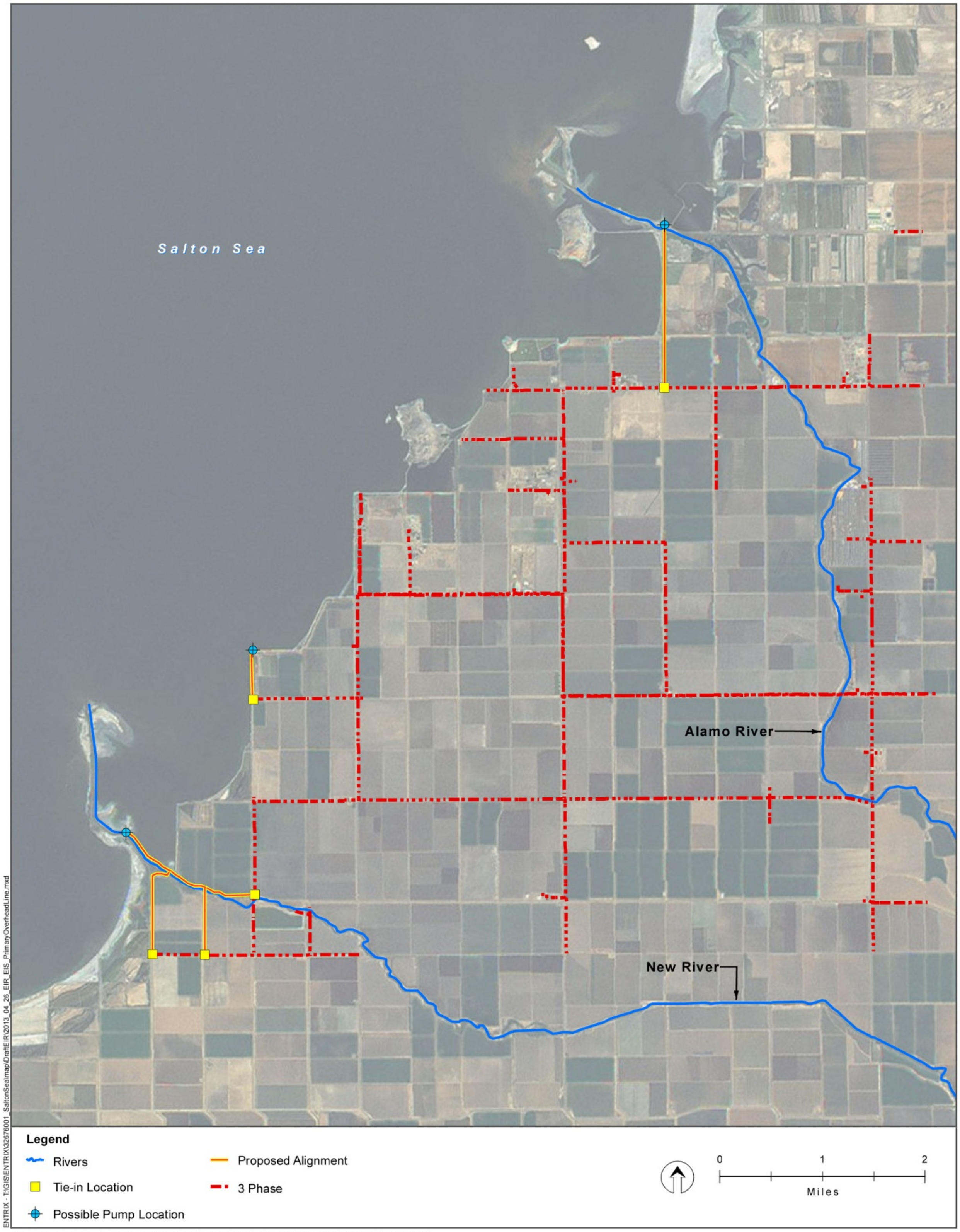
The land where the SCH ponds would be located is owned by IID and would be leased from IID for the Project's duration, with the exception of the land at the Wister Beach SCH pond, which is owned by a number of private parties. Portions of the area listed on Figure 2-2 as "Sonny Bono Salton Sea NWR" are under BLM management authority and would require a right-of-way grant for use of BLM land to locate Project facilities on these parcels or to use them for access or construction materials. Other parcels in the Project area ~~Much of the land where the ponds would be located is~~ are owned by IID but ~~already~~ leased ~~by IID to the~~ to USFWS for the management of the Sonny Bono Salton Sea NWR. An agreement between DFG and USFWS~~,~~ and the right-of-way grant from BLM would be established prior to construction of the SCH Project in order to ensure compatibility between NWR uses and the SCH Project. Other Project facilities, such as pump stations, pipelines, or access roads may be located on IID land, public right-of-way, or private land. Access roads would be needed for construction vehicles to move from the public right-of-way to the construction site. In the case of private land, easements would be obtained from willing landowners only. If an easement cannot be negotiated with a landowner, the proposed facilities would be located at another site. The easement would be structured so as to not preclude the continued use of the property by the landowner. The land in the easement would be disturbed during construction but then would be returned to the preexisting condition after construction, except at the sites of permanent facilities, such as pump stations, diversion works, and pipeline access manholes.

Section 2.4.1.24 Public Access, page 2-22, after line 7

The construction of a channel to bring saline water to a shore-based pump (Section 2.4.1.13) may require the construction of a launching ramp for the dredge and for long-term maintenance of the channel. In the future, this ramp potentially could be used as a public access boat ramp that would provide water access to the receding Sea.

Section 2.4.1.25 Project Compatibility with other Potential Future Land Uses, page 2-22, line 9

The SCH Project would be designed and operated to be compatible with other projects in the area. In the case of Federal lands, the proposed uses would be consistent with the management authority of the Federal agency that is assigned management responsibility of the parcel.



Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 2-5 Location of IID's Three-Phase Power Lines and Potential Project Extensions

Section 2.4.2.9 Power Line Construction, page 2-25, lines 11-12

Three-phase power would be required to operate the river or saline pumps. In both instances, power would have to be extended from 1 to 2 miles from the current locations to supply the pumps (Figure 2-5). Extension of the power lines would occur using aboveground power lines and require the placement of power poles. The extension would be similar to what is currently found in the area. The required equipment includes an auger, small crane, and a power line machine. Obtaining ~~Provision of~~ the power and connecting into the existing system would require coordination with IID, who would review and approve the final design. Power lines for the saline pumps would be provided in underwater conduit. Aboveground electrical power lines extended as a result of the SCH Project would be modified to prevent bird collisions and electrocutions (e.g., bird deterrents).

Section 2.4.2.10 Interaction with Existing Facilities, page 2-25, line 23

In addition, according to the California Division of Oil, Gas, and Geothermal Resources' (DOGGR) database, 11 plugged and abandoned shallow temperature gradient geothermal wells are located in or near the area of the proposed SCH Project, which may require plugging to present standards if the wells are exposed or the present abandonment plugs are altered. Prior to construction, DOGGR records about the location of these wells would be reviewed, and any wells present in the construction area would be identified in the field and marked to avoid contact by construction activities. Additionally, DOGGR would be contacted to obtain information on the requirements for approval to perform any remedial operations on these wells.

Section 2.4.6 Maintenance and Emergency Repairs, page 2-27, line 16

The potential for biological fouling at pipes and pumps exists and would be addressed in maintenance plans. Typically, clogging of pipes would be reduced by periodic cleaning and flushing of the pipes. However, if the buildup of organisms in pipelines became excessive, pipe replacement may be required. Draining the ponds would not be a routine maintenance activity, but may be required if a berm were damaged or under another type of emergency situation. Monitoring as part of the adaptive management plan would identify any invasive plant species that colonized the ponds, and eradication or control methods would be implemented as needed.

Section 2.4.7 Best Management Practices, page 2-27, lines 25-26

Additionally, the Project would comply with the Imperial County Air Pollution Control District's Regulation VIII ~~rules~~ Rules 800-806 for dust control (general requirements, construction and earthmoving activities, bulk materials, open areas, and conservation management practices), carry-out and track-out, and paved and unpaved roads, which are required for all projects. This regulation is included in Appendix G. Additionally, during construction and maintenance, contractors and staff would implement the following measures to reduce emissions from fuel combustion and work activities:

Section 2.4.8 Decommissioning, page 2-28, line 10-11

The SCH Project would be designed to last until the end of the 75-year period covered by the QSA (2078)~~for approximately 75 years~~. At the end of this period, or when funds ~~are~~ were no longer available to operate the Project, the SCH facilities would be decommissioned. Decommissioning would require breaching the berms and removing the pumping plants and diversion structures and filling in the sedimentation basin. The environmental impacts of such activities would be speculative because it is not known what conditions would be present that far in the future. Thus, they are not analyzed in this document, although they likely would be less than those that would occur during the initial construction. Such activities would be subject to environmental review at the time they occurred.

Section 2.7 Alternative 3 – New River, Pumped Diversion + Cascading Ponds, page 2-37, lines 13-14

Saline Water Source. The saline pump would be located to the north of East New on a structure in the Salton Sea or near the shore. Water would be delivered to the saline pump through a channel excavated in the Sea bed or an intake pipeline and delivered to the SCH ponds ~~intakes~~ through a pressurized pipeline.

SECTION 3.1 AESTHETICS

Section 3.1.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds, page 3.1-10, lines 42-45

Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area (less-than-significant impact). Views from KOP B may include a trailer that would be present at the site for use by permanent employees. The trailer would be compatible with existing agricultural uses that predominate. The sedimentation basin that would be located near the New River would also be compatible with agricultural uses, and the brackish water pipeline corridor would be restored to its previous condition. The diversion structure would require the removal of a small amount of vegetation around the New River, but the disturbed area would be minor and would not be visible from sensitive viewpoints at the Sonny Bono NWR. The seawater pump station would be located on a platform in the Sea and may have to be relocated as the Sea recedes or it could be located onshore near the Sea. A pipeline would be required to bring seawater to the ponds, but it would be buried. Power to operate the seawater pumps would come from one or more short (approximately 0.5- to 1-mile--long) transmission line extensions (Figure 2-5). The segments within the SCH ponds and Salton Sea would be buried and thus would not cause an aesthetic impact. The routes along the north side of the New River and the east side of Bruchard Bay would be in areas where no power lines are currently present, although they are common throughout the region, while the third route would follow an existing power line for about half of its length. ~~A pipeline would be required to bring seawater to the ponds.~~ Such small-scale facilities would be visually compatible with surrounding agricultural uses. Therefore, impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

SECTION 3.2 AGRICULTURAL RESOURCES

Section 3.2.3 Affected Environment, page 3.2-4, line 35

Imperial County covers an area of 4,597 square miles, or 2,942,080 acres. Approximately 20 percent of the land is irrigated for agricultural purposes, most notably the central area known as Imperial Valley. With over 500,000 acres of harvested commodities, agriculture remains one of the most valuable industries in Imperial County. Cattle are the county's top commodity, followed by head and leaf lettuce, wheat, and alfalfa. Other important crops include broccoli, carrots, onions, sugar beets, and spring mix (County of Imperial Agricultural Commissioner 2010). As shown in Table 3.19-4 in Section 3.19, Socioeconomics, the relative importance of individual crops may change over time, although cattle are consistently the top commodity.

Section 3.2.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds, page 3.2-9, line 22

Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use (less-than-significant impact). The sedimentation basin would be located on Farmland adjacent to the New River, which would require the permanent loss of approximately 60 acres. This amount would be negligible when compared to the more than ~~5,0~~500,000 acres in production in Imperial County and well within the range of variability of the amount of agricultural land fallowed each year. The amount of land that was fallowed in the IID service area between 2002 and 2009 ranged from over 23,000 acres in 2002 to over 49,000 acres in 2007 (Table 3.2-4); the amount of fallowed land increased during this period due in part to water conservation measures required as a result of the Quantification Settlement Agreement, and it also fluctuates annually. Sixty acres represents only 0.~~0~~014 percent of the average acreage of land fallowed between 2004, when the IID fallowing program began, and 2009. It also is well under the annual variation in the amount of land that is fallowed (e.g., the amount of fallowed land increased by 1,761 acres between 2006 and 2007, whereas the acreage decreased by 6,198 between 2007 and 2008). This impact would be less than significant when compared to both the existing environmental setting and No Action Alternative given the small area affected in relation to the total area in production and the amount of land fallowed each year.

Section 3.2.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds, page 3.2-10, lines 4-9

Impact AG-3: Construction of the sedimentation basin potentially would result in the permanent conversion of Williamson Act contract land to nonagricultural use (significant impact). Depending on where the sedimentation basin is sited, the Project could permanently convert approximately 60 acres of Williamson Act land to nonagricultural use, which would require the payment of cancellation fees (personal communication, A. Havens 2011). The Williamson Act provides financial incentives to encourage the retention of agricultural land. As discussed under Impact AG-2, the conversion of 60 acres of agricultural land would negligible in relation to the amount of land that is currently farmed and fallowed in the Imperial Valley. However, the conversion of land under Williamson Act contracts prior to the nonrenewal termination date would conflict with this Act, which is intended to preserve agricultural land through financial incentives.~~would require the payment of cancellation fees (personal communication, A. Havens 2011)~~. This impact would be significant when compared to both the existing environmental setting and No Action Alternative.

SECTION 3.3 AIR QUALITY

Section 3.3.1 Introduction, page 3.3-1, lines 14-15

The study area includes the Salton Sea Air Basin (Basin). Imperial County Air Pollution Control District (ICAPCD) and South Coast Air Quality Management District (SCAQMD) have jurisdiction over the Basin's southern and northern portions, respectively. SCAQMD oversees the northern Basin's Riverside County and Coachella Valley portions. ICAPCD oversees the entire geographical area within Imperial County~~Calexico, Imperial County, and the Imperial Valley~~ in the southeastern Basin, which is where the Project would be located. Thus, the Project falls exclusively under ICAPCD's jurisdiction.

Section 3.3.2.2 Federal Regulations – General Conformity Rule, page 3.3-5, lines 19-20

As discussed in Section 3.3.4.5, Attainment Status Designations, Imperial County is designated moderate nonattainment for the Federal 8-hour O_3 NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as a serious nonattainment area for 24-hour Federal PM_{10}

and a nonattainment area for $PM_{2.5}$. The entire County is designated as a state nonattainment area for O_3 and PM_{10}.

Section 3.3.2.4 Source-Specific Regulations – Portable Equipment Registration Program (PERP), page 3.3-7, lines 33-38

The statewide PERP establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered in PERP, engines and equipment units may operate throughout the state of California without the need to obtain individual permits from local air districts, as long as the engine and/or equipment does not reside in the same location for more than 12 months. Owners or operators of portable engines and certain types of equipment can register their units under the PERP to operate their equipment anywhere in the state.

Although all permanently installed water pumps at the SCH Project would be electrically operated and not subject to ICAPCD's permits, the construction machinery at the SCH Project site with 50 horsepower or greater would be ~~The Project is not~~ subject to ICAPCD's Authority to Construct requirements. ~~because the Project would not include construction of any stationary air pollution sources that are subject to ICAPCD's review (all permanently installed water pumps would be electrically operated).~~

Section 3.3.3.5 Attainment Status Designations, page 3.3-16, line 10

Imperial County Attainment Status and Applicable Plans

Imperial County is designated as moderate nonattainment for the Federal 8-hour O_3 NAAQS. The Imperial Valley (which is the Imperial County portion of the Salton Sea Air Basin) is designated as Federal serious nonattainment area for PM_{10} and nonattainment for $PM_{2.5}$. All areas of the County are designated as attainment for CO, NO_2, and SO_2 NAAQS. Imperial County is designated as nonattainment for O_3 and PM_{10} CAAQS. The entire County is designated attainment or unclassified for $PM_{2.5}$, CO, NO_2, and SO_2 CAAQS. As part of the Ozone Attainment demonstration, a Reasonably Available Control Technology (RACT) demonstration was required. RACTs are emission control technologies that are economically and technically feasible. In compliance with this requirement, ICAPCD released the *2009 Reasonable Available Control Technology (RACT) State Implementation Plan* (ICAPCD 2010a).

Section 3.3.3.5 Attainment Status Designations, page 3.3-17, lines 7-10

~~As part of USEPA's final ruling, a Reasonably Available Control Technology (RACT) demonstration was also required. RACTs are emission control technologies that are economically and technically feasible. In compliance with this requirement, ICAPCD released the *2009 Reasonable Available Control Technology (RACT) State Implementation Plan* (ICAPCD 2010a).~~

Section 3.3.3.5 Attainment Status Designations, page 3.3-17, line 30

In August 2009, ICAPCD released the *2009 Imperial County State Implementation Plan for Particulate Matter Less than 10 Microns in Aerodynamic Diameter* (ICAPCD 2009). This document presents the SIP for PM_{10} on ICAPCD's behalf, but the PM_{10} SIP has yet to be approved by USEPA or CARB.

Section 3.3.4.5 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Mitigation Measures, page 3.3-34, lines 3-16

The SCH Project would be required to comply with ICAPCD's Regulation VIII, Fugitive Dust Control Measures (Appendix G). ~~, but~~ In addition to those measures that are required for all projects by the ICAPCD (Section 7.1 Construction Equipment and Fugitive PM_{10} Mitigation Measures of the ICAPCD's

CEQA Air Quality Handbook and the ICAPCD's Policy 5), the following ~~additional~~ mitigation measures would be implemented to further minimize impacts from NO_x and PM_{10} emissions.

MM AQ-1: Implement fugitive PM_{10} control measures. The following measures will be incorporated into the construction contract specifications in order to reduce PM_{10} emissions from fugitive dust~~, in addition to those measures that are required for all projects by the ICAPCD~~:

- Water exposed soil with adequate frequency to keep it continually moist ~~for continued moist soil~~ so that visible dust emissions would be limited to 20 percent opacity for dust emissions at all times (~~at least twice daily and~~ as indicated by soil and air conditions).
- Replace ground cover in disturbed areas as quickly as possible.
- Limit vehicle speed for all construction vehicles to 15 miles per hour on any unpaved surface at the construction site.
- Develop a trip reduction plan to achieve a 1.5 average vehicle ridership for construction employees.

MM AQ-2: Implement diesel control measures. The following measures will be incorporated into the construction contract specifications in order to reduce PM_{10} and NO_x emissions from diesel engines~~, in addition to those measures that are required for all projects by the ICAPCD~~:

- A schedule of low-emissions tune-ups will be developed and such tune-ups will be performed on all equipment, particularly for haul and delivery trucks.
- Low-sulfur (≤-15 ppmw S) fuels will be used in all stationary and mobile equipment.
- Curtail construction during periods of high ambient pollutant concentrations as directed by the ICAPCD.
- Reschedule activities to reduce short-term impacts to the extent feasible.

Section 3.3.4.5 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Mitigation Measures, page 3.3-34 – 3.3-35, lines 39-40 and 1-2, respectively

The SCH Project, along with all other projects, would be required to comply with ICAPCD's Regulation VIII, Fugitive Dust Control Measures (Appendix G). In addition to those measures that are required for all projects by the ICAPCD (Section 7.1 Construction Equipment and Fugitive PM_{10} Mitigation Measures of the ICAPCD's CEQA Air Quality Handbook and the ICAPCD's Policy 5), ~~All projects would be required to comply with the ICAPCD's Regulation VIII, which is not mitigation per se, but which would minimize PM_{10} emissions.~~ MM AQ-1 and MM AQ-2 would be implemented by the SCH Project to reduce the Project's contribution to the significant cumulative impact from NO_x and PM_{10} emissions, and other projects would be required to implement similar measures should their emissions exceed regulatory thresholds.

Section 3.3.5 General Conformity, page 3.3-39, lines 35-37

Under section 176(c)(1) of the Federal CAA, Federal agencies that "engage in, support in any way or provide financial assistance for, license or permit, or approve any activity"[1] must demonstrate that such actions do not interfere with state and local plans to bring an area into attainment with the NAAQS. Imperial County is designated moderate nonattainment for the Federal 8-hour ozone NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as a serious nonattainment area for 24-hour Federal PM_{10} and a nonattainment area for $PM_{2.5}$. The program by which a Federal agency determines that its action would not obstruct or conflict with air quality attainment plans

1 42 USC section 7506(c)

is called "General Conformity." The implementing regulations for General Conformity are found in 40 CFR part 93, subpart B.[2]

Section 3.3.5 General Conformity, page 3.3-40, line 20

When describing the 2010 revisions to the definition of indirect emissions, USEPA offered the following explanation:

> EPA is revising the definition for indirect emissions to clarify that only indirect emissions originating in a nonattainment or maintenance area need to be analyzed for conformity with the applicable SIP. In addition EPA is revising~~on~~ the definition of "indirect emissions" to clarify what is meant by "the agency can practically control" and "for which the agency has continuing program responsibility." This clarification represents EPA's long standing position that Congress did not intend for conformity to apply to "cases where although licensing or approving action is a required initial step for a subsequent activity that causes emissions, the agency has no control over that subsequent activity, either because there is no continuing program responsibility or ability to practically control."[3]

Section 3.3.5 General Conformity, page 3.3-43, lines 5-6

As a result of these USEPA findings and determinations, there is no specific attainment year for PM_{10}, only annual increments of 5 percent reductions (these reductions constitute the emissions budget). Ozone is ~~tentatively~~ in attainment with the 1997 8-hour ozone NAAQS, as ozone data up to 2010 have been validated by the USEPA.~~pending certification of 2008 monitoring data, until any future USEPA determination to the contrary.~~ Thus, the year during which the total of direct and indirect emissions from the action is expected to be the greatest on an annual basis is the appropriate scenario for this analysis. This General Conformity determination is properly focused on emissions related to construction only, shown in Tables 3.3-16 and 3.3-17.

SECTION 3.4 BIOLOGICAL RESOURCES

Section 3.4.3.3 Wildlife – Common Bird Species, page 3.4-16, lines 35-37

The Basin provides important habitat for 48 species of gulls (40,000+ individuals), terns, and shorebirds. It is one of only five areas in the interior of western North America used by tens of thousands of birds in spring (Shuford et al. 2000). Some common aquatic bird species for which the Salton Sea provides important habitat include American avocet (*Recurvirostra americana*), American coot (*Fulica americana*), American wigeon (*Anas americana*), American white pelican (*Pelecanus erythrorhynchos*) (30 percent of North American breeding population), black-necked stilt (*Himantopus mexicanus*), California brown pelican (*Pelecanus occidentalis*), eared grebe (*Podiceps nigricollis*) (90 percent of North American population in some years), and ruddy duck (*Oxyura jamaicensis*) (50 percent of Pacific Flyway population) (USFWS 2010b; Shuford et al. 2000; Jehl 1994). Bird populations vary throughout the year as birds migrate to the Sea for breeding and as they stop over during migration to points north and south. The American avocet, American coot, American white pelican, ~~California brown pelican,~~ and ruddy duck are all found at the Salton Sea throughout the year. In some years, the California brown pelican is present throughout the year. The American wigeon and eared grebe are absent for a few months in the summer (USFWS 2010b).

[2] General conformity regulations were ~~recently~~ amended effective July 6, 2010. (75 FR 17254, ~~(~~April 5, 2010~~))~~)

[3] 75 FR 17260 (April 5, 2010) (citations omitted)

Section 3.4.3.3 Wildlife – Common Bird Species, page 3.4-17, lines 26-29

The Caspian tern (*Hydroprogne caspia*) is a common breeding bird that occurs within the Salton Sea region from mid-April through October. It is most abundant at the Sea from late summer through fall. Most Caspian terns depart from the region by the end of October, but some remain through the winter (Patten et al. 2003). Caspian terns forage primarily or exclusively for fish but may occasionally take crayfish and insects (Cuthbert and Wires 1999). Approximately 25 percent of the North American population of the Caspian tern breeds at the Salton Sea (Cuthbert and Wires 1999; personal communication, K. Molina 2010). In 2009, the population size within the Project area was in the hundreds for the winter months and in the thousands for the breeding season (USFWS 2010b). In the past, Caspian terns nested on Mullet Island (Molina 2004). In 2010, nesting numbers of Caspian terns were up to ~~several thousand~~2,500 breeding pairs~~,~~ ~~predominantly~~ on ~~Mullet Island and~~ the D pond islands ~~but also along Morton Bay's shore~~ (~~personal communication, K. Molina 2010~~Molina 2010).

Section 3.4.3.3 Wildlife – Common Bird Species, page 3.4-17, line 45

The laughing gull (*Leucophaeus atricilla*) was only observed at the Salton Sea in August during 2009 bird counts (USFWS 2010b), but was observed during summer 2010 surveys (Dudek 2010), and it is a fairly common summer and fall visitor. The Sea is the only area where the laughing gull occurs regularly in the western U.S. It has been observed nesting at Sonny Bono NWR after several decades of no breeding activity (Molina 2000; Molina 2004; Patten et al. 2003).

Section 3.4.3.3 Wildlife – Common Bird Species, page 3.4-18, line 9

Least terns (*Sternula antillarum*) at the Salton Sea may be either from coastal California or more likely from Mexico. It has not been recorded breeding at the Sea (Patten et al. 2003), but may breed due to recent observations of pairs. This species was not observed in the 2009 aquatic surveys (USFWS 2010b) or by Dudek in 2010. The least tern probably occurs at the Sea on an annual basis and has been observed at Sonny Bono NWR's Unit 1, Red Hill, IWA's Wister Unit, and at other locations farther away from the Project area. It occurs most often on mudflats and at the deltas of the New and Alamo rivers where it forages in fresh water in rivers or ponds (Patten et al. 2003).

Section 3.4.3.3 Wildlife – Rookeries, page 3.4-19, lines 18-21

A number of bird species occur at the Salton Sea as colonial nesting species specifically using rookeries including double-crested cormorant, great blue heron (*Ardea herodius),*and great (*Ardea alba*), snowy (*Egretta thula*), and cattle (*Bubulcus ibis*) egrets. During the 2010 focused surveys, rookeries of the double-crested cormorant and great blue heron were observed at the mouth of the Alamo and New rivers. The double-crested cormorant also breeds on Mullet Island in one of the largest North American colonies (Shuford et al. 2002). Great blue herons also are recorded within rookeries along the shoreline around IWA's Wister Unit and the New River delta (Shuford et al. 2000; Patten et al. 2003). The great blue heron does not form dense nesting colonies, but the species uses snags of partly submerged dead trees at the Salton Sea. Great egret nesting tends to be more colonial with sites concentrated along the shoreline at IWA's Wister Unit and Morton Bay around the delta of the New River (Molina and Sturm 2004; Patten et al. 2003). Similar to the great blue heron, the great egret nests in partially submerged snags. The snowy egret is similar to the great egret in nesting behavior and locations (Molina and Sturm 2004; Patten et al. 2003). At the Salton Sea, the cattle egret establishes massive rookeries (Molina and Sturm 2004; Patten et al. 2003), and during the 2010 surveys, hundreds to thousands of individuals were observed flying up and down the New and Alamo rivers (Dudek 2010). The rookeries for the cattle egret were only located along the Alamo River (Shuford et al. 2002; Dudek 2010).

Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project

Common Name	Scientific Name	Status (Fed / State / CNPS)	Potential to be Present/Notes
Birds			
Gull-billed tern	*Gelochelidon nilotica*	– / SSC / – (nesting)*	High. Forages over many habitats including fresh and saline emergent wetlands, lakes, mudflats, croplands, grasslands, and, rarely, brushlands. Nests in small colonies on the ground in areas typically devoid of vegetation; may nest ~~immediately adjacent to the shoreline~~on nearshore islets. Salton Sea is the only interior nesting site for gull-billed terns in western North America north of Mexico (Molina 2004).CNDDB records from 1994 and 1998 near the mouths of the Whitewater and Alamo rivers. Observed during Summer 2010 surveys at Sonny Bono NWR and at the USGS ponds near the Alamo River (Dudek 2010). Between 1992 and 2001 approximately 72 to 155 breeding pairs were present. ~~Currently~~In 2010, fewer than~~,~~ ~~approximately 65 to 200~~ 100 pairs attempted to breed ~~breeding pairs are~~ at the Salton Sea (personal communication, K. Molina 2010).
Black skimmer	*Rynchops niger*	– / SSC / (breeding)*	High. ~~Breeds~~ Has bred at the Sea's northern and southern ends with variable reproductive success (Shuford and Gardali 2008). Nest on the ground on sandy islands or sandy areas in salt marshes. Prefer islands with fine homogeneous substrates and no vegetation. The Salton Sea is the only interior nesting site for black skimmers in western North America north of Mexico (Molina 2004). Roosting takes place on sandy beaches or gravel bars. Rarely alights on water. Forage for fish by skimming the water surface. Observed during Summer 2010 surveys along the New and Alamo rivers and also nesting on the islands of Sonny Bono NWR (Dudek 2010).

Section 3.4.3.4 Special-Status Species – Terrestrial Species, pages 3.4-27 – 3.4-28, lines 45-46 and 11-13, respectively

Gull-Billed Tern. Gull-billed terns nest on protected spits, berms, and islands composed of sand or barnacle shells; at the Salton Sea, they also nest on ~~earthen levees~~eroded or discontinuous levees that are isolated by water and on constructed islands in shallow brackish impoundments. For Salton Sea colonies, available nesting substrates include fine, poorly drained, clay soils devoid of all vegetation with cobbles and boulders located sparsely. Nests are often located adjacent to cobbles, boulders, or other debris. Gull-billed terns forage primarily in freshwater ponds and flooded agricultural fields. They are fairly common breeders at the Salton Sea, which is considered the breeding stronghold for this species in the western United States. Approximately 25 percent of the entire subspecies nests at the Salton Sea; approximately 80 percent of the U.S. population breeds at Salton Sea (Molina 2004). They arrive at the Salton Sea in mid-March and remain until October. Foraging habitat within the Project area would likely include agricultural fields, marshes, mudflats, drainage ditches, and fresh or saline open water. At the Salton Sea, the species forages for small fish, crayfish, lizards, butterflies, beetles, crickets, weevils, and occasionally, the young chicks of other birds. In 1999, 101 nesting attempts were recorded, 57 on the Sea's northern end near Johnson Street and 44 at Rock Hill on the southern shore (Shuford et al. 2000). ~~In 2009, gull-billed terns were observed between April and July within the Project region and were most abundant in July with almost 200 individuals recorded but not documented as nesting, predominantly at Morton Bay and Mullet Island (personal communication, K. Molina 2010).~~ In 2010, 87 pairs attempted to nest at five

~~locations~~ sites, including Sonny Bono NWR's D pond islands and Unit 1 A4 ponds, USGS ponds near the Alamo River, and at Obsidian Butte and Obsidian Butte South, but were generally unsuccessful, likely due to predation (Molina 2010).

Section 3.4.3.4 Special-Status Species – Terrestrial Species, page 3.4-28, lines 44-49

Black Skimmer. Black skimmers are relatively recent arrivals to California and were first observed at the Salton Sea in 1968. They are now a fairly common breeder at the Sea with approximately 40 percent of the California breeding population (Ornithological Council 1988). The Sea is the only interior nesting site for black skimmers in western North America north of Mexico (Molina 2004). They seldom overwinter. They typically nest on sandy islands or sandy areas in salt marshes and they can also nest on isolated sections of eroded impoundment levees. Nesting habitat usually has little vegetative cover (<30 percent) with adequate protection from predators; areas with encroaching vegetation were rendered unsuitable for nesting. Shallow water near nest sites is required to soak their bellies to aid in cooling their eggs. Colonies choose areas where the chance of terrestrial predators is minimal. Black skimmers forage on small fish in calm, shallow waters around the Sea. From 1990 to 2000, the Salton Sea breeding population ranged between 80 and 487 pairs, with a mean of 360 pairs between 1992 and 2001. In 1999, 377 breeding pairs were recorded at Rock Hill at the Sea (Shuford et al. 2000). They also nest at the Sea near the Whitewater River delta, various locations on the southern shoreline, and near Salton City (Patten et al. 2003). In 2009, black skimmers were observed between May and October and were most abundant in August with approximately 150 individuals recorded near and within the Project area (USFWS 2010b). Near the Project area, this species has been recorded breeding at Sonny Bono NWR. Colonies usually include approximately ~~50~~ 50 to 200 nests (Molina 1996). Suitable breeding areas within the Project area for this species include Mullet Island and sandbars if isolated from predators. They seldom overwinter.

Section 3.4.3.4 Special-Status Species – Terrestrial Species, page 3.4-29, lines 1-6

California Brown Pelican. The California brown pelican occurs at the Salton Sea as ~~newly fledged~~immatures ~~young~~ and post-breeding adults as they disperse from nesting areas in Baja California (Patten et al. 2003). During summer, brown pelicans forage around the Sea's margin. Since the mid-~~-~~1990s, single day counts have reached 2,000 individuals (Shuford et al. 2000) and probably exceed 3,000 (Patten et al. 2003). Peak numbers of brown pelicans detected during surveys in 2005 and 2006 were over 5,000 birds (DWR and DFG 2007). In ~~recent years~~the past, brown pelicans have nested in small numbers, especially at the Sea's southern end at the mouth of the Alamo River (Molina and Sturm 2004). In 2009, California brown pelicans were most abundant in August with almost 3,000 individuals recorded near and within the Project area; numbers declined in the fall but the species remained a consistent visitor throughout the year (USFWS 2010b). This species was observed during summer 2010 surveys foraging within the Sea at the mouths of the New and Alamo rivers and along the shoreline (Dudek 2010); suitable roosting and loafing habitat includes sandbars, islands, and rocky areas within the Project area.

Section 3.4.4.3 No Action Alternative – Contaminants, page 3.4-32, lines 24-25

Selenium occurs in the Salton Sea's water and sediment, and has the potential to bioaccumulate and adversely affect fish and wildlife (DWR and DFG 2007), as discussed in Appendix I, Selenium Management Strategies. Aquatic and benthic invertebrates are a major route of food-chain transfer in the Salton Sea food chain (DWR and DFG 2007). The suggested toxicity threshold for invertebrates as prey (to avoid bioaccumulation in birds) is 3 to 4 μg/g dw (Hamilton 2004). However, selenium concentrations observed at the Salton Sea vary widely among locations and taxa and frequently exceed this threshold. Mean invertebrate selenium concentrations ranged from 2.37 to 6.64 μg/g dw at Salton Sea, 2.16 to 8.50 μg/g dw at the SHP complex. At the SHP complex, mean concentrations exceeded 4.0 μg/g dw in 67 to 80 percent of corixid samples and 0 to 30 percent of chironomid samples (Miles et al. 2009). In the IID agricultural drains, selenium concentrations in chironomids ranged considerably higher (mean 6.5 µg/g dw, maximum 50.6 µg/g dw) (Saiki et al. 2010).

Fish currently exposed to selenium include tilapia, sailfin molly, western mosquitofish, and desert pupfish. Lemly (2002) recommended a threshold of 4 µg/g dw to avoid toxic effects in sensitive fish species. Selenium levels in fish currently exceed this threshold. Mean whole-body fish selenium concentrations were 10.4 µg/g dw in the open Salton Sea, 9.67 µg/g dw in the New River Estuary, 11.5 µg/g dw in the Alamo River Estuary (DWR and DFG 2007, Appendix F), 6.81 to 6.89 µg/g dw in IID agricultural drains (Saiki et al. 2010), and 2.8 to 4.7 µg/g dw in New River wetlands upstream (Johnson et al. 2009). USGS studies noted that sailfin mollies and moquitofish did not appear to be adversely affected at concentrations of 3.1 to 30.4 µg/g dw, and pupfish in laboratory experiments did not exhibit negative health effects from such levels of selenium exposure (Saiki et al. 2010).

Selenium's most substantial effects occur in bird embryos, such as increased risk of reduced hatching success and teratogenesis (embryo deformities) at higher concentrations. As such, selenium in the egg is the most sensitive measure for evaluating hazards for birds (Skorupa and Ohlendorf 1991, as cited in Ohlendorf and Heinz 2011). The responses to selenium vary among bird species, ranging from "sensitive" (e.g., mallard) to "average" (e.g., black-necked stilt) and "tolerant" (e.g., avocet) (Skorupa 1998, as cited in Ohlendorf and Heinz 2011). Cormorants and terns are likely to be fairly tolerant of selenium in keeping with greater tolerance of other saltwater-adapted species, such as avocets and snowy plover, compared to freshwater-adapted species, such as mallards (personal communication, H. Ohlendorf 2010). Risk of impaired reproduction can start to occur at egg concentrations of 6-12 micrograms per gram (µg/g) dry weight (dw). The risk of teratogenesis starts to occur above 12 µg/g dw for sensitive species and above 20 µg/g dw for moderately sensitive species (Ohlendorf and Heinz 2011).

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Desert Pupfish, page 3.4-35, lines 15-18

Because desert pupfish are or could be present in agricultural drains and in shallow water along the Sea's shoreline, construction activities for the ponds and saline diversion and diversion of the drain outflows around the Project area would result in habitat loss, alteration of adjacent habitat through turbidity from excavation of the Sea bed and pond areas and potential discharge of excavated sediments to the Sea, and mortality of some individuals. If construction activities occurred during the desert pupfish breeding season (approximately April through October), reproductive success for those mature pupfish in the Project footprint and at the sediment discharge location in the Sea could be greatly reduced. Since the species generally does not live more than 2 years, loss of reproduction for 1 year could have substantial effects on the population size at a specific location. Construction of the pump stations and channel or pipeline for bringing saline water from the Salton Sea to mix with the river water ~~for~~ to achieve the desired salinity ~~control~~ in the ponds would be both from a barge and the adjacent berm and would temporarily affect a small area of the Sea, primarily through underwater sound and turbidity. Few, if any, desert pupfish would be affected by this construction activity. As the Sea recedes, the ~~outer~~ saline pump station and pipeline or intake channel would need to be moved or extended, requiring additional construction~~, or another one built, and the pipeline extension placed on or within the exposed Seabed~~. By that time, salinity in the Sea would exceed the tolerance of desert pupfish, and construction would not affect them.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Desert Pupfish, page 3.4-36, line 8, line 14, and Bird Species, line 25

Operation of the pump stations to bring saline ~~Water~~ water to the ponds has the potential to entrain desert pupfish until the Sea becomes too saline for their survival. The intake would be screened until that time, and maintenance activities to clean or to replace the screen could affect pupfish in the intake's immediate vicinity. Maintenance of the pump stations could result in release of lubricants or other chemicals potentially toxic to pupfish. Due to the proposed location of the pump stations (adjacent to the outer berm and offshore from the ponds), few desert pupfish are likely to be affected by maintenance activities.

Maintenance activities for the ponds, such as excavation of materials for berm repair, also could affect desert pupfish that are present in the ponds. Turbidity effects, disturbance of feeding and spawning areas, and direct mortality could occur. Dropping the water level of one or more ponds for maintenance could strand desert pupfish resulting in mortality from desiccation or predation by birds. Under an emergency situation, draining one or more of the ponds for maintenance could occur and would strand desert pupfish resulting in mortality from desiccation or predation by birds.

Construction as well as operation and maintenance activities could affect special-status bird species that are present within the Project footprint through direct habitat disturbance, noise, and human presence. Individuals immediately adjacent to Project activities, including staging area(s) for construction of the ponds and gravity diversion, could also be affected by noise. Noise has been documented to adversely affect avian reproduction, and thus, construction noise and activity, if adjacent to areas occupied by nesting birds, could result in nesting failure if such activities occur during the breeding season.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Bird Species, page 3.4-39, line 4

Project construction would result in a temporary disturbance or alteration of shallow shoreline habitat (approximately 6.3 miles) where the ponds would be constructed compared to current conditions. Although gull-billed terns and black skimmers might forage along the shoreline, few would be expected to nest in this area because nesting is limited due to lack of predator protection along the shoreline. Construction noise and activity, if adjacent to areas occupied by gull-billed tern or black skimmer, would have a low potential to result in nesting failure if such activities occur during the breeding season (April through September).

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds –page 3.4-41, line 34

Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status ~~bird and mammal~~ species (less-than-significant or no impact).

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds –page 3.4-41, lines 5-7

Western Snowy Plover. Conduct preconstruction (or pre-maintenance) focused surveys for western snowy plovers within suitable habitat that could be affected. Surveys will be conducted using current USFWS methods and/or methods approved by the DFG. If western snowy plovers are detected within the Project impact area, construction or maintenance activities will be conducted under a qualified biologist's supervision so that direct impacts are avoided. If breeding snowy plovers are detected within the Project impact area, construction or maintenance will be postponed and a protective buffer of at least 100 feet (as determined by a qualified biologist at the site) provided until it is confirmed that breeding is complete.

MM BIO-2: Prepare and implement a preconstruction/maintenance survey plan for bird species.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Birds, page 3.4-42, line 5

During operations, noise from the pumps that brings saline water to the ponds is unlikely to affect breeding because the pump stations would be located at the edge of the outer berm and offshore (approximately 3,000 feet or more from the existing shoreline), or on the exposed seabed when the Sea recedes that far. Power to operate the saline water pumps would come from one or more short (0.7- to 1.0-mile--long) transmission line extensions (~~see~~ Figure 2-5). The segments within the SCH ponds and Salton Sea would be buried. The routes along the north side of the New River and the east side of Bruchard Bay would be in areas where no power lines are currently present, while the third route would follow an existing power line for about half of its length. Special-status birds in the Project area are unlikely to collide with these short power lines due to their habitat use patterns. They tend to remain near the marshes or shoreline and/or they do not migrate in large flocks at night. The only species with a low potential for collision with a power line is the peregrine falcon while stooping (diving) to capture a bird lower than the power line. Given the small number of peregrine falcons in the Project area and bird deterrents included as part of the Project, no loss is expected. Impacts would be less than significant compared to the existing environmental setting and the No Action Alternative.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Birds, page 3.4-42, line 44

Gull-Billed Tern and Black Skimmer. Compared to the No Action Alternative, Project construction would result in temporary disturbance or alteration of shallow shoreline habitat, but would maintain that shoreline as the Sea recedes, presumably providing a continuing food source within the ponds that would not otherwise exist under the No Action Alternative. Compared to current conditions, the Project would result in a temporary loss of foraging area and a very limited loss of potential nesting areas, and would equally replace foraging areas. Maintenance activities within the ponds could temporarily disturb foraging in the immediate vicinity of the work, but other foraging areas in the ponds would remain. Impacts would be less than significant compared to the existing environmental setting and the No Action Alternative.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Birds, page 3.4-43, line 11

Mountain Plover, Lesser Sandhill Crane, and Greater Sandhill Crane. The mountain plover and lesser and greater sandhill cranes occur near the Project area as wintering species. They occur within plowed, barren, and burned agricultural fields and could occur within the Project area depending on placement of the diversion and conveyance pipeline. The mountain plover and lesser and greater sandhill cranes are nomadic and forage where suitable food is available. Their occurrence within the region and within the Project area is unpredictable. Due to their nomadic nature and flexibility for foraging, the foraging large area that is available to them, and their ability to avoid ~~disburbances~~disturbances, these species are unlikely to be affected by Project construction and operation (including maintenance). Therefore, impacts would be less than significant. Assuming suitable foraging habitat would be available, Project effects on these species would be similar under the No Action Alternative and existing conditions.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – page 3.4-47, lines 7-8

Impact BIO-5a: Project construction, ~~and~~ operation, and maintenance could affect nesting by some common bird species and introduction of invasive species (significant impact).

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – page 3.4-48, lines 13-16 and add after line 16

Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities (less-than-significant or no impact). No common upland native plant communities are present in the Alternative 1 area, and no impacts would occur from Project construction or operation.

Some aquatic organisms would be entrained with the water diverted from the New River and end up in the sedimentation basin and ultimately in the SCH ponds. Since they are freshwater species, many would survive in the sedimentation basin, but none are expected to survive in the ponds, which would typically be managed at salinities above 20 ppt. River flow downstream of the diversion would be reduced by less than 50 percent (~~see~~ Section 3.11), which would also reduce the amount (volume) of aquatic habitat and its structure (e.g., depth). Loss of some individuals of or habitat for nonnative aquatic species would not adversely affect their populations in the New River, and impacts would be less than significant.

A reduction in river flow would have minimal effects on existing riparian vegetation along the river banks downstream of the diversion location because more than 50 percent of the river flow would remain, and groundwater levels that help support this vegetation would remain high due to the river flow, adjacent agricultural field irrigation, and infiltration from the adjacent SCH ponds. Thus, riparian habitat value for common birds would not be reduced due to the SCH Project, and impacts would be less than significant.

The river delta and associated estuary will move seaward with or without the Project as the Sea recedes. The Project-related reduced river inflow would decrease the size of the estuary (mixing zone), but increases in the salinity of the Sea will also affect mixing by increasing the density gradient between the inflowing river water and Sea water, irrespective of the Project. Development of riparian vegetation along the margins of the extending river (across the exposed Seabed and moving delta) will occur over time and may or may not become as dense and large in stature as that currently at the river delta. A number of factors unrelated to the Project, in addition to amount of river water, would affect this vegetation growth. Thus, habitat value for common birds along the extending river and its delta will likely be lower than at the current delta with and without the Project. Impacts of the Project would be less than significant.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – page 3.4-49, line 14

Operation of the pump stations to bring saline water to the ponds would not disrupt breeding of common birds that nest within the Project area because the pump stations would be located adjacent to the seaward side of the outer berm and in the Sea away from any nesting habitat, including the islands within the ponds. Maintenance activities have the potential to disturb bird foraging throughout the Project. Effects on foraging, however, would be less than significant because maintenance would occur in only a portion of the ponds at a time leaving other foraging areas available nearby within the Project area. Transmission lines to bring power to the pump stations would have less-than-significant impacts on birds as described in Impact BIO-1b.

Section 3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds – Effects of Contaminants, page 3.4-49, lines 31-33

Contaminants in the water and sediment, such as selenium and pesticides, could impact biota utilizing the SCH ponds. Breeding species that could be exposed to selenium by feeding at the SCH ponds include gull-billed tern, California brown pelican, double-crested cormorant, Caspian tern, black skimmer, black-necked stilt, American avocet, and western snowy plover. Ecorisk modeling was used to estimate potential selenium concentrations in water and biota for different Project alternatives and operations (model scenarios of river water blended with Salton Sea water to achieve 20 ppt or 35 ppt salinity in ponds) (Sickman et al. 2011~~,~~; ~~see~~ Appendix I). For Alternative 1, estimated fish tissue selenium concentrations would be 4.3-5.5 µg/g dw in ponds operated at salinities of 20 to 35 ppt, which exceeds a protective standard of 4.0 µg/g dw (Lemly 2002) but is similar to or less than existing levels at the Salton Sea and rivers (DFG and DWR 2007, Johnson et al. 2009, Saiki et al. 2010). Bird egg selenium concentrations would be 6.0~~-~~ to 8.3 µg/g dw in ponds operated at salinities of 20 to 35 ppt, and less than 6 µg/g dw for ponds operated at 40 ppt or greater. This egg selenium concentration exceeds the conservative toxicity threshold (>6.0 µg/g dw), which would increase the probability of reduced hatching success in some species, but would not reach levels associated with teratogenesis (>12 µg/g dw) (Ohlendorf and Heinz 2011).

Section 3.4.4.5 Alternative 2 – New River, Pumped Diversion – page 3.4-54, lines 1-2

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 1; impacts would be less than significant.

Section 3.4.4.5 Alternative 2 – New River, Pumped Diversion – page 3.4-54, line 3

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 1; impacts would be less than significant. Transmission lines to bring power to the pump stations would have less-than-significant impacts on special-status birds as described for Alternative 1.

Section 3.4.4.5 Alternative 2 – New River, Pumped Diversion – page 3.4-55, lines 26-27

Effects of diversion entrainment, reduced river flows downstream of the diversion, ~~and~~ water quality fluctuations in the SCH ponds, and temporary disturbances of adjacent habitats in the Sea on aquatic biota and temporary construction disturbances of shallow shoreline and terrestrial habitat on birds and terrestrial wildlife would be the same as described under Alternative 1, and impacts would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Section 3.4.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds – page 3.4-58, lines 16-17

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 1; impacts would be less than significant.

Section 3.4.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds – page 3.4-58, line 18

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 1; impacts would be less than significant. Transmission lines to bring power to the pump stations would have less-than-significant impacts on special-status birds as described for Alternative 1.

Section 3.4.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds – page 3.4-59, lines 37-38

Effects of diversion entrainment, reduced river flows downstream of the diversion, ~~and~~ water quality fluctuations in the SCH ponds, and temporary disturbances of adjacent habitats in the Sea on aquatic biota and temporary construction disturbances of shallow shoreline and terrestrial habitat on birds and terrestrial wildlife would be the same as described under Alternative 1, and impacts would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Section 3.4.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Ponds – page 3.4-62, lines 14-15

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts of construction, operation, and maintenance on these species would be the same as described for Alternative 1; impacts would be less than significant.

Section 3.4.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Ponds – page 3.4-62, line 17

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts of construction, operation, and maintenance on these species would be the same as described for Alternative 1; impacts would be less than significant. Power to operate the saline water pumps would come from a short (approximately 1-mile--long) transmission line extension (~~see~~ Figure 2-5). The segment within the SCH ponds and Salton Sea would be buried. The above-ground route follows an existing power line. Special-status birds in the Project area are unlikely to collide with this short power line as described for Alternative 1.

Section 3.4.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Ponds –page 3.4-64, lines 1-13

Effects of diversion entrainment, reduced river flow downstream of the diversion, ~~and~~ water quality fluctuations in the SCH ponds, and temporary disturbance of adjacent habitats in the Sea on aquatic biota would be the same as described under Alternative 1, except that the effects would be at the Alamo River, and impacts would be less than significant. Project effects on shallow shoreline habitat and common terrestrial wildlife would be less than significant as described for Alternative 1. Operation of the pump station (including the power line) and sedimentation basin would have effects similar to those described for Alternative 1, except the sedimentation basin would be 37 acres (23 acres less than for Alternative 1).

Effects of selenium uptake, pesticides, and avian diseases on common bird species would be essentially the same as described for Alternative 1, although the risk of selenium uptake would be slightly higher due to the higher selenium concentration in Alamo River water than in New River water. Ecorisk modeling was used to predict potential selenium concentrations in water and biota for different Project alternatives and operations (river water blended with Salton Sea water to achieve 20 ppt or 35 ppt salinity in ponds) (Sickman et al. 2011~~–~~; ~~see~~ Appendix I). For Alternative 4, predicted fish tissue selenium concentrations would be 5.9~~-~~ to 8.5 µg/g dw in ponds operated at salinities of 20 to 35 ppt, which exceeds a protective standard of 4.0 µg/g dw (Lemly 2002) but is similar to existing levels at the Salton Sea and rivers (DFG and DWR 2007, Saiki et al. 2010). Bird egg selenium concentrations would be 8.9 µg/g dw for ponds operated at 35 ppt, and 12.7 µg/g dw for ponds operated at 20 ppt. This amount exceeds the conservative toxicity threshold (>6.0 µg/g dw), which would increase the probability of reduced hatching success in some sensitive species, and approaches levels associated with teratogenesis in sensitive species (>12 µg/g dw). However, overall impacts on breeding birds using the SCH ponds would be less than significant for the reasons described under Alternative 1.

Section 3.4.4.8 Alternative 5 – Alamo River, Pumped Diversion – page 3.4-66, lines 33-34

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 4; impacts would be less than significant.

Section 3.4.4.8 Alternative 5 – Alamo River, Pumped Diversion – page 3.4-66, add after line 35

The transmission line to bring power to the pump stations would have less-than-significant impacts on special-status birds as described for Alternative 1.

Section 3.4.4.8 Alternative 5 – Alamo River, Pumped Diversion – page 3.4-68, lines 11-14

Effects of diversion entrainment, reduced river flow downstream of the diversion, ~~and~~ water quality fluctuations in the SCH ponds, and temporary disturbance of adjacent habitats in the Sea on aquatic biota would be the same as described under Alternative 1, except that the effects would be at the Alamo River, and impacts would be less than significant. Operation of the pump stations (including the power lines) and sedimentation basin would have effects similar to those described for Alternative 1, except the sedimentation basin would be 30 acres (half of that for Alternative 1).

Section 3.4.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds – page 3.4-70, lines 31-32

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 4; impacts would be less than significant.

Section 3.4.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds – page 3.4-70, add after line 33

The transmission line to bring power to the pump stations would have less-than-significant impacts on special-status birds as described for Alternative 1.

Section 3.4.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds – page 3.4-72, lines 11-14

Effects of diversion entrainment, reduced river flow downstream of the diversion, ~~and~~ water quality fluctuations in the SCH ponds, and temporary disturbance of adjacent habitats in the Sea on aquatic biota would be the same as described under Alternative 1, except that the effects would be at the Alamo River, and impacts would be less than significant. Operation of the pump stations (including the power lines) and sedimentation basin would have effects similar to those described for Alternative 1, except the sedimentation basin would be 50 acres (10 less than for Alternative 1).

SECTION 3.8 GEOLOGY, SOILS, AND MINERALS

Section 3.8.3.7 Mineral Resources, page 3.8-11, lines 39-40

Since the geothermal brines of the Salton Sea Known Geothermal Resource Area have a greater concentration of valuable minerals, this area's resource is being developed. ~~Cal Energy is operating a zinc extract plant near the Salton Sea.~~ Some of the minerals being extracted from geothermal brines, such as manganese and tin, have strategic value for national defense (County of Imperial 2006).

SECTION 3.9 GREENHOUSE GAS EMISSIONS/CLIMATE CHANGE

Section 3.9.4.2 Thresholds of Significance, page 3.9-11, added after line 19

As discussed in Section 3.9.2.1, the CEQ has determined that if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO_2-equivalent emissions, CEQ encourages Federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs. Based on Tables 3.9-3 through 3.9-6, the direct and indirect emissions of CO_2-equivalents during construction and operations would be well below 25,000 metric tons per year. Based on the low emissions, no further analysis is warranted under NEPA. The following significance thresholds and impact analysis are for CEQA purposes.

Section 3.9.4.2 Thresholds of Significance – Application of Significance Criteria, page 3.9-12, lines 7-11

- **Generate GHG emissions that may have a significant impact on the environment** – The Project alternatives would directly and indirectly generate GHG emissions from construction and operational activities. Direct GHG emissions would be generated through fuel consumption, fuel combustion resulting from construction activities, emissions from the transportation of goods and other materials to the sites, and workers traveling in vehicles to and from the sites during both construction and operation~~.~~ The Project also would indirectly result in GHG emissions, primarily from the generation of electric power used by the ~~freshwater~~ brackish water pumps required for Alternatives 2, 3, 5, and 6, and the seawater pumps required for all alternatives; additionally, a negligible amount of power would be required at the trailer that would serve as office space for the permanent employees. GHG emissions of each alternative are analyzed, and the potential for these emissions to have a significant impact on the environment is based on ~~is compared with existing environmental conditions and regulations.~~ factors such as:
  - Relative amounts of GHG emissions, taking into consideration whether the amount of emissions is small compared to the 25,000 metric tonne CO_2e reporting threshold for AB 32 and 7,000 metric tonne CO_2e threshold of significance suggested by CARB draft guidance in 2008.
  - Potential to contribute to a lower carbon future and energy efficiency.

Section 3.9.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds, page 3.9-12, lines 38-39

As shown in Table 3.9-3, construction would generate approximately 5,800 metric tonnes of CO_2e over the course of 2 years (approximately 2,900 metric tonnes of CO_2e per year). These emissions would be temporary and would cease upon completion of work. The annual construction emissions would be well under the annual 25,000 metric tonne CO_2e reporting threshold established by AB 32. The emissions also would be well under the draft annual 7,000 metric tonne CO_2e threshold suggested by CARB. To provide additional perspective, if the 5,796 metric tonnes of total construction emissions were amortized over the approximately 64-year Project duration, they would be approximately 45 metric tonnes of CO_2e per year. ~~Moreover, they would be well under the amount of GHG emissions that major facilities are required to report emissions (25,000 metric tons of carbon dioxide equivalents (CO_2e) or more per year).~~

Section 3.9.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds, page 3.9-15, lines 1-19

The Project has been designed to be energy-efficient to the extent feasible. Minimal power would be required at the trailer that would serve as office space for the permanent employees.

The primary power demand during operations would result from pumping, and electric pumps were chosen over diesel to minimize air emissions.~~ Minimal power would be required at the trailer that would serve as office space for the permanent employees~~. During operation, the pumps required to move water from the river and Salton Sea to the ponds would ~~utilize~~ use an average of 975 motor horsepower and consume about 6,925 MW-hr of electric power annually. Thus, indirect GHG emissions from the fossil fuel component of mixed electric power generation would increase as a result of the Project. Indirect GHG emissions from electric power used by the pumping plants would be about 2,280 metric tonnes CO_2e annually (CCAR 2009). As noted in Section 3.9.2.2, the State of California has imposed a number of regulations requiring the reduction of GHG emissions and the increased use of renewable energy sources. Power to supply the Project would be provided by IID, which is adding more renewable energy sources into its resource mix in order to meet regulatory requirements (IID 2010). Thus, power required to operate the Project pumps would increasingly come from sources that minimized the production of GHG emissions, and indirect emissions would be expected to decrease over time.

In addition to indirect ~~generation~~ emissions, direct GHG emissions from maintenance equipment and vehicles would be about 96 metric tonnes of CO_2e annually. Combined direct and average indirect operational emissions would be about 2,380 metric tonnes of CO_2e annually, which is well under the annual 25,000 metric tonne CO_2e reporting threshold established by AB 32 and the draft annual 7,000 metric tonne CO_2e threshold suggested by CARB.

~~Due to its small scale and requirements imposed on power sources by the State of California, the Project's impacts on the environment as a result of the GHG emissions generated during construction and operations would be less than significant when compared to both the existing environmental setting and the No Action Alternative. Moreover, the SCH Project would comply with the best management practices outlined in Section 2, which would reduce the amount of GHGs generated by the Project.~~ Additionally, as indicated on page 3.9-15, the Project would comply with best management practices that are intended to reduce GHG emissions during construction, operations, and maintenance to the extent feasible. (~~r~~Refer to Section 2.4.7 for a description of these practices.)~~.~~ Using these best management practices would contribute to energy efficiency.

Using the mandatory reporting threshold of 25,000 metric tonnes of CO_2e established by CARB and the 7,000 metric ton significance threshold suggested in the draft staff proposal to the CARB as guides as to the level of emissions that might be considered significant, and looking at specific characteristics of the Project as described in Section 3.9.4.2, the lead agencies have determined that this impact would be less than significant when compared to both the existing environmental conditions and the No Action Alternative.

SECTION 3.11 HYDROLOGY AND WATER QUALITY

Section 3.11.2.1 Water Rights, page 3.11-3, line 12

Individuals and agencies in the Salton Sea Basin hold seven individual water rights permits for diversion from Salton Sea tributaries. Imperial Irrigation District (IID) has water rights on the Colorado River for delivery of water through the All American Canal. Metropolitan Water District of Southern California has submitted a water right application to divert agricultural return flows from the New and Alamo rivers. The return flows are a result of the application of Colorado River water to irrigated lands in IID's service area. The New River water right application seeks 700 cfs up to a maximum of 433,400 afy. The Alamo

River water right application is for a diversion of 800 cubic feet per second (cfs) up to 475,000 acre-feet per year (afy). To date, Metropolitan Water District of Southern California has not prepared the required environmental document for these water rights permits and so the California State Water Resources Control Board (SWRCB) has not acted upon these permits. In addition, IID has asserted that it has the right to the use of all agricultural return flows within their service area, which is the majority of flows in the New and Alamo rivers. Therefore, the SCH Project must obtain IID's consent to use these return flows.

Section 3.11.2.2 Salton Sea and Agricultural Drainage, page 3.11-3, added after line 20

The Salton Sea receives runoff from several small tributaries, in addition to the Whitewater, New, and Alamo rivers. Flows from the three rivers are largely the result of agricultural return flows. The application of irrigation water introduces salts to the land, which are leached through the soil and collected in subsurface drains located 4 to 6 feet below the surface. This water is then conveyed to surface drains connected directly to the Salton Sea, or to the New or Alamo rivers and then to the Sea.

The California Legislature in 1968 passed Assembly Bill 461 that reserves the Salton Sea for collection of agricultural drainage flows, seepage, and other flows. In December 2000, as part of the Torres Martinez Desert Cahuilla Indians Claims Settlement, the Salton Sea was declared a permanent flowage easement for IID and the Coachella Valley Water District (Pub. L. 106-568, 114 Stat. 2906. See 25 U.S.C. § 1778 a(6); 1778e(a),(b)).

Section 3.11.2.5 Surface Water Hydrology – Salton Sea, page 3.11-7, lines 8-10

The Salton Sea is a terminal water body that receives water from the New, Alamo, and Whitewater rivers, along with numerous small streams, precipitation, and groundwater. The only outflow from the Sea is through evaporation and seepage. Formed in 1905–1907 from Colorado River flood flows, the Salton Sea is supported primarily by agricultural return flows. These return flows have decreased in recent time~~,~~ ~~largely~~ because of several factors, including a reduction in water orders from farmers during the last 10 years and reduced flows from Mexico. Lower precipitation also has contributed to the decline in flows in the New and Alamo rivers.~~water transfers from the Imperial Valley and the resulting water conservation measures~~. Recent Salton Sea elevations show the elevation peak around May 1995 and a decreasing trend to the end of the 2010 water year (Figure 3.11-2). Inflow to the Sea from the Imperial Valley is projected to continue to decline from the current annual average of 1,029,620 afy to 723,940 afy (with adjustment for the Quantification Settlement Agreement [QSA]) by 2020 (DWR and DFG 2007). The combined inflow from the Imperial Valley and Mexico to the Salton Sea represents about 86.3 percent of the total inflow to the Sea. The Coachella Valley accounts for 8.5 percent of the total inflow to the Sea. The total salt loading to the Sea from these sources is 92.6 and 5.8 percent, respectively (DWR and DFG 2007). The relative magnitude of the annual flow to the Sea from the three major tributaries is shown on Figure 3.11-3.

Section 3.11.2.5 Surface Water Hydrology – Alamo River, page 3.11-11, line 2

The Alamo River ~~also~~ originates ~~in the Mexicali Valley~~at the south side of the All American Canal on the eastern boundary of Calexico and flows north to the Salton Sea. Runoff from the Chocolate Mountains to the southeast contributes to the Alamo River through numerous watercourses that eventually are picked up in agricultural drains within IID's service area. Along its course, the river picks up stormwater, municipal wastewater, and agricultural return flows. During dry periods, the river flow is composed almost entirely of agricultural return flow (drainwater). The elevation of this basin is primarily at or below sea level, with a mean annual precipitation less than 2 inches near the Salton Sea.

Section 3.11.2.5 Surface Water Hydrology – Agricultural Drains/Natural Watercourses, page 3.11-11, line 30

IID is the agricultural water purveyor in the Imperial Valley, providing water from the Colorado River through the All American Canal. IID receives and delivers about 90 percent of the 3.2 million afy of irrigation water delivered from the Colorado River (Lawrence Livermore National Laboratory [LLNL] 2008). IID also provides a network of drainage channels that receive water from on-farm subsurface drainage systems (Figure 3.11-6). This drainage water is then conveyed to the New River, Alamo River, or directly to the Salton Sea. Agricultural drainage from the Imperial Valley directly to the Sea comprises about 10 percent of total Imperial Valley contribution to the Sea's inflow, which is estimated at 93,848 afy (DWR and DFG 2007).

Section 3.11.2.6 Surface Water Quality, page 3.11-13, line 19

Sediment

Sediment loading to the Salton Sea comes from the New, Alamo, and Whitewater rivers, numerous natural watercourses that flow into the Sea, and also the individual drains and canals that directly enter the Sea. Total suspended solids, a measure of the sediment load, has been measured in both the New and Alamo rivers. These data indicate that the average total suspended solids for the New River is 217 milligrams per liter (mg/L) and 261 mg/L for the Alamo River. Assuming an average annual flow for the New River of 612 ~~845~~ cfs and ~~612~~ 845 cfs for Alamo River, then the annual sediment loading to the Sea is 132,000 and 232,600 tons/year for the New and Alamo rivers, respectively.

Section 3.11.2.6 Surface Water Quality – Phosphorus, page 3.11-18, lines 35-37

In the rivers during 2004-2010, average levels of soluble orthophosphates were 75 percent greater in the New River compared to the Alamo River (536 µg/L and 306 µg/L, respectively) (Table 3.11-5) (C. Holdren, Reclamation, unpublished data). Similar to the Salton Sea, during the summer months levels of soluble orthophosphates and total phosphorus were lowest. Total phosphorus concentrations are highest during the fall months at the New River and during the winter months at the Alamo River. Average annual concentrations of total phosphorus were approximately 56 percent greater in the New River compared to the Alamo River (976 µg/L and 624 µg/L, respectively) (C. Holdren, Reclamation, unpublished data). ~~Nutrient concentrations have not decreased recently, despite TMDLs for total suspended solids and phosphorus or changes in agricultural practices (personal communication, C. Holdren Reclamation, 2010).~~

Section 3.11.3.3 No Action Alternative, page 3.11-36, lines 11-17

As water use within IID decreases due to increased conservation and water transfers, the flow in the New and Alamo rivers would be expected to decrease by approximately 305,670 afy, which would result in a declining water surface elevation in the Sea and an increasing salinity because of the concentrating effect of evaporation. Simulations in the PEIR (DWR and DFG 2007) showed water surface elevations declining and salt levels increasing under the No Action Alternative (CEQA Baseline, Figure 3.11-9, and Figure 3.11-10) until 2046 when the surface elevation stabilizes at about ~~-258.3~~ -247.8 feet msl. The PEIR also looked at the baseline condition that considered a larger decrease in inflow to the Sea (referred to as the Variability Conditions Inflow baseline). That simulation showed the Sea declining to -258.3 in 2046 (also shown on Figure 3.11-9 and Figure 3.11-10). ~~The stabilized elevation would be about 6 feet lower than the 1925 elevation that the Salton Sea had declined to before rising in response to increased agricultural runoff.~~ The simulations conducted for the PEIR suggest the current trend and show a remnant Salton Sea that would become a brine sink with salinity exceeding 100 ppt by 2030~~24 and approximately 243 ppt by 2046~~ (DWR and DFG 2007).

Figure 3.11-9 Simulated Salton Sea Elevation under the No Action Alternative, page 3.11-37

The revised figure follows.

Figure 3.11-10 Simulated Salton Sea Salinity under the No Action Alternative, page 3.11-38

The revised figure follows.

Section 3.11.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds, page 3.11-39, lines 17-33

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 223,770 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by about 118,100 ~~130,200~~ af compared to the No Action Alternative. The Sea's surface elevation would be about 0.6~~8~~ foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth (water surface elevation minus the ~~bottom~~ lowest elevation of the Sea) would be reduced by 2.4~~4.3~~ percent, and its water surface elevation would be about 0.7~~9~~ foot lower as a result of the SCH diversions. Table 3.11-10 compares the Salton Sea's water surface elevation, storage volume, and surface area that would occur in the absence of the Project with the Project at the onset of operations, the end of the proof-of-concept period, and the end of the Project's lifetime.

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077~~,~~ although Alternative 1 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 482~~940~~ acres of playa.

Alternative 1 also would result in a change to the Salton Sea's water surface elevation when compared to existing conditions. Most of the change, however, would be a consequence of the changes in inflow to the Sea described above, and not related to the Project. Table 3.11-10 shows the changes from the existing conditions that occur under the No Action Alternative and a small increment associated with the Project. For example, by 2077 the water surface elevation of the Sea is expected to decline by 13.6~~27.2~~ feet relative to existing conditions. While this is substantial change in elevation, all but 0.7~~9~~ feet of the change would a result of the No Action Alternative. That is, the Sea will get smaller, shallower, and saltier regardless of whether the SCH Project is implemented or not, which expected to result in the collapse of the ecosystem. Alternative 1 would offset a portion of this lost habitat by providing new habitat that is usable by birds, fish, and other organisms. It would not, in itself, result in changes that would have an adverse effect on or preclude the beneficial uses of the Salton Sea identified in the Basin Plan. Impacts from the change in water surface elevation in the Salton Sea would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

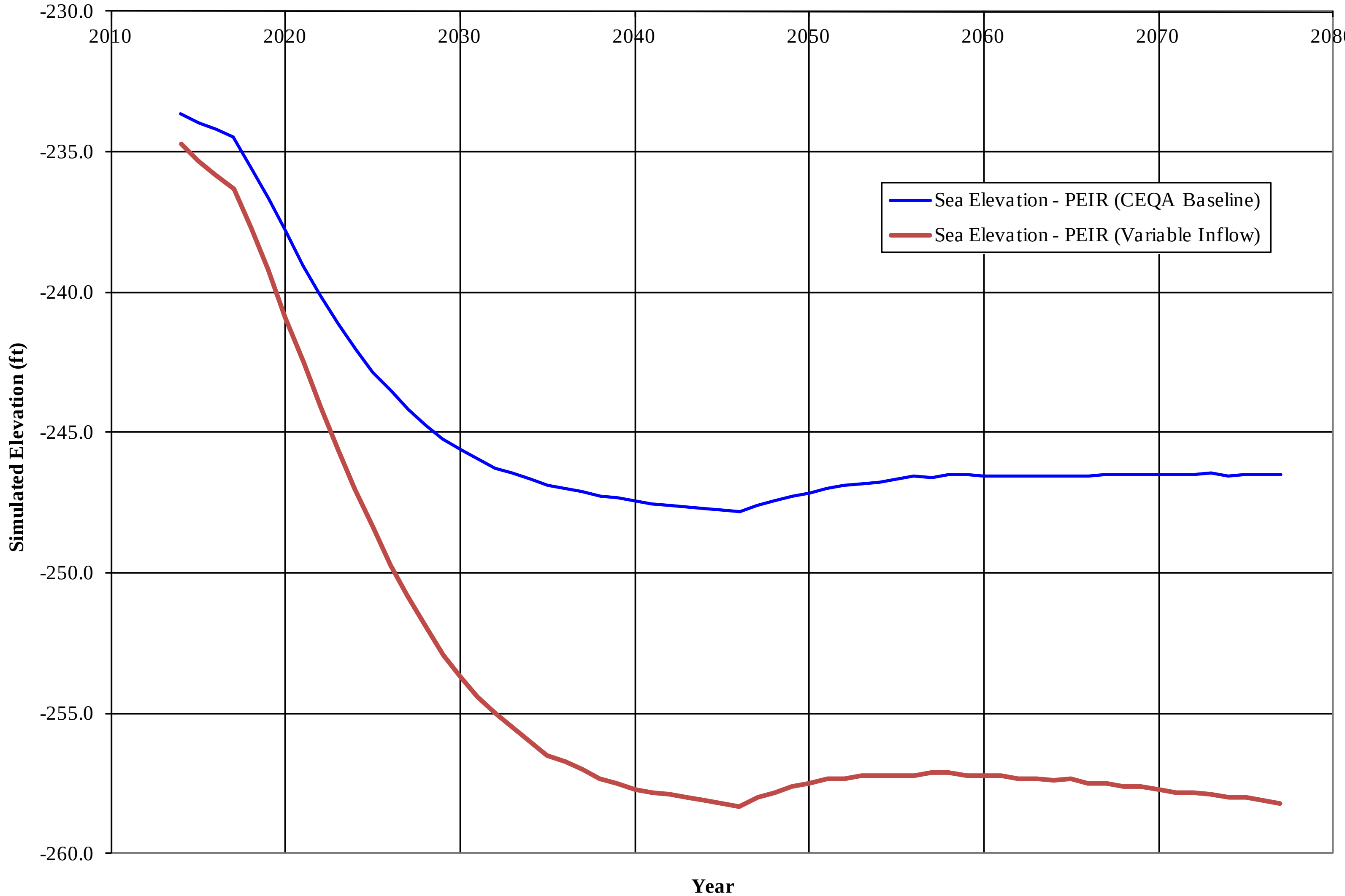


Figure 3.11-9 Simulated Salton Sea Elevation under the No Action Alternative

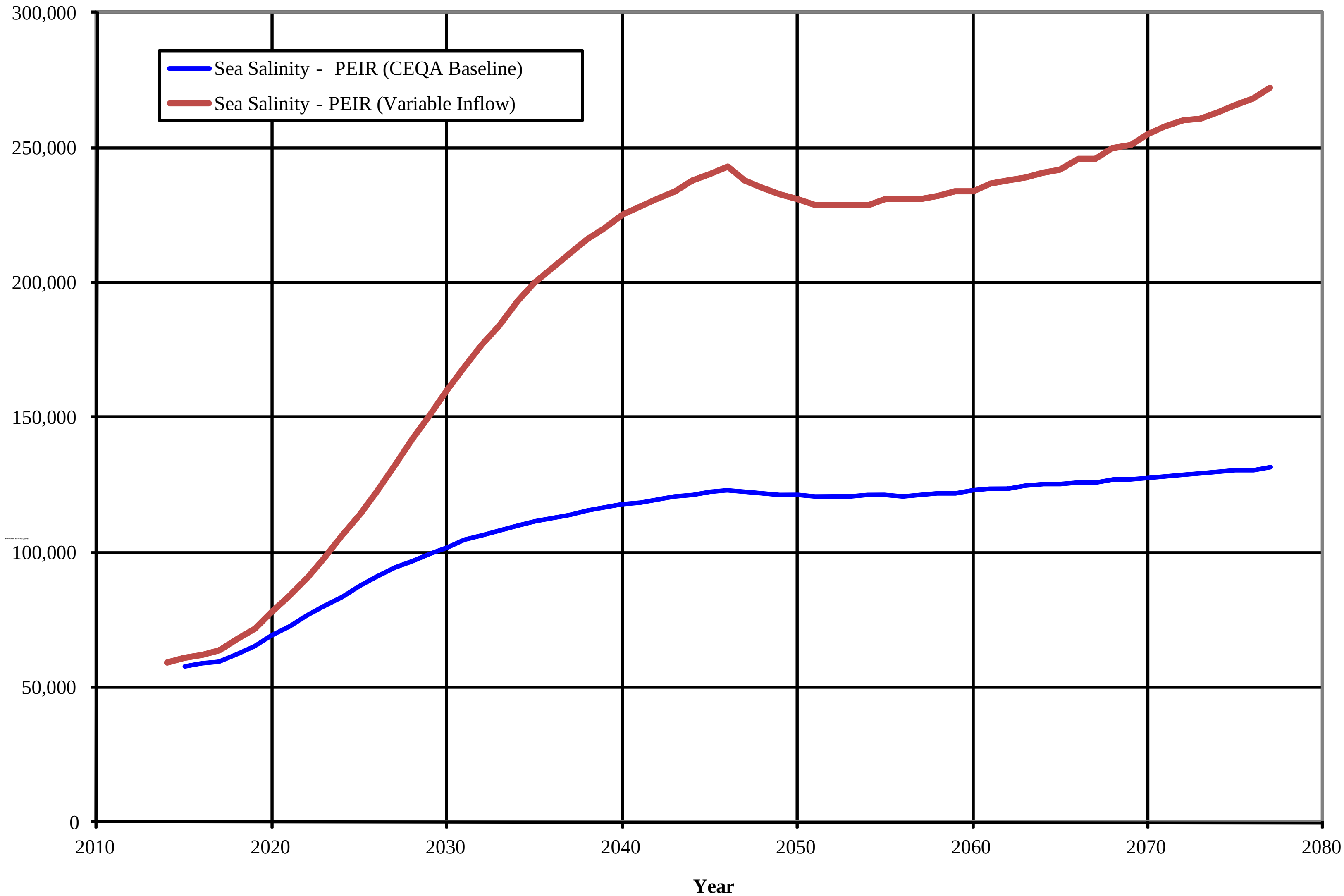


Figure 3.11-10 Simulated Salton Sea Salinity under the No Action Alternative

Table 3.11-10 Salton Sea Surface Elevation and Area – No Action[1] and SCH Project Alternatives, page 3.11-40

This table replaces Table 3.11-10 in the Draft EIS/EIR.

Table 3.11-10 Salton Sea Surface Elevation and Area – No Action[1] and SCH Project Alternatives

	Elevation			Storage			Area		
	2014 (ft)	2025 (ft)	2077 (ft)	2014 (af)	2025 (af)	2077 (af)	2014 (acres)	2025 (acres)	2077 (acres)
Existing[2]	-231.0	--	--	6,744,357	--	--	227,299	--	--
No Action	-233.6	-242.8	-246.5	6,116,192	4,182,992	3,511,895	222,649	190,029	176,102
Alternative 1	-233.6	-243.5	-247.2	6,116,192	4,064,941	3,380,848	222,649	187,576	173,450
Difference	0.0	-0.6	-0.7	0	-118,052	-131,047	0	-2,454	-2,652
Alternative 2	-233.6	-243.4	-247.1	6,116,192	4,082,584	3,400,305	222,649	187,942	173,844
Difference	0.0	-0.5	-0.6	0	-100,408	-111,590	0	-2,087	-2,258
Alternative 3	-233.6	-243.6	-247.4	6,116,192	4,040,851	3,354,251	222,649	187,075	172,912
Difference	0.0	-0.8	-0.9	0	-142,141	-157,644	0	-2,954	-3,190
Alternative 4	-233.6	-243.3	-247.0	6,116,192	4,096,702	3,415,859	222,649	188,235	174,159
Difference	0.0	-0.5	-0.5	0	-86,290	-96,036	0	-1,794	-1,942
Alternative 5	-233.6	-243.3	-247.0	6,116,192	4,104,749	3,424,719	222,649	188,402	174,340
Difference	0.0	-0.4	-0.5	0	-78,243	-87,176	0	-1,627	-1,762
Alternative 6	-233.6	-243.4	-247.2	6,116,192	4,072,214	3,388,871	222,649	187,727	173,612
Difference	0.0	-0.6	-0.7	0	-110,778	-123,024	0	-2,303	-2,490

Notes:
1. No Action modeled in PEIR, Appendix H-2, Attachment 2, Table H2-2-3 (DWR and DFG 2007).
2. Existing Conditions is represented by 2010 conditions.

Table 3.11-11 Salton Sea Salinity – No Action and SCH Project, page 3.11-41

This table replaces Table 3.11-11 in the Draft EIS/EIR.

Table 3.11-11 Salton Sea Salinity – No Action and SCH Project Alternatives

	2014 (ppt)	2025 (ppt)	2077 (ppt)
Existing[1]	51.0	--	--
No Action	57.0	87.5	131.6
Alternative 1	57.0	90.0	136.7
Percent Change	0.0%	2.9%	3.9%
Alternative 2	57.0	89.6	135.9

Table 3.11-11 Salton Sea Salinity – No Action and SCH Project Alternatives

	2014 (ppt)	2025 (ppt)	2077 (ppt)
Percent Change	0.0%	2.5%	3.3%
Alternative 3	57.0	90.6	137.8
Percent Change	0.0%	3.5%	4.7%
Alternative 4	57.0	89.3	135.3
Percent Change	0.0%	2.1%	2.8%
Alternative 5	57.0	89.2	134.9
Percent Change	0.0%	1.9%	2.5%
Alternative 6	57.0	89.9	136.3
Percent Change	0.0%	2.7%	3.6%

[1] Existing Conditions is represented by 2010 conditions.

Section 3.11.3.5 Alternative 2 – New River, Pumped Diversion, page 3.11-44, lines 25-38

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 190,350 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by about 10~~1~~0,4~~7~~00 af compared to the No Action Alternative. The Sea's surface elevation would be about 0.5~~6~~ foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 2.4~~3.7~~ percent, and its water surface elevation would be about 0.6~~7~~ foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 2 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 408~~790~~ acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,670 acre pond, the Sea's salinity would increase relative to No Action by 2.5~~3.6~~ percent (to 89.6~~118.1~~ ppt) by 2025 and by 3.3~~6.7~~ percent (to 135.9~~290.1~~ ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Section 3.11.3.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds, page 3.11-45, lines 17-30

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 269,460 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by about 142,100~~156,700~~ af compared to the No Action Alternative. The Sea's surface elevation would be about 0.8~~9~~ feet lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 2.4~~5.1~~ percent, and its water surface elevation would be about 0.9~~1.0~~ foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 3 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 584~~1150~~ acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 3,770-acre pond, the Sea's salinity would increase relative to No Action by 3.5~~5.2~~ percent (to 90.6~~119.9~~ ppt) by 2025 and by 4.7~~9.5~~ percent (to 137.8~~297.9~~ ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Section 3.11.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond, page 3.11-46, lines 11-24

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 163,650 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by about 96,000~~124,260~~ af compared to the No Action Alternative. The Sea's surface elevation would be about 0.5~~7~~ foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 2.4~~4.1~~ percent, and its water surface elevation would be about 0.5~~8~~ foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 4 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 350~~194~~ acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,290 acre pond, the Sea's salinity would increase relative to No Action by 2.1~~4.1~~ percent (to 89.3~~118.6~~ ppt) by 2025 and by 2.8~~7.5~~ percent (to 135.3~~292.4~~ ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Section 3.11.3.8 Alternative 5 – Alamo River, Pumped Diversion, page 3.11-47, lines 14-27

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 148,440 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by about 78,200~~86,300~~ af compared to the No Action Alternative. The Sea's surface elevation would be about 0.4~~5~~ foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 2.4~~9~~ percent, and its water surface elevation would be about 0.5~~6~~ foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 5 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 317~~600~~ acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,080~~-~~-acre pond, the Sea's salinity would increase relative to No Action by 1.9~~2.8~~ percent (to 89.2~~117.5~~ ppt) by 2025 and by 2.5~~5.1~~ percent (to 134.9~~286.0~~ ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Section 3.11.3.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds, page 3.11-48, lines 11-23

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 209,990 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by about 110,800~~122,143~~ af. The Sea's surface elevation would be about 0.6~~7~~ foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 2.4~~4.0~~ percent, and its water surface elevation would be about 0.7~~8~~ feet lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 6 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 451~~880~~ acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,940–acre pond, the Sea's salinity would increase relative to No Action by 2.7~~4.0~~ percent (to 89.9~~118.5~~ ppt) by 2025 and by 3.6~~7.4~~ percent (to 136.3~~292.0~~ ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

SECTION 3.13 LAND USE

Section 3.13.2.1 State Programs and Regulations, page 3.13-1, lines18-20

The California State Lands Commission (SLC) manages State-owned lands that underlie California's navigable and tidal waterways. The State holds these lands, known as "sovereign lands," for the benefit of all the people of the state, subject to the Public Trust for water-related commerce, navigation, fisheries, recreation, open space and other recognized Public Trust uses." The SLC has determined that ~~one~~ two parcels included in the potential SCH Project sites are within its jurisdiction (Figure 1-2). Parcel ~~(~~010-020-030~~), shown on Figure 1-2)~~ is included as part of Alternatives 4 and 6 and would be subject to a lease for the use of sovereign lands. Additionally, a portion of Alternatives 4, 5, and 6 is within Parcel 020-010-040, and its use could require a mineral least from the SLC if any soils were removed from this parcel as part of the SCH Project.

Section 3.13.3.5 Future Land Uses in the Study Area – Geothermal Energy Production, page 3.13-9, line 29

As noted above, the proposed pond sites are located in an area that contains important geothermal resources, and IID has granted mineral rights to various geothermal companies that would allow them to develop geothermal facilities in this area (subject to the appropriate environmental compliance and approval processes) (personal communication, B. Wilcox 2010). Future geothermal power plants may be located in areas that are currently submerged by the Salton Sea. Future facilities on land owned by IID could include one 10-acre well pad in each quarter section in unspecified locations within the Project's boundaries, pipelines to convey geothermal water, roads that can support heavy loads, and electric transmission lines. The 10-acre wells pads could include multiple well heads with directional boring under the surrounding SCH Project areas. Pipelines, roads, and electric transmission lines may require easements up to 600 feet wide for construction, access, and maintenance. Geothermal power generation plants typically require sites up to 50 acres. At this time, it is not known whether such facilities would be constructed and where they would be located. Their siting, construction, and operation would require permits and independent environmental analysis.

Section 3.13.4.3 No Action Alternative, page 3.13-11, line 30

Declining water levels will also expose Salton Sea shoreline areas as playa; this exposed land area will become available for potential future economic development. This land would likely be designated for specific land uses by the appropriate land use agency, such as Imperial County, for residential, commercial, industrial, or open space development, and future development would be required to be consistent with the requirements of the agency with jurisdiction over the land. Extensive geothermal resources exist in the vicinity of the New and Alamo rivers. These areas are planned for geothermal production and are expected to be developed with pads to locate drilling and well facilities. Additionally, IID plans to construct experimental air quality management plots in the Project vicinity. The No Action Alternative would not restore habitat along the existing shoreline or convert exposed playa to open water, and would not, therefore, have the potential to conflict with future planned land uses for the exposed playa areas.

Figure 3.13-3 Existing Land Uses near the New and Alamo Rivers, page 13-7-7.

The revised figure is on the following page.

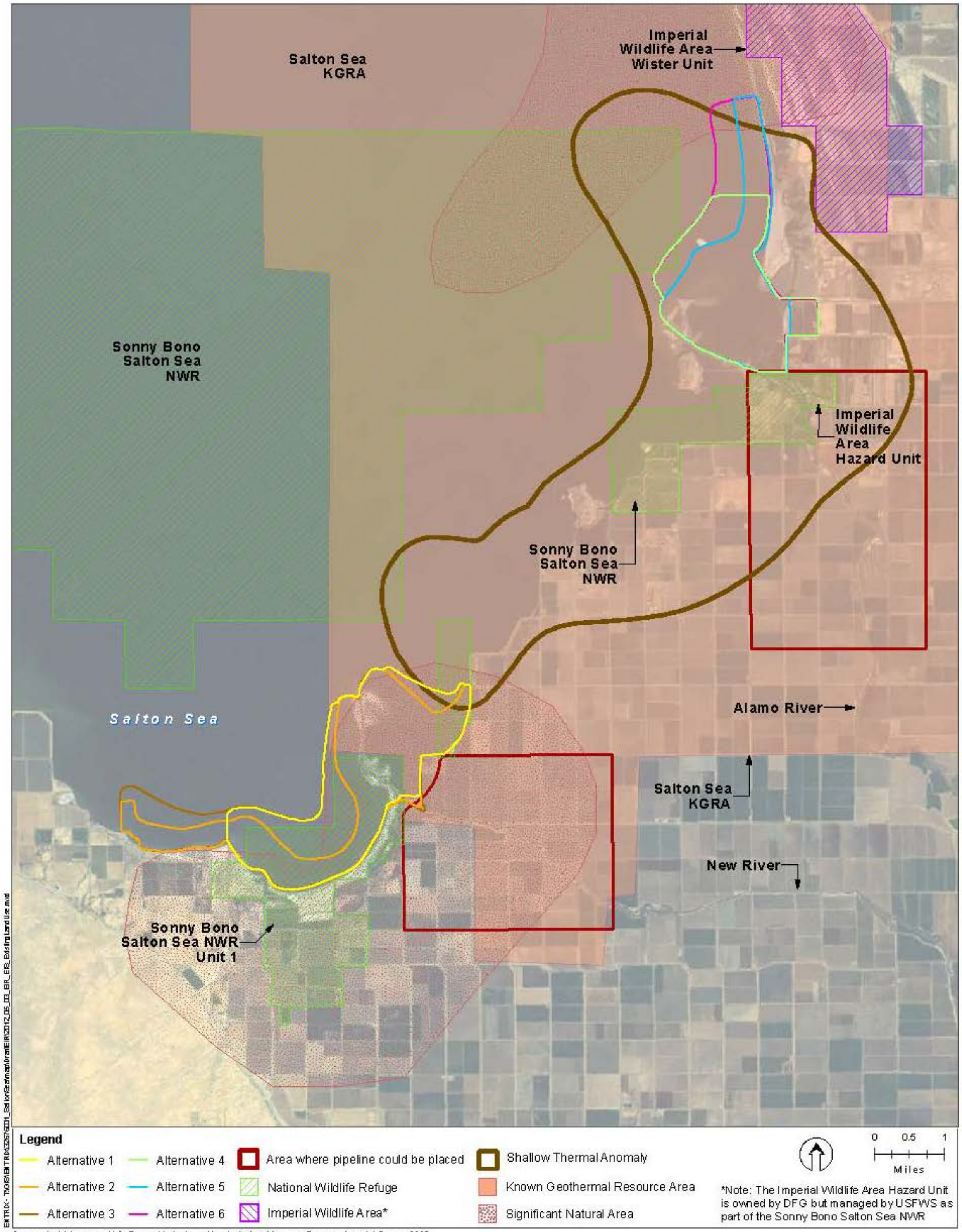


Figure 3.13-3 Existing Land Uses near the New and Alamo Rivers

SECTION 3.19 SOCIOECONOMICS

Section 3.19.3.3 No Action Alternative, page 3.19-7, lines 22-30

As the Salton Sea recedes, there is a potential that farmers could reclaim the exposed land for agricultural uses, but the likelihood of this occurring is speculative. The land near the river deltas would be composed primarily of sand, silt, and fine particles and would be suitable for agriculture, but it would require reclamation, as well as the provision of irrigation water by the Imperial Irrigation District. Reclamation would involve leaching the salts out of the soils through the application of water, and in some areas the ground would need to be 6 to 7 feet higher than any standing or running water in the area. Groundwater intrusion could also be an issue, requiring a good drainage system to prevent the upward movement of salty water (personal communication, K. Bali 2010).Some areas along the western shoreline of the Salton Sea contain more well-drained soils than the river delta areas and could be reclaimed as farmland without the installation of tile lines, thus eliminating or reducing the need for ground surfaces to be 6 to 7 feet higher than any standing or running water in the area. Additionally, the Imperial Irrigation District and local farmers are currently investigating the potential for reclamation of these soils without excessive leeching (with repeated deep tillage of the soil to promote aeration). Most of these areas are well to the west of the Project alternatives, but some reclaimed areas may be identified within the river deltas.~~Water also would need to be made available by the Imperial Irrigation District for irrigation (personal communication, K. Bali 2010). Thus~~ Therefore, there is a potential for exposed~~, the likelihood of this~~ land to be~~ing~~ reclaimed in the future~~ is possible~~, but it is considered speculative at this time (personal communication, D. Vargas 2011).

SECTION 4.0 CUMULATIVE IMPACTS

Section 4.3.6 Energy Consumption, page 4-18, line 44

The geographic scope for the energy consumption cumulative impact analysis is Imperial County. Construction, operation, and maintenance of the projects discussed above would result in the consumption of energy, including electricity, natural gas, diesel fuel, and gasoline, but would not necessarily result in the inefficient, wasteful, or unnecessary consumption of energy. Several of the projects discussed above would result in the generation of electrical energy and cumulative impacts would be less than significant. SCH Project operation would require the use of ~~diesel~~electrically powered pumps to deliver saline water from the Salton Sea to the SCH ponds. Over time, the efficiency of the saline pump may decrease under long-term pumping; however, a comparatively minor amount of energy would be required, and the SCH Project's contribution to the cumulative impact would not be considerable and is therefore, less than significant.

SECTION 6.0 COMPLIANCE, CONSULTATION, AND COORDINATION

Section 6.1.2.4 California State Lands Commission Public Trust Doctrine, page 6-9, lines 36-38

The SLC has determined that parcel 020-010-030, which falls within the boundaries of Alternatives 4 and 6 (Figure 1-2), is within its jurisdiction and would require a lease that would be subject to findings of consistency with the Public Trust Doctrine and the Public Trust Policy administered by the SLC. ~~The proposed uses for the SCH Project fall within the definition of uses consistent with the Public Trust Doctrine and Policy.~~ Additionally, a portion of Alternatives 4, 5, and 6 is within Parcel 020-010-040 (Figure 1-2), and its use could require a mineral lease from the SLC if any soils were removed from this parcel as part of the SCH Project. All decisions on lease issuance and Public Trust consistency of leases and proposed uses of sovereign lands would be made only by the three-member panel of Commissioners.

Section 7.3 Environmentally Preferable/Environmentally Superior Alternative, page 7-2, line 12

The Council on Environmental Quality's National Environmental Protection Act Guidelines, section 1505.2(b) requires that, in cases where an EIS has been prepared, the Record of Decision (ROD) must identify all alternatives that were considered, ". . . specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in National Environmental Protection Act section 101. Ordinarily, this designation means the alternative that causes the least damage to the biological and physical environment; the designation also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. Additionally, the United States Environmental Protection Agency's section 404(b)(1) Guidelines require the Corps to issue a permit only for the "least environmentally damaging practicable alternative," which is the most practicable alternative that would result in the least damage to aquatic resources and is not contrary to the public interest. Therefore, the "least environmentally damaging practicable alternative" will be the Corps' preferred alternative. California Environmental Quality Act Guidelines section 15126.6 also requires the identification of the environmentally superior alternative; if the No Action Alternative is considered environmentally superior, then an environmentally superior alternative must be chosen from one of the Project alternatives.

APPENDIX D PROJECT OPERATIONS

Section D.2.6 Agricultural Drain Interception Ditch, page D-5, added after paragraph 1

Water from adjacent agricultural drains that currently flows (or is pumped) directly into the Salton Sea would be rerouted around the SCH ponds. The interception ditch would allow for the continuation connection of these drains to the Salton Sea and not disturb the flow of agricultural drainwater from the adjacent fields. IID would maintain operational control of ~~these~~ the interception ditch and agricultural drains and continue to provide all maintenance activities necessary on these drains, subject to the requirements of IID's Habitat Conservation Plan and related permits and authorizations.

Section D.3.1 Habitat Requirements and Operational Constraints, page D-5, second bulleted list

SCH pond operations would attempt to meet Project goals and objectives given certain constraints of physical conditions, water quality, and climate. The general characteristics of the aquatic habitat that would likely be present for fish include:

- Highly eutrophic, shallow-water ponds that would be highly turbid in spring through fall.
- Low temperatures below 50 degrees Fahrenheit (°F) (10 degrees ~~Celcius~~Celsius [°C]) during short periods (hours) of the winter and high temperatures in the low– to mid-90s °F (low 30s °C) in the late spring through early fall.
- Dissolved oxygen (DO) concentrations ranging from zero mg/L at the mudline to super-saturated during daylight hours in spring to fall.

Section D.3.6 Fish Stocking in Ponds - Tilapia, page D-10, 3rd full paragraph

Tilapia satisfy the entire suite of attributes sought in a candidate species, more than any other single species being considered for the SCH Project (DFG 2011). This family of fishes has wide tolerances for water quality conditions, flexible diet including algae and invertebrates, high fecundity, and distribution throughout the water column. Furthermore, they could also support sport fishing. This species is highly tolerant of a wide range of salinities, including high salinities, as demonstrated by their current dominance in the hypersaline Salton Sea. Juvenile Mozambique hybrids can be slowly acclimated up to 95 grams per liter and survive at least for 5 days if the temperature is kept constant at 73 to 77°F (23 to 25°C) (Sardella et al. 2004a). Tilapia are less capable of dealing with high salinity under extreme temperatures (Sardella et al. 2004b). The preferred temperature range for optimum tilapia growth is 82° to 86°F (28 to 30°C). Growth diminishes significantly at temperatures below 68°F (20°C) and death would occur below 50°F (10°C) (Rakocy and McGinty 1998). At temperatures below 54°F (12°C), tilapia are more vulnerable to infections by bacteria, fungi, and parasites. The temperature regime in the SCH ponds would be expected to be more extreme than that of the current lake (DWR and DFG 2007). Models of water temperatures for the SCH ponds predict temperatures below the ~~lethal~~ tolerance ~~threshhold~~threshold for Mozambique hybrid tilapia (Appendix J). The impacts of cold are affected by salinity and the duration of cold spells. Tilapia can survive brief cold snaps of a day or so (personal communication, K. Fitzsimons 2010). Cold spells could kill some fish, but other fish would survive to recolonize the pond.

Section D.3.6 Fish Stocking in Ponds - Tilapia, page D-11, 4th full paragraph

The relative tolerances of these species to combinations of salinities (20 ppt, 45 ppt, and 60 ppt) and temperatures (cold 11-16°C [52-61–°F]), warm 23-28°C [73-82–°F], and hot 33-38°C [91-100°F]) were tested experimentally (Lorenzi and Schlenk 2011~~, in preparation~~). The fish tolerance study (Lorenzi and Schlenk 2011) looked at survival over a longer time period (30 days), rather than single cold snap, using an expected winter temperature range with typical diurnal flux (11-16°C, based on field measurements and modeling data). The tested fish included Mozambique tilapia (two strains: wild fish from Salton Sea and an aquaculture strain from a local fish farm), fish from a blue tilapia assemblage in the New River, and redbelly tilapia from the New River. The temperature-salinity tolerance study found very good survival at 11-16°C and 20 ppt salinity for wild Mozambique tilapia (100 percent), hatchery Mozambique tilapia (67 percent), and blue tilapia (80 percent). The best survival at cold temperatures was observed with the wild Mozambique tilapia, while the aquacultural strain of Mozambique tilapia was the best performer overall for all salinities at warm temperatures. The blue tilapia strain surprisingly did not have better survival than Mozambique tilapia in cold conditions. Redbelly tilapia results were equivocal, due to other sources of mortality in captivity. While most strains and species had moderately good survival in 45 ppt and 60 ppt conditions at warm temperatures, all species showed poor survival in hot high-salinity (60 ppt) conditions.

Section D.3.6 Fish Stocking in Ponds - Desert Pupfish, page D-11, 5th full paragraph

Desert pupfish are listed as an endangered species under both Federal and California Endangered Species Acts. They currently inhabit the agricultural drains and creeks that feed into the Salton Sea, shallow areas of the Sea itself, and numerous created refuge habitats. A study of IID agricultural drains found an abundance of desert pupfish positively correlated with western mosquitofish, but negatively correlated with salfin molly~~,~~ and Mozambique hybrid tilapia (Martin and Saiki 2005). Desert pupfish are observed most frequently in shallow water less than about 1 foot (30 centimeters) deep with velocities less than about 1 foot/second (Black 1980). They are capable of moving freely between the relatively fresh water in the agricultural drains and the highly saline environment in the Salton Sea (DWR and DFG 2007).

Section D.3.6 Fish Stocking in Ponds – Filling and Stocking of SCH Ponds, page D-13, 3rd full paragraph

Several species and strains of tilapia are present in the waters of the Salton Sea drainage, and each requires a different approach for securing sufficiently large numbers of founders. Mozambique hybrid tilapia are currently abundant in the Salton Sea and large numbers could easily be captured for stocking into SCH ponds. However, their long-term availability is tenuous with the increasing salinity in the Sea. The same fish is available from local aquacultural facilities, but may not perform as well as wild caught fish, given the selection pressure on the wild population that would likely result in greater tolerance of the

Sea's salinity and temperature range (Lorenzi and Schlenk 2011~~, in preparation~~). Redbelly tilapia are abundant in drains at the Sea's northern end, particularly those filled by tilewater. These populations should persist, due to the consistency of water quality in those drains, and fish would be available for seining/trapping for SCH ponds in the future. Finally, tilapia resembling blue tilapia are present in the rivers, agricultural drains, and Brawley Wetlands.

Section D.4 Possible Operational Scenarios, page D-15, 2nd paragraph

Water Quality Tolerances of Target Fish – The fish species used in the ponds would have to survive and reproduce given the expected water quality conditions, both managed (salinity) and uncontrolled (air temperature, wind mixing, DO) conditions. Tilapia appear to meet many of the requirements for a productive, sustainable fishery resource for piscivorous birds. For some tilapia species or strains, cold tolerance (below 13°C [55°F]) is impaired at higher salinities (Lorenzi and Schlen~~c~~k 2011~~, in preparation~~). Hydrological modeling suggests that water temperatures could drop below 11-13°C (52-55°F) during December through February. DO concentrations could dip below tilapia minimum tolerances. Nutrient concentrations are high in the New and Alamo rivers, due to contributions from agricultural runoff. Water quality modeling suggests high levels of algal growth are possible, along with oxygen deprivation problems that accompany hot weather algal blooms (B. Barry and M. Anderson, University of California Riverside, unpublished data). Also, seasonal anoxia could be more frequent and prolonged in spring (March through May) and fall (October) due to algal blooms.

APPENDIX I SELENIUM MANAGEMENT STRATEGIES

Section I.3.1 Ecological Receptors and Exposure Pathways – California Brown Pelican, page I-12, lines 25-27

The California brown pelican occurs at the Salton Sea as ~~newly fledged young~~immature and post-breeding adults as they disperse from nesting areas in Baja California (Patton et al. 2003). During summer, brown pelicans forage around the Sea's margin. Since the mid-1990s, single day counts have reached 2,000 individuals (Shuford et al. 2000) and probably exceed 3,000 (Patten et al. 2003). Peak numbers of brown pelicans detected during surveys in 2005 and 2006 were over 5,000 birds (DWR and DFG 2007). In ~~recent years~~the past, brown pelicans have nested in small numbers, especially at the Sea's southern end at the mouth of the Alamo River (Molina and Sturm 2004). In 2009, California brown pelicans were most abundant in August with almost 3,000 individuals recorded near and within the Project area; numbers declined in the fall but the species remained a consistent visitor throughout the year (USFWS 2010). This species was observed during Summer 2010 surveys foraging within the Sea at the mouths of the New and Alamo rivers and along the shoreline (Dudek 2010); suitable roosting and loafing habitat includes sandbars, islands, and rocky areas within the Project area.

Section I.3.4 Conclusions, page I-19, lines 7-9

The modeling results yield several findings with relevance to SCH design and operation. First, the selenium risk in SCH ponds supplied with Alamo River water would likely be substantially higher than in ponds utilizing New River water. Risk characterization indices suggest moderate to high risk for reduced egg viability in black-necked stilts would occur in Alamo River-supplied SCH ponds and that the risks would be elevated above current risk levels (Sickman et al. 2011). Second, inverse modeling supports the premise that higher salinity levels would result in lower risk from selenium (due to using less river water in the blended water supply). Blended water ~~of~~with ~~S~~salinity of 35 ppt is recommended to reduce risk of reproductive effects (<6 µg/g dw). If low to moderate levels of reduced hatching success are deemed acceptable, then blended water with salinity levels closer to 20 ppt would be adequate for New River-supplied SCH ponds.

Section I.4.1 Source Control and Minimization – Prevent Wildlife Access to Sedimentation Basins, page I-20, line 37

The first pond where sediment would settle out is likely to have the highest concentrations of selenium, due in part to physical transport into the ponds of selenium in water and on sediment and particulate matter. In addition, as seen at the SHP ponds, selenium concentrations can be higher in the first pond due higher primary productivity and selenium uptake by primary producers in the lower salinity conditions (Miles et al. 2009). For the SCH Project, this location would be the sedimentation basin where river water is first diverted. Therefore, the sedimentation basin would be constructed and maintained to be deep with steep sides to discourage foraging and nesting by birds such as black-necked stilts. If necessary, other bird deterrent methods (e.g., Gorenzel and Salmon 2008) would be considered if selenium concentrations in the basins are at levels of concern and bird use is high.

APPENDIX J SUMMARY OF SPECIAL STUDIES SUPPORTING THE EIS/EIR IMPACT ANALYSIS

Section J.3.2 Approach and Results, page J-7, line 39

Blending Sea and river water is the only feasible means to achieve the desired salinity range (20-40 ppt) across all ponds. Evaporation would increase salinity over time, depending on mean depth (indicative of water volume) and residence time. With an inflow salinity of 20 ppt and hydraulic residence time of 60 days, the resulting pond salinity would be 30 ppt in a 0.5-m-deep pond and 23 ppt in a 1.5-m-deep pond. However, relying solely on evapoconcentration of river water (2 ppt) would never achieve target salinities, and would increase selenium loading to ponds because water selenium concentrations are greater in the rivers than the Salton Sea. Cold temperatures less than (10°C) are periodic events of short duration (hours). Modeling by UCR of proposed SCH designs suggested that events lasting more than 12 hours would occur about five times over a 3-year modeled period (Barry and Anderson, unpublished data). Conditions when anoxia would likely occur were during periods of algal blooms in spring and fall (Appendix J, page J-8, lines 1-8). This is not unexpected given the high nutrient levels and eutrophic conditions of the Salton Sea, Alamo River, and New River.

Section J.3.2 Approach and Results, page J-7, lines 41-45

The water quality modeling provided one-dimensional vertical profiles of temperature and DO, hourly over a ~~three~~3-year simulation period. Temperature profiles were very similar across scenarios. Water temperatures would periodically drop below tilapia tolerances (11-13°C [52-55°F]) during December through February. Thermal stratification occurred in ponds with smaller surface area (200 acres), which have less fetch and therefore less wind mixing, than larger pond areas. Deeper ponds (1.5 m mean depth) would experience stratification more frequently than shallower ponds (0.76 m mean depth). Modeling found that most cold events were short duration (a few hours). Cold events longer than 12 hours occurred five times over the 3-year modeling period. Cold events would be expected to reduce fish numbers, but not eliminate the population.

Section J.3.3 Application to SCH Project, page J-8, lines 20-25

The models, as limited as they are, confirmed assumptions that a productive aquatic system could be developed that would include fish for birds. This exercise proved useful to look for trends and periods of concern. Stressful conditions would occur periodically. Water temperatures would be too cold for tilapia ~~to tolerate~~ for periods (hours) during December to February. Anoxia would occur near the bottom and occasionally complete anoxia through the water column when phytoplankton blooms occur in spring and fall. Stratification would maintain a layer of oxygenated water near the surface. Bottom anoxia is more of a concern for benthic invertebrates than for tilapia, which can tolerate conditions of 1 µg/L DO and can move upwards to oxygenated water near the surface. This one-dimensional water quality model does not capture spatial heterogeneity and microhabitats. It is plausible to expect that areas near the surface or in different areas of the pond could have different localized water quality conditions. Model results have guided development of the proposed operations and have focused the number of operational scenarios to be validated in the proof-of-concept phase (Appendix D).

Section J.4.1 Purpose and Need, page J-8, line 35

The fish species that would be stocked in the ponds would have to survive and reproduce given the expected water quality conditions, both managed (salinity) and uncontrolled (air temperature, wind mixing, dissolved oxygen). Tilapia appear to meet many of the requirements for a productive, sustainable fishery resource for piscivorous birds (DFG 2011). Tilapia are currently in the Salton Sea, are an important forage species for birds, and have impressively wide tolerances for salinity (currently persisting in the Sea at 53 ppt) and low dissolved oxygen. Their main drawback, other than potential competition with desert pupfish, is whether they could handle the lowest water temperatures predicted for SCH ponds. The preferred temperature range for optimum tilapia growth is 82º to 86°F (28 to 30°C). Growth diminishes significantly at temperatures below 68°F (20°C), and death would occur below 50°F (10°C) (Rakocy and McGinty 1998). At temperatures below 54°F (12°C), tilapia are more vulnerable to infections by bacteria, fungi, and parasites. Tilapia are vulnerable to cold temperatures below 10°C, but the impacts are affected by salinity and the duration of the cold spell. Tilapia can survive brief cold snaps of a day or so (personal communication, K. Fitzsimons 2010). The fish tolerance study looked at survival over a longer time period (30 days), rather than single cold snap, using an expected winter temperature range with typical diurnal flux (11 -to 16°C, based on field measurements and modeling data). While the SCH ponds could be operated to adjust salinity (proposed range 20-40 ppt, Appendix D), it will be difficult if not impossible to control water temperatures that naturally fluctuate widely in this desert climate.

This laboratory experiment by Dan Schlenk and Varenka Lorenzi of UCR tested the survival tolerances of different tilapia species exposed to various combinations of salinity and temperature in order to inform design of operational scenarios and selection of fish species for stocking (Lorenzi and Schlenk 2011).

Section J.4.2 Approach and Results, page J-9, lines 9-17

The tested fish included Mozambique hybrid tilapia (two strains: wild fish from Salton Sea and an aquaculture strain from a local fish farm), fish from a blue tilapia assemblage in the New River ("New River blue tilapia"), and redbelly tilapia collected from an agricultural drain at the northeast Salton Sea (Lorenzi and Schlenk ~~in preparation~~2011). Juvenile fish were collected, acclimated in the lab, and then exposed to different combinations of salinity and temperature. The three salinity concentrations (20, 45, and 60 ppt) were obtained by blending water from the Salton Sea and New River, similar to the approach that would be used to operate the SCH ponds. The three temperature regimes mimicked daily fluctuation of 5 degrees Celsius (°C): cold 11-16°C (52-61 degrees Fahrenheit [°F]), warm 23-28°C (73-82 °F), and hot 33-38°C (91-100°F). These temperature regimes were based on field measurements at the Saline Habitat Ponds, and hydrologic modeling extrapolated to conditions of the SCH Project (1 meter) (Barry 2009, as cited in Lorenzi and Schlenk 2011). After an acclimation period, survival and condition of fish was tested over a 30-day period.

When maintained at 20 ppt salinity, the New River blue tilapia had the best overall survival across all temperature regimes (80 percent survival at cold, 40 percent at warm, and 27 percent at hot) (Lorenzi and Schlenk ~~in preparation~~2011). Redbelly tilapia survival was very poor in the lab, but this likely was due to other stressful conditions in captivity, namely aggression. It does not appear appropriate to draw conclusions about this species' thermal and salinity tolerances from such data. While most strains and species had moderately good survival in 45 ppt and 60 ppt conditions at warm temperatures, all species showed poor survival in hot high-salinity (60 ppt) conditions.

Section J.4.3 Application to SCH Project, page J-11, added before paragraph 1

Tilapia are vulnerable to cold temperatures below 10°C, but the impacts are affected by salinity and the duration of cold spells. Tilapia can survive brief cold snaps of a day or so (personal communication, K. Fitzsimons 2010). The fish tolerance study looked at survival over a longer time period (30 days), rather than a single cold snap, using an expected winter temperature range with a typical diurnal flux (11 to 16°C, based on field measurements and modeling data). The temperature-salinity tolerance study found very good survival at 11 to 16°C and 20 ppt salinity for wild California Mozambique tilapia (100 percent), hatchery California Mozambique tilapia (67 percent) and blue tilapia (80 percent). Cold spells could kill some fish, but other fish would survive to recolonize the pond.

ATTACHMENT 1

Written and Verbal Comments on the Draft EIS/EIR

Federal Agencies

U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

August 18, 2011

Lanika L. Cervantes
U. S. Army Corps of Engineers, Los Angeles District
Regulatory Division – Carlsbad Field Office
Attn: CESPL-RG-S-2010-00142-LLC
6010 Hidden Valley, Suite 105
Carlsbad, California 92011

Dear Ms. Cervantes:

This is in response to your request for comments on Public Notice #201000142-LLC, Species Conservation Habitat Project in Imperial County, California.

Please review the current effective Flood Insurance Rate Maps (FIRMs) for the County of Imperial (Community Number 060065), Maps revised September 26, 2008. Please note that the County of Imperial, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The Imperial County floodplain manager can be reached by calling Brian Donley, Building Official, at (760) 482-4311.

If you have any questions or concerns, please do not hesitate to call Robert Durrin of the Mitigation staff at (510) 627-7057.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Brian Donley, Building Official, Imperial County
Garret Tam Sing/Salomon Miranda, State of California, Department of Water Resources, Southern Region Office
Robert Durrin, Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

Lorraine Woodman

From: DO NOT REPLY [noreply@cardno.com]
Sent: Monday, September 12, 2011 2:19 PM
o: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Gilbert Anaya

Gilbert Anaya has entered a comment.Contact Information:
E-Mail: gilbert.anaya@ibwc.gov
Affiliation: International Boundary and Water Commission Mailing Address:
4171 N. Mesa St.
C-100
El Paso, Texas 79902-1441

Attachments:
Comment:
Thank you for the Notice of Availability for the Draft EIS/EIR, Application for Permit, and Notice of a Public Hearing in reference to the Salton Sea Conservation Habitat Project to be conducted along the New River or Alamo River and adjacent areas of the Salton Sea in Imperial County, California. The United States Section, International Boundary and Water Commission (USIBWC) has reviewed the draft EIS/EIR regarding the restoration of shallow water habitat through creation of shallow ponds using a blend of New or Alamo River water and Salton Sea water and does not have any comments or concerns at this time. The proposed action is not anticipated to have any impacts to projects or resources of the USIBWC. IBWC-1

Thank you again for the opportunity to review and comment on the project. Please keep the USIBWC informed of additional projects near the international border.

United States Department of the Interior

BUREAU OF RECLAMATION
Lower Colorado Regional Office
P.O. Box 61470
Boulder City, NV 89006-1470

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Ms. Lanika Cervantes
U.S. Army Corps of Engineers
Los Angeles District, Regulatory Division,
San Diego Field Office
Attn: CESPL-RG-RS-2010-00142-LLC
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

Subject: Bureau of Reclamation's Comments on the Draft Salton Sea Species Conservation Habitat Project (Project) Environmental Impact Statement/Environmental Impact Report (EIS/EIR) (per Public Notice/Application No.:SPL-2010-00142-LLC)

Dear Ms. Cervantes:

Thank you for the opportunity to review the subject Draft EIS/EIR (comment period August 17, 2011 through October 17, 2011). Reclamation is supportive of the Project and appreciates the opportunity to participate as a cooperating agency in the development of the EIS/EIR. BOR-1

Section 3.13-11, lines 27-35, discuss potential uses of land that will become exposed at the Salton Sea in the future. Please clarify that uses of Reclamation land would be designated in accordance with the Agency's authorities, regulations, and policies. BOR-2

If you have questions regarding this comment, please contact Ms. Faye Streier, National Environmental Policy Act Coordinator, at 702-293-8132 or fstreier@usbr.gov.

Sincerely,

Amelia Porter

for Valerie E. Thomas, Chief
Resources Management Office

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Pacific Southwest Region
333 Bush Street, Suite 515
San Francisco, CA 94104

IN REPLY REFER TO:
ER# 11/791

Electronically Filed

17 October 2011

Ms. Lanika Cervantes,
Corps Project Manager
U.S. Army Corps of Engineers,
Los Angeles District, Regulatory Division, San Diego Field Office
ATTN: CESPL-RG-RS-2010-00142-LLC
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

Subject: Draft Environmental Impact Statement/Environmental Impact Report for the Proposed Salton Sea Species Conservation Habitat Project at the Salton Sea, Imperial County, CA

Dear Ms. Cervantes,

The Department of the Interior has received and reviewed the subject document and has the following comments to offer:

Throughout the document the Programmatic Environmental Impact Report (DWR and DFG 2007) is cited as the source of information for findings, data, or statements of fact. Citing the PEIS rather than the original sources makes it much more difficult for the reader to evaluate the information. We suggest that the final EIS reference the original source of information where possible.

The document establishes a framework for developing a salinity gradient system of shallow impoundments (Sections 1.3 and 1.6.1) similar to those developed by the U.S. Bureau of Reclamation and U.S. Geological Survey. There are differences; this document describes attempts to develop a system capable of supporting an array fish to provide forage for fish eating birds, but in most respects the systems are similar in form and function.

The premise set forth in some sections of this document is also articulated in and supported by Miles et al. (2009), which predates Sickman et al. 2011, and establishes the rationale for mixing and blending sources of water, establishes a robust dataset for the ecological risk assessment, and articulates the role of salinity management in reducing selenium risk and vector control. We suggest that the final EIS reference Miles et al. (2009) in section 1.6.1, and describe the theory underlying the project. The theory is documented in Miles et al. (2009) pages 3 & 4.

SECTION 3.4

The document states that the principal reason for SCH development is to produce fish to support a bird community that relies on fish as a foraging base; however, the document contains minimal discussion of the maintenance of a self-sustaining population of fish. Data on the effects of selenium (Anderson, 2009) and evidence from the Reclamation/USGS ponds that desert pupfish will prosper at certain ponds and environmental conditions are not addressed. Additional analysis is needed to describe how desert pupfish will coexist with the many non-native fish species anticipated for use in SCH, and of how the primary project fish, tilapia, will deal with the potential reproductive effects of selenium at a higher rate of exposure than in the Salton Sea or the rivers and drains. We suggest that the authors review the data and information presented in the following references for possible inclusion in the final EIS.

<u>References on population-level effects of selenium</u>

Anderson, TW. 2009. Avian use and selenium risks evaluated at a constructed saline habitat complex at the Salton Sea, California. MS Thesis, San Diego State University.

Hamilton, SJ. 2004. Review of selenium toxicity in the aquatic food chain. Sci .Tot. Env. 326: 1–31.

Cumbie, PM, SL Van Horn, 1978. Selenium accumulation associated with fish mortality and reproductive failure. Proceedings of Annual Conference of Southeastern Assoc. Fish Wildlife Agencies; 32 pp.612 –624.

Hamilton, SJ, KJ Buhl, FA Bullard, SF McDonald. 1996. Evaluation of toxicity to larval razorback sucker of selenium-laden food organisms from Ouray NWR on the Green River, Utah. National Biological Service, Yankton, SD, Final Report to the Recovery Implementation Program for the Endangered Fishes of the Colorado River Basin, Denver.

Hamilton, SJ, KJ Buhl, FA Bullard, EE Little. 2000. Chronic toxicity and hazard assessment of an inorganic mixture simulating irrigation drain water to razorback sucker and bony tail. Environ Toxicol. 15:48 –64.

Hamilton, SJ, RT Muth, B Waddell , TW May. 2000. Hazard assessment of selenium and other trace elements in wild larval razorback sucker from the Green River, Utah. Ecotoxicol. Envion. Safety 45(2):132-147.

Harris, T. 1986. The selenium question. Defenders. March–April 1986:10 –20.

Lemly, AD. 1997. A teratogenic deformity index for evaluating impacts of selenium on fish populations. Ecotoxicol. Environ. Safety 37:259 –266.

Lemly, AD, HM Ohlendorf. 2002. Regulatory implications of using constructed wetlands to treat selenium-laden wastewater. Ecotoxicol. Environ. Safety. 52:46 –56.

Saiki, MK, RS Ogle. 1995. Evidence of impaired reproduction by western mosquito fish inhabiting seleniferous agricultural drain water. Trans. Am. Fish. Soc. 124:578 –587.

<u>Presentations on Pupfish</u>

Keeney D, Sharon, Walker T, Michael, Thomas E, Valerie, Crayon J, John. Removal of a desert pupfish *Cyprinodon macularius* population from temporary ponds at the Salton Sea Presented to Desert Fish Council. Moab, Utah. November 2010.

Keeney Sharon and John J. Crayon. Removal of a desert pupfish population from temporary ponds at the Salton Sea. Western Section The Wildlife Society. Riverside, CA. Feb 2011.

Saiki, Michael K., Martin, Barbara M., Anderson, Thomas W. Unusual Dominance by Desert Pupfish in a Shallow Experimental Pond System Within the Salton Sea Basin Presented to Desert Fish Council, Moab, Utah. November 2010.

Page 3.4-14:

The document provides a good description of the sequence of actions undertaken by DFG in introducing non-native sport fish to the Salton Sea. However, the document does not mention that the Desert Pupfish Recovery Plan (1993) indicates that the introduction of non-native sport fish precipitated a decline and endangerment of the Desert Pupfish.

We suggest the final EIS include a discussion of the status of the Desert pupfish (see page 3.4-26) that addresses potential impacts, adverse or beneficial, to the Desert Pupfish related to interaction with other fish species. Evidence collected by the USGS in 2010 indicated that salinity gradient ponds, similar to those proposed by this plan, will benefit the Desert Pupfish. Specifically, an estimated 1 million Desert Pupfish were recovered and relocated prior to closure of the Reclamation/USGS experimental ponds. (See <u>Presentations on Pupfish</u>)

Page 3.4-16:

We suggest the final EIS include the multi-year analysis of waterfowl counts for the Salton Sea region, including some shoreline habitats, provided in Barnum and Johnson (2004). Anderson (2009) also provides a wealth of species count data, nest fate date related to selenium, and site specific habitat use information for a variety of species in the Reclamation/USGS pond system all of which are directly applicable to the SCH project and might be incorporated in the final EIS.

Barnum, DA, and S Johnson. 2004. The Salton Sea as important waterfowl habitat in the Pacific Flyway. Studies in Avian Biol. 27:100-105.

Page 3.4-50:

The section on disease does not address the role of selenium in immune system dysfunction and how this may play a role in disease outbreaks. We suggest this section be revised and enhanced in the final EIS. References that might provide additional information are:

Albers, PH., DE Green, and CJ Sanderson. 1996. Diagnostic criteria for selenium toxicosis in

aquatic birds: dietary exposure, tissue concentrations, and macroscopic effects. J. Wildl. Dis., 32:468-485.
Fairbrother, A, and J Fowles 1990. Subchronic effects of sodium selenite and selenomethionineon several immune functions in mallards. Arch. Environ. Contam. Toxicol. 19:836-844.
Lemly, AD. 1993. Metabolic stress during winter increases the toxicity of selenium to fish. Aquatic Toxicol. 27:133-158.

Larsen, CT., FW Pierson, and WB Gross. 1977. Effect of dietary selenium on the response of stressed and unstressed chickens to *Escherichia coli* challenge and antigen. Bio1. Trace. Elem. Res. 58: 169- 176.

Wang, C., RT Lovell, and PH Klesius. 1997. Response to *Edwardsiella ictaluri* challenge by channel catfish fed organic and inorganic sources of selenium. J. Aquat. Anim. Health, 9: 172-179.
Whiteley, PL., and TM Yuill. 1989. Immune function and disease resistance of waterfowl using evaporation pond systems in the southern San Joaquin Valley, California, 1986-89. Final Report to the U.S. Fish and Wildlife Service, National Wildlife Health Research Center, Madison, WI. 202 p.

Page 3.4-50:

The document includes a discussion of selenium effects, but the discussion is limited to embryo mortality and impaired reproduction. There may be a potential synergistic effect of low levels of selenium and disease outbreak due to immune system dysfunction. We suggest the final EIS include a discussion of the link between selenium burden and compromised immune system functioning. (see References on population-level effects of selenium)

APPENDIX I

Page I-3, Section I.1:

The report by Sickman et al. (2011) used Miles et al. (2009) as a principal source of data and employed a selenium model developed by USGS (Presser and Louma, 2010). Although the model doesn't provide good approximations, project decisions were made on the basis of Appendix I. We suggest that the final EIS include appropriate caveats about the reliability of the Sickman model. We suggest that these caveats be documented in the main document so the readers are aware of the importance of this effort in the decision process.

Page I-20, Section I.4.1, Lines 36 & 37:

The document states "The first pond where sediment would settle out is likely to have the highest concentrations of selenium 37 (Miles et al. 2009)". This is an incorrect conclusion attributed to the Miles et al. 2009. The selenium risk has little to do with sediment deposition and is based on the greater rate of primary productivity associated with the lower salinity water typically observed in the first of a series of salinity gradient ponds. The increased primary productivity, relative to the downstream ponds, is responsible for the uptake of selenium from the water and sediments whereupon much of the selenium is then deposited back to the sediments or consumed in the food chain. We suggest that the statement be corrected.

Pages I-19 to 20, Section I.4.1:

We applaud the extensive analysis of selenium risk; however, the strategy is limited to the use of salinity gradients. We agree that this is expected to move the system in the right direction, but if the system fails to produce the anticipated results, there is no alternative plan. For example, this document implies that if birds use the initial ponds too much, or breed there, then a system of bird deterrence will be deployed.

Unfortunately, this strategy has failed to prevent bird use and damages at other selenium contaminated environments in California. We suggest that an adaptive management approach be adopted to allow for some flexibility should the proposed remedies fail to have the desired effects. This approach could consider the utility of approaches under consideration and the decision/determination points at which they will be deployed, the decision making responsibilities, and the criteria upon which those decisions would be made. We also suggest the final EIS include a discussion of the utility of providing mitigation wetlands using uncontaminated sources of water to offset any documented project effects.

Pages I-11 to 12, Section I.3.1:

The discussion of selenium and effects on fish species is limited, especially the discussion and analysis of tilapia, the primary fish the document is counting on to supply forage to fish eating birds. We suggest that the discussion of tilapia be expanded.

Page I-12, Section I.3.4, line 11:

The document states “Selenium’s most substantial effects occur in bird embryos, such as reduced hatching success and teratogenesis.” This statement is not necessarily true. Selenium’s effects can be observed throughout the ecosystem. Within the life cycle of a bird, the most obvious and noticeable effect is on the avian embryo. However, there are numerous examples available in the scientific literature in which selenium has caused massive reproductive failure among fish and decimated or completely eliminated fish from selenium-contaminated environments. We suggest the final EIS clarify the statement.

Page I-19, Section I.3.4, lines 6 & 10:

The premise is not based on salinity per se, and the interpretation is that the relationship is to salinity rather than to selenium concentration in the various sources of water. The Salton Sea type of water has overall lower concentrations of selenium than the rivers. Achieving target salinity requires less of the relatively higher source of selenium to blend with the Salton Sea water, thus presenting a lower concentration of selenium. The true relationship for selenium concentration in the blended water ponds will be one of relative volume of water from different sources, not salinity directly. We suggest the final EIS include text to clarify this point.

Page I-12, Section I.3.4, line 34:

Anderson (2009) documents other species of birds that breed at the ponds and can be expected to utilize SCH. However, we have no record of Brown pelicans breeding at or near the ponds and records of any recent nesting by this species are more than a decade old and few in numbers. Our understanding of the historical data for breeding birds in the Salton Sea Ecosystem is that there are very limited records of any breeding by California Brown pelicans. We suggest that the document be revised accordingly.

Page I-18, Section I.3.3, Lines 11 & 12:

This section addresses only the selenium risk to migratory birds as a result of egg impairment. We suggest that the final EIS include information on the risk to birds that are now exposed to impounded waters in a habitat type that previously has not existed at the Salton Sea.

Thank you for the opportunity to review and comment on the DEIS. If you have any questions concerning these comments, please contact Gary LeCain, USGS Coordinator for Environmental Document Reviews, at (303) 236-1475 or at gdlecain@usgs.gov

Sincerely,

Patricia Sanderson Port

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC
Loretta B. Sutton, OEPC staff contact
Director, USGS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

October 14, 2011

RECEIVED

OCT 20 2011

REGULATORY BRANCH
CARLSBAD FIELD OFFICE

Lanika Cervantes
U.S. Army Corps of Engineers
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

Subject: Salton Sea Species Conservation Habitat Project Draft Environmental Impact Statement / Environmental Impact Report, Imperial County, California, August 2011 (CEQ 20110263)

Dear Ms. Cervantes:

The U.S. Environmental Protection Agency (EPA) has reviewed the above project pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), our NEPA review authority under Section 309 of the Clean Air Act, and the provisions of the Federal Guidelines (Guidelines) promulgated at 40 CFR 230 under Section 404(b)(1) of the Clean Water Act (CWA).

EPA-1

Since the DEIS does not identify a preferred alternative, we have rated each alternative, pursuant to EPA's *Policy and Procedures for the Review of Federal Actions Impacting the Environment*. Our rating, the same for each alternative, is *Lack of Objections* (please see the enclosed "Summary of EPA Rating Definitions"). EPA supports the project purpose -- developing a range of aquatic habitats to support fish and wildlife species dependent on the Salton Sea. As the Draft Environmental Impact Statement (DEIS) explains, the Salton Sea habitat is being lost to increasing salinity and decreasing Sea elevation. The action alternatives would create 2,080 to 3,370 acres of aquatic habitat ponds intended to serve as a proof of concept for an even larger restoration effort. We recommend that the FEIS include the jurisdictional delineation. We have also enclosed detailed comments on water quality impacts, farmland impacts, and alternatives.

We appreciate the opportunity to review the DEIS and look forward to continued coordination with Army Corps. When the FEIS is published, please send a copy to me at the address above (Mail Code: CED-2). If you have any questions, please contact me at (415) 972-3521 or contact Tom Kelly, the principal reviewer for the project, at (415) 972-3856 or kelly.thomasp@epa.gov.

Sincerely,

Kathleen M. Goforth, Manager
Environmental Review Office
Communities and Ecosystems Division

Enclosures: Summary of Ratings Definitions
Detailed Comments

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

Water Quality

Section 404, Clean Water Act Permitting

The project would restore shallow water habitat lost due to the Salton Sea's ever-increasing hypersalinity and reduced area, as the Sea recedes. Construction of the proposed project may impact up to 24 acres and temporarily impact up to 1,760 acres of waters of the U.S. (p. 3.4-58); however, the jurisdictional delineation has not been verified by the Army Corps. EPA-2

Recommendation:
The FEIS should include the findings of the Corps-verified jurisdictional delineation.

Changing Water Management Practices

The DEIS discusses water quality in Section 3.11. It provides contaminant concentrations and water quality parameters in Table 3.11-5, Comparison of Water Quality Objectives with Current Conditions (2004-2010 Mean Annual). The DEIS also states that "Inflow to the Sea from the Imperial Valley is projected to continue to decline from the current annual average of 1,029,620 afy [*acre-feet per year*] to 723,940 afy (with adjustment for the Quantification Settlement Agreement [QSA]) by 2020 (DWR and DFG 2007)." (p. 3.11-7) This will occur about the same time as the Imperial Irrigation District fallowing program also ends in 2018. The DEIS does not clarify the potential for these changes to alter phosphorus, nitrogen and pesticide concentrations in the New and Alamo Rivers. EPA-3

Recommendation:
The FEIS should discuss expected changes to water quality based on changing water management practices, and the potential for these changes affect the project's success.

Contingency Planning

The proposed project would provide habitat for both fish and invertebrate species, which in turn would provide forage for bird species dependent on the Salton Sea Ecosystem. The project is designed as a "proof-of-concept" project for a period of ten years, in which several project features, characteristics, and operations could be tested under an adaptive management framework. This allows operators to try different combinations of storage, salinity, and residence times to investigate how these factors could be adjusted to provide the best conditions for fish and birds presently and to inform future restoration (p. 2-10). The DEIS acknowledges the funding uncertainty of the project by stating (p. 2-10): EPA-4

> "The proof-of-concept period would last for approximately 10 years after completion of construction (until 2025). By that time, managers would have had time to identify those management practices that best meet the Project goals. After the proof-of-concept period, the Project would be operated until the end of the 75-year period covered by the QSA (2078) or until funding were no longer available."

Recommendation:
The FEIS should include a Contingency Plan, should operation and management funding terminate. This Contingency Plan should provide for project modifications (*e.g.,* breach of berms) to maximize habitat acreage and function if the project site is no longer managed and provided with an adequate water supply to maintain existing habitat. EPA-4 Cont.

Pond Seepage

Appendix C discusses pond seepage as a concern for berm stability. In the construction of New River Wetlands Demonstration Project, seepage from beneath the ponds exceeded evaporation[1]. Initially, some of the ponds in the proposed project are likely to be in direct contact with groundwater, substantially limiting seepage, but this is not true for ponds further from the shore. Additionally, as the level of the Salton Sea declines to –258 feet below mean sea level in 2077 (p. 2-9), the entire pond complex will be well above the water table. Mitigation measures, such as geosynthetic liners or low permeability soil layers, can readily prevent seepage. EPA-5

Recommendation:
The FEIS should discuss the relative significance of pond seepage and consider mitigation if appropriate.

Project Maintenance

The DEIS describes vegetation removal from the sedimentation basin, interception ditch and around the river pump station (p. D-23), but does not describe vegetation removal from the Species Conservation Habitat (SCH) ponds. The lack of any vegetation description for the SCH ponds leads us to assume no vegetation is planned there, however, a variety of invasive species are likely to inhabit the ponds over time. EPA-6

Recommendation:
The FEIS should describe and budget for vegetation removal from the SCH ponds.

Farmland

The DEIS considered the loss of 37 acres of farmland, in Impact AG-2 (permanent conversion of a small amount of farmland to nonagricultural use), less than significant for alternatives 1 and 4. Alternatives 1 and 4 convey water from the Alamo and New Rivers by gravity diversion, rather than by pumping and pipes. The next section, Impact AG-3, apparently considered the same impact significant, because the land would permanently convert Williamson Act contract land to nonagricultural use. In clarifying the significant impact, the DEIS offered the following explanation (p. 3.2-10): EPA-7

> The Williamson Act provides financial incentives to encourage the retention of agricultural land. As discussed under Impact AG-2, the conversion of 60 acres of agricultural land [*the measure of significance for AG-2*] would negligible in relation to the amount of land that is currently farmed and fallowed in the Imperial Valley. However, the conversion of land under Williamson Act contracts prior to the nonrenewal termination date would require the payment of cancellation fees (personal communication, A. Havens 2011). This impact

[1] Selenium in the New River and an Evaluation of Human Health Risk Reduction by the Brawley and Imperial Constructed Wedlands Demonstration Project (W-06-3), Richard M. Gersberg, San Diego State University, see: http://scerpfiles.org/cont_mgt/doc_files/W_06_3.pdf

would be significant when compared to both the existing environmental setting and No Action Alternative.

The basis for the significance rating appears to be the payment of cancellation fees, rather than the project's environmental impacts. We also note that alternatives that include the fee payment may represent an overall project savings, when lower energy costs are also considered.

EPA-7 Cont.

Recommendation:
The FEIS should clarify the entity that would need to make the fee payment, for converting Williamson Act land, and explain why this impact would be significant.

Alternatives

The Department of Natural Resources selected Alternative 3 as the California Environmental Policy Act preferred alternative, "because it would provide greater long-term benefits by restoring the greatest amount of habitat, while minimizing environmental impacts to the extent feasible." (p. ES-21) Section 2.2 and Appendix B describe the development of the project alternatives; however, these sections do not clarify the reason for pond sizes associated with each alternative. If maximization of habitat is a primary criterion for selection of the preferred alternative by the Army Corps, which EPA supports, the document should provide an explanation for limiting pond size associated with alternatives at the same river. For example, do specific factors (topography or project costs) prevent construction of ponds similar to alternative 3, using gravity diversion?

EPA-8

Recommendation:
The FEIS should discuss constraints on the pond size associated with each alternative.

State Agencies

STATE OF CALIFORNIA

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

Edmund G. Brown, Jr., *Governor*

RECEIVED
BERMUDA DUNES OFFICE
SEP - 6 2011
DEPARTMENT OF FISH & GAME
STATE OF CALIFORNIA

August 26, 2011

Mr. David Elms
California Department of Fish & Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Re: SCH# 2010061062; Joint NEPA/CEQA Notice; draft Environmental Impact Report (DEIR)/draft Environmental Impact Statement for the **"Salton Sea Species Conservation Habitat Project;"** located at two project areas at the southern end of the Salton Sea; one where the New River empties in the Sea northwest of the City of Brawley and the other where the Alamo River empties into the Sea northwest of the City of Calipatria, California's largest lake and one suffering from decades dumping contaminated agriculture drainage; project will restore up to 3,770-acres of marine, flora and fauna habitat; Imperial County, California.

Dear Mr. Elms:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources pursuant to California Public Resources Code §21070 and affirmed by the Third Appellate Court in the case of EPIC v. Johnson (1985: 170 Cal App. 3rd 604). The NAHC wishes to comment on the proposed project.

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law. State law also addresses the freedom of Native American Religious Expression in Public Resources Code §5097.9. NAHC-1

The California Environmental Quality Act (CEQA – CA Public Resources Code 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. The NAHC Sacred Lands File (SLF) search resulted as follows: **Native American cultural resources were identified** within one-half mile of the 'area of potential effect (APE) where the New River empties into the Salton Sea, but not where the Alamo River flows into the sea. Also, the absence of recorded Native American cultural resources does not preclude their existence. NAHC-2

NAHC-3

The NAHC "Sacred Sites,' as defined by the Native American Heritage Commission and the California Legislature in California Public Resources Code §§5097.94(a) and 5097.96. Items in the NAHC Sacred Lands Inventory are confidential and exempt from the Public Records Act pursuant to California Government Code §6254 (r).

NAHC-4

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries of cultural resources or burial sites once a project is underway. Culturally affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We strongly urge that you make contact with the list of Native American Contacts on the attached list of Native American contacts, to see if your proposed project might impact Native American cultural resources and to obtain their recommendations concerning the proposed project. Pursuant to CA Public Resources Code § 5097.95, the NAHC requests that the Native American consulting parties be provided pertinent project information. Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). Pursuant to CA Public Resources Code §5097.95, the NAHC requests that pertinent project information be provided consulting tribal parties. NAHC-5 The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and Section 2183.2 that requires documentation, data recovery of cultural resources.

NAHC-6

Furthermore, the NAHC is of the opinion that the current project remains under the jurisdiction of the statutes and regulations of the National Environmental Policy Act (e.g. NEPA; 42 U.S.C. 4321-43351). Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq.* and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.'

NAHC-7

Confidentiality of "historic properties of religious and cultural significance" should also be considered as protected by California Government Code §6254(r) and may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APEs and possibility threatened by proposed project activity.

NAHC-8

Furthermore, Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery'.

NAHC-9

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects. NAHC-9 Cont.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse

Attachment: Native American Contact List

California Native American Contact List
Imperial County
August 26, 2011

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
PO Box 1120 — Dieguen/Kumeyaay
Boulevard , CA 91905
gparada@lapostacasino.
(619) 478-2113
619-478-2125

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas
P.O. Box 775 — Diegueno -
Pine Valley , CA 91962
(619) 709-4207

Manzanita Band of Kumeyaay Nation
Leroy J. Elliott, Chairperson
PO Box 1302 — Kumeyaay
Boulevard , CA 91905
ljbirdsinger@aol.com
(619) 766-4930
(619) 766-4957 Fax

Torres-Martinez Desert Cahuilla Indians
Ernest Morreo
PO Box 1160 — Cahuilla
Thermal , CA 92274
maxtm@aol.com
(760) 397-0300
(760) 397-8146 Fax

Campo Kumeyaay Nation
Monique LaChappa, Chairperson
36190 Church Road, Suite 1 — Dieguen/Kumeyaay
Campo , CA 91906
(619) 478-9046
miachappa@campo-nsn.gov
(619) 478-5818 Fax

Fort Yuma Quechan Indian Nation
Keeny Escalanti., President
PO Box 1899 — Quechan
Yuma , AZ 85366
qitpres@quechantribe.com
(760) 572-0213
(760) 572-2102 FAX

Kumeyaay Cultural Heritage Preservation
Paul Cuero
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Campo , CA 91906
(619) 478-9046
(619) 478-9505
(619) 478-5818 Fax

Augustine Band of Cahuilla Mission Indians
Mary Ann Green, Chairperson
P.O. Box 846 — Cahuilla
Coachella , CA 92236
hhaines@augustinetribe.
(760) 398-6180
760-369-7161 - FAX

This list is current only as of the date of this document.
Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2010061062; Joint NEPA/CEQA Notice; draft Environmental Impact Report (DEIR)/draft Environmental Impact Statement (DEIS) for the Salton Sea Species Conservation Habititat Project; located where the New and the Alamo Rivers flwo (south to north) into the Salton Sea, California's largest, at the lake's southern end; project will restore up to 3770-acres of habitat for marine, flora and fauma; Imperial County, California.

California Native American Contact List
Imperial County
August 26, 2011

Torres-Martinez Desert Cahuilla Indians
Diana L. Chihuahua, Vice Chairperson, Cultural
P.O. Boxt 1160 — Cahuilla
Thermal , CA 92274
dianac@torresmartinez.
760) 397-0300, Ext. 1209
(760) 272-9039 - cell (Lisa)
(760) 397-8146 Fax

Cabazon Band of Mission Indians
Judy Stapp, Director of Cultural Affairs
84-245 Indio Springs — Cahuilla
Indio , CA 92203-3499
markwardt@cabazonindia

(760) 342-2593
(760) 347-7880 Fax

Ewiiaapaayp Tribal Office
Will Micklin, Executive Director
4054 Willows Road — Diegueno/Kumeyaay
Alpine , CA 91901
wmicklin@leaningrock.net
(619) 445-6315 - voice
(619) 445-9126 - fax

Ewiiaapaayp Tribal Office
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4054 Willows Road — Diegueno/Kumeyaay
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michaelg@leaningrock.net
(619) 445-6315 - voice
(619) 445-9126 - fax

Cocopah Museum/Cultural Resources Dept.
Jill McCormick, Tribal Archaeologist
County 15th & Ave. G — Cocopah
Sommerton , AZ 85350
culturalres@cocopah.com
(928) 530-2291 - cell
(928) 627-2280 - fax

Augustine Band of Cahuilla Mission Indians
Karen Kupcha
P.O. Box 846 — Cahuilla
Coachella , CA 92236
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916-369-7161 - FAX

Quenchan Indian Nation
THPO
P.O. Box 1899 — Quechan
Yuma , AZ 85366
b.nash@quechantribe.com
(928) 920-6068 - CELL
(760) 572-2423

Ah-Mut-Pipa Foundation
Preston J. Arrow-weed
P.O. Box 160 — Quechan
Bard , CA 92222 — Kumeyaay
ahmut@earthlink.net
(928) 388-9456

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California Native American Contact List
Imperial County
August 26, 2011

Kumeyaay Cultural Repatriation Committee
Bernice Paipa, Vice Spokesperson
P.O. Box 1120 Diegueno/Kumeyaay
Boulevard , CA 91905
(619) 478-2113

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Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

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Lorraine Woodman

From: DO NOT REPLY [noreply@cardno.com]
ent: Wednesday, September 21, 2011 8:32 AM
o: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Benjamin Minx

Benjamin Minx has entered a comment.Contact Information:
E-Mail: Benjamin.Minx@conservation.ca.gov
Affiliation: DOGGR
Mailing Address:
605 Wake Avenue
Suite 7
El Centro, CA 92243

Attachments: salton_sea_lettersigned.pdf salton_sea_wells.pdf
Comment:
On behalf of the Division, I have included a letter that comments on the Project. I have also included a map scan that helps illustrate what we have found. DOGGR-1

In addition, on page 308 - line 39-40, there is a mention that CalEnergy is operating a zinc extraction plant. I believe that they used to have a zinc extraction facility, but do not currently operate one now. DOGGR-2

DEPARTMENT OF CONSERVATION

Managing California's Working Lands

DIVISION OF OIL, GAS, & GEOTHERMAL RESOURCES

605 Wake Ave • Suite 7 • El Centro, California 92243

PHONE 760 / 353-9900 • **FAX** 760 / 323-0424 • **WEB SITE** conservation.ca.gov

September 20, 2011

Mr. David Elms
Dept. of Fish and Game
78-078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

To Mr. Elms:

SALTON SEA SPECIES CONSERVATION HABITAT PROJECT DRAFT EIS/EIR
SCH# 2010061062

The Division of Oil, Gas, and Geothermal Resources (Division) has reviewed the above referenced project. The Division supervises the drilling, maintenance, plugging and abandonment of oil, gas, and geothermal wells in California. The Division offers the following comments for your consideration.

There may be a potential risk of construction near plugged and abandoned wells. According the Division's database, eleven plugged and abandoned shallow temperature gradient wells are located in or near the area of the proposed project that may require plugging to present standards if the wells are exposed or the present abandonment plugs are altered. The attached map shows the approximate location of these wells.

In addition, the geothermal well, "Westmorland" 47 (API # 025-90105), was not plugged and abandoned before being submerged. It will require plugging when sea level recedes and the well is exposed.

This office must be contacted to obtain information on the requirements for approval to perform any remedial operations on these wells.

Thank you for the opportunity to comment on this project. If you have any questions, please contact Cliff Parli or myself at 760-353-9900.

Sincerely,

Benjamin Minx
Geothermal Engineer

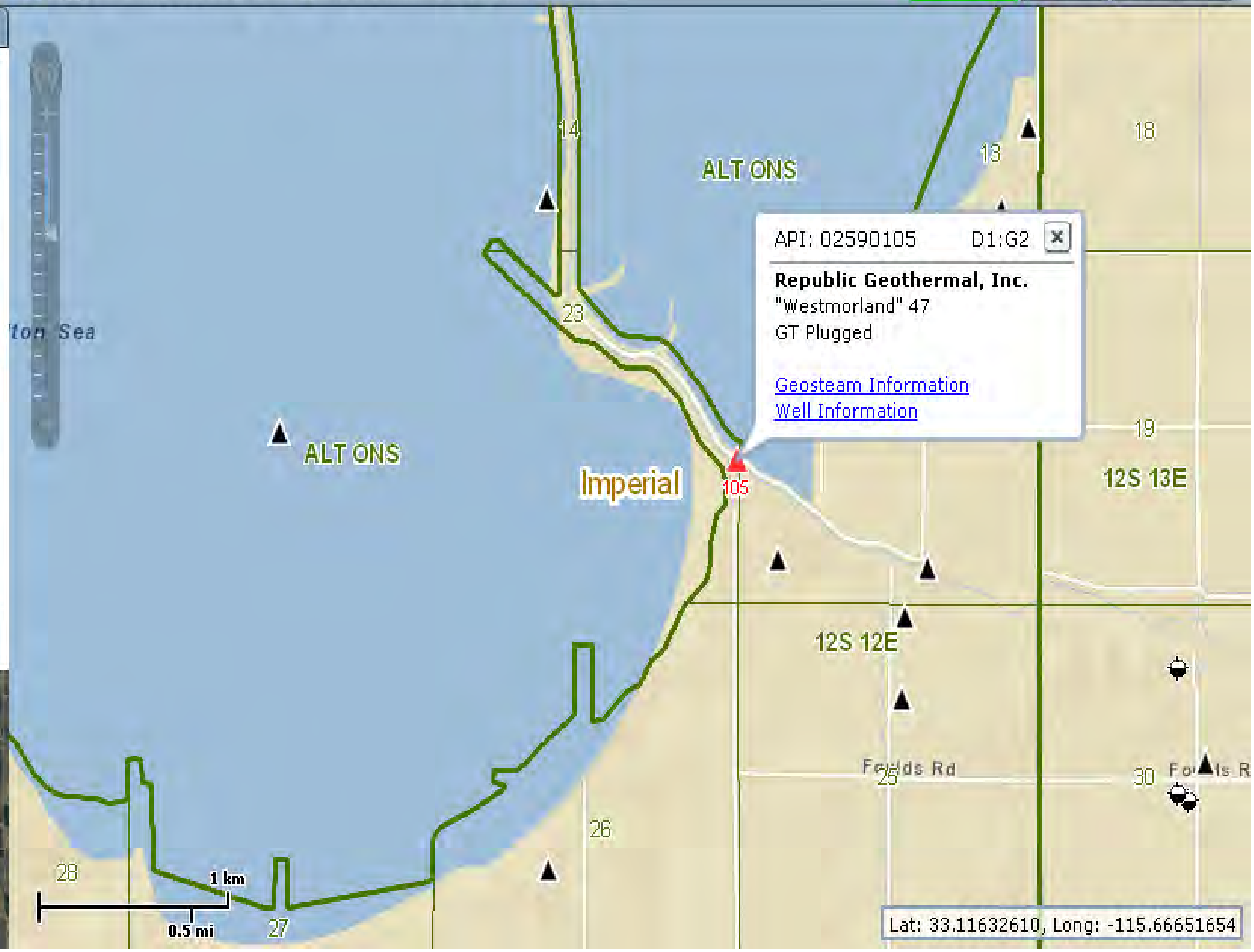
State of California
Department *of* Conservation

Welcome to DOMS | Map Layers | Well Options | Load Wells | Streets | Topo | Imagery

Main | Find | List | Help

API	Description
02590138	"Westmorland" 26
02590769	P1-20
02590462	81-07
02590743	P4-16
02590767	P1-17
02590741	P4-13
02590105	"Westmorland" 47
02590768	P1-19
02591037	"TP" 22
02590766	P1-14
02590129	"Westmorland" 17

Remove / Select All 11 Wells



California Regional Water Quality Control Board
Colorado River Basin Region

73-720 Fred Waring Drive, Suite 100, Palm Desert, California 92260
(760) 346-7491 • FAX (760) 341-6820
http://www.waterboards.ca.gov/coloradoriver

Matthew Rodriquez
Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

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OCT 19 2011
DEPARTMENT OF FISH & GAME
STATE OF CALIFORNIA

October 14, 2011

David Elms, CDFG Project Manager
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Dear Mr. Elms:

This letter is in reference to the Salton Sea Species Conservation Habitat Project Draft EIS/EIR.

I wish to call your attention to an enclosed agenda item from the September 15, 2011 meeting of the State of California CRWQCB, CRBR. The Board enforces water quality standards for the IID El Centro Generating Station in returning cooling water to a canal which flows into the Salton Sea. This cooling water would average 700,000 gallons per day of potential fresh water for the Salton Sea.

However, because it is cheaper IID has chosen to use deep well injection of the cooling water thereby avoiding any cleanup costs and forever losing that water for the Salton Sea.

RWQCB-1

The Water Quality Board has no jurisdiction over that decision and there were no noted comments from either State or Fish and Game or Fish and Wildlife. EPA limited its comments to technical well drilling issues.

The vital freshwater needs of the Salton Sea appeared to not appear in this process and I suspect this disconnect is not singular in occurrence.

The State of California needs to have an active engaged role to keep fresh water flowing into the Sea!

Sincerely,

Buford Crites
Board Member
Colorado River Basin
Regional Water Quality Control Board

WRITTEN AS BOARD MEMBER BUT NOT ON BEHALF OF THE BOARD

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

CURTIS L. FOSSUM, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
California Relay Service From TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1890**
Contact FAX: **(916) 574-1885**

October 17, 2011

File Ref: SCH# 2010061062

David Elms
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Subject: Draft Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the Salton Sea Species Conservation Habitat Project, Imperial County

Dear Mr. Elms:

Staff of the California State Lands Commission (CSLC) has reviewed the draft EIS/EIR for the proposed Salton Sea Species Conservation Habitat Project (Project), which is being prepared by the Natural Resources Agency (Agency) as the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The CSLC has prepared these comments as a trustee and/or responsible agency because of its trust responsibility for projects that could directly or indirectly affect sovereign or school lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters.

<u>CSLC Jurisdiction</u>

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

Based on CLSC staff's review of the Project and as outlined in the CSLC letter dated August 22, 2011(enclosed):

- the proposed Project may include lands within which the State has reserved mineral interests,[1] and
- two of the Alamo River alternatives are located within lands acquired by the CSLC from the Imperial Irrigation District (IID) under sovereign land exchange SLL 10: 40 acres described as assessor's parcel number (APN) 020-010-030. The IID has reserved certain rights-of-way and easements.

Should the Project involve dredging on lands within which the State has reserved mineral interests, a lease from CSLC may be required. Should the Project incorporate Alamo River alternatives 4 and 6, including APN 020-010-030, a lease from CSLC would be required.

Project Location and Description

The Project site is located at the southern end of the Salton Sea in Imperial County. The EIS/EIR also analyzes six alternatives that extend onto lands near the mouth of the Alamo River and the mouth of the New River.

The Project would restore up to 3,770 acres of shallow water habitat lost due to the Sea's ever-increasing hypersalinity and reduced area as the sea recedes. Ponds to support fish and wildlife species dependent on the Salton Sea would be constructed and operated by the California Department of Fish and Game (DFG) and supplied with a combination of brackish and saline water, blended to maintain an appropriate salinity range. The Project's goals are to:

- develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and
- develop and refine information needed to successfully manage the Project habitat through a "proof-of-concept" adaptive management process.

Project construction would be extensive, involving dredging, earthwork, concrete placement, electrical, and structural processes. The Project would be constructed over a two-year period beginning in late 2012. The proof-of-concept period would last approximately 10 years after completion of construction; the ponds would then be

[1] Please be advised that the Alamo River Alternatives will be located within lands the State acquired and patented as School Lands, all minerals reserved on the East ½ of the Northeast ¼ of Section 16, Township 11 South, Range 13 East, San Bernardino Meridian. Any movement or removal of a portion of the mineral estate may require a CSLC lease or permit.

operated until the end of the 75-year period covered by the Quantification Settlement Agreement[2] or until funds were no longer available.

Environmental Review

Dredging, Excavation, or Placement of Structures

The draft EIS/EIR states that "Project construction …would include some actions likely to involve dredging, excavation, or placement of structures in Waters of the United States, including wetlands" (p. 6-2), and "…a hydraulic dredge would be used to provide greater depth to borrow channels or create new channels through areas with soft soils. Soils removed as dredge spoils would be placed either within the Project footprint or outside of the exterior berm in the Sea" (p. 2-15).

Although the draft EIS/EIR estimates over 1,800 hours of dredging time during the two-year construction schedule, it does not appear to include an estimate of the quantity of dredged spoils that may be generated by the Project, and provides only vague information about where the spoils would be placed.

In order to determine CSLC jurisdiction relative to lands within which the State has reserved mineral interests, CSLC staff requests that the EIS/EIR include more specific information regarding proposed dredging activities (e.g., location of dredging, quantity of spoils generated and where the dredged spoils would be placed). Any construction activity which would occur on sovereign lands under CSLC jurisdiction (i.e., APN 020-010-030) such as dredging, excavation, building of new berms, modifications to existing berms,[3] or bank protection (e.g., placement of riprap or other materials) would require a lease from the CSLC. It should be noted that all decisions on lease issuance and Public Trust consistency of leases and proposed uses of sovereign lands are made only by the three-member panel of Commissioners, not by CSLC staff or other agencies; as such, the statement on page 6-9 of the EIS/EIR that the Project falls "within the definition of uses consistent with the Public Trust Doctrine" should be clarified or removed.

Greenhouse Gas (GHG) Emissions

The EIS/EIR would benefit from a more clear presentation of a specific measure or metric against which the Project's impacts are measured to determine significance. As

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[2] During the mid-1990s, many discussions took place throughout the California water community about how best to reduce California's use of Colorado River water. After intensive negotiations, legislation emerged to implement the Quantification Settlement Agreement and provide for restoration of the Salton Sea. Under the provisions of the legislation, the State is charged with "restoration of the Salton Sea ecosystem and the permanent protection of the wildlife dependent on that ecosystem."

[3] On February 9, 2006, a five year lease (PRC 8665.9) was issued to the Bureau of Reclamation for the construction of a parking/staging area and creation, use and maintenance of a pond, less than two feet deep, and four islands for the purpose of providing an area for bird nesting in connection with the Salton Sea Shallow Habitat Pilot Project. Upon completion of the project, all equipment was to be removed and the constructed berms and islands were to remain in place as requested by IID. Aerial photos of the vicinity indicate that the prior parking/staging area, pond, berms and islands are still in place on the parcel. This project is also referenced in section 1.6.3 in the EIS/EIR (p. 1-9).

presented, the EIS/EIR only discusses the GHG significance thresholds in very general terms that limit the CSLC's ability to compare the Project's incremental change to the baseline against a readily identified, measureable threshold. As such, it is difficult to draw the logical link, using substantial evidence, between the incremental change to the environment and the ultimate "less than significant impact" and "no mitigation required" conclusions for GHGs. Notwithstanding the statement in the EIS/EIR that Project-related construction emissions are well under the 25,000 metric tons of carbon dioxide equivalents (CO_2e) that would trigger reporting for "major facilities" (EIS/EIR p. 3.9-12), which is not held out in the EIS/EIR as the document's stated significance threshold, CSLC staff suggests that the potential to generate the equivalent of up to 6,650 metric tons of CO_2e per year (under Alternative 3) for the duration of Project construction could be considered a significant impact that requires mitigation absent a more clearly articulated threshold. If the EIS/EIR concludes that no feasible mitigation is available, then the EIS/EIR should state that the impact is significant and unavoidable.

CSLC staff also requests that the EIS/EIR reanalyze the appropriateness of the conclusion that the cumulative impacts to global climate change, from Project construction and operation, are less than significant and that no mitigation is required.

Cultural Resources

Mitigation Measure (MM) CR-1 (p. 3.5-11) requires preparation and implementation of a survey plan and an inadvertent discovery plan. The measure states that resources considered significant would be avoided or subject to a data recovery program. The data recovery program would be designed in consultation with appropriate state (i.e., Office of Historic Preservation) and Federal agencies and include excavation of an archaeological site to recover any buried artifacts or other data.

Please note that the Agency should also consult with the CSLC in the event that any cultural resources are discovered on sovereign lands under the jurisdiction of the CSLC (i.e., APN 020-010-030). Any archaeological site or historic resource remaining on State lands for more than 50 years is presumed to be significant.

Mitigation Monitoring and Reporting Program (MMRP)

Upon adoption of the EIS/EIR, the Agency should provide a MMRP pursuant to State CEQA Guidelines section 15074, subdivision (d). The MMRP should include methods for coordination, timing for implementation of mitigation measures and list all parties and/or state and federal agencies, in addition to the Agency, responsible for ensuring compliance and enforcement through permit conditions, agreements or other measures during construction and management of the Project.

Thank you for the opportunity to comment on the draft EIS/EIR for the Project. As a responsible and/or trustee agency, the CSLC may need to rely on the final EIS/EIR for the issuance of a lease and, therefore, we request that you consider our comments prior to adoption of the EIS/EIR.

Please send copies of future Project-related documents or refer questions concerning environmental review to Joan Walter, Environmental Scientist, at (916) 574-1310 or via e-mail at joan.walter@slc.ca.gov. For questions concerning archaeological or historic resources under CSLC jurisdiction, please contact Senior Staff Counsel Pam Griggs at (916) 574-1854 or via email at pamela.griggs@slc.ca.gov. For questions concerning CSLC leasing jurisdiction, please contact Drew Simpkin, Public Land Management Specialist, at (916) 574-2275, or via email at drew.simpkin@slc.ca.gov. For questions concerning CSLC reserved mineral interests, please contact Greg Pelka, Senior Mineral Resources Engineer, at (562) 590-5227, or via email at greg.pelka@slc.ca.gov.

Sincerely,

Cy R. Oggins, Chief
Division of Environmental Planning
and Management

Enclosure:

1. CSLC letter dated August 22, 2011

cc: California Natural Resources Agency
1416 Ninth Street, suite 1311
Sacramento, CA 95814

Office of Planning and Research
D. Simpkin, LMD, CSLC
J. Walter, DEPM, CSLC
P. Griggs, LEGAL, CSLC
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AUG 22 2011

File Ref: SD 2011-06-14.6

Sarah Lozano
Environmental Planning Manager
DUDEK
605 Third Street
Encinitas, CA 92024

Subject: California Department of Fish and Game Salton Sea Species Conservation Ecosystem Restoration Program, Salton Sea, Imperial County

Dear Ms. Lozano:

This letter is in response to your request for a determination by the California State Lands Commission (CSLC) as to whether it asserts a sovereign title interest in the proposed California Department of Fish and Game (DFG) Salton Sea Species Conservation Ecosystem Restoration Program.

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (PRC §6301 and §6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

Based on the information you provided on behalf of DFG, it appears the proposed New River Alternative is located within lands the State acquired and patented as lieu lands; and in lands the State did not acquire or patent and are federal lands patented by the U.S. under various patents. It also appears that portions of the proposed project site are within the Salton Sea National Wildlife Refuge.

The proposed Alamo River Alternative is located within lands the State acquired and patented as School Lands; and in lands the State did not acquire or patent and are federal lands patented by the U.S. under various patents. Assessor parcel number 020-010-030, containing 40 acres, was acquired by the State (CSLC) from the Imperial Irrigation District under sovereign land exchange in SLL 10. The Imperial Irrigation District has reserved certain rights-of-ways and easements. Should the proposed Alamo River Alternative include APN 020-010-030, a lease from the CSLC would be required. All other proposed locations would not require a lease at this time.

This determination is without prejudice to any future assertion of State ownership or public rights, should circumstances change, or should additional information come to our attention. In addition, this letter is not intended, nor should it be construed as, a waiver or limitation of any right, title, or interest of the State of California in any lands under its jurisdiction. If you have any questions, please contact Drew Simpkin, Public Land Management Specialist, at 916-574-2275 or via email at drew.simpkin@slc.ca.gov.

Sincerely,

Brian Bugsch, Chief
Land Management Division

cc: Drew Simpkin, CSLC

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
5796 Corporate Avenue
Cypress, California 90630

Edmund G. Brown Jr.
Governor

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REGULATORY BRANCH
CARLSBAD FIELD OFFICE

September 30, 2011

Ms. Lanika Cervantes
U.S. Army Corps of Engineers
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

NOTICE OF COMPLETION & ENVIRONMENTAL IMPACT REPORT (EIR) FOR SALTON SEA SPECIES CONSERVATION HABITAT PROPOSAL

Dear Ms. Cervantes:

The Department of Toxic Substances Control (DTSC) has received your submitted Notice of Preparation of the Environmental Impact Report for the above-mentioned project. The following project description is stated in your document: "The Salton Sea currently supports a wide variety of bird species and a limited aquatic community. Over many decades, the components of the aquatic-dependent community have shifted in response to receding water levels and increasing salinity. The Salton Sea is currently a hypersaline ecosystem (about 51 ppt). Without restoration, declining inflows in future years will result in the Sea's ecosystem collapse due to increasing salinity (expected to exceed 60 ppt by 2018, which is too saline to support fish) and other water quality stresses, such as temperature extremes, eutrophication, and related anoxia due to algal productivity".

DTSC sent you comment on the Notice of Preparation of the Environmental Impact Report for the above-mentioned project on 2/18/2010. Based on the review of the submitted document DTSC has no further comments. DTSC-1

If you have any questions regarding this letter, please contact me at ashami@dtsc.ca.gov, or by phone at (714) 484-5472.

Sincerely,

Al Shami
Project Manager
Brownfields and Environmental Restoration Program

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
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CEQA # 3309

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CARLSBAD FIELD OFFICE

Ms. Lanika Cervantes, Corps Project Manager
U.S. Army Corps of Engineers, Los Angeles District
Regulatory Division, San Diego Field Office
ATTN: CESPL-RG-RS-2010-00142-LLC
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

SUBJECT: Salton Sea Species Conservation Habitat Project Draft EIS/EIR, Public Hearings and Section 404 Permit Request Notice

Dear Ms. Cervantes:

On August 17, 2011, we received from the U.S. Army Corps of Engineers and the California Natural Resources Agency, the Notice of Availability and Public Hearing of a Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), and a Section 404 Permit request notice for the Salton Sea Species Conservation Habitat (SCH) Project. The SCH Project would restore shallow water habitat lost due to the Salton Sea's ever-increasing hypersalinity and reduced area as the Sea recedes. The Natural Resources Agency is requesting a Section 404 permit from the U.S. Army Corps of Engineers for the construction of up to 3,770 acres of shallow ponds and associated infrastructure at the southern end of the Salton Sea in Imperial County, California. This construction would permanently impact up to 24 acres and temporarily impact up to 1,760 acres of Waters of the U.S. Compared to existing conditions, the SCH Project would result in a net increase in the extent of Waters of the U.S. by up to 1,986 acres because the ponds would restore Waters of the U.S. between elevation -228 feet and -231 feet previously lost by the receding Sea. The SCH Project would be located at the southern end of the Salton Sea, in an unincorporated area of Imperial County, California. The California Natural Resources Agency's preferred alternative for the SCH Project would be located near the mouth of the New River, although other alternatives under consideration would be located near the mouth of the Alamo River.

Pursuant to the above, the Imperial Irrigation District (IID) submits the following comments on the Draft EIS/EIR:

Executive Summary and General Comments

1. IID is supportive of implementing the SCH project and believes this is a reasonable first step in restoration at the Salton Sea. IID-1

2. In a number of places, the document mentions applications filed by the Metropolitan District of Southern California (MWD) with the State Water Resources Control Board (SWRCB) to appropriate water from the New and Alamo Rivers for use by MWD. It also notes that no action has been taken on these applications because the required IID-2

environmental analysis has not been done. The document should state that IID has the right to the use of water from agricultural return flows from the IID service area. If MWD were to proceed with its applications, IID and others would have the right to protest the application. The quantity of agricultural drain flow in a given year is directly related to how much water is used in irrigation in the first instance. Water orders vary greatly, depending upon many factors, including the economy, weather conditions, rainfall, types of crops grown, etc., which in turn means that the drain flow varies greatly, so it would not be a particularly reliable source of water for a potable water supplier. IID-2 Cont.

Section 1.0 Introduction

3. Subsection 1-3 CEQA Project Goals and Objectives/NEPA Purpose and Need: Discussion of the Quantification Settlement Agreement (QSA) states IID is required to provide conserved water to the Salton Sea to mitigate the effects of transfer on salinity until 2017. IID requests that this be updated to reflect that IID and San Diego County Water Authority will file a petition with SWRCB requesting that mitigation water to the Salton Sea stop at the end of 2013 and a higher functional value and longer lasting mitigation be substituted for the mitigation water in the form of habitat creation similar to that proposed by California Department of Fish and Game's (CDFG) SCH. IID-3

   Subsection 1.10 Required Permits and Consultations, Page 1-12: Discussion should include IID approval of use of agricultural return flows in Alamo and New Rivers. IID-4

Section 2.0 Alternatives

General Comments

4. IID believes that the proposed SCH should be built in areas outside of the Salton Sea Known Geothermal Resource Area (KGRA), which is essentially the areas immediately east of the New River, continuing east past the Alamo River and through the Morton Bay area, and/or the County of Imperial Geothermal Overlay. If alternatives are implemented within the KGRA, specific easements or other provisions for geothermal activity should be established prior to implementation of the alternative. IID believes that geothermal development and habitat creation/ management are compatible and both need to be considered equally in the implementation of the SCH. IID-5

5. The proposed SCH project should be designed and located so as to minimize loss of active or potential agricultural land and to minimize loss of production on agricultural land during the construction and operation of the project. IID-6

6. IID suggests that some fresh water cells should be included in the SCH. This would allow for additional research into fresh water selenium pathways and perhaps help to develop better risk assessment criteria for freshwater systems around the Salton Sea. IID-7

Specific Comments

7. Page 2-4, Subsection 2.2.1 Exclusionary Criteria, 1. Available Water Rights, Lines 13-19: IID has the right to the use of all agricultural return flows from IID's service IID-8

area (which is the majority of the flows in the New and Alamo Rivers). Furthermore, the document should state that IID has the right to the use of all water from its agricultural return flows and that the SHC Project must obtain IID's permission to use the return flow. IID-8 Cont.

8. Page 2.10, Subsection 2.3.2.3 Pupfish Connectivity, Lines 3-15: Implementation of any of the alternatives (except no action) will require coordination with IID to identify the most efficient methods for drain connectivity. IID and the state SCH team have coordinated during the design and preparation of the Draft EIS/EIR and IID recommends that the coordination continue during the final design and implementation stages of the project. IID would suggest that an IID representative be included in the final planning, design and construction coordination meetings for the project. IID-9

9. Page 2-13, Subsection 2.4.1.3 Berms, Lines 32-40: In keeping with the idea of the initial ponds being a pilot project to inform later designs and habitat creation, IID suggests incorporating some geotube barriers in the design to evaluate their effectiveness and the logistics of their installation. IID-10

10. Pages 2-15 and 2-16, Subsection 2.4.1.7 Water Supply, Lines 40-44 and 1-5, respectively: Again in keeping with the pilot project concept, IID suggests that the state evaluate various salinity conditions and how that salinity concentration impacts other area wildlife. IID-11

11. Page 2-16, Subsection 2.4.1.10 River Diversion Gravity Diversion Structure, Lines 27-35: As has been discussed in the preliminary design meetings and public workshops, any water control structures in the river channels should be designed to avoid or mitigate for impacts to IID and farmer irrigation infrastructure (including tail and tile water discharges). This appears to be the case, based on the discussion in the Draft EIS/EIR, but IID would request a review of the final design plans to verify. In general, IID supports pipeline delivery systems over open channels because of the reduced footprint required for pipelines (thus reducing the loss of additional agricultural land and production). IID-12

12. Page 2-17, Subsection 2.4.1.15 Power Supply, Lines 31-38: *See item no. 17.* IID-13

13. Page 2-19, Subsection 2.4.1.17 Interception Ditch/Local Drainage, Lines 14-30: The SCH team has coordinated with IID in the planning and preparation of the Draft EIS/EIR regarding drainage issues and IID recommends that coordination should continue to address stormwater and agricultural drainage potentially impacted by the project and the pupfish connectivity issue. *See item no. 8 regarding IID representative on the design/implementation team.* IID-14

14. Page 2-20, Subsection 2.4.19 Bird Habitat Features, Lines 1-25: IID supports the multiple habitat approach to the SCH. We also support the state's plan to use these cells, not only as functional habitat, but as a pilot project to inform future projects and operations regarding selenium and salinity concentratIID-8 fish and avian habitat areas. IID would like to continue the science partnership tnat the state has developed with various academic organizations, tribal entities, private firms, state and federal wildlife, water and land use agencies and the IID that has proved so successful in the IID-15

development of this plan and the advancement of other restoration, reclamation and mitigation projects around the Salton Sea. IID-15 Cont.

15. Page 2-21, Subsection 2.4.1.23 Land Acquisition, Lines 26-28: IID and the state design team have had preliminary discussions regarding property acquisition and the IID Board has passed a resolution in support of the concept of the SCH project, conditioned on the design not precluding or significantly inhibiting other land uses. It is very important to the IID that the SCH project be compatible with geothermal energy resources and continued agricultural production either through selective location or design/permitting criteria. Final disposition of any IID-owned land will require IID Board approval. IID-16

16. Page 2-22, Subsection 2.4.1.25 Project Compatibility with other Potential Future Land Uses – Geothermal, Lines 10-31: IID appreciates that the SCH team consulted with IID and the geothermal development groups during the project development. There should be additional coordination during the final design and implementation to assure that geothermal development activity is adequately recognized as a compatible land use and that potential future development in the vicinity of the SCH is not significantly curtailed by the project. IID-17

17. Page 2-25, Subsection 2.4.2.9 Power Line Construction, Lines 7-14: IID Energy will require coordination review and approval of any power line construction that will be incorporated into the IID distribution system. IID-18

Section 3.0 – Affected Environment, Impacts and Mitigation Measures

18. Section 3.2 Agricultural Resources: *See item no. 33 on recoverable farmland.* IID-19

19. Pages 3.3-23 to 3.3-26, Subsection 3.3.4 Air Quality: IID has, or is in the process of, implementing the measures included in the **Quantification Settlement Agreement Implementation** section of the Draft EIS/EIR. Access restrictions have been implemented and IID continues to coordinate with Imperial County and other land owners on gating specific areas. Several years ago the Joint Powers Authority (JPA) and the State of California partnered to implement six air stations around the Salton Sea to gather data for the QSA mitigation requirements and to provide data to the state's Salton Sea Ecosystem Restoration project. The JPA funded the installation and operation of six stations that monitor metrological and particulate matter data around the Salton Sea. As part of that plan the state would add gaseous monitoring equipment to the stations at a later date, subject to available state funding. The stations have been in operation, collecting metrological and particulate matter data for several years. IID-20

    The JPA has also funded several pilot projects at the Salton Sea. These projects include sheet flow flooding of several areas to evaluate potential vegetation enhancement and inundation of the playa as dust emission controls. Additional projects, including the application of surfactant products to the exposed playa are also underway. Several pilot projects to evaluate other land uses for exposed playa, such as solar energy generation, reclaimed agricultural, shallow water habitat are in the planning stages. IID also plans to implement more traditional control measures such as wind barriers.

20. Section 3.4 Biological Resources: The river deltas are recognized in the QSA draft Habitat Conservation Plan (HCP) and related permits as high value habitat for bird species. Any diversions from the river channels should be managed so as to prevent any reduction in habitat value within the reaches of the river delta. IID-21

21. Page 3.4-30, Subsection 3.4.42 Resources Thresholds of Significance, Lines 34–38: While IID's Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) is not approved; IID has been operating under the requirements of the draft plan. We believe that the SCH project should be compatible with the requirements that IID has been operating under since the completion of the draft HCP and related authorizations and documents. IID-22

22. Section 3.6.1 Energy Consumption: Based on the projected inflows into the SCH system, energy consumption may be very high. IID requests that the hydrologic and water balance data and models be reviewed by IID and others to verify flow rates. Until this verification is completed it is difficult to comment on proposed energy consumption rates for pumping. IID-23

23. Section 3.11 Hydrology and Water Quality general comment: IID requests access to the hydrologic model and data used in the evaluation of future Salton Sea water elevations and salinity concentrations. This data is necessary to further evaluate the analysis presented and compare it to other existing Salton Sea hydrologic models. IID-24

24. Page 3.11-3, Subsection 3.11.2.1 Water Rights, Lines 3-12: IID has the right to the use of all return agricultural flows in the Alamo and New rivers that come from its service area. *See item no. 7.* IID-25

25. Page 3.11-3, Subsection 3.11.2.2 Salton Sea and Agricultural Drainage, Lines 19-20: The Salton Sea has also been declared a permanent flowage easement for IID and the Coachella Valley Water District in December, 2000 as part of the Torres Martinez Desert Cahuilla Indians Claims Settlement (Pub. L. 106-568,114 Stat.2906. See 25 U.S.C. && 1778 a (6); 1778e (a), (b)). IID-26

26. Page 3.11-7, Subsection 3.11.2.5 Surface Water Hydrology-Salton Sea, Lines 8-9: Reduction in water orders from farmers during the last 10 years, reduced flows from Mexico and lower precipitation have also contributed to the decline in flows in the New and Alamo Rivers. IID-27

27. Page 3.11-11, Subsection 3.11.2.5 Surface Water Hydrology, Lines 30-32: Please verify accuracy of claim that 10 percent is agricultural drain water. IID-28

28. Pages 3.11-21 to 3.11-30, Subsection 3.11.3.1 Surface Water Hydrology Impact Analysis Methodology: It appears that the flow rates for inflow to the cells is high. IID would like to review the modeling data to further evaluate the flow rates suggested in the document. IID suggests that resident time be evaluated as part of the operation of the SCH cells. A water quality and biological monitoring program could also be implemented to evaluate the habitat parameters under different resident times. If, based on the water quality and habitat evaluations, longer resident times are supported; it could mean a reduction in operation costs and water use. IID-29

29. Pages 3.11-30 and 3.11-31, Subsection 3.11.3.2 Thresholds of Significance, Lines 42-44 and 1-3, respectively: Excavation of sediment ponds 15-20 feet below existing ground surface may intercept localized water tables and may experience soil liquefaction making excavation difficult. Even with dewatering this may be difficult. IID-30

30. Page 3.11-35, Subsection 3.11.3.3 No Action Alternative, Lines 22-28: Some of the current projections for inflows from Mexico are much less than those noted in the Draft EIS/EIR. Reuse of New River water in Mexico may significantly reduce inflow volumes in future years. IID-31

31. Page 3.13-9, Subsection 3.13.3.5 Future Land Use in the Study Area - Geothermal Energy Production, Line 27: The well pads could include multiple well heads with directional boring under the surrounding SCH areas. IID-32

32. Page 3.13-16, Subsection 3.13.4.4 Alternative 1 – New River Gravity Diversion – Cascading Ponds, Lines 16-27: The planned SCH should include provisions that establish and preserve access for geothermal activity after suitable habitat is established in the ponds. Given that the ponds are designed to support multiple species, including some that are protected or otherwise recognized under state or federal regulation and guidelines, there should be some acknowledgement that the future or current presence of those species in the SCH areas will not preclude geothermal development activity. Note: this comment applies to all of the alternatives. IID-33

33. Page 3.19-7, Subsection 3.19.3.3 No Action Alternative, Lines 22-30: Some areas along the western shoreline of the Salton Sea (Elmore Ranch area) contain more well drained soils than the river delta areas and may be reclaimed as farmland without the installation of tile lines (thus eliminating or reducing the need for ground surface to be 6-7 feet above water level). Additionally, IID and local farmers are investigating the potential for reclamation of these soils without excessive leeching (with repeated deep tillage of the soil to promote aeration). Most of these areas are well to the west of any of the alternatives presented, but some reclaimed areas may be identified within the river deltas. IID agrees that reclamation of farmland within the area of the proposed alternatives is speculative. IID-34

Appendices

Appendix D Operations

34. Pages D-4 and D-5, Section D.2.6 Agricultural Drain Interception Ditch, Lines 39-42 and 1-2, respectively: Activities conducted by IID in the interception ditches would be subject to the requirements of the HCP and related permits and authorizations. As with other IID maintained drains, IID would have the final decisions on the maintenance conducted (subject to the provisions of the HCP and related documents). IID-35

35. Page D-6, Section D.3.2 Salinity of Stored Water: IID agrees with the concept of testing different salinities under various conditions to more closely evaluate selenium concentrations. We also believe the evaluation should include some cells that are irrigated with only drain water (no Salton Sea water mix) to evaluate selenium concentrations, track bioaccumulation and how that might affect individuals and IID-36

overall species populations. This field experiment would help inform the selenium Ecological Risk Modeling reported in Appendix I. IID-36 Cont.

36. Page D-9, Section D.3.4 Residence Time: IID supports evaluating residence time in the SCH cells. Longer resident times could maintain habitat functional values, manage salinity and reduce pumping costs for replacement water. This might require a more intensive water quality monitoring program. IID suggests that residence time be tied to water quality or habitat quality instead of a set number of days. *See item no. 28.* IID-37

37. Pages D-14 and D-15, Section D.4 Possible Operational Scenarios: IID would suggest reducing the lower limit on the salinity operational variable to 10 ppt or less in at least one cell to evaluate selenium concentrations and potential bioaccumulation. With a robust monitoring program any potential affects to wildlife could be identified early and the salinity range increased if required. IID-38

Appendix I Selenium Management Strategies

38. IID suggests that some fresh water (agricultural drain water) cells be incorporated into the SCH habitat to further evaluate the potential risks to wildlife associated with freshwater systems. IID-39

General Provisions

39. IID lands with geothermal resources may not be available for this project. IID-40

40. The proponent may not use IID's canal or drain banks to access the project sites. IID-41

41. If any additional crossings or modification to the existing ones are needed, then the applicant will be responsible for the cost of these improvements and IID will design and construct them. IID-42

42. Fences should be installed at the boundary of IID's right-of-way for safety and allow access for IID operation and maintenance activities. IID-43

44. Any construction or operation on IID property or within its existing and proposed right of way or easements will require an encroachment permit, including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities. A copy of the encroachment permit application is included in the IID's *Developer Project Guide 2008*. The guide can be accessed at the following web site: http://www.iid.com/Modules/ShowDocument.aspx?documentid=2328. Also, instructions for the completion of encroachment applications can be found at http://www.iid.com/Modules/ShowDocument.aspx?documentid=2335. The IID Real Estate Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits. IID-44

45. Any new, relocated, upgraded or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation. IID-45

Failure to do so will result in postponement of any construction and/or upgrade of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully mitigated. **Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.** IID-45 Cont.

Should you have any questions, please do not hesitate to contact me by phone at 760-482-3609 or by e-mail at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Environmental Specialist

David Elms. – Project Manager, CDFG Bermuda Dunes Field Office
Carlos Villalon. – Manager, Water Dept.
Mike L. King. – Manager, Water Dept.
Jeff M. Garber. – General Counsel
Juan Carlos Sandoval. – Asst. Mgr. Energy Dept.
Joel Ivy. – Asst. Mgr. Energy Dept.
Carlton L. King. – Asst. Mgr., Energy Dept. Customer Service Operations
Tina Shields. – Asst. Mgr., Water Dept. Resources Planning & Management
David L. Barajas. – General Supt., Energy Dept. System Planning & Engineering
Michael S. Trump. – General Supt., Energy Dept. Customer Operations & Planning
Ismael Gomez. – Chief Engineer, Water Dept. Engineering Services
Bruce Wilcox. – Environ. Proj. Mgr., Water Dept. QSA Water Transfer
James P. Kelley. – Supervisor, Real Estate & Right-of-Way
Vikki Dee Bradshaw. – Asst. Supv., Environmental Management

San Diego County Water Authority

4677 Overland Avenue • San Diego, California 92123-1233
(858) 522-6600 FAX (858) 522-6568 www.sdcwa.org

October 17, 2011

Ms. Lanika Cervantes, Corps Project Manager
U.S. Army Corps of Engineers, Los Angeles District, San Diego Field Office
ATTN: CESPL-RG-RS-2010-00142-LLC
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

Re: Draft Environmental Impact Statement/Environmental Impact Report for the Salton Sea Species Conservation Habitat Project (SCH No. 2010061062)

Dear Ms. Cervantes:

The San Diego County Water Authority (Water Authority) has reviewed the subject document and supports the general concept of the proposed Species Conservation Habitat (SCH) project. The SCH project is intended to serve as a proof of concept for shallow water habitat restoration at the Salton Sea (Sea). This habitat type currently supports fish and wildlife that are being lost due to increasing salinity and declining Sea elevations. Without some form of restoration, declining water inflows in future years will result in ecosystem collapse due to continued water quality degradation.

On June 25, 2007, the California Resources Agency certified a Final Program Environmental Impact Report for the Salton Sea Ecosystem Restoration Program that identified a preferred alternative for restoring the Sea. The Water Authority participated as a member of the Advisory Committee that assisted in the preparation of the PEIR and preferred alternative. Disappointingly, the State has taken no further action to implement restoration despite repeated requests by various public agencies and other concerned organizations. The proposed SCH project is very similar to the Saline Habitat Complexes described in the Ecosystem Restoration Program FPEIR and provides the first meaningful State contribution to Sea restoration. SDCWA-1

The Water Authority concurs with the two stated project goals: 1) develop a range of aquatic habitat that will support fish and wildlife species dependent on the Sea, and 2) develop and refine information needed to successfully manage the SCH through an adaptive management process. Because the SCH is intended to evaluate various approaches for shallow water habitat restoration, it is important that the project be designed and implemented to test multiple hypotheses related to water quantity/quality and establishing appropriate habitat for target species. SDCWA-2

The Water Authority does not favor any particular alternative. However, the Water Authority offers the following general comments on whatever alternative is ultimately selected:

1. The selected alternative should be located to avoid areas with high potential for geothermal development. Maximum development of renewable energy sources is important to combating climate change and can be an important economic benefit to the Imperial Valley. Significant geothermal resources exist in and around the Sea. As the Sea recedes, renewable energy development along a newly exposed shoreline could help reduce wind-blown dust, thus lowering projected particulate emissions and preventing further air quality degradation. SDCWA-3

2. The selected alternative should minimize adverse effects on existing agricultural lands, both during construction and long-term operation, to ensure minimal impacts to the local economy. SDCWA-4

3. The design and operation of the selected alternative should include elements that allow testing of various water quality parameters, such as salinity, temperature, dissolved oxygen, as well as chemical constituents such as selenium. An appropriate design would ensure that any potential relationships between physical, chemical and biological criteria could be evaluated. SDCWA-5

4. The selected alternative should include elements to provide for desert pupfish connectivity. The dispersal routes for the various desert pupfish populations found in the New and Alamo Rivers and agricultural drains must be maintained. SDCWA-6

5. Final design of the selected alternative should account for the variability of water flows to the Sea expected in various models. The propose primary source of water for the SCH, agricultural drain flows, are highly variable and dependent on the amount and type of agricultural activity at any given time. SDCWA-7

6. The identified preferred alternative involves pumping rather than gravity flow. Additional detail on cost/benefit should be included in the FEIR to justify this highly engineered and potentially costly solution. Less intensively managed systems (e.g., gravity flow systems) typically more easily approximate natural habitats. Permanent conversion of limited agricultural land for the sedimentation basins may be justified if it results in a substantial lifetime cost savings and provides a greater probability of achieving project goals. SDCWA-8

7. The selected alternative should not adversely affect implementation of mitigation measures for the Quantification Settlement Agreement and Imperial Irrigation District Water Conservation and Transfer Projects. The Imperial Irrigation District, in partnership with the Water Authority and others, is currently implementing various mitigation measures approved as part of these projects. Close coordination with the SDCWA-9

Imperial Irrigation District may avoid conflict and identify opportunities for synergy between the projects. SDCWA-9 Cont.

Thank you for the opportunity to comment of the proposed SCH project. The Water Authority would appreciate receiving the Final EIS/EIR when is completed. Please contact me at (858) 522-6752 if you have any questions regarding these comments.

Sincerely,

Laurence Purcell

Laurence Purcell
Water Resources Manager

Cc: Mr. David Elms, CDFG

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AIR POLLUTION CONTROL DISTRICT

October 17, 2011

Mr. David Elms
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

SUBJECT: Public Notice/Application No.: SPL-2010-00142-LLC; State Clearinghouse No. 2010061062

Dear Mr. Elms:

The Imperial County Air Pollution Control District (Air District) has finalized its review of the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Salton Sea Species Conservation Habitat (SCH) Project. The Air District and County hereby submits the following air quality review comments on the Draft SCH EIS/EIR. The U.S. Army Corps of Engineers (Corps) is the NEPA lead agency, and the California Natural Resources Agency (NRA) is the CEQA lead agency. The NRA (applicant) is requesting a Section 404 permit from the U.S. Army Corps of Engineers (Corps) for the construction of up to 3,770 acres of shallow pounds and associated infrastructure at the southern end of the Salton Sea in Imperial County, California. The permit is required RWQCB-1 activities would discharge fill material on the riverbed or banks within the Corps jurisdictio thin the New River or the Alamo River and the Salton Sea. The proposed ponds will be constructed and used as aquatic habitats that will support fish and wildlife species dependent on the Salton Sea. The construction of the ponds will also assist in refining information needed to successfully manage the SCH Project habitat through an adaptive management process. The project is scheduled to be constructed within two years beginning in 2013.

Six project alternatives were studied in the Draft EIS/EIR. Alternative 3 was selected by the Natural Resources Agency as their preferred Alternative. Alternative 3 consists on the development of 3,770 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped diversion of river water, and independent ponds extended to include Far West New and cascading pond units.

<u>OVERALL PROJECT-RELATED EIR/EIS COMMENTS</u>

1. The Draft EIR/EIS states that the project is intended to be funded under a legislative appropriation made pursuant to Fish and Game Code section 2932, subdivision (b). This law established the Salton Sea Restoration Fund for implementing the preferred alternative for restoring the Salton Sea. The Draft EIS/EIR needs to provide a full explanation of how this project affects and implements the Salton Sea restoration preferred alternatives identified by the Federal government, the Sate, and the Salton Sea Authority. Further, the Draft EIR/EIS misquotes Section 2932, subdivision b, which states: "Implementation of conversation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including ICAPCD-1

adaptive management measurements *pursuant to Section 2081.7*". The omitted reference to Section 2081.7 is important because subdivision b is for the implementation of conservation measures for the invalidated Quantification Settlement Agreement (QSA). The Draft EIR/EIS fails to disclose how this project relates to the invalidated QSA and its relationship to the promised, but never completed, Salton Sea Habitat Conservation Strategy that was to mitigate impacts to 96 species. ICAPCD-1 Cont.

2. Section 2081.7 also refers to the sale of the 800,000 acre feet of water, initially intended for delivery to the Salton Sea to mitigate impacts of the QSA, instead to Metropolitan Water District (MWD), and sale of yet an additional 800,000 acre feet (for a total of 1.6 million acre feet of water in addition to the other QSA water transfers from the Imperial Valley). DWR is responsible for any environmental impacts related to use or transfer of that water. On September 13, 2011, Imperial Irrigation District (IID) adopted a resolution stating its intent to seek a modification to the SWRCB Order WRO 2002-0013 to cease delivering the Salton Sea's mitigation water, presumably to sell the water to MWD instead of delivering it to the Salton Sea as provided by Section 2081.7. According to its May 10, 2011 report, MWD expects to have a surplus of 1.07 maf of water this year and its water storage to be at an "all-time high" of 2.6 maf by the end of this year. If this project will facilitate in any way the transfer of the Salton Sea's mitigation water and/or the other 800,000 acre feet of water, then the project description is incorrect, and the impacts of the reductions in water inflow to the Salton Sea as a result of Section 2081.7 must be analyzed and further mitigation needs to be identified. There has never been a CEQA or NEPA analysis performed for the selling of this 1.6 million acre feet of water to MWD. These changes would be significant and require re-circulation of the draft document. ICAPCD-2

3. The "no action" alternative improperly assumes the landowners are entirely responsible for mitigating emissions from the exposed Salton Sea's shoreline between the pre-QSA baseline of -228 to -235 feet msl. A -7 foot msl difference results in approximately 16,000-acres of exposed area playa. This assumption ignores the contributions of the QSA to the declining Salton Sea elevation level. There is no explanation of the mitigation measures the project proponents expect the landowners to implement, how the measures will be funded, or how the project proponents intend to ensure the three landowners implement the measures. Since one of the project proponents is also one of the landowners (federal government), the Army Corps of Engineers should commit to implement the necessary air quality mitigation on federally-owned land. ICAPCD-3

4. The "no action" alternative wrongly assumes that the QSA and associated mitigation the parties agreed to as part of the QSA will be implemented, including that the QSA parties will mitigate air quality impacts between -235 and -248 feet msl. These assumptions are incorrect because the Sacramento Superior Court has invalidated 12 of the QSA contracts, and legal challenges to the IID-SDCWA water transfer EIR/EIS and QSA PEIR are pending in state court. The invalidation of the QSA Joint Powers Authority (QSA-JPA) contract also means that the QSA-related mitigation is unfunded and there is no assurance it will be implemented. Therefore, the reliance on the QAS and the QSA environmental documents results in this project's impacts being underestimated and insufficient mitigation required. ICAPCD-4

5. The Draft EIR/EIS assumes that air quality impacts will be mitigated by the four-step air quality mitigation that is in the IID-SDCWA water transfer EIR/EIS and to which the Air District has previously expressed to the State and QSA parties is inadequate, and which remains under legal ICAPCD-5

challenge. The 4-Step Plan is an ill defined "wish list" focused on studying the problem instead of committing to actual mitigation that will reduce air quality impacts. The mitigation also relies on the Air District's adoption of an air pollution credit trading program to generate PM10 ERCs that it has not agreed to do and without any assessment of the feasibility of such a program, impacts to the economy, or whether there are sufficient sources that could reduce emissions in lieu of reducing emissions at the Salton Sea. ICAPCD-5 Cont.

6. The Draft EIR/EIS adopts the flawed baseline approach from the QSA EIR/EIS and PEIR EIS assuming that the Sea will decline to -258.2 feet msl and its salinity will be 272 ppt. The baseline is the actual conditions at the time the notice of preparation is issued, which is reported in the Draft EIR/EIS to be -231 feet msl and 51 ppt salinity for the Salton Sea. The impacts are improperly measured from the -258.2 feet msl instead of -231 feet msl and from 272 ppt instead of 51 ppt. The California Supreme Court in *Cmtys. for a Better Env't v. S. Coast Air Quality Mgmt. Dist.*, (2010) 48 Cal.4th 310 has rejected the baseline approach used in this document because it misleads the public as to the reality of the impacts and subverts full consideration of the actual environmental impacts. ICAPCD-6

7. The Draft EIR/EIS states that the project will be operated until the end of the 75-year period covered by the QSA or until funding is no longer available. The project duration is uncertain because the QSA has been invalidated and without a valid QSA-JPA there is no funding for the mitigation assumed in this document. ICAPCD-7

TECHNICAL COMMENTS

1. **(Executive Summary) ES1.9, line 3, pg ES-7**
   This sentence states, "Additionally, the Imperial County Air Pollution Control District would require preparation of a Fugitive Dust Control Plan under Regulation VIII, Fugitive Dust Rules (800-806)". The Air District would like to mention that a Dust Control Plan (DCP) must be developed for the construction phase. In addition, a second DCP must be developed for the operational phase. ICAPCD-8

2. **(Introduction) Section - 1.10 Required Permits and Consultations, line 23, pg 1-12**
   Same recommended changes as comment number 1. ICAPCD-9

3. **(Alternatives) Section - 2.4.2 Construction, line 1, pg 2-23**
   This section describes the construction process that would be necessary to construct the ponds as well as the equipment that will be required. It is important to note that equipment such as power generators, emergency generators, sandblasters, or other type of machinery with 50 horse-powers or greater requires an Air District permit, or must have a statewide PERP registration operated within PERP guidelines. Please contact the Air District Engineering Department for further assistance. ICAPCD-10

4. **(Alternatives) Section 2.4.7 – Best Management Practices, line 24, pg 2-27**
   This sentence states "Additionally, the Project would comply with the Imperial County Air Pollution Control District's Regulation VIII rules for dust control (general requirements, construction and earthmoving activities, bulk materials, open areas, and conservation management practices), which is required for all projects". It is important to note that the ICAPCD-11

project will also be subject to the requirements of Rule 803 – Carry-Out and Track-Out as well as Rule 805 – Paved and Unpaved Roads. These Rules are an integral part of Regulation VIII. ICAPCD-11 Cont.

5. **(Air Quality) Section 3.3.1 - Introduction, line 14, pg 3.3-1**
This sentence states, "ICAPCD oversees Calexico, Imperial County, and the Imperial Valley in the southeastern Basin, which is where the Project would be located". The Air District would like to point out that the agency oversees the entire geographical area within Imperial County and not just specifically Calexico, therefore it is requested that this change is made to this section. ICAPCD -12

6. **(Air Quality) Section 3.3.2.2 – Federal Regulations, lines 17 thru 20, pg 3.3-5**
This sentence states, "As discussed in Section 3.3.4.5, Attainment Status Designations, Imperial County is designated moderate nonattainment for the Federal 8-hour O_3 NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as serious nonattainment area for 24-hour Federal PM_{10} and $PM_{2.5}$". While it is true that Imperial County is a serious non-attainment for PM_{10} it is not for $PM_{2.5}$. ICAPCD -13

7. **(Air Quality) Section 3.3.2.4 – Portable Equipment Registration Program, line 32, pg 3.3-7**
This sentence states, "Once registered in PERP, engines and equipment units may operate throughout the state of California without the need to obtain individual permits from local air districts". The Air District would like to point out that although this statement is correct, the engine is not considered portable if it resides in the same location for more than 12 months. This also means that any engine such as a back-up or stand-by engine, that replaces engine(s) at a location, and is intended to perform the same or similar function as the engine(s) being replaced, will be included in calculating the consecutive time period. Therefore, if the construction phase does take over a year and the equipment is expected to be at the site for over a year, the equipment must be permitted by the Air District. ICAPCD -14

8. **(Air Quality) Section 3.3.3.5 – Attainment Status Designations, line 7 thru 10, pg 3.3-17**
This sentence states, "As part of USEPA's final ruling, a Reasonably Available Control Technology (RACT) demonstration was also required. RACT's are emission control technologies that are economically and technically feasible. In compliance with the requirements, ICAPCD released the 2009 Reasonable Available Control Technology (RACT) State Implementation Plan" The Air District must clarify that the RACT SIP was developed as part of the Ozone Attainment demonstration and has nothing to do with US.EPA's PM_{10} Serious Non-Attainment Designation therefore this section has to be either revised or deleted. ICAPCD -15

9. **(Air Quality) Section 3.3.3.5 – Attainment Status Designations, line 28 thru 30, pg. 3.3-17**
This section states, "In August 2009, ICAPCD released the 2009 Imperial County State Implementation Plan for Particulate Matter Less than 10 Microns in Aerodynamic Diameter (ICAPCD 2009). This document presents the SIP for PM_{10} on ICAPCD's behalf". It is important to note that the PM_{10} SIP has yet to be approved by the California Air Resources Board (CARB) or US.EPA. ICAPCD -16

10. **(Air Quality) Section 3.3.4.1 – Impact Analysis Methodology, line 12 thru 14, pg. 3.3-20**
This sentence states, "Extending the schedule longer than 2 years would not affect the air quality analysis because it is based on maximum daily emissions (pounds per day) and total emissions (tons), which would remain relatively unchanged". The Air District believes this statement needs further clarification for the following reasons. If construction is delayed for an ICAPCD -17

unknown reason and construction equipment usage and activities stop completely, then there are no emissions being created. However, once construction resumes, construction equipment usage and activities must not go over the daily proposed equipment usage scheduled or activity scheduled that is used in this analysis to calculate daily emissions, otherwise this would increase the daily emissions. Furthermore, if an unforeseen problem with soil movement or any other construction activity was to occur prompting an increase in the construction fleet mix or related construction activities for any day, it would also increase the daily emission production. The construction manager should ensure that this does not occur by off-setting the usage of other construction equipment or activities on those days. This comment must be addressed in this section as well as any other section(s) in the EIS/EIR. ICAPCD -17 Cont.

11. **(Air Quality) Section 3.3.4.5 – Alternative 1 – New River, Gravity Diversion + Cascading Ponds, line 28 thru 30.**
This sentence states "Peak daily NOx and fugitive PM_{10} emissions from on and off-site sources during construction would exceed ICAPCD's thresholds, which would be a significant impact when compared to both the existing environmental setting and the No Action Alternative". Although this statement is referring to Alternative 1, the Air District noticed that the Preferred Alternative (Alternative 3) also exceeds the NOx and PM_{10} Air District thresholds. Therefore in order to help reduce or eliminate construction impacts, the project is required to implement standard, discretionary and enhanced mitigation measures for construction equipment and fugitive PM_{10}. These measures are found in Section 7.1 of the Air District's CEQA Air Quality Handbook. Furthermore, the project will also be subject to the Air District's Policy 5 which requires the mitigation of NOx and PM10 emissions exceeding the CEQA threshold. Attached is a copy of the Air District's Policy 5 for your review. ICAPCD -18

12. **(Air Quality) Section 3.3.4.5 – Alternative 1 – New River, Gravity Diversion + Cascading Ponds, line 8, pg 33-34**
This sentences states, Water exposed soil with adequate frequency for continued moist soil (at least twice daily and indicated by soil and air conditions). The Air District would like to clarify that Rule 801-Construction and Earthmoving Activities, requires the application of water or chemical stabilization at the sites to limit Visible Dust Emissions (VDE) to 20% opacity at all times, therefore watering more than twice a day may be necessary to not exceed the opacity limit. ICAPCD -19

13. **(Air Quality) Section 3.3.5 – General Conformity, line 35 thru 37, pg, 3.3-39**
This sentence states, "Imperial County is designated nonattainment for the Federal 8-hour ozone NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as nonattainment area for 24-hour Federal PM_{10} and $PM_{2.5}$". The Air District would like to clarify that the Imperial County is currently classified as a "moderate" non-attainment area of the 1997 8-hour Ozone NAAQS. The Imperial County is designated as "serious" non-attainment area for PM10 and non-attainment for $PM_{2.5}$. ICAPCD -20

14. **(Air Quality) Section 3.3.5 – General Conformity, line 20, pg, 3.3-40**
The word "revision" should be changed to "revising". ICAPCD -21

15. **(Air Quality) Section 3.3.5 – General Conformity, line 4 thru 6, pg, 3.3-43**
This paragraph states, "Ozone is tentatively in attainment pending certification of 2008 monitoring data, until any future USEPA determination to the contrary". The Air District would ICAPCD -22

like to clarify that all Ozone data up to 2010 has been validated and US.EPA had determined that the Imperial County has and continues to attain the 1997 8-hour NAAQS for Ozone. ICAPCD -22 Cont.

16. <u>(Air Quality/Greenhouse Gases Documentation) Appendix G-2, Table G-3</u>

Please explain why the proposed equipment list only accounts for 1 (one) water truck for the construction phase of this project. If the project is intended to take place in over 3,770 acres and as per the analysis, watering will take place at a minimum of twice per day, it is difficult to suppose one water truck will be able to accomplish such task. In addition, please explain why the manager trip/day is only.50 and the foreman, equipment operator and laborers at .33 per/day. ICAPCD -23

17. <u>(Air Quality/Greenhouse Gases Documentation) Appendix G-2, Table G-10 and Table G-12</u>

The Air District noticed that a 95% emission reduction control is being applied to the Off-road Dust Emissions as well as Maintenance Off-road Dust. Please explain where the emission reduction factor derived from. The analysis indicates that water will be applied at a minimum of twice per day in the construction area however this does not constitute a 95% reduction. As per *AP42, Section 13.2.2 Unpaved Roads*, application of water emissions reductions thru watering requires the evaluation of several factors (e.g. vehicle weight, temperature, ground moisture content) and therefore such an evaluation must be completed before applying such emission reduction. ICAPCD -24

In Summary, all standard mitigation measures and discretionary mitigation measures for fugitive PM10 and NOx control should be applied for the construction phase of the project to mitigate NOx and PM10 emissions. Both standard mitigation and enhanced measures for construction combustion equipment should be applied as well. The project will also be subject to Policy #5 to mitigate the NOx and PM10 emissions above the Air District's CEQA threshold. ICAPCD -25

In Closing, please provide the revised or additional analysis based on the comments above for the APCD to review. ICAPCD -26

Should you have any questions regarding this letter, please do not hesitate to call our office at (760) 482-4606.

Sincerely,

Brad Poiriez
Imperial County Air Pollution Control Officer

CC: Imperial County Air Pollution Control District Board of Directors
Ralph Cordova, Imperial County Executive Officer
Armando Villa, Director, Imperial County Planning/Development Department
Reyes Romero, Assistant APCO
Monica Soucier, APC Planning Manager

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AIR POLLUTION CONTROL DISTRICT

POLICY: OFF-SITE MITIGATION / IN-LIEU FEE

DATE: March 30, 2007 POLICY NUMBER: 5

REFERENCE: ICAPCD CEQA Air Quality Handbook Thresholds of Significance (Policy 36)

The Imperial County Air Pollution Control District has an approved CEQA Air Quality Handbook that is a guidance document for project developers. This document establishes the thresholds of significance for non-attainment pollutants and their precursors.

As such, if a project exceeds the established thresholds, the proponent can propose and administer further emission reduction mitigation measures, as approved by the APCD, to reduce emission levels to below significance. Another option available to the proponent is payment of an in-lieu mitigation fee.

If the in-lieu mitigation fee option is selected by the proponent, the following is how the fee is determined and administered by the APCD:

1: The fee is derived by utilizing the current year CARL MOYER grant program average cost effectiveness for Imperial County multiplied by amount of tons needed to be offset (ex. 2007 Carl Moyer average = $12,336. If 40 tons of Nox needs to be offset, the calculation would be: $12,336 X 40 = $493,440).

2: In-lieu fees collected shall be placed into an ICAPCD specified development project account(s), for appropriate tracking.

3: The ICAPCD may utilize no more than 10% of received funds to offset costs of administering the off-site mitigation/ in-lieu fee program.

4: All excess funds shall be allocated by the Imperial County Air Pollution Control Board of Directors through a Request for Proposal (RFP) process. Proposed mitigation projects will be evaluated based on cost analysis and emission reductions provided that they meet the following minimum criteria:

4.a Emission reductions produced by the in-lieu fee mitigation projects must not be required by any federal, state, or local regulation, memorandum of agreement/understanding with a regulatory agency, settlement agreement, mitigation requirement, or other legal mandate.

4.b Mitigation projects must adhere to a minimum cost-effectiveness of current monetary figure established by the Carl Moyer Program to offset one weighted ton of Nox or PM10.

4.c No emission reductions obtained by the in-lieu fee mitigation projects shall be utilized as marketable emission reduction credits, or to offset any emission reduction obligation of any individual or entity.

4.d Mitigation projects are obligated to have a minimum project life of ten years. Proposed projects possessing shorter life spans may be approved on a case-by-case basis with recommendation by the APCO to the APCD Board of Directors. In addition, projects with shorter lives may be subject to additional funding restrictions, such as lower cost-effectiveness limit and/or a project cost cap.

4.e Potential mitigation projects that do not meet designated criteria may be considered on a case-by-case basis if evidence supplied to the APCO demonstrates potential surplus, real, quantifiable, and enforceable emission reduction benefits.

Stephen L. Birdsall
Air Pollution Control Officer

Salton Sea Authority Comments on the
Species Conservation Habitat EIR
10/18/11

General Comments

The Salton Sea Authority appreciates the opportunity to review the Draft EIR for the Species Conservation Habitat (SCH). We applaud the State for moving forward with this project and we support the overall goals of the program. The EIR presents a careful analysis of the issues and a reasonable set of alternatives. SSA-1

Specific Comments

Specific comments are provided below:

1. **Non-Interference with Agricultural Drainage**. Final designs should be coordinated with IID to avoid interference with agricultural drainage. SSA-2

2. **Ownership and Easements**. Likewise, land ownership and easement issues need to be coordinated with IID. SSA-3

3. **Known Geothermal Resource Area (KGRA)**. The Authority is concerned that some of the alternatives my cause interference with access to geothermal resources. Based on our understanding of the location of the KGRA, we believe the alternative areas west of the mouth New River would be acceptable and would not interfere with potential future geothermal energy production. In areas where the footprints of the alternatives overlay the KGRA, access for geothermal energy production should be considered and may be needed as a mitigation for potential loss of an energy resource if access is not allowed. SSA-4

4. **Selenium and Freshwater Habitats**. Selenium data presented in Appendix I suggests that there is only a slight difference between the selenium levels in the south end of the Sea and those in the New River. In fact, the Amrhein and Smith (2011) data from 2010 shows a mean selenium level in the New River of 1.8 µg/L compared the mean level in the Salton Sea near shore area of 2.46 µg/L. SSA-5 The Salton Sea Authority recommends that the State consider having at least some freshwater cells in the SCH design. This would provide an excellent opportunity for further research on freshwater habitats in the area. Considering the potential expenditure on this project, it would be a great loss of opportunity not to include some freshwater habitat. SSA-6

5. **Flow Rates and Residence Times**. The flow rates for various residence times presented on page 3.11-22 and on Table 3.11-7 on pages 3.11-23 and 3.11-24 are very high. An example is discussed in the text on page 3.11-22 for Alternative 3 (the State's preferred alternative) with a target salinity of 20 ppt and a residence time of two weeks. To achieve these conditions, a flow rate from the New River of 313 cfs (202 MGD or 227,000 AFY) would be required and 163 cfs SSA-7

(105 MGD or 118,000 AFY) of salt water would need to be pumped from the Sea. What will happen if the flows in the river cannot support these large withdrawals? How will the flow in the river be affected by such large diversions? SSA-7 Cont.

In 2005, the Salton Sea Authority developed cost estimates for low head pumping stations using Bureau of Reclamation costs factors. Based on these factors in 2005 dollars, a 200 MGD pumping plant could cost about $8 million and have annual operating, maintenance, energy and repair (OMER) costs of $440,000. A 100 MGD pumping station could cost about $5 million and have annual OMER of $370,000. Therefore, in 2005 dollars, the combined cost for pumping is estimated at $13 million in capital cost and $810,000 in annual OMER. Even with the longest residence times, the Authority believes the two pumping stations could have a combined cost of $5 million and annual OMER costs of over $500,000. SSA-8

The Salton Sea Authority suggests that the gravity flow system would be better to avoid large capital and OMER costs. In addition it may be possible to have salt water mix in the lower cells by gravity using a gates that could be opened and closed as needed or by using porous dikes. SSA-9 If the system requires large annual OMER outlays, how will they be funded? Will a fund be established to continue OMER funding in perpetuity? SSA-10

6. **Budget**. Please provide the latest budget estimate for the project. SSA-11

While the Salton Sea Authority appreciates that the State is moving forward with the SCH Project, we remain concerned that there seems to be little progress toward a larger solution for the Sea. SSA-12 In addition, we are frustrated by the slow pace that the State is taking in the Financial Assistance Program which has been presented at several stakeholder meetings and continues to run behind each schedule that has been presented. SSA-13

DISTRICT 1
JOHN R. RENISON
DISTRICT 2
JACK TERRAZAS
DISTRICT 3
MICHAEL W. KELLEY
DISTRICT 4
GARY WYATT
DISTRICT 5
RAY CASTILLO

Board of Supervisors

County of Imperial

COUNTY ADMINISTRATION CENTER
940 MAIN STREET, SUITE 209
EL CENTRO, CA 92243-2871
TELEPHONE: (760) 482-4220
FAX: (760) 482-4215

October 11, 2011

Mr. David Elms, DFG Project Manager
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Re: Salton Sea Species Conservation Habitat Project

Dear Mr. Elms:

The purpose of this letter is to provide comments of the Imperial County Board of Supervisors on the Draft Environmental Impact Statement/Report (DEIS/R) for the Salton Sea Species Conservation Habitat (SCH) Project. We understand that the goal of this project is to restore shallow water habitat being lost due to the Sea's increasing salinity and reduced surface area, and we support those objectives. However, there are some other aspects of the proposed project that we have concerns about, and we want to take this opportunity to formally express those.

As you may be aware, Imperial County is the second-largest geothermal energy producing county in the nation. This industry sector is a vitally important part of our economy and provides hundreds of well-paying jobs and other economic benefits to our county and its residents. Furthermore, it is generally recognized that our county and the Salton Sea area in particular, is the location of the largest known undeveloped geothermal resource in the nation. As California moves forward aggressively to meet its renewable energy targets in the coming years, we anticipate that additional geothermal production facilities will be constructed, providing even more jobs and benefits to our area and the state. We therefore view with some anxiety, any proposal that might threaten the ability of geothermal industry to fully access the vital resources located within in this area. ICBOS-1

As can be readily discerned from the attached map, the project boundaries for all six alternatives identified in the DEIS/R lie either entirely or partially within the Salton Sea Known Geothermal Resource Area (KGRA) as established by the State of California Department of Conservation Division of Oil, Gas and Geothermal Resources (DOGGR). In fact, Alternatives 4, 5 & 6 overlie a part of the KGRA that is suspected of being one of the most promising locations for future development. We therefore strongly oppose any future consideration of Alternatives 4, 5 or 6 as the location for the SCH project. ICBOS-2

ICBOS-3 The other sites (Alternatives 1, 2 & 3) though less problematic, still contain significant potential for conflict with geothermal activity, especially in the area north and east of the mouth of the New River. We understand that the construction of the SCH is proposed to be completed in phases over a several year period. We therefore recommend that any construction phasing of Alternatives 1, 2, or 3 be accomplished in a manner to avoid that area east of the river until such time in the future when further exploration and analysis of the potential for geothermal development in that area can be more fully assessed. Additionally, specific provisions and/or easements to accommodate geothermal activity should be developed prior to the implementation of any of the alternatives being considered. The County believes that geothermal development and habitat creation can be compatible if both are considered equally in the development of the SCH project.

The Imperial County Board of Supervisors appreciates this opportunity to provide comments on the Salton Sea Species Conservation Habitat Project. We look forward to working with you and the other state and federal agencies involved toward the successful completion of what we hope will be an important first step in the development of a full restoration plan for the Salton Sea.

Sincerely,

Jesus J. Terrazas, Chairman
Imperial County Board of Supervisors

Established in 1918 as a public agency

Coachella Valley Water District

Directors:
Peter Nelson, President - Div. 4
John P. Powell, Jr., Vice President - Div. 3
Patricia A. Larson - Div. 2
Debi Livesay - Div. 5
Franz W. De Klotz - Div. 1

Officers:
Steven B. Robbins, General Manager-Chief Engineer
Julia Fernandez, Board Secretary

Redwine and Sherrill, Attorneys

October 12, 2011

File: 0541.132

David Elms
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Dear Mr. Elms:

Subject: Draft Environmental Impact Statement/Environmental Impact Report for the Proposed Salton Sea Species Conservation Habitat Project

Thank you for affording the Coachella Valley Water District (CVWD) the opportunity to review the Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) for the proposed Salton Sea Species Conservation Habitat (SCH) Project located along the south end of the Salton Sea in Imperial County. CVWD provides domestic water, wastewater, recycled water, irrigation/drainage, regional stormwater protection and groundwater management services to a population of 265,000 throughout the Coachella Valley in Southern California.

At this time, CVWD submits the following comments for your consideration:

CVWD-1

1. There are at least two competing alternatives for the overall restoration of the Salton Sea. There were separate plans that were developed by the State of California and the Salton Sea Authority. The Legislature of the State of California has not acted to select a preferred alternative. CVWD supports the Salton Sea Authority's plan. The proposed SCH Project is characterized in the DEIS/DEIR as a stand-alone project with two stated goals: 1) develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and 2) develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process. However, on the State of California, Department of Water Resources website it states:

   "The release of this study is an important step in a phased approach to ecosystem restoration in the Salton Sea," said Secretary for Natural Resources, John Laird. "This early start habitat will help maintain necessary habitat for the wildlife in the Salton Sea and will complement future restoration efforts."

   That statement seems to indicate that Secretary Laird sees this project as the Early Start Habitat project described in the State Plan.

MAILED
OCT 13

It appears that the State may be circumventing the Legislature by beginning implementation of the State Plan for the restoration of the Salton Sea without proper public discourse; the DEIS/DEIR is presenting a portion of a larger project in a piece-meal fashion that appears to conflict with environmental law. CVWD-1 Cont.

2. On September 13, 2011, the Imperial Irrigation District (IID) Board resolved to ask the California State Water Resources Control Board (SWRCB) to allow it to stop putting Quantification Settlement Agreement (QSA) mitigation water into the Salton Sea, thereby setting the stage to sell nearly 400,000 or 500,000 acre-feet of additional water to coastal communities. How would that action affect the proposed SCH project, either positively or negatively, as Secretary Laird described this project, not as species conservation habitat, but as Early Start habitat? How would that action affect any future projects, positively or negatively? CVWD-2

3. The DEIS/DEIR describes a project that will have operation and maintenance requirements after completion of construction, as well as, adaptive management requirements. Although not stated in the DEIS/DEIR, it has been stated in public meetings and on the State of California, Department of Water Resources website that construction of this project is to use Proposition 84 (Chapter 5) funding, and the ongoing maintenance and adaptive management would be funded using the Salton Sea Mitigation Fund consisting of funds paid by the water agencies pursuant to the requirements of the QSA. CVWD-3

   This appears to indicate that the State is planning to use a finite revenue stream (the QSA-based Salton Sea Mitigation Fund) to fund infinite, ongoing operations, maintenance and adaptive management. Once these funds are expended, this appears to place obligations on the State similar to the obligations the State assumed under the QSA, causing the QSA to be deemed unconstitutional.

4. Section 3.4: DEIS/DEIR states that SCH Project is designed to support fish species that provide a forage base for piscivorous birds and that the fish proposed for introduction to the SCH are currently, or have in the recent past, been introduced to the Salton Sea. It is well known that the desert pupfish (*Cyprinodon macularius*), a southwestern species whose original range in portions of Arizona, California, and northern Mexico, has been greatly curtailed by proliferation of non-native fish species. CVWD is concerned that the fish species known to impair desert pupfish survival is being considered as the forage base in the SCH Project. Several researchers (e.g., Schoenherr, 1981x; Steinhart, 1990; Moyle, 2002) have suggested predation on eggs, juveniles, and adults, and competition for food and space as possible ways that the hybrid Mozambique tilapia (*Oreochromis mossambica* by *O. uroleriis*), redbelly tilapia (*Tilapia zillii*), sailfin molly (*Poecilia latipinna*), and other non-native species can adversely affect populations of desert pupfish. CVWD-4

The project should consider the use of Striped Mullet (*Mugil cephalus linnaeus*). This species has been associated with the Salton Sea on and off since the formation of the sea. They were also stocked in the Salton Sea in the late 1940's and 1950's. This species is not known for predating on desert pupfish, its eggs or the fry; however, it is a detritus eater and may compete with the pupfish on that scale. These mullet are tolerant of high salinity water and freshwater alike, form large schools in shallow water and were typically found at the mouths of the Alamo and New Rivers. They are a prime forage fish for piscivorous birds and may be a more appropriate species to consider for the SCH Project. CVWD-5

5. Section 3.11.2.1: This paragraph describes water rights held by IID and Metropolitan Water District of Southern California for diversions from Salton Sea tributaries, but fails to identify similar diversion water rights held by CVWD. CVWD maintains water rights for diversions from Salton Sea tributaries which include appropriative rights described in SWRCB Permit Nos. 536 and 3011. In addition, CVWD maintains appropriative water rights for Colorado River water covered by SWRCB Permit No. 7650 and used to irrigate lands within CVWD's irrigation service area and has submitted a water right application to divert agricultural return flows from the Coachella Valley Stormwater Channel and agricultural drains tributary to the Salton Sea. CVWD-6

6. Tables 3.11-8 and 3.11-9. These tables provide values representing the percentage of the New River and Alamo River flows needed to supply the SCH to meet several alternative salinity targets and pond residence times. While not stated in the DEIS/DEIR, it appears these percentages are based on historical flows measured at USGS gages for the periods 1944-2010 and 1960-2010 for the New River and Alamo River, respectively. CVWD is concerned that these historical flow measurements may not provide an accurate representation of future flows in the New River and Alamo River and may underestimate the impact of diversions needed for the proposed SCH. CVWD-7

7. SCH project costs. CVWD is unable to locate a summary of the projected SCH costs in the DEIS/DEIR. Estimates for both the total capital costs and annualized operations and maintenance costs per acre would be useful for evaluating the impact of the proposed SCH project. CVWD-8

If you have any questions, please contact Dan Farris, Director of Operations, at 760-398-2651 extension 3500.

Sincerely,

Steve Robbins
General Manager-Chief Engineer

LS:pr/eng/env/11/oct/Salton Sea Conservation Habitat Project

Organizations and Corporations

Nancy Dorfman

From: Lorraine Woodman
Sent: Tuesday, November 29, 2011 1:51 PM
To: Nancy Dorfman
Subject: FW: New SCH EIS-EIR comment from Richard McKay

Lorraine Woodman, Ph.D.
Senior Consultant / Environmental Planning Cardno ENTRIX
201 North Calle Cesar Chavez, Suite 203, Santa Barbara, CA 93103
Phone: 805 962 7679 Direct: 805 963 0468 Mobile: 805 284 1878 Fax: 805 963 0412

-----Original Message-----
From: DO NOT REPLY [mailto:noreply@cardno.com]
Sent: Sunday, August 21, 2011 8:04 PM
To: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Richard McKay

Richard McKay has entered a comment.Contact Information:
E-Mail: richard@solarpowerandwater.com
Affiliation: Solar Power&Water Inc.
Mailing Address:
5242 Rosehill Ct

Reno, NV 89502

SP&W-1-1

Attachments: salton_sea_becomes_imperial.pdf
Comment:
My comment applies to The Salton Sea Conservation Habitat (SCH) Project in its entirety. We, Solar Power&Water Inc. submitted a plan to the Secretary of the Interior, the Commissioner of Reclamation, the Chairman of California Water Resources, and the California Financial Office.
http://www.solarpowerandwater.com/assets/Salton%20Sea%20plan2%20and%20opinions.pdf If you are not thoroughly versed in our plan, shame on you.

Our plan would maintain the Salton Sea full size at 228 feet below sea level. In so doing, the proposed SCH ponds would all be flooded. Our plan might also lead to the elimination of the QSA. The SCH is dependent on funding; ours produces income, and is better in all respects. Study it and learn why.

Nancy Dorfman

From: Lorraine Woodman
Sent: Tuesday, November 29, 2011 1:54 PM
To: Nancy Dorfman
Subject: FW: New SCH EIS-EIR comment from Richard McKay

Lorraine Woodman, Ph.D.
Senior Consultant / Environmental Planning Cardno ENTRIX
201 North Calle Cesar Chavez, Suite 203, Santa Barbara, CA 93103
Phone: 805 962 7679   Direct: 805 963 0468   Mobile: 805 284 1878   Fax: 805 963 0412

-----Original Message-----
From: DO NOT REPLY [mailto:noreply@cardno.com]
Sent: Saturday, October 01, 2011 2:24 PM
To: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Richard McKay

Richard McKay has entered a comment.Contact Information:
E-Mail: richard@solarpowerandwater.com
Affiliation: Solar Power&Water Inc.
Mailing Address:
5242 Rosehill Ct

Reno, NV 89502

SP&W-1-2

Attachments:
Comment:
Far superior than any of your six alternatives is the plan by Solar Power&Water Inc. to remediate the entire Sea. See http://www.solarpowerandwater.com/assets/Salton%20Sea%20plan2%20and%20opinions.pdf

RECEIVED

OCT 17 2011
MBS
REGULATORY BRANCH
CARLSBAD FIELD OFFICE

October 13, 2011

Attention Ms. Cervantes:

We originally sent our comments by email October 7, 2011 but did not receive a response of receipt for the comments as requested. Since then we have discovered additional information and have added to our comments of October 7, 2011. We are therefore submitting a revised set of comments which supersedes the comments submitted October 7, 2011.

Thanks

Al Kalin
ICFB Environmental Committee Chairman

Imperial County
Farm Bureau

October 13, 2011

RECEIVED
OCT 17 2011
MJS
REGULATORY BRANCH
CARLSBAD FIELD OFFICE

U.S. Army Corps of Engineer
Lanika Cervantes
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

Re: Salton Sea Species Conservation Habitat Project

Dear Ms. Cervantes:

The Imperial County Farm Bureau (ICFB) is a private, non-profit advocacy organization that serves approximately 800 members primarily farmers, ranchers, landowners and farm service providers in the Imperial County. As reported in the 2010 Imperial County Agricultural Commissioner's Crop & Livestock Report, the gross value for agricultural products produced in our county was $1.6 billion from our 450,000 acres of irrigated farmland.

Please find enclosed written comments regarding the Salton Sea Species Conservation Habitat Project. Feel free to contact me with any questions or concerns of our comments that you may have at (760) 352-3831.

Thank you in advance for your consideration.

Al K Kalin

Al Kalin
Chairman
ICFB Environmental Committee

1000 Broadway, El Centro CA 92243 | 760 352 3831 phone | 760 352 0232 fax | info@icfb.net | www.icfb.net

Updated Written Comments by the Imperial County Farm Bureau
Submitted 10/13/2011
By Al Kalin, Chairman
Imperial County Farm Bureau Environmental Committee

Salton Sea Species Conservation Habitat Project Draft Environmental Impact Statement / Environmental Impact Report

A great deal of what is reported in this Draft EIS/EIR suggests that a lot more is known than is being reported in this document. It therefore becomes very difficult to make logical and intelligent comments.

A lack of O&M costs being reported or costs to construct the various projects are a major concern to the Imperial County Farm Bureau. ICFB-1

Are the fish grown in the acreage of ponds sufficient to feed all the fish eating birds, in particular, the cormorants? Have you studied yield in pounds per acre of fish and possible pounds of fish that could be consumed by the bird population? ICFB-2

High concentrations of birds in the ponds may lead to the higher bird populations in the vicinity of nearby Willey Reservoir, using that reservoir for loafing and fresh water. Their feces could very well increase the E. coli counts in the irrigation water to the point where leafy green vegetables could not be used for irrigation. A very high proportion of the acres around the New River produce leafy green vegetables as well as broccoli, cauliflower, celery, melons, and sweet corn because of the warm micro-climate created by the Salton Sea. 15% to as high as 35% of the water used to grow these crops is pumped from the Willey Reservoir and mixed with water of Vail Main canal. The threat of E. coli counts in the irrigation water as a result of this project directly affects agriculture and must be mitigated. ICFB-3

2.2.1
1. Available Water Rights
Does the State have a water right or the right to take the water from the New or Alamo Rivers for this project? MWD has filed for the rights to use the water. Will this all end up being a MWD project with MWD getting mitigation credits and trading the New and Alamo River water for Colorado River water? Will the state have to buy this water from MWD? ICFB-4

2. Available Land

Have there been any discussions with IID regarding the use of their land for this project? Will the land be leased on a long term basis or purchased? How will IID be indemnified from damage, loss, or injury as a result of this project? Who will be liable for any damages caused by the project, particularly if the project is a long term lease from IID? These are important issues that need further clarification. ICFB-5

3. Adequate Water Supply

There appears to be an adequate water supply for the near future, however in 25 years flows from the Alamo and New Rivers will be diminished considerably and the amount of brackish water needed for projects of this size many not be available. Recent discussions by participants of the Imperial Integrated Regional Water Management Plan have suggested IID drain water might be used for cooling purposes for future geothermal plants. This could affect the quantity of water ultimately flowing to the Salton Sea in the New and Alamo Rivers. ICFB-6

2.3.1 Actions that Could Affect Inflows to the Salton Sea

Metropolitan Water District's attempt at appropriating the New and Alamo River waters may certainly affect this project including the consequences it would have on the project and IID should they decide to continue with their appropriation claims. ICFB-7

Page 2-9 Line 12 states that: **"the average inflow to the Salton Sea will average 900,000 acre feet until 2078".** The Imperial County Farm Bureau believes this assumption is flawed. This assumption assumes past history can be used to predict future inflows and does not take into consideration the changes in farming methods that will conserve water in the future including the change in cropping patterns and methods of irrigation. ICFB-8

Inflows have already shown a rapid decline since the 2002 when the QSA was signed. According to information furnished by IID, the average four year inflow to the Salton Sea from 2002-2005 was 1,148,957 acre feet per year. The average four year inflow from 2007-2010 was 1,077,172 acre feet per year which is an average of 71,785 acre feet less per year. This includes an average of 38,062 acre feet of mitigation water being delivered to the Salton Sea per year between 2007 and 2010.

During the next 25 years farmers will be tasked with finding new ways to conserve water while still providing the crops with their necessary water demand. Farm practices are already changing with more acres being irrigated every year using drip and sprinkler irrigation which generate little or no surface run-off. By 2035 the Imperial County Farm Bureau estimates that that there will be very little surface run-off, if any, from the fields. The IID drains will only carry subsurface run-off. If this should become fact the estimated flow to the Salton Sea by 2035 will be closer to 500,000 acre feet a year, not 900,000 acre feet as modeled. This could mean neither river would be able to furnish the required water for this project. ICFB-8 Cont.

2.4.1.4 Boat Ramps
A flat-bottom aluminum boat equipped with a long-shaft marsh outdrive is capable of running in extremely shallow water and even mud. The motors are also known as mud motors or backwater motors. At only 40 horsepower, at most, these boat/motor combinations are much cheaper and more cost effective to operate than an airboat and would be perfect for the SCH ponds. ICFB-9

2.4.1.7 Water Supply
Does the State have a water right or the right to take the water from the New or Alamo Rivers for this project? MWD has filed for the rights to use the water. Will this all end up being a MWD project with MWD getting mitigation credits and trading the New and Alamo River water for Colorado River water? Will state have to buy this water from MWD? ICFB-10

Section 2.0 Page 2-14 (Figure 2-4) also 2.4.1.8. Inflow/Outflow Structures
Figure 2-4 shows a drawing of the precast concrete structure that will be used as a control and outlet structure for the water to move from pond to pond. These structures can only handle a small amount of water. Even the widest precast form available (48" Wide), will only allow 4.7 cubic feet per second (CFS) of water to flow through the structure with six inches going over the grade boards. In June, when evaporation is the highest, the water demand would be 253 CFS for Alternate 3. These small precast structures are fine for little duck ponds of 15 acres. They have no place in ponds exceeding hundreds of acres each. It would be better to install standard IID canal structures that allow for both an overpour and undershot. When demand is high more water could be moved through a bank of 72 inch wide control structures with jack-gates to allow for and set the appropriate undershot and overpour from the same structure. ICFB-11

2.4.1.10 River Diversion Gravity Diversion Structure
Will the gravity flow river diversion pipe lines run on both sides of the river? This will take up even more valuable farmland. Or will there be a cross-over from one side of the river to the other? If so, how will that be accomplished? ICFB-12

2.4.1.11 Brackish Water Pipeline
The brackish water pipeline will disrupt farming while being installed and may very well disrupt the farm area of the individual fields it travels across to the point where the land cannot be farmed.

Tile drainage lines below the surface of the farm fields may have to be rerouted, which may prove to be impossible because of slope requirements. ICFB-13

Deep groundwork may not be possible because the equipment may hit the buried pipeline. Lack of subsurface tile drainage in the area of the brackish water pipeline will lead to salt buildup and deterioration of the soil making it unfit to grow winter vegetables. ICFB-13 Cont.

The last sentence states: **"It is estimated that three 5-foot-diameter pipes would be needed to minimize the velocity in the brackish water pipeline (thereby minimizing head loss)."** By reducing velocity in the pipelines you will also be allowing the sediment to fall out and eventually plug the pipelines. ICFB-14

2.4.1.12 River Diversion Pump Stations

These pump stations must not block access to the Salton Sea River deltas through the river channel. The New and Alamo Rivers are the main artery to the Salton Sea for waterfowl hunters and catfishermen, both who use boats launched in the area of current gauge stations to access the sea and/or the river for fishing, hunting, and sightseeing. ICFB-15

2.4.1.13. Saline Water Supply Pump Station

Has anyone studied the saltwater delivery system? Will barnacles plug up the pipeline? Where boats have been left floating in the Salton Sea at marinas they usually sink within two years because of the weight of the barnacles that rapidly grow on their hulls. ICFB-16

Depending where the saltwater pump station is located, it may not be pumping salt water. The water exiting the New and Alamo River Deltas floats on top of the saltwater and moves counterclockwise with the current for some distance depending on the wind and current velocity before mixing with the saltwater. It is possible the saline pumps would then be pumping brackish water. ICFB-17

The north and northwest winds on the Salton Sea disturb and stir up the mud and sediment out to the 12 foot depth with every high wind over 15 mph. This is also where the majority of the killing hydrogen sulfide is released and red tides form during wind events. The saltwater intake will be in this area and could very well carry saline water to the SCH ponds that would kill the fish in the pond. Are there operational plans to stop saline water from entering tile drainage lines or farm fields when these events occur? That will affect the water balance of the project. ICFB-18

Are there provisions to run the salt water through a settling pond before dumping into the SCH ponds? Sea water can contain high silt loads after a wind and the silt will most definitely cause accelerated erosion to the pumps and add to the silt load entering the SCH ponds. ICFB-19

There is no provision noted how the saline pumps will be accessed for their required constant maintenance and replacement. A similar pumping system currently exists in the Willey Reservoir. The three pumps deliver 48 CFS to the Vail 3 heading over 3.5 miles away through a pressurized pipeline. These pumps must be pulled and transported to a repair facility on a frequent basis. They also require an automated trash rack that collects trash and aquatic weeds in the ICFB-20 water and deposits it in a dumpster that is serviced sometimes twice a day when aquatic vegetation is heavy. In the Salton Sea currents carry floating trash dumped in the sea by the rivers, especially after large rain events or other events that increase the flow of the rivers such as mitigation water being added to the Salton Sea. There is no mention of silt or trash being a problem with the saline pumps. Access to the pumps for maintenance and hauling off the collected trash will be problematic. ICFB-20 Cont.

2.4.1.15 Power Supply

Who will be responsible for payment of power? Has anyone even figured out how much power will be needed? If alternative 3 is chosen and water for the ponds will be kept at 20 PPT with a 28 day residence time you would have to supply the power necessary to lift 172 cfs of brackish water out of the New River and pump 80 cfs of saline water from the Salton Sea. This will require a tremendous amount of horsepower. Has anyone calculated how much power this will require or if the infrastructure will even handle that much power? ICFB-21

There is no mention of estimated costs for the operation and maintenance of this project, including power. This is important stuff! Why is it missing? ICFB-22

2.4.1.16 Sedimentation Basin

The planned one day retention time is only sufficient to remove the sand and heavy fraction of the silt particles. The majority of the silt particles and all of the clay particles will remain suspended and travel to the SCH ponds. The planned sedimentation basins will have very little effect on the turbidity of the river water. ICFB-23

The planned 2:1 slope of the banks of the sedimentation basin will be prone to sloughing and erosion from wind driven wave action. A buildup of muskrat populations and their holes and burrows along the shoreline, will create massive erosion and sloughing. Wave action forcing water into their burrows and dens will create a hydraulic battering ram which will quickly erode the banks. Nothing in this report shows this type of problem has been considered. The Willey Reservoir, situated on the south side of the New River near the planned New River sedimentation basin, has experienced waves that built to two feet high during strong west winds. A series of serpentine structures in the basin would reduce wind erosion. ICFB-24

The slopes of the bank should be vegetated with native saltgrass, (Distichlis spicata), prior to the initial filling of the sedimentation pond, to reduce erosion, sloughing and the establishment of noxious weeds. Saltgrass is capable of living in very harsh climates, and thrives in saline soils, and grows vigorously with brackish to saline water. The plant is also capable of transferring oxygen to its root system if the root system is submerged below the water for extended periods of time. All of these factors make native saltgrass an excellent ground cover to armor the banks of the sedimentation basin. ICFB-25

The IID's Vegetation Management Plan promotes the growth of saltgrass to armor their canals and drain banks to reduce sloughing, reduce weed populations, and reduce silt sedimentation in its 3,000 miles of drainage ditches and canals. ICFB-25 Cont

2.4.1.17 Interception Ditch/Local Drainage (Applies to all alternatives)
Sloughing in the interceptor drain could cause the drainwater to back up into the adjacent field's tile drainage lines. Who would be responsible for maintenance of these drains specifically maintaining the slope and shape of the drain banks as well as controlling unwanted vegetation? Who would pay for this maintenance? ICFB-26

The Imperial County Farm Bureau requests the interceptor drain be planted with native saltgrass, (Distichlis spicata), to reduce erosion in the drain as well as reduce noxious weed from becoming established. ICFB-27

Since this drain will also be collecting salty seepage water from the SCH ponds it will increase the salinity of the water in the drains. This may affect the natural flora and fauna that reside in the IID drain system. Should the drain plug due to trash, mechanical failure, sloughing or earthquake liquefaction, the adjacent farm fields will be at risk from saltwater backing up into the field tile drainage system and causing damage to the soil and existing crops. Mitigation will be necessary and a planned and funded response program is needed should this happen. ICFB-28

2.4.1.18 Aeration Drop Structures
Unless properly designed the aeration drop structures may cause erosion of the berm where water drops 2-5 feet into the adjacent pond. ICFB-29

2.4.1.19 Bird Habitat Features
The roosting islands planned with steep sides will be subject to erosion on their north and west sides. ICFB-30

How will salt cedars and other halophytes be controlled on these and other islands planned? ICFB-31

2.4.1.20 Fish Habitat Features (Swales or Channels)
High winds from the west, northwest, and north will stir up large amounts of silt and clay in the ponds which will rapidly fill the swales or channels planned for the project. In addition clay, silt, dead plankton and other detritus will eventually mix with the clay and silt and add to the mix that fills the swales or channels. The swales or channels SCH ponds will quickly become repositories for easily stirred up sediment to foul the ponds every time a wind event greater than 15 miles per hour occurs. The newly built IID Managed Marsh has similar swales next to the berms and they are already half full of silt after only two years of operation. ICFB-32

2.4.1.21 Operational Facilities

Storing boats and other equipment at the Wister Headquarters is both impractical and a waste of fuel and time for ponds built in the New River Delta Area which is 27 miles away from Wister. It would be more practical to store the needed equipment in one or more lockable portable containers on site. ICFB-33

2.4.1.22 Fish Rearing

Rapid plankton growth in the ponds, fueled by high nutrient loads from the water sources, both brackish and saline, may lead to anaerobic conditions at times. The breakdown of dead plankton will reduce oxygen and cause a buildup of hydrogen sulfide that will act as a poison in the ponds as well as lower the ph and create an imbalance in the water chemistry. ICFB-34

Should a massive fish die-off occur a plan needs to be included for the fast and efficient cleanup and disposal of the dead fish. ICFB-35

2.4.1.24 Public Access

The Salton Sea Delta areas have been favorite waterfowl hunting spots for over a hundred years which is evidenced by the hundreds of blinds that can be seen around the delta of all three rivers that feed the Salton Sea. The SCH pond locations will cover many of these hunting areas. These areas must remain open to waterfowl hunting as they have in the past, including access to the Salton Sea through the New and Alamo River channels. A lease clause in the IID lease with the State must specify that the area will remain open to public access for recreational purposes using gasoline powered boats in the river channels and furthermore that boats have access to the SCH ponds using electric motors. In addition, the current trails along either side of both rivers, which provide access to the delta areas, must remain open to foot, ATV, or off-road traffic. ICFB-36

2.4.2.2 Land-Based Equipment

Tractor pulled or self-propelled scrapers or any other equipment with rubber tires will prove impractical in the areas around the New and Alamo Deltas. The ground is too saturated to support their weight once the top one-half to one foot of soil is removed. Long-reach excavators, working from atop the berm they are constructing may be the only practical way to construct the berms near the Sea. Any dozers or excavators used should be equipped with wide low-pressure tracks. ICFB-37

2.4.2.3 Floating Equipment

There is no information discussing how the barge-mounted excavator or clamshell dredge would be launched in the sea or what precautions taken to protect it during high wind events and rough seas. ICFB-38

2.4.2.6 Pumping Plants

Pumping water directly from the New or Alamo River without first running it through a settling basin will lead to premature erosion of the pump casing and impeller and failure of the pumps as evidenced at the recent pilot project at the ICFB-39 corner of Davis and McDonald Roads where water was pumped directly from the Alamo River at the end of Garst Road and conveyed through a pipeline to the Pilot SCH ponds. ICFB-39 Cont.

2.4.2.10 Interaction with Existing Facilities

It is unfortunate that the authors of this EIS/EIR are unfamiliar with agriculture in the Imperial Valley. It is also unfortunate that they did not accept help and input from locals familiar with agriculture even though assistance was offered. ICFB-40

An example of interaction with existing facilities is given that states: "If the gravity brackish water pipeline were to intersect an agricultural drain, the drain would be rerouted to bypass the work area until the brackish water pipeline was placed and the backfilled. The drain would then be restored to the pre-Project condition." This statement shows a total lack of knowledge of the IID's drain infrastructure and fails to understand that it is not a simple matter to reroute an IID drain by simply moving it. Tile drainage lines enter the IID drains at a guaranteed elevation and location in the IID drain so that brackish drainwater will not back up into the farmer's field, thus pushing the salt in the water to the surface. The only way the subsurface drain water could be rerouted would be to pump it and maintain the existing unsubmerged tile outlet elevation.

It can be assumed that a brackish water pipeline eventually would have to rise above the level of the tile drainage lines and then the farm fields it is traversing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the subsurface drainage lines in half and making it near impossible to farm the field while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system.

2.4.2.11 Vehicle Routes

Like the previous section, this section contains faulty information and shows the person that wrote this section has never followed the routes listed.

The route described to reach the New River site follows Bruchard Road, which is a very soft and sandy single lane road in places once it crosses Walker Road. Trucks seldom use this road because they easily become stuck in the sand. Bruchard Road ends at Foulds Road, which is .75 miles south of the project site. The single lane 14 foot wide road that continues north is a ditch bank easement road for IID and farmers which is not suited for truck traffic without major reconstruction. Trifolium Lateral 12 canal/drain runs along the west side of the road and a IID power line and farmer's field, three to four feet lower than the road, runs along the east side of the easement road. ICFB-41

This road dead-ends at the south side of the New River which is flowing west at this point. This easement road would only access the SCH ponds to the south and west of the New River. There is no way to get to the other half of the project on the north side of the New River.

For truck traffic to use this road it would have to be widened. This would require moving the existing power line, taking agricultural land out of production to widen the road, rerouting the field drains along the east side of the road, rerouting the tile drainage lines, as well as moving the two deep tile cisterns and pumps.

Directions to the Alamo site are correct until you reach West Sinclair Road. The directions fail to mention that from there the trucks would travel east on Sinclair Road one mile to Garst Road and then travel 1.65 miles north to the project site.

ICFB-41 Cont.

2.4.3 Operations
Plans need to be crafted to address what to do if funding should disappear during construction or after the project is operating. Building this tremendous infrastructure and then walking away from it without a discussion of what would happen to the adjacent agriculture is not advisable.

ICFB-42

2.4.5 Mosquito Control
West Nile virus thrives in the Delta areas of the Alamo and New River. From the shoreline of the Salton Sea back 50 to 300 yards, (depending on the slope of the ground), the clay that was deposited as the Salton Sea receded cracks and shrinks as it dries out leaving a web of cracks one inch wide and up to eight inches deep. These cracks then partially fill with seepage water that creates the perfect habitat for mosquitoes to breed. Treatment during construction will be expensive but necessary and may require aerial application of the proper pesticide or larvicide to gain control.

ICFB-43

2.5 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

River Water Source
From looking at the rough map/photograph it appears the brackish water would be diverted into a sedimentation basin just west of Lack Road on the south side of the New River and east of the IID Willey Reservoir and bordered on the south by Foulds Road. This property, currently owned by Jack Brothers, is intensively farmed to winter vegetables, primarily broccoli and cauliflower. By removing this field from agricultural production you would be reducing some of the prime farmland in the Imperial Valley that feeds the nation during the winter months. The rest of the year wheat or export hay is produced.

ICFB-44

The buried gravity pipe lines would have to cross a deep channel (Trifolium Lateral 9 Drain), pass by Willey Reservoir on its south side because there is not enough room between the New River and the Willey Reservoir on the north side. In passing on the south side of Willey Reservoir it would be traversing three fields famed by Del Sol Farms. These three fields also contain prime agriculture ground and are intensely farmed to cauliflower, carrots, tomatoes, cut flowers, potatoes,

ICFB-45

lettuce, broccoli, and sweet onions to feed the nation during the winter months. The rest of the year wheat or export hay is produced. At times they are farmed to alfalfa. ICFB-45 Cont.

Saline Water Source (applies to all Alternatives)

As the New River brackish water exits the New River Delta into the Salton Sea it floats up on top of the saltwater. Strong counter-clockwise currents immediately carry it in an easterly direction where it follows the shoreline all the way to the Alamo Delta and beyond. The floating freshwater is often found two miles or more out to sea. In other words it does not immediately mix with the saltwater.

The water exiting the New River will float on top of the salt water and not mix for some time depending on wind conditions. During this period Salton Sea Currents will carry the brackish New River water to the area of the saline pump station. ICFB-46

Where the freshwater and saltwater mix it creates what is known to locals as a scum line. Trash from the New River is concentrated at this scum line. When the scum line is viewed on sonar it shows trash stacked up from the bottom of the sea floor to the surface, trapped there by two different waters with differing specific gravities. The scum line is constantly moving, carrying the trash with it and is often in the area near the proposed saline pump intake. A system of trash racks would have to be built and maintained on a constant basis. There are no plans showing how this trash will be removed from the pump station, one out in the Salton Sea.

Hydrogen sulfide is a poison, generated by rotting algae and plankton that settles on the bottom. The hydrogen sulfide is often trapped by a thermocline and then released during wind events. Red Tides are also generated in this area. Both the hydrogen sulfide and water from the poisonous red tide will be picked up by the saline pump and transported to the pond site where it will poison the fish and invertebrates. ICFB-47

In addition, the floating freshwater carries heavy silt loads. Depending where the saltwater pump station and intake is located brackish water, heavily laden with silt will be pumped to the SCH ponds instead of saline water. ICFB-48

To further complicate matters, north and northwest winds on the Salton Sea disturb and stir up the mud and sediment on the bottom of the Salton Sea out to a depth of 12 feet with every high wind over 15 MPH. The saltwater intake will be in this area. Are there provisions to run the salt water through a settling pond before dumping into the SCH ponds? Sea water can contain high silt loads after a wind and most definitely will cause accelerated erosion to the pumps and siltation at the SCH ponds. ICFB-49

Sedimentation Basin

The Draft EIS/EIR states the diverted brackish water would be retained in the sedimentation basin for one day to allow the silt to settle out. This is not sufficient time. Only the sand and heaviest fraction of silt will settle out in one day leaving the majority of the silt and clay particles in suspension. ICFB-50

The Draft EIS/EIR also states that a 60 acre sedimentation basin would be constructed and excavated below the ground surface to 20 feet. It is impossible to excavate much more than five feet below the surface because the weight and vibration of the equipment will create hydraulic pumping leading to liquifacton of the soil. ICFB-51

A 60 acre area excavated to 20 feet below the surface will generate 1,936,000 cubic yards of soil. The plan does not address where this amount of soil would be deposited. To put this amount of soil in proper perspective, if a dike were constructed using this large amount of spoil, and its dimensions were 100 feet wide at the base, 20 feet wide at the top, and 15 feet high, there would be enough soil to build a dike of this size over 11 miles long. Furthermore if you loaded all the truck and trailers necessary to haul this much dirt and parked them end to end they would reach from the Salton Sea to the Mississippi River near Memphis. ICFB-52

Conceptual Layout of Alternative 1

As currently drawn, the exterior berm in the far northeast corner of East New pond and interception drain, cuts through 15 acres of private land owned by Sea View Conservancy. The legal description of this property is: The east ½ of the southeast ¼ of section 23, township 12 south, range 12 east, San Bernardino baseline meridian. This property is part of a long term Audubon California Landowner Stewardship Project and any disturbance is forbidden. ICFB-53

2.6 Alternative 2 – New River, Pumped Diversion

River Water Source

The metal bridge which crosses the New River and is used to support the diversion pipes that carry the pumped water to sediment basins on either side of the New River must remain high enough to allow boat traffic to pass underneath the structure. ICFB-54

Saline Water Source

Please refer to comments made for Alternative 1. ICFB-55

Sedimentation Basins (applies to Alternative 3 also)

No information is given on how the sedimentation basin is constructed, how deep it will excavated or where the spoil will be put. Hopefully it is not similar to the sedimentation basin described for Alternate 1. ICFB-56

Conceptual Layout of Alternative 2

As currently drawn, the exterior berm in the far northeast corner of East New pond and interception drain, cuts through 15 acres of private land owned by Sea View Conservancy. The legal description of this property is: The east ½ of the southeast ¼ of section 23, township 12 south, range 12 east, San Bernardino baseline meridian. This property is part of a long term Audubon California Landowner Stewardship Project and any disturbance is forbidden. ICFB-57

The map/photo shows no connection to the interception drain for the Trifolium Lateral 12 drain. In addition there is no information regarding the size of the interception drain, how deep it will be, or which direction the two drains flow. Has any surveying been done to determine if the interception drain can successfully intercept the IID lateral drains at the correct elevation and then be able to transport the IID drain water around the project and into the Salton Sea? ICFB-58

2.7 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

River Water Source
The metal bridge which crosses the New River and is used to support the diversion pipes that carry the pumped water to sediment basins on either side of the New River must remain high enough to allow boat traffic to pass underneath the structure. ICFB-59

Saline Water Source
Please refer to comments made for Alternative 1. ICFB-60

Sedimentation Basins
No information is given on how the sedimentation basins are constructed. Hopefully it is not similar to the sedimentation basin planned for Alternate 1. ICFB-61

Water Demand
The Imperial County Farm Bureau developed a water demand model to better understand the amount of daily evaporation in the SCH ponds and therefore the amount of saline and brackish water need daily throughout the year to keep the ponds at a static level. This model is useful in determining the amount of saline and brackish water that is needed for various alternatives, various salinity of the rivers and Salton Sea, and various residence times. It shows that when salinity of the SCH ponds exceeds 28 PPT the amount of saline water required almost equals the amount of river water required. ICFB-62

There is no mention of the amount or cost of power necessary to pump the tremendous amounts of water required or the cost of maintenance of the pumps and pump intake stations. ICFB-63

Pond Connectivity
Without knowing the acres of each individual pond or the size of the control structures it is impossible to judge whether the control structures planned for ICFB-64

each individual pond is of sufficient size. It would be best if the control structures were wider and used jack gates like those used on the IID canal system so that the gates can be set with an undershot which will handle much more water than a control structure that uses a overpour control structure. The jack gates used by the IID can easily be set for an undershot and also be able to handle an overpour at the same time should a summer flash flood occur in the area, where dumping three inches of rain in a half hour period is not uncommon. ICFB-64 Cont.

Conceptual Layout of Alternative 3
As currently drawn, the exterior berm in the far northeast corner of East New pond and interception drain, cuts through 15 acres of private land owned by Sea View Conservancy. The legal description of this property is: The east ½ of the southeast ¼ of section 23, township 12 south, range 12 east, San Bernardino baseline meridian. This property is part of a long term Audubon California Landowner Stewardship Project and any disturbance is forbidden. ICFB-65

The map/photo shows no connection to the interception drain for the Trifolium Lateral 12 drain. In addition there is no information regarding the size of the interception drain, how deep it will be, or which direction the two drains flow. Has any surveying been done to determine if the interception drain can successfully intercept the IID lateral drains at the correct elevation and then be able to transport the IID drain water around the project and into the Salton Sea? ICFB-66

Aerial Backgrounds of all the Alternatives
It is unfortunate that the aerial backgrounds shown for all alternatives are not current photographs. Current photographs were easily available and one local aerial photography company even offered their services to the consultant for the project but were told their services were not needed. It is very difficult to comment on the Draft EIS/EIR when the Salton Sea has evaporated numerous feet and the shoreline has receded ¼ to ½ mile than shown on the photos being used. ICFB-67

2.8 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Saline Water Source (Comments apply to Alternatives 4 & 5)
This plan is lacking detail but it appears the saline water will be conveyed through the old original Red Hill Marina access channel build in the 1950's. It is unclear where the pumps will be located. The plan says the pump will be located in the Sea west of Red Hill but the map/photo show it on land near Red Hill. The original channel was armored with rock and appears to still be usable if the actual channel were cleaned with a long-reach excavator and extended out into the sea to deeper water. Like the current channel, a dog-leg at the western tip of the channel would have to be included in the plan to keep silt from building up at its entrance. The channel could also be extended around Red Hill, all the way to the south side of the Garst Road Bridge on the Alamo River negating the need for a ICFB-68

pump in the sea. There is no discussion how the saline water will be conveyed across the Alamo River to the north side to the ponds. ICFB-68 Cont.

As discussed earlier in this report this plan will have to address the following issues:

- River water, laden with trash, floating on top of the salt water at the inlet point of the channel and only brackish water entering the pumps
- High silt loads during wind events
- Hydrogen sulfide being released during high wind events and being transported to the SCH ponds
- Red tides forming near the channel inlet and being transported to the SCH ponds
- Sediment buildup in the actual channel

ICFB-69

Sedimentation Basin

The location of the sedimentation basin is not well described but appears to be prime farm land owned by Brant Family Farms and currently irrigated from Vail Lateral 1. If it is built similar to the sedimentation basin described for Alternative 1 the same comments made for that project will apply here as well. ICFB-70

It also appears that the water will be conveyed west through the three massive pipelines from the planned sedimentation basin. The lines would have to cross the Vail 2 drain, Kalin Road (Paved), Vail 2 Canal, Vail 2A drain, Hatfield Road, Vail 2A Canal, Vail 3 drain, then turn north, following Garst Road to the south side of the Alamo River, cross the Alamo River, and finally arrive at the SCH pond location on the north side of the Alamo River. It is unclear how these pipe lines would cross the Alamo River to reach the pond site. ICFB-71

The described area where the sedimentation pond and pipe line to the SCH pond site is planned is also an area that has shown tremendous subsidence in the past 25 years. IID engineers have recorded 15 inches of subsidence in the area. As a result it has become difficult to deliver the amount of water in the IID canals that they were originally designed to handle. The farmer who farms most of this area has had to re-level his property, abandon and re-install tile drainage lines, and replace his concrete lined supply ditch because of subsidence. ICFB-72

Pond Layout (Comments apply to all Alamo Projects)

The location of the ponds for Alternative 4 is situated in the middle of the most active area of CO^2 vents and mud pots at the Salton Sea. If all of this CO^2 is trapped by the ponds it will lead to massive algae blooms, the reduction of dissolved oxygen, the lowering of the water's pH, and production of hydrogen sulfide, all of which will kill any fish and invertebrates trying to be grown. In the past, natural currents carried the high concentrations of CO^2 out of the area and diluted it with the Salton Sea water. ICFB-73

Agricultural Drainage and Natural Runoff

According to the map/photo on page 2-43 there is no provision for the IID N, O, and P Lateral Drains to exit to the Salton Sea. According to the plan, they are blocked by the project's berm and have no access to the interceptor drain. ICFB-74

IID's N,O, P, Q, R, and S Lateral drains currently empty directly into the Salton Sea. In the mid 90's when the Salton Sea reached it's highest elevation and started to recede, it deposited a barnacle shoal along the shoreline east of Mullet Island. The barnacle shoal was high enough to block the drain water from the various alphabet drains that drained directly into the sea but it was very porous and drain water flowed through the barnacle shoal and into the sea. In the process though, it flushed the saltwater from the shoal and soil underneath. Eventually silt was trapped and salt cedar seeds germinated and the salt cedars rooted down, anchoring the barnacle shoal. As time went by the shoal blocked more silt and eventually the water from the alphabet drains began to pond up behind the natural berm and aquatic plants began to grow. First alkali bulrush and later cat-tails as the salt was leached out of the soil and a beautiful marsh, close to 1,000 acres in size, was formed. ICFB-75

The interceptor drain should not disturb this marvel of nature and should be constructed to the west of the natural barnacle shoal berm.

2.9 Alternative 5 – Alamo River, Pumped Diversion

Pond Location
The photo/map on page 2-47 shows that the north end of the north pond at Wister Beach is on private property owned by Al & Carson Kalin. The legal description of this property is: The west ½ of section 34, township 10 south, range 13 east, San Bernardino baseline meridian. The southeast corner of this property is one mile west of the intersection of Davis and Spoony Road. ICFB-76

Agricultural Drainage and Natural Runoff
According to the map/photo on page2-47 there is no provision for an interceptor drain to pick up the drain water for IID Q, R, S, T, and U Lateral Drains. According to the plan, they are blocked by the project's berm. The natural freshwater wetland fed by these drains have no way to exit to the Salton Sea. ICFB-77

Berm Configuration
The photo/map on page 2-47 shows a river berm between McDonald and Hazard Road. There is no river at that location. ICFB-78

2.10 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Saline Water Source
The water exiting the Alamo River will float on top of the salt water and not mix for some time depending on wind conditions. Salton Sea Currents will carry the ICFB-79

brackish Alamo River water to the area of the pump station. Where the freshwater and saltwater mix, it creates what is known to locals as a scum line. Trash from the Alamo River is concentrated at this scum line. If the scum line is viewed on sonar it will show trash stacked up from the bottom of the sea floor to the surface. The scum line is constantly moving and it is often in the area near the saline pump intake. A system of trash racks would have to be built and maintained on a constant basis. ICFB-79 Cont.

This plan will have to address the following issues: ICFB-80

- Brackish Alamo river water floating on top of the salt water at the pumping platform
- High silt loads being picked up during wind events
- Hydrogen sulfide being released during high wind events and picked up by the saline pump
- Red tides forming near the pump inlet and being transported to the SCH ponds
- Maintenance of the trash racks to keep trash from entering the pump

Pond Location

The photo/map on page 2-51 shows that the north end of the north pond at Wister Beach covers over 100 acres of private property owned by Al & Carson Kalin. The legal description of this property is: The west ½ section 34, township 10 south, range 13 east, San Bernardino baseline meridian. The southeast corner of this property is one mile west of the intersection of Davis and Spoony Road. ICFB-81

Agricultural Drainage and Natural Runoff

According to the map/photo on page2-51 there is no provision for an interceptor drain to pick up the drain water for IID Q, R, S, T, and U Lateral Drains or drainage from the Wister Ponds. According to the plan, they are blocked by the project's berm. The natural freshwater wetlands fed by these drains or Wister Ponds have no way to exit to the Salton Sea. ICFB-82

3.11.2.5 Surface Water Hydrology

Salton Sea

Page 3.11-7, Lines 8-10 state: **"These return flows have decreased in recent time, largely because of water transfers from Imperial Valley and resulting water conservation measures."** This statement is incorrect. Water conservation measures resulting from the transfers out of the Imperial Valley will not begin until 2017, therefore water conservation measures have nothing to do with the decrease of return flows. ICFB-83

In the meantime as water is transferred out of the valley freshwater from the Colorado River is being added to the Salton Sea at the rate of 1 acre foot for every 2 acre feet transferred out of the Imperial Valley for the express purpose of stopping the Salton Sea from receding because of the water transfers. The ICFB-84 addition of this mitigation water will end 2017 and on-farm conservation measures will supposedly take up the slack. ICFB-84 Cont.

Less water is being delivered to the Salton Sea because of a long term drought, because crops are changing in the valley which require less water, and because irrigation methods of some crops are changing, resulting in no surface water and in some cases less subsurface water leaving the fields. ICFB-85

Alamo River

The first sentence is incorrect. The Alamo River may have originated in the Mexicali Valley at one time, but since the All-American Canal was built in the 40's the Alamo River now originates at the south side of the All-American Canal on the eastern boundary of Calexico where a concrete control structure blocks its flow from Mexico. Any flow originating at this point is seepage from the All-American Canal. Tile drainage lines and field run-off dump into a pool at the base of the control structure and start their way towards the Salton Sea. ICFB-86

3.11.2.6 Surface Water Quality

Sediment

Page 3.11-13, last sentence. The flows listed for the New and Alamo Rivers are incorrect but the annual sediment loading is correct. ICFB-87

3.11-18

Phosphorus

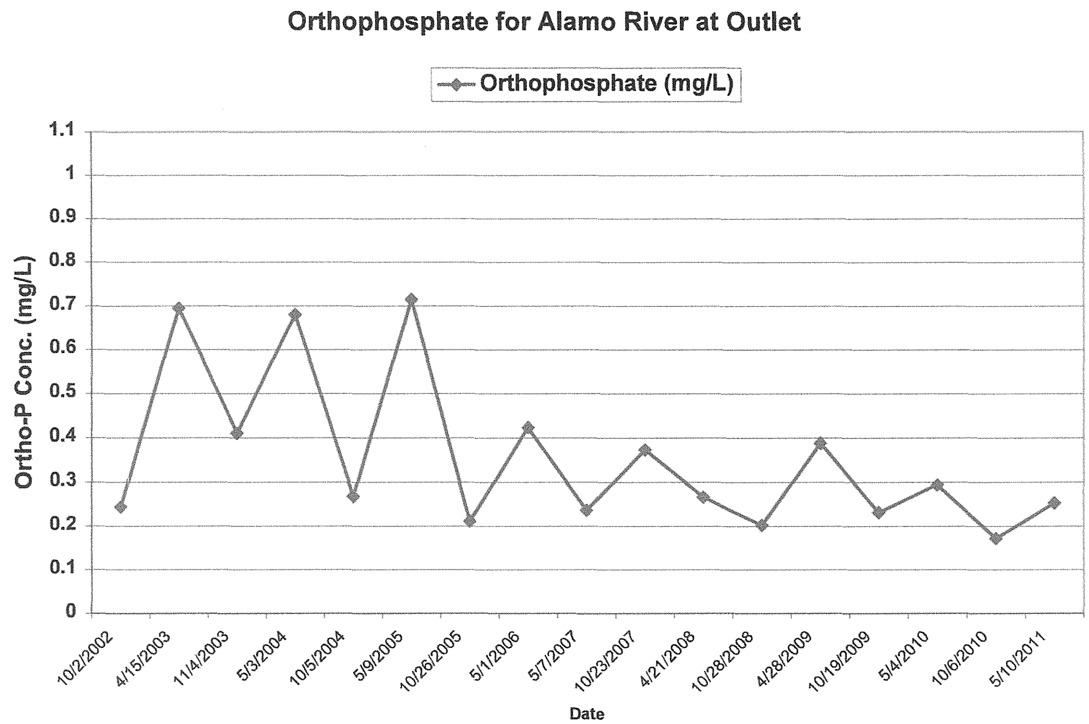
Line 35 (Regarding phosphate levels in the New and Alamo Rivers)

Line 35 states: **"Nutrient concentrations have not decreased recently, despite TMDLs for total suspended solids and phosphorus or changes in agricultural practices (personal communication, C. Holdren Reclamation, 2010)."** This statement by Chris Holdren, Reclamation, seems to contradict the monitoring done on the New and Alamo Rivers by Region 7 Regional Quality Control Board staff. SWAMP findings show tremendous reductions of phosphate loading in the New and Alamo Rivers. ICFB-88

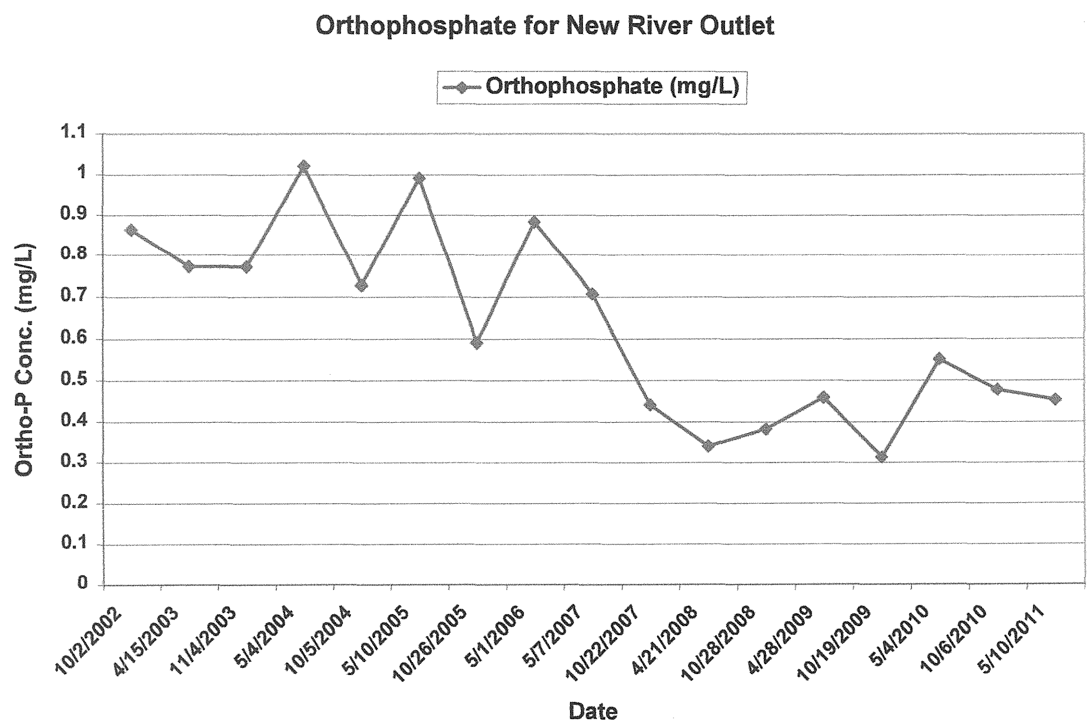
Shown below, are the graphs furnished by:
Nadim Shukry-Zeywar, Senior Environmental Scientist
TMDL Unit Chief
CA Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

SWAMP Phosphorous Data for the Alamo River and the New River

ICFB-88
Cont.



Orthophosphate for Alamo River at Outlet
Orthophosphate (mg/L)
Ortho-P Conc. (mg/L)
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10/2/2002
4/15/2003
11/4/2003
5/3/2004
10/5/2004
5/9/2005
10/26/2005
5/1/2006
5/7/2007
10/23/2007
4/21/2008
10/28/2008
4/28/2009
10/19/2009
5/4/2010
10/6/2010
5/10/2011
Date



Orthophosphate for New River Outlet
Orthophosphate (mg/L)
Ortho-P Conc. (mg/L)
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10/2/2002
4/15/2003
11/4/2003
5/4/2004
10/5/2004
5/10/2005
10/26/2005
5/1/2006
5/7/2007
10/22/2007
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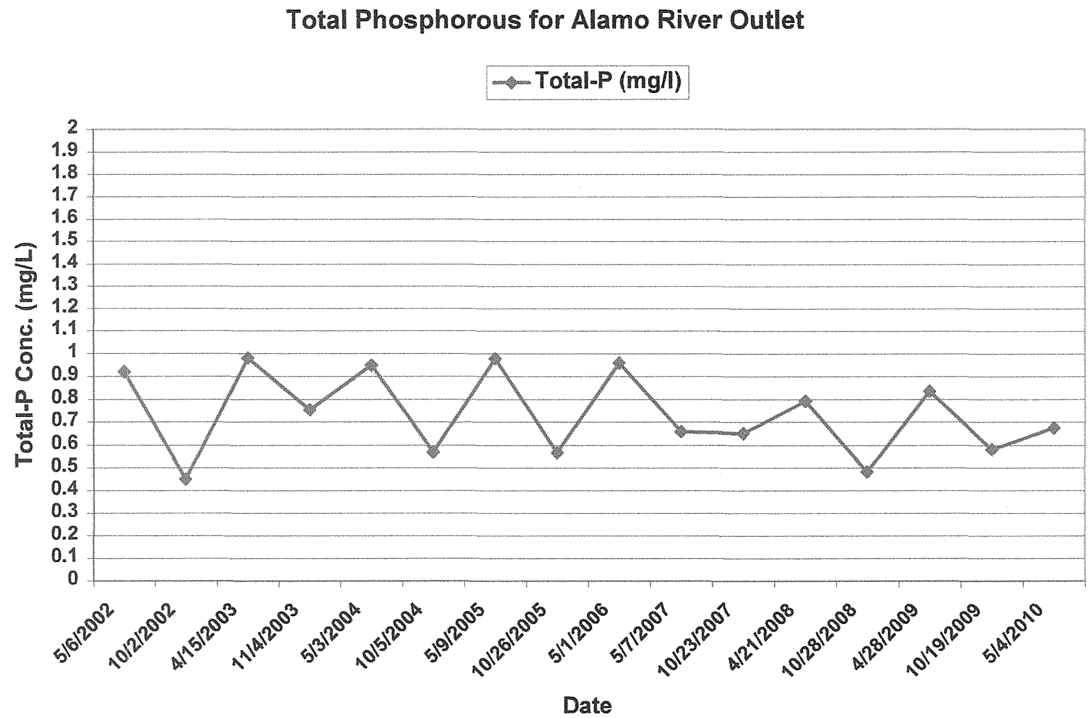
10/28/2008
4/28/2009
10/19/2009
5/4/2010
10/6/2010
5/10/2011
Date



Total Phosphorous for Alamo River Outlet
Total-P (mg/l)
Total-P Conc. (mg/L)
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5/6/2002
10/2/2002
4/15/2003
11/4/2003
5/3/2004
10/5/2004
5/9/2005
10/26/2005
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10/19/2009
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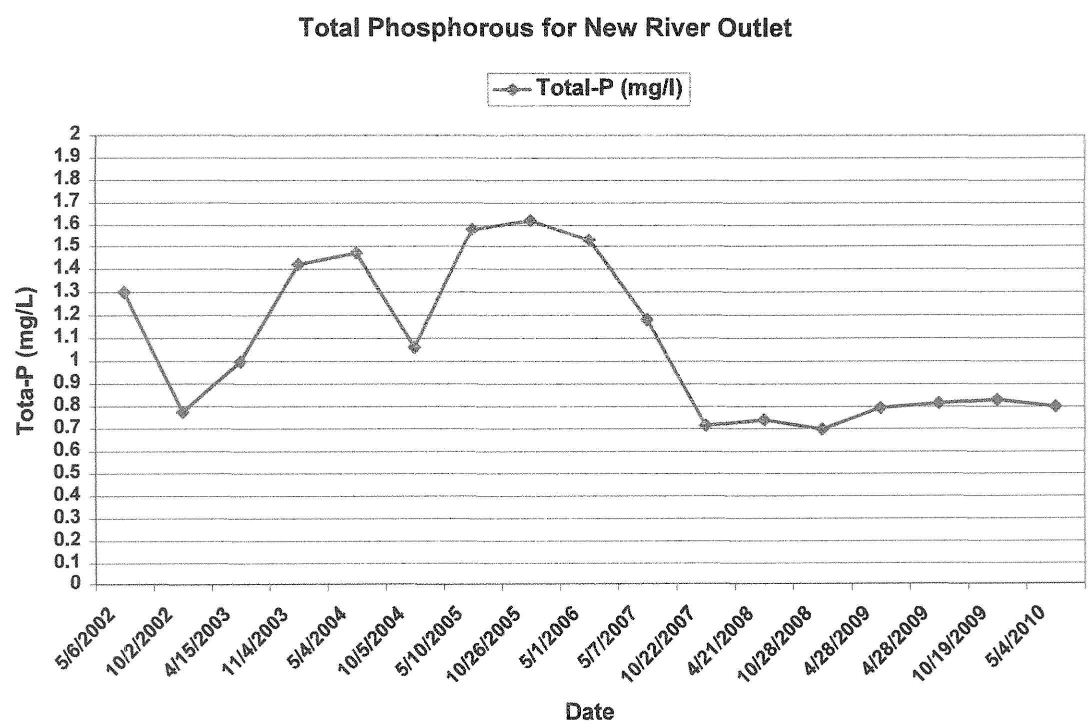
Date



Total Phosphorous for New River Outlet
Total-P (mg/l)
Tota-P (mg/L)
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5/6/2002
10/2/2002
4/15/2003
11/4/2003
5/4/2004
10/5/2004
5/10/2005
10/26/2005
5/1/2006
5/7/2007
10/22/2007
4/21/2008
10/28/2008
4/28/2009
4/28/2009
10/19/2009
5/4/2010
Date

ICFB-88
Cont.

3.2 AGRICULTURAL RESOURCES

Impacts on Agricultural Resources
Of the six alternatives at the New and Alamo River Deltas, Alternatives 1 and 4 create the most negative impacts for Agriculture. ICFB-89

First, the sedimentation ponds remove prime agriculture land from production in perpetuity. This is not the same as fallowing where agricultural land can easily be put back into production. In other words, the land is lost forever for producing food to feed our nation. Not only is there a loss of income to the farmer, there is also lost water sales to the IID and all the service providers that service the farmer with goods and services as well as the labor required to farm the field. ICFB-90

Secondly, the conveyance pipe lines will directly impact the farmability of agricultural land that they cross, perhaps making it impossible to farm those fields depending on their elevation. ICFB-91

All agricultural fields are leveled to allow surface irrigation water to flow across them ultimately ending up at the lowest point of the field. The conveyance lines may interrupt the flow of this water keeping the field from receiving water if the lines are above ground. ICFB-92

The majority of fields in the Imperial Valley have tile drainage lines, installed four to seven feet below the surface, to collect and remove the leached salts from the irrigation water. These underground lines are all tied together and installed at the correct slope, just like the levels of the fields, to allow the surface drain water and subsurface tile water to exit the field and into the IID drain ditch at the lowest point of the field. The conveyance lines crossing an agricultural field very well could disrupt the entire tile drainage system and make it impossible to leach salts from a portion of the field. ICFB-93

The third point is that Imperial Valley fields are worked up to 45 inches deep with massive rippers every year to help leach the salts down to the tile drainage lines. Any underground conveyance pipes crossing a farm field may keep the farmer from tilling his field as deep as he needs to. ICFB-94

As mentioned earlier in this report, the tremendous amount of soil removed from the planned sedimentation ponds would be the largest excavation of soil in agricultural history in the Imperial Valley. Absolutely no mention is made of what will be done with the excavated soil, almost two million cubic yards worth, or even how it is possible to dig below the five foot level without the heavy equipment becoming bogged down as liquefaction creates an unworkable excavation site. This is a major undertaking yet it is glossed over in this Draft EIS/EIR. In the description of the sedimentation basin for Alternative 4 there is ICFB-95 even less information about the project than in the description for Alternative 1 which leaves one guessing about construction, location of the sedimentation pond or the route the pipe lines will take. Obviously there is a planned location for the two sedimentation ponds as well as a planned route for the pipe lines yet the amount of information included in the report is minimal to the point it leads one to believe it was done on purpose. ICFB-95 Cont.

Adding to these three problems is the fact that the location of both sedimentation ponds for Alternatives 1 and 4 are on land currently enrolled in the Williamson Act. ICFB-96

Looking at all the major concerns listed above, the Imperial County Farm Bureau believes Alternatives 1 and 4 create significant and unavoidable impacts which may not be easily mitigated. ICFB-97

3.2.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use (less-than-significant impact).
The construction and resulting conveyance pipelines would cause significant and unavoidable impact where the 220-foot right-of-way crossed producing agricultural land. The natural slope of the tile drainage systems would be disrupted. The conveyance lines would make it impossible to reroute the tile system while maintaining the correct slopes. IID drain ditches would also be affected and again the slopes and guaranteed outlet elevations for the tile system of adjoining field would be disrupted. If the buried conveyance lines crossed producing agricultural land the farmer would not be able to do the deep groundwork normally done to help leach salts downward and allow plant roots to grow unimpeded. Diverting a IID drain or tile system temporarily or permanently would be problematic. For these reasons the Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture. ICFB-98

Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use (less-than-significant impact).
60 acres would be permanently lost with the construction of the sedimentation pond. This Draft EIS/EIR argues that 60 acres in minimal compared to the 5,000,000 acres in production in the Imperial Valley. There are only 473,000 acres in production in Imperial Valley, not five million acres as stated. The Draft EIS/EIR goes on to argue that the 60 acres removed from agriculture is minimal compared to the 40-50 thousand acres of farmland that is fallowed yearly in Imperil Valley. Fallowing has nothing to do with trying to justify removing 60 acres in perpetuity from farming. Fallowed ground is ground that has been brought into production, leveled, tiled, ditches installed, and farmed at one time ICFB-99

but is no longer being farmed. Fallowed ground can easily be farmed again just by tilling the soil, planting and irrigating. The same is not true of land removed from agricultural production in perpetuity. The Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture. ICFB-99 Cont.

3.2.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Ponds

Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use (less-than-significant impact).
The construction and resulting conveyance pipelines would cause significant and unavoidable impact where the 220-foot right-of-way crossed producing agricultural land. The natural slope of the tile drainage systems would be disrupted. The conveyance lines would make it impossible to reroute the tile system while maintaining the correct slopes. IID irrigation and drain ditches would also be affected and again the slopes and guaranteed outlet elevations for the tile system of adjoining field would be disrupted. If the buried conveyance lines crossed producing agricultural land the farmer would not be able to do the deep groundwork normally done to help leach salts downward and allow plant roots to grow unimpeded. Diverting an IID drain or tile system temporarily or permanently would be problematic. For these reasons the Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture. ICFB-100

Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use (less-than-significant impact).
37 acres would be permanently lost with the construction of the sedimentation pond. This Draft EIS/EIR argues that 37 acres in minimal compared to the 5,000,000 acres in production in the Imperial Valley. There are only 473,000 acres in production in Imperial Valley, not five million acres as stated. The Draft EIS/EIR goes on to argue that the 37 acres removed from agriculture is minimal compared to the 40-50 thousand acres of farmland that is fallowed yearly in Imperil Valley. Fallowing has nothing to do with trying to justify removing 37 acres in perpetuity from farming. Fallowed ground is ground that has been brought into production, leveled, tiled, ditches installed, and farmed at one time but is no longer being farmed. Fallowed ground can easily be farmed again just by tilling the soil, planting and irrigating. The same is not true of land removed from agricultural production in perpetuity. The Imperial County Farm Bureau believes there would be a significant and unavoidable impact to agriculture. ICFB-101

3.4.3.3 Wildlife Page 3.4-17 Lines 3-5
At the top of the page it states that the eared grebe population is the greatest in January with a peak of over 5,000 individuals. This statement is correct but the peak actually amounts to over 1 million individuals in some years and represents ICFB-102

over 95% of the continental population according to the U.S. Fish and Wildlife Service. ICFB-102 Cont.

3.4.3.3 Wildlife Page 3.4-18 Lines 15-19
The black tern is most prevalent in July, August, and September and predominately feed on insects flying above farm fields being summer flooded to leach the salts down to the tile lines. (Al Kalin – Audubon California Imperial Valley Landowner Stewardship Program Coordinator 2009) ICFB-103

Table 3.4.4 Special-Status Species Potentially affected by the SCH Project
The potential to be present for the American peregrine falcon is high, not moderate as reported. The American peregrine falcon is a very common visitor to the New and Alamo River Delta year around. It is often found perched on the shady side of a power pole on the metal brace that braces the cross arm. Is also found perched on snags in the small bay east of the New River Delta where it feeds on waterfowl in the winter and nesting black-necked stilts in the spring and summer. Cattle egrets feeding on insects in irrigated bermudagrass fields are also a common prey for the American peregrine falcon. In the Alamo River area they are commonly seen around Obsidian Butte, Lookout Hill, Red Hill and perched on the power lines in the area, particularly along Davis Road. Again, the potential to be present is high. (Al Kalin – Audubon California Imperial Valley Landowner Stewardship Program Coordinator 2009) ICFB-104

The burrowing owl is a common resident of the New River Delta where it prefers to build its burrows and nest in the holes created by the large rock rip-rap used to armor the dike that separated the farmland from the Salton Sea between the New River and Alamo Deltas. In some areas of the dike there are as many as three nesting pair per half mile. These owls must be inventoried and mitigated for during any construction. (Al Kalin – Audubon California Imperial Valley Landowner Stewardship Program Coordinator 2009) ICFB-105

3.11-30 Line 18 Reduce the flow in a river to the detriment of downstream water users
Reducing the flow of the rivers at the pumping stations or sedimentation basins will have a substantial impact on the velocity of the river downstream and create problems with silt/sedimentation fallout thus plugging the river and backing the water up. This action will back water into agricultural drains in Alternatives 1 and 4 and possibly submerge subsurface tile outlets with guaranteed elevations. The reduction of river flow will also lead to noxious vegetation taking over the channel if it is not kept dredged out. ICFB-106

3.11-30 Line 42
It is not clear what is meant by the sedimentation basin storing 6 feet of water. ICFB-107

3.11-31 Line 2 ICFB-108

The last sentence states: **"Because of these design elements, this criterion is not a Project impact and is not considered further."** It should be considered further! Building a sedimentation basin 15-20 below adjacent field levels right next to the rivers is an impossibility given the funding and scope of this project. The surrounding water tables will not allow for it. As stated previously, the enormous size of the excavations, the dewatering necessary, the disposition of the spoil from the project, **all make the project ludicrous and certainly calls attention to the credibility of those that produced this draft document.** ICFB-108 Cont.

3.19.1.2 Commodity Specific Food Safety Guidelines for the Production and Harvest of Lettuce and Leafy Greens

High concentrations of birds in the ponds may lead to the higher bird populations in the vicinity of nearby Willey Reservoir, using that reservoir for loafing and fresh water. Their feces could very well increase the E. Coli counts in the irrigation water to the point where this irrigation water could cause leafy green vegetables to be rejected by the marketing order. A very high proportion of the acres around the New River produce leafy green vegetables as well as broccoli, cauliflower, celery, melons, and sweet corn because of the warm micro-climate created by the Salton Sea. 15% to as high as 35% of the water used to grow these crops is pumped from the Willey Reservoir and mixed with water of the Vail Main canal. A very large portion of the fields irrigated by Vail Laterals 1 through 7 off the Vail Main produce leafy green vegetables. The threat of high E. Coli counts in the irrigation water as a result of this project directly affects agriculture and must be mitigated. ICFB-109

Affected Environment, Impacts, and Mitigation Measures

3.19.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact)

It is doubtful that this project would generate many jobs for local workers. Although Table 3.19-2 shows a pool of 4,700 available construction workers it is doubtful very many are qualified to operate heavy machinery which is where the majority of help is needed. Currently the work on the third phase of the Brawley By-Pass has required hundreds of trucks to haul fill dirt for the road and overpass. The majority of these trucks being used have out of county names on their doors. One can only assume the same will be true during construction of this project and very few from Imperial Valley will be employed. ICFB-110

Impact SOC-5: The SCH Project would result in the temporary loss of agriculture revenue due to construction and maintenance activities in the water pipeline right-of-way (less-than-significant impact).

The loss to agriculture, with the construction of the sedimentation pond and pipe line would not be temporary. ICFB-111

Impact SOC-6: Pipeline construction would require the temporary disruption of Agricultural drains and canals (less-than-significant impact). As stated earlier, it can be assumed that the brackish water pipelines eventually would have to rise above the level of the tile drainage lines and eventually the farm fields they are crossing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the subsurface drainage lines in half and making it near impossible to farm the field while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system.

ICFB-112

The loss of farmland in perpetuity means the loss of tax revenue to the county, loss of revenue to farmers, as well as agricultural service providers such as seed companies, fertilizer companies, pesticide companies, tractor companies, hardware stores, custom harvesters including hay and grain, and just as importantly the loss of income from the sale of water and loss to laborers. Water sales help pay for the maintenance of canals and drains that service the area near the proposed sedimentation pond and brackish water pipeline.

There appears to be no impact noted for the loss of farm land and how that affects the local economy in an area that prides itself in feeding the nation.

3.19.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Ponds

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact)
It is doubtful that this project would generate many jobs for local workers. Although Table 3.19-2 shows a pool of 4,700 available construction workers it is doubtful very many are qualified to operate heavy machinery which is where the majority of help is needed. Currently the work on the third phase of the Brawley By-Pass has required hundreds of trucks to haul fill dirt for the road and overpass. The majority of these trucks being used have out of county names on their doors. One can only assume the same will be true during construction of this project and very few from Imperial Valley will be employed.

ICFB-113

Impact SOC-5: The SCH Project would result in the temporary loss of agriculture revenue due to construction and maintenance activities in the water pipeline right-of-way (less-than-significant impact).
The loss to agriculture, with the construction of the sedimentation pond and pipe line would not be temporary.

ICFB-114

As stated earlier, it can be assumed that the brackish water pipelines eventually would have to rise above the level of the tile drainage lines and eventually the farm fields they are crossing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the subsurface drainage lines in half and making it near impossible to farm the field

ICFB-115

while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system. ICFB-115 Cont.

Impact SOC-6: Pipeline construction would require the temporary disruption of Agricultural drains and canals (less-than-significant impact). As stated earlier, it can be assumed that the brackish water pipelines eventually would have to rise above the level of the tile drainage lines and eventually the farm fields they are crossing to reach the SCH ponds at the correct elevation. That means these pipelines would end up cutting any farm fields as well as the subsurface drainage lines in half and making it near impossible to farm the field while maintaining the required slope of the land as well as the slope and guaranteed outlet elevation of the tile drainage system. ICFB-116

As noted for Alternative 1 there appears to be no impact noted for the loss of farm land and how that affects the local economy in an area that prides itself in feeding the nation. ICFB-117

The loss of farmland in perpetuity means the loss of tax revenue to the county, loss of revenue to farmers, as well as agricultural service providers such as seed companies, fertilizer companies, pesticide companies, tractor companies, hardware stores, custom harvesters including hay and grain, and just as importantly the loss of income from the sale of water. Water sales help pay for the maintenance of canals and drains that service the area near the proposed sedimentation pond and brackish water pipeline. ICFB-118

Figure 3.20-3 Road Network around the New River
At 2.4.2.11 it was pointed out that the access route to Alternatives 1, 2, and 3 were incorrect. Figure 3.20-3 shows a map with an entirely different route to access Alternative 1, 2, and 3 and it too is incorrect. The map shows the route leaving Highway 78/86 at McNearny Road. This is impossible since McNearny Road does not connect to Highway 78/86. ICFB-119

3.20.3.4 Alternate 1 – New River, Gravity Diversion + Cascading Ponds
See comments at 2.4.2.11

In addition, there is no mention of traffic impact to the proposed construction site for the sedimentation basin or the mitigation measures needed. ICFB-120

3.20.3.7 Alternate 4 – Alamo River, Gravity Diversion + Cascading Ponds
The construction of the sedimentation basin and multiple pipe lines are not even mentioned or considered. There is nothing discussed regarding the movement of hundreds of thousands of cubic yards of soil and where the spoil would be put. In addition there will be miles of pipe lines that will pose serious impacts during construction as well as after construction since the pipe lines would be crossing ICFB-121

ag land, ag tile drainage systems, private canals and drains, IID canals and drains, county roads and geothermal pipe lines. ICFB-121 Cont.

4.3.6 Energy Consumption

Line 42 – How does this project produce electrical energy as stated? ICFB-122

Line 44 – States diesel powered pumps will be used to deliver saline water to the projects. Everywhere else in the Draft EIS/EIR it talks about electrical pumps being used. The efficiency of the saline pump will be low if the three pumps used on the Willey Reservoir are any indication and would create a significant impact in the operational and management costs of the project. Diesel pumps also generate great quantities of air pollution. ICFB-123

Stakeholder Comments

Salton Sea Species Conservation Habitat Project

Submitted by	Company	Date Submitted
Alexander Schriener Jr Director of Geothermal Resources (760) 348-4044 alexander.schriener@calenergy.com and Randy Keller Director of Development (760) 348-4005 randy.keller@calenergy.com	CalEnergy Operating Corp. 7030 Gentry Road Calipatria, CA 92233	October 14, 2011

CalEnergy comments to the Draft Environmental Impact Study/Environmental Impact Report (EIS/EIR) sponsored by the California Natural Resources Agency, U.S. Army Corps of Engineers, Department of Fish and Game, and Department of Water Resources (collectively, the Agencies) and presented at public meetings held in Brawly and Palm Desert, CA on September 14 and 15, 2011, respectively.

CalEnergy owns and operates ten existing geothermal electricity generating plants within the Salton Sea Known Geothermal Resource Area (SSKGRA) located in the vicinity of the southern shore of the Salton Sea. These facilities provide 342 megawatts (MWs) of reliable low-cost base-load renewable power. CalEnergy's current development plan of an additional 470 MWs of generating facilities at the Salton Sea will help California meet its Renewable Portfolio Standards (RPS) goals of 33% by 2020.

CalEnergy generally supports the Agencies' initiative to develop the Species Conservation Habitat (SCH) projects to restore shallow water habitat lost due to the ongoing increasing salinity and receding shoreline of the Salton Sea. While these projects will be a significant first step to provide habitat for both fish and bird species dependent on the fragile Salton Sea ecosystem; these projects overlap in part with the valuable known geothermal resource that also occupies the southern shore of the Salton Sea. If built as proposed, these ponds would restrict and possibly deny access to the geothermal reservoir and thus deeply hamper and even in some cases eliminate future development of renewable geothermal energy.

A review of the draft EIS/EIR document identifies and acknowledges the existence of the SSKGRA; however, the EIS/EIR contains no detailed discussion or supporting documentation of limits of the SSKGRA. Nor does the draft EIS/EIR discuss the published limits of the Salton Sea geothermal reservoir. Both these outlines should have been overlay on the proposed Alternatives. To that end we offer Figures 1, 2 and 3. Figure 1 shows the limits of the SSKGRA, as defined by the United States Geological Survey, and the two proposed EIR/EIS SCH project sites associated with the New and Alamo Rivers. Figures 2 and show the proposed limits of the Salton Sea geothermal reservoir overlaid on the EIR/EIS SCH project sites.

Figure 1 displays the limits of the SSKGRA, which is approximately 136 square miles in size and covers most of the southern area of the Salton Sea, both on and off shore. The limits of the SSKGRA overlap on about one-half of the proposed New River SCH sites (Alternatives 1-3) and all of the proposed Alamo River SCH sites (Alternatives 4-6). Figure 1 further shows the proposed limits of the Salton Sea geothermal reservoir, as estimated by shallow thermal gradients (modified from figure 6 in Hulen, Kaspereit, Norton, Osborn, and Pulka, 2002, Refined Conceptual Modeling and a New Resource Estimate for the Salton Sea Geothermal Field, Imperial Valley, California, Geothermal Resources Council Transactions, Vol 26, p. 29-36). A copy of the reference paper is provided as attached to these comments. The proposed limits of the geothermal reservoir is about 34 square miles and is currently the best estimate of where the existing and potential limit of the Salton Sea geothermal reservoir.

Figures 2 and 3 are a more detailed display of the limits of the Salton Sea geothermal reservoir overlain on the two proposed EIR/EIS SCH project sites. Specifically note how all but a small part of the most eastern-portion of the New River SCH Alternatives 1-3 area is within this boundary, whereas virtually all of the Alamo River SCH alternatives are within the geothermal resource estimate. CalEnergy believes that this type of analysis should have been included in the EIR/EIS to give the stakeholders a clear view of how the proposed alternatives will impact development of renewable geothermal energy.

CalEnergy notes that the draft EIS/EIR lacks any of the supporting documentation which detailed the discussions and input from the geothermal industry operators in and around the Salton Sea geothermal field. In addition, there is no discussion of how the alternatives, placed in the middle of the projected geothermal field and on land under lease for geothermal development, were designed to accommodate expected impacts typically associated with development, construction, and operation of a geothermal power plant that would now be adjacent to a SCH. The deficiency is improper and should be rectified.

Specifically, CalEnergy will not support and will object to any habitat designed, proposed or permitted associated with the Alamo River area. Of the six alternative habitats presented; Alternatives 4, 5, and 6 are associated with the Alamo River. These proposed Alternatives are located predominately on Imperial Irrigation District (IID) mineral and surface interest lands where CalEnergy has a current and active geothermal mineral lease. CalEnergy is working with the IID to develop these lands for renewable geothermal energy, as outlined in the lease. The SCH Alternatives 4-6 would greatly hamper or even halt our ability to develop renewable energy from these lands. Even if SCH projects were proposed and permitted but never constructed in the Alamo River area, the very existence of permits could, in the eyes of regulatory and financial agencies, throw into doubt that any overlapping geothermal development could exist in the same area.

Due to these likely adverse impacts on the development of renewable energy in the Alamo River area, CalEnergy proposes insertion to the EIS/EIR report that there is to be a moratorium of thirty years, from 2011 to 2041, before any habitat project is built within the limits of the Salton Sea geothermal field (as defined by Hulen and others, 2002) and specifically in the Alamo River area.

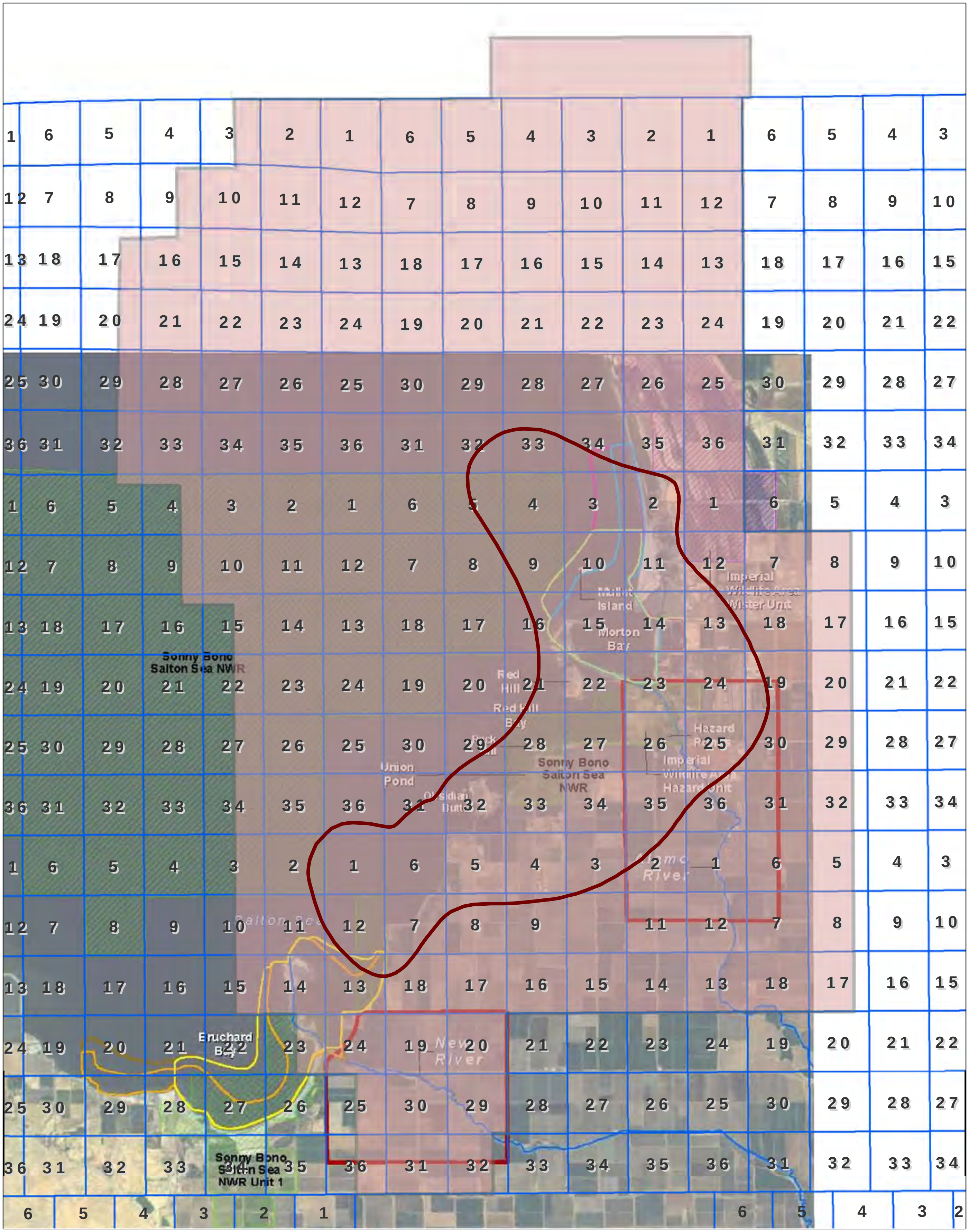
The eastern-most portions of Alternatives 1, 2, and 3 also may impact CalEnergy's and the IID's ability to utilize the renewable resource. The eastern-most portion encroaches on the boundary of CalEnergy's existing field operations and our offshore expansion. CalEnergy would support a modified version of Alternatives 1, 2, and 3 if the habitats were scaled back to only occupy the shoreline west of the New River. It is CalEnergy's understanding that the Natural Resources Agency's preferred Alternative 3 is proposed to be phased construction and that the initial pond would satisfy this "west of the New River" concept. In addition, it was discussed at the Palm Desert meeting on September 15, 2011, that current funding in place would cover the construction costs of this initial pond and that any further phases would seek significant additional funding.

While CalEnergy will support a modified preferred Alternative 3 habitat, we are concerned that implementation of the permitting process of all the alternative sites will create unnecessary regulatory/permitting barriers associated with the future development of the SSKGRA. Therefore, as previously discussed, CalEnergy requests that any permitting effort should only include the preferred Alternative 3, modified to exclude SCH east of the New River.

Finally, an opportunity for project sponsors to participate in the continued phased development of Alternative 3 to provide impact mitigation has been overlooked. Presently, in the draft EIS/EIR there is no administrative mechanism available for project sponsors to take advantage of this type of "in lieu" of mitigation. Nor is there an administrative mechanism for mitigation "banking". Any permitting of the preferred Alternative 3 should require a clearly defined administrative mechanism for both "in lieu" mitigation and "banking".

CalEnergy commends the California Natural Resources Agency, U.S. Army Corps of Engineers, Department of Fish and Game, and Department of Water Resources staffs in their efforts to take this initial step and stands ready to support this process by participating in stakeholder initiatives as necessary.

Figure 1 - Salton Sea Shallow Thermal Anomaly, Known Geothermal Resource Area (approximate location) & Species Conservation Projects

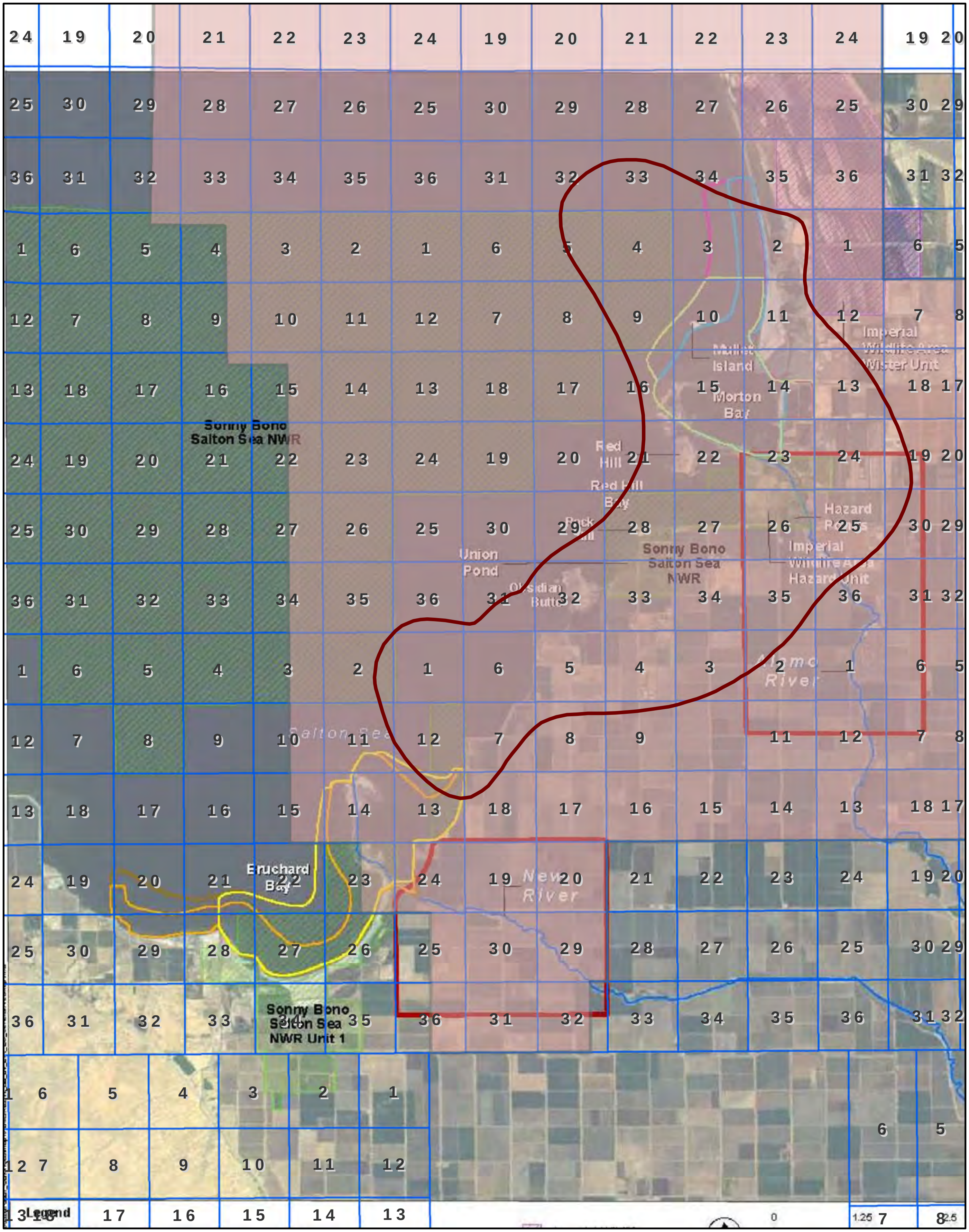


Scale 1:140,000
CA State Plane, VI - NAD83 FT

CALENERGY OPERATING CORPORATION

October 6, 2011
J. Trujillo

Figure 2 - Salton Sea Shallow Thermal Anomaly, Known Geothermal Resource Area (approximate location) & Species Conservation Projects

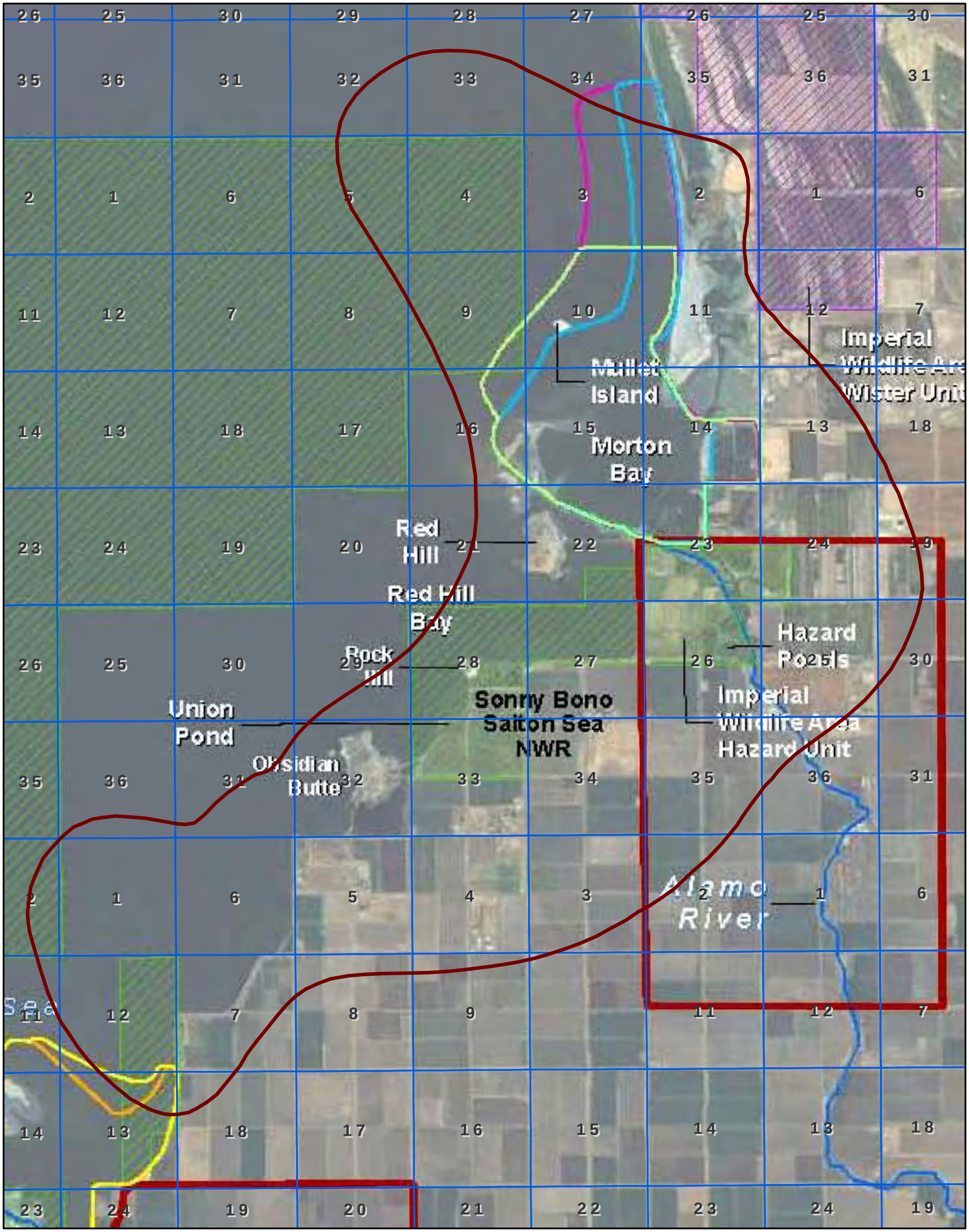


Scale 1:120,000
CA State Plane, VI - NAD83 FT

CALENERGY OPERATING CORPORATION

October 6, 2011
J. Trujillo

Figure 3 - Salton Sea Shallow Thermal Anomaly & Species Conservation Projects



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CA State Plane, VI - NAD83 FT

CALENERGY OPERATING CORPORATION

October 12, 2011
J. Trujillo

Geothermal Resources Council Transactions, Vol. 26, September 22-25, 2002

Refined Conceptual Modeling and a New Resource Estimate For the Salton Sea Geothermal Field, Imperial Valley, California

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ABSTRACT

Interim results of a new conceptual modeling effort for the Salton Sea geothermal field (SSGF), in the Salton Trough of southernmost California, show that this resource: (1) is hotter at depth (up to at least 389°C at 2 km) than initially thought; (2) is probably driven by a still-cooling felsic intrusion rather than (or in addition to) the primitive mafic magmas previously invoked for this role; (3) may be just the most recent phase of hydrothermal activity initiated at this site as soon as the Trough began to form ~4 m.y. ago; (4) is thermally prograding; and (5) in spite of 30 years' production has yet to experience significant pressure declines.

Thick (up to 400 m) intervals of buried extrusive rhyolite are now known to be common in the central SSGF, where temperatures at depth are also the hottest. The considerable thicknesses of these concealed felsic volcanics and the lack of corresponding intermediate-composition igneous rocks imply coeval granitic magmas that probably originated by crustal melting rather than gabbroic magmatic differentiation. In the brine-saturated, Salton Trough sedimentary sequence, granitic plutons inevitably would engender convective hydrothermal systems. Results of preliminary numerical modeling of a system broadly similar to the one now active in the SSGF suggest that a still-cooling felsic igneous intrusion could underlie deep wells in the central part of the field by no more than a kilometer. The model results also indicate that static temperature profiles for selected Salton Sea wells could have taken 150,000 to 200,000 years to develop, far longer than the 20,000 years cited by previous investigators as the probable age of the field. The two viewpoints conceivably could be reconciled if the likely long hydrothermal history here were punctuated rather than prolonged. Configurations of the temperature profiles indicate that portions of the current Salton Sea hydrothermal system are still undergoing thermal expansion.

A newly consolidated, field-wide reservoir database for the SSGF has enabled us to re-assess the field's ultimate resource potential with an unprecedented level of detail and confidence. The new value, 2330 MW_e (30+ year lifetime assured) closely matches an earlier estimate of 2500 MW_e (Elders, 1989). If this potential were fully developed, the SSGF might one day satisfy the household electrical-energy needs of a fourth the present population of the State of California.

Introduction

Because of their distinctive geologic setting and plate-tectonic significance, the Salton Trough and the SSGF (Figure 1) have anchored a number of landmark scientific investigations (e.g., White *et. al.*, 1963; Helgeson, 1968; Elders *et. al.*, 1972; Elders, 1984; Lachenbruch *et. al.*, 1985; Elders and Sass, 1988; Williams and McKibben, 1989). For years, however, scientific studies of the field were hampered by the reasonable proprietary concerns of neighboring geothermal companies exploring and developing the field. The field is now operated by a single company, CalEnergy Operating Corporation (CEOC). As a result, researchers are now permitted judicious access to previously confidential reservoir data and borehole samples.

The Energy & Geoscience Institute, University of Utah, is collaborating with CEOC to develop a refined conceptual model for the entire SSGF. The new model will advance basic understanding of the dynamics of incipient continental breakup, while providing new insight into the mechanisms by which high-temperature hydrothermal systems here and elsewhere in the region have arisen and evolved above asthenospheric-mantle-rooted, sediment-smothered spreading centers. The model will also help enable CEOC to develop, expand, and sustain the field with optimum efficiency, profitability, and environmental responsibility.

Geologic Setting and Prior Investigations

The Salton Trough, a major transtensional basin in southernmost California and northern Mexico (Figure 1, overleaf), is the structural and physiographic northern extension of the Gulf of California (Elders *et. al.*, 1972; Elders, 1979; Lonsdale, 1989). The Gulf and the Trough straddle a continental rift separating

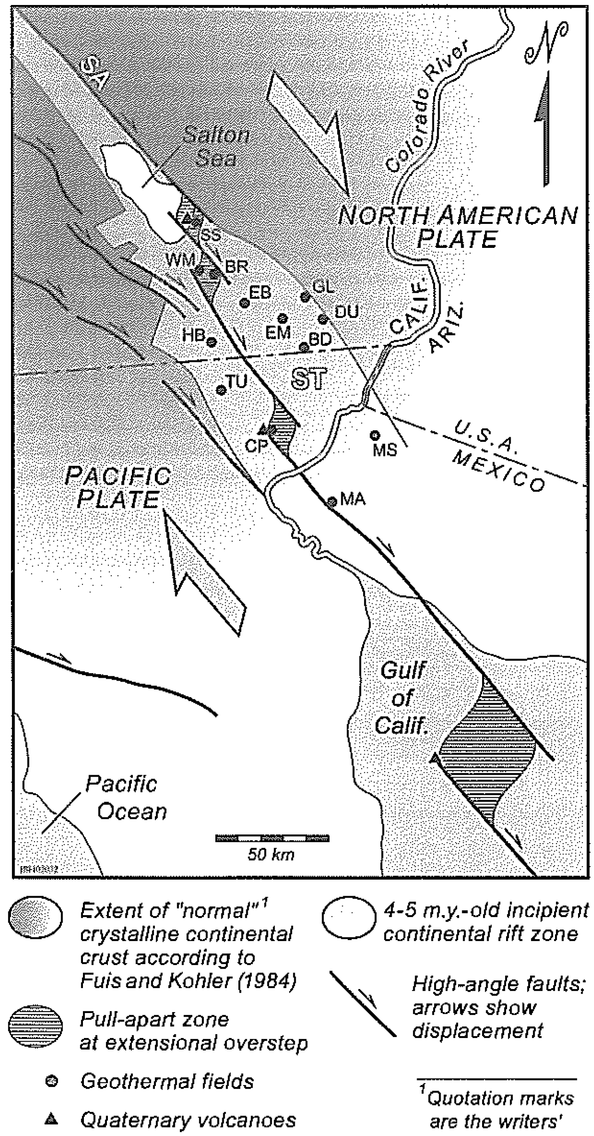


Figure 1. Location and tectonic map of the Salton trough (*ST*) and its high-temperature geothermal systems relative to the southeastern terminus of the San Andreas transform fault zone (*SA*) and the tip of the Gulf of California. Geothermal fields (not all currently producing abbreviated as follows: *BD* – Border; *BR* – Brawley; *EB* – East Brawley; *EM* – East Mesa; *GL* – Glamis; *HB* – Heber; *MA* – Mesa de Andrade; *MS* – Mesa de San Luis; *SS* – Salton Sea; *TU* – Tulecheck; *WM* – Westmoreland; Large arrows show modern relative motion of tectonic plates. Note location of SS and CP fields withing two prominent pull-apart zones, which also host the Trough's only exposed Quaternary volcanoes. Synthesized and redrawn from Elders *et. al.*, (1982); Lachenbruch *et. al.*, (1985); and Elders and Sass (1988).

the Pacific plate, to the west, from the North American Plate, on the east. Subsiding pull-apart basins above ocean-type spreading centers scattered along the length of the rift host vigorously active magma-hydrothermal systems. Two of these systems in the Trough, at Cerro Prieto and the SSGF, are among the world's largest and hottest.

The Trough began its existence in Oligocene to Miocene time as a coaxial but broader and shallower proto-rift, developed as a Basin-Range-style back-arc basin in response to subduction of the Farallon plate beneath the North American plate (Karig and Jensky, 1972; Herzig and Jacobs, 1994). Oligocene to Miocene basalts along the margins of the modern Trough attest to the lithospheric thinning, heating, and characteristic mafic-alkaline magmatism that accompanied the older rifting episode.

The modern Trough started to form at about 4 Ma (Elders *et. al.*, 1972; Crowell, 1974; Lonsdale, 1989), as the proto-rift was further extended and ultimately ruptured to the asthenosphere to create a new and more landward margin between the Pacific and North American plates. The margin has evolved as a series of right-stepping, right-lateral transforms, linked at the oversteps by pull-apart basins (Elders *et. al.*, 1972).

The Trough was filled as it subsided by sediments from the Colorado River, which constructed a transverse alluvial dam ("the delta") across the basin, impeding further marine incursions. Thereafter, frequent diversion of the River northward into the Trough rather than the Gulf supplied enormous volumes of water and sediment to the developing rift. As a result, the Trough is now filled by up to 6 km of fluid-saturated sandstone, siltstone, and mudstone (Merriam and Bandy, 1965; Muffler and Doe, 1968; Van de Kamp, 1973; Fuis and Kohler, 1984; Herzig *et. al.*, 1988).

The nature of the basement in the Trough remains conjectural. Gravity and seismic data suggest that low-density sediments rest upon an intermediate-density basement extending to about 12 km depth. The intermediate basement, in turn, overlies a higher density layer extending to the base of the crust at about 23.5 km (Moore, 1973; Fuis and Kohler, 1984; Elders, 1984; Lachenbruch *et. al.*, 1985; Elders *et. al.*, 1997). This deep layer is inferred to be gabbro, added to the crust to compensate isostatically for the low-density sediments supplied from above. The intermediate crust permissibly could be: (1) hydrothermally metamorphosed Trough-fill sediments (Muffler and White, 1969); (2) pre-Trough continental crust, thinned and sparsely intruded by gabbro; or (3) some combination of these end-member alternatives.

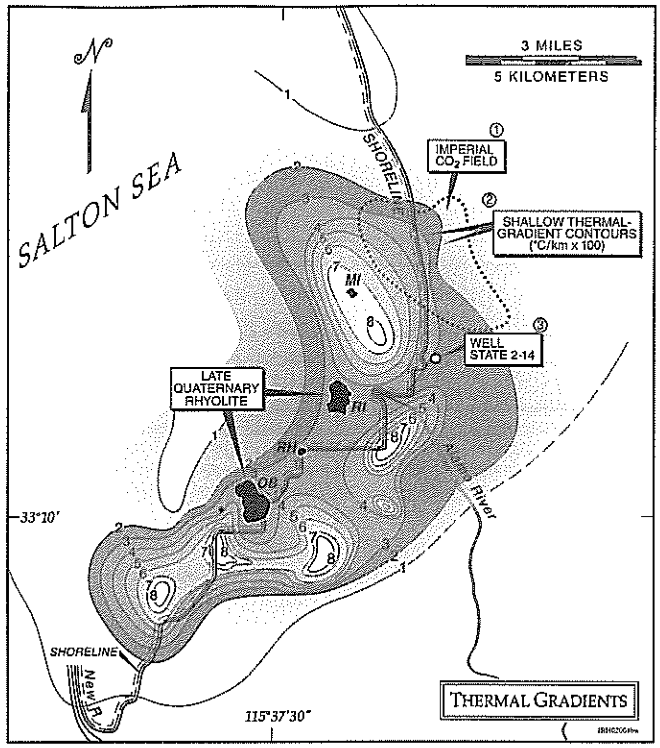
Heat sources for the high-temperature geothermal systems of the Salton Trough have traditionally been envisioned as gabbroic (e.g., Elders, 1984; Elders *et. al.*, 1997). We will show later in this paper that in the upper crust of the SSGF, granitic heat sources not only cannot be ruled out, they are probably the most likely candidates.

Production fluids for the SSGF are brines (up to at least 30% total dissolved solids/TDS; e.g., Helgeson, 1968). The brines are believed to have originated largely though dissolution, during intermittent flooding of the Trough by the Colorado River, of saline residues left in the wake of evaporating lakes much like the modern Salton Sea and its immediate predecessor, Lake Cahuilla (Sykes, 1937; Elders, 1979; Rex, 1983; Osborn, 1989; McKibben and Hardie, 1997).

Williams and McKibben (1989) determined that the SSGF brines have a crude vertical salinity (and therefore density) zonation. Deeper brines, generally below depths of about 1000 m, are exclusively hypersaline (20-30 wt.% TDS). Shallower brines range in TDS down to a few per cent. The deeper and hotter fluids are also metalliferous (McKibben and Hardie, 1997), having precipitated sparse but widespread base-metal veinlets in the past (e.g., McKibben and Elders, 1985). At present, high-purity electrolytic zinc is being extracted from the brines by CEOC; the eventual annual yield of the metal is anticipated to reach 30,000 tons.

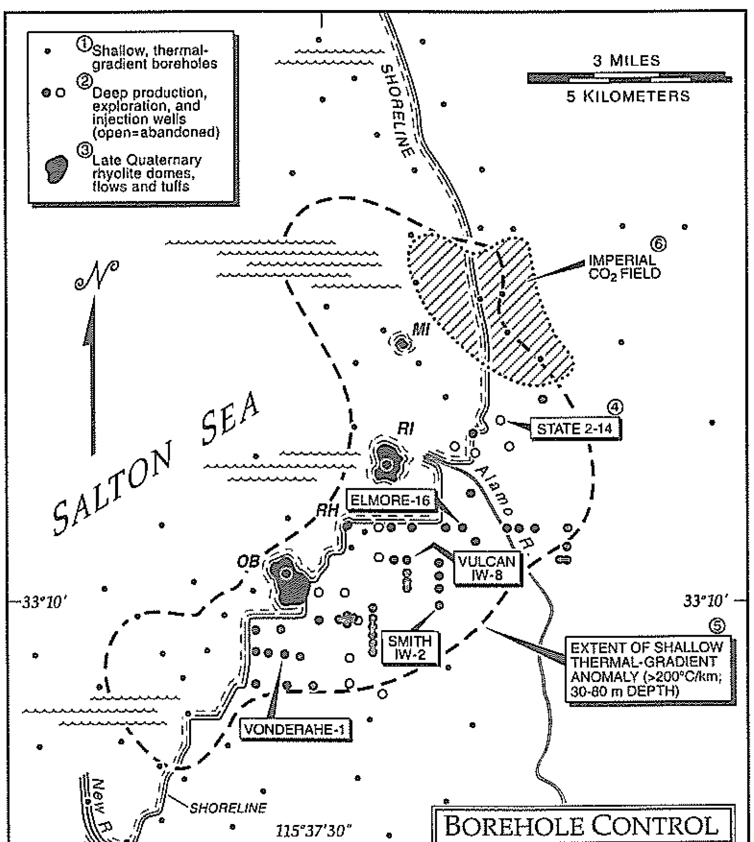
Extent and Configuration Of the SSGF Heat Anomaly

As one phase of our modeling effort, we have revised a map of the shallow thermal-gradient anomaly encompassing the SSGF. Figure 2 documents the extensive borehole control on which the revision is based; the new map is shown as Figure 3. The general "boomerang" or "porkchop" shape of the anomaly has changed little from Newmark *et. al.*, (1988), but the newer drilling results show the feature to be more areally extensive (72.4 km^2). The revised map also reveals a more complex configuration of shallow "hot spots" within the anomaly.



① Rook and Williams, 1942; Muffler and White, 1968 ② 30-80m depth; this document; modified and updated from Newmark et al. (1988) ③ Salton Sea Scientific Drilling Project (Elders and Sass, 1988)

Figure 3. The Salton Sea shallow thermal-gradient anomaly, based on data available through June 2002. Revised and updated from Newmark *et. al.*, (1988). *MI* – Mullet Island; *OB* – Obsidian Butte; *RH* – Rock Hill; *RI* – Red Island.



① From Newmark et al. (1988) ② Drilled by various geothermal companies ③ Robinson et al. (1976) ④ Salton Sea Scientific Drilling Project (Elders and Sass, 1988) ⑤ Modified and updated from Newmark et al. (1988) ⑥ Rook and Williams (1942); Muffler and White (1968)

Figure 2. Borehole control for an updated shallow thermal-gradient map of the Salton Sea geothermal field and vicinity (Figure 3).

Felsic Volcanism and the Nature of the Heat Source

We have alluded to the idea that granitic rather than gabbroic plutons could well be the immediate principal heat sources for the SSGF. The major reason for this contention is the unexpectedly large volume of buried extrusive rhyolite penetrated in central SSGF wells since 1997. Hulen and Pulka (2000) documented such rhyolites and associated phreatomagmatic tuffs up to several hundred meters thick and concealed beneath 1.6 km of Trough-fill sedimentary rocks in injection wells Smith IW-2 and Vulcan IW-8 (Figure 2). Since theu, a new high-temperature production well, Elmore-16 (Figure 2) has penetrated, below a depth of 1.5 km, three separate rhyolite intervals with an aggregate thickuess of 400 m.

The felsic melts that erupted to form the exposed rhyolite domes of the SSGF have been cited as the products of either crustal melting (Robinson *et. al.*, 1976) or (on the basis of additional isotopic evidence) magmatic differentiation (Herzig and Jacobs, 1994). The latter interpretation is presently preferred, but the Salton domes are thin (30-150 m) and volumetrically modest features; all four volcanic centers probably aggregate less than 0.5 km^3. By contrast, the implied volume of the newly discovered buried rhyolites is much larger. These felsic volcanics are up to several hundred meters thick. Rhyolites of this thickness elsewhere commonly occur in flow-dome fields (e.g., at Coso, California; Duffield *et. al.*, 1979) that may be up to several cubic kilometers in volume.

Even without pending isotopic confirmation, we feel confident in asserting that the newly discovered buried rhyolite bodies and the dome field(s) they imply in the central SSGF cannot have originated simply by differentiation from a mafic magmatic parent. If these felsic igneous rocks (and those yet undrilled) are as voluminous as indicated, then their origin as differentiates would seem to mandate a much larger volume of intermediate-composition magma and its crystallization products, for example andesite or granodiorite. No such rocks have been reported for the SSGF; only mafic and felsic varieties. In view of this distinctly bimodal igneous-rock suite, we suggest that crustal melting is a much more likely means of producing all or most of the rhyolite encountered at depth in the SSGF.

Smith and Shaw (1975) argue that young rhyolites can be excellent indicators of sizable, high-temperature geothermal systems. The reason is that the rhyolites are typically associated with large, initially viscous, slowly cooling granitic magma bodies, the optimum geothermal heat sources in continental geologic settings. We believe it very likely that such plutons have been and continue to be primary heat sources for the SSGF. A graphic portrayal of this scenario is offered as Figure 4.

An intriguing possibility for the central SSGF is that a large, hot, granitic intrusion might underlie the drilled portion of the field by no more than a kilometer, and perhaps much less than that value. One well here has a static temperature of 389°C at a depth of only 2 km. Norton and Knight (1977), Norton (1982), and Norton and Taylor (1979) have shown through numerical modeling and geologic analysis that regardless of the composition, depth, or size of an igneous heat source, the 400°C isotherm in an overlying convective hydrothermal system rarely extends more than a few hundred meters above the top of the pluton. For example, in the numerical hydrothermal system above the ~320 km^3 Skaergaard gabbro in Greenland, the 400°C isotherm extends only about 0.8 km above the pluton at the system's thermal maximum (Norton and Taylor, 1979). Even above a hypothetical cooling felsic batholith, the 400°C isotherm (with the exception of small salients) extends a maximum of about 1 km above the igneous body (Norton and Knight, 1977). A hypothetical granitic intrusion beneath the Salton Sea geothermal field would likely be orders of magnitude smaller than the above examples, perhaps more like the intrusions associated with porphyry copper deposits. Norton (1982) has shown that in porphyry systems, the 400°C isotherm barely ascends above the pluton during the lifetime of the associated magmatic-hydrothermal system. From these analyses and the foregoing evidence, we predict that a 1-10 km^3, still-cooling felsic igneous heat source will be found just below presently drilled depths in the the central part of the geothermal field.

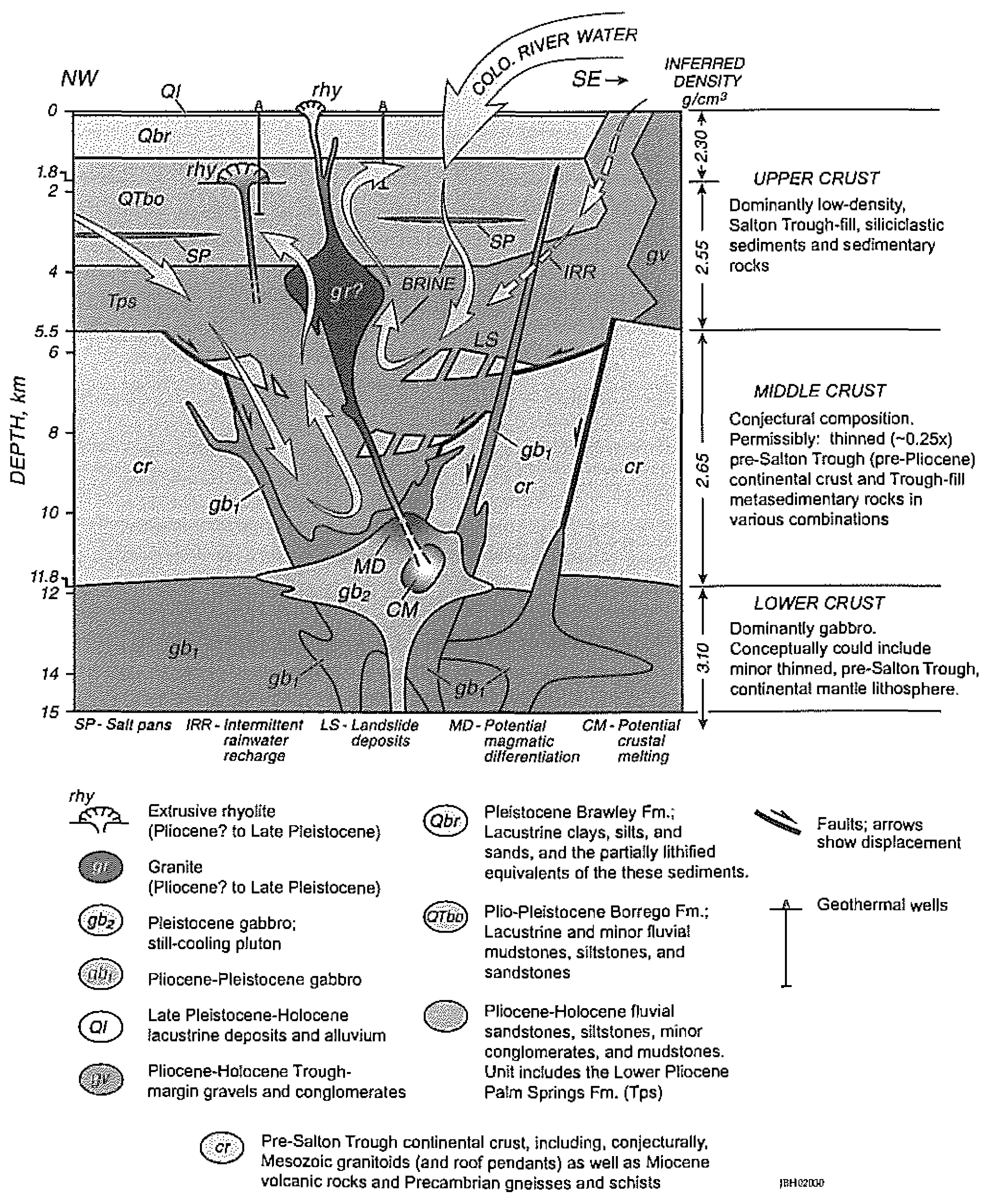


Figure 4. Conceptual lithostratigraphic and hydrologic section through the eastern Salton trough and the Salton Sea pull-apart zone. Synthesized and modified from Moore (1973); Fuis and Kohler, 1984; Elders *et. al.*, (1984); Lachenbruch *et. al.*, (1985); and Elders and Sass (1988), with configuration of the young deep gabbro pluton (gb_2) adapted from Norton *et. al.* (1984).

Age and Duration of the Hydrothermal System

Previously published estimates of the age of the Salton Sea geothermal system range from a few thousand years (Heizler and Harrison, 1991) to at least 100,000 years (Williams and McKibben, 1989). McKibben and Hardie (1997) suggest that this broad range of age estimates likely reflects a combination of (1) different viewpoints about the behavior (e.g., diffusion rates) of radiogenic elements in the dated minerals; and (2) a complex evolution with multiple thermal pulses. Results of our investigation to date support the latter interpretation, but suggest that even the most recent pulse may be more long-lived than previously imagined.

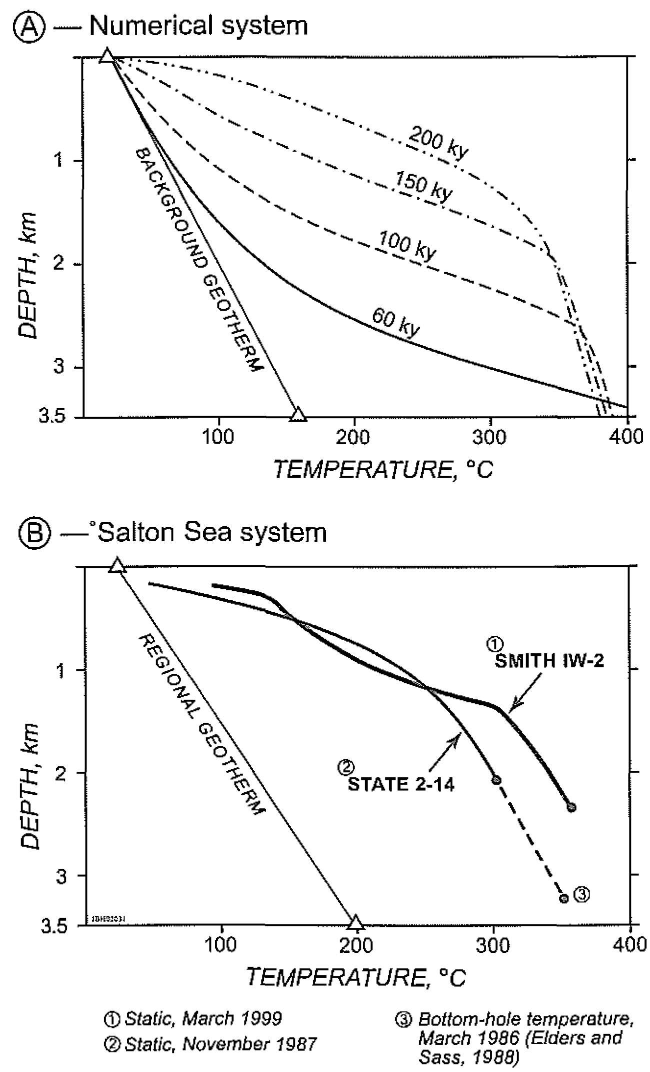


Figure 5. Comparison of computed temperature-depth (T-z) profiles for a highly simplified, generic numerical magma-hydrothermal system (*A*) with measured, static T-z profiles for Salton Sea geothermal wells Smith IW-2 and State 2-14 (*B*). The 2-D numerical system is generated by a 4 X 4 km felsic pluton, instantaneously emplaced at a temperature of 900°C beneath a 4 X 4 km *lithocap* (the rock volume above the pluton) with a permeability of 0.25 millidarcies from pluton top to ground surface. Note that in the numerical system, concave-up thermal profiles, similar to the one measured for Smith IW-2, occur only when the system is thermally prograding. Preliminary modeling completed by D.L. Norton utilizing FLOW 6 software.

We now know that there are voluminous buried extrusive rhyolites as old as 700,000 years at drilled depths in the SSGF (Hulen and Pulka, 2000). These rhyolites imply coeval granitic intrusions, which, as we have argued, probably crystallized from crustal melts produced around or within deep, mantle-derived, gabbroic magma chambers (Figure 4). On the basis of 3.7 m.y.-old basalt xenoliths in the Salton rhyolite domes (Herzig and Jacobs, 1994), these primitive gabbroic magmas (and derivative felsic crustal melts) have likely always been characteristic of the Salton Sea spreading center. The viscous felsic melts, intruded into the brine-saturated Salton Trough sediments, inevitably would have engendered high-temperature hydrothermal systems (Norton, 1984), indistinguishable from the one circulating in the SSGF today. From these arguments, it seems likely that high-temperature hydrothermal activity has been characteristic of this site since inception of the Salton Trough ~4 m.y. ago.

As a preliminary test of the long-duration hydrothermal hypothesis, one of us (Norton) has completed a simplified, 2-D, numerical hydrothermal-history model of a system broadly similar to the one now active in the SSGF. It is assumed for the model that a 4 X 4-km felsic pluton is emplaced beneath a 4 X 4-km mass of fluid-saturated siliciclastic sedimentary rock with porosity and permeability approximating that measured and geophysically inferred for the reservoir itself. For details of the methods, procedures, and assumptions employed for the modeling, the reader is referred to Norton (e.g., 1982, 1984) and Norton and Taylor (1979). A sequence of modeled temperature vs. depth curves (Figure 5A) above the numerical cooling pluton suggest that static thermal profiles measured in selected production and injection wells (Figure 5B) could take 150,000 to 200,000 years to develop.

On the basis of this preliminary modeling, and on the likely intrusion of gabbroic and deriviative granitic plutons at this site for the last 4 m.y., we suggest that Kasameyer *et. al.*'s (1988) numerically modeled age of 20,000 years for the system substantially underestimates the true age and full duration of hydrothermal activity. Our differing viewpoints conceivably could be resolved if, as suggested by Williams and McKibbern (1989), the long-lived hydrothermal activity has been intermittent rather than continuous. Still, the available evidence suggests that even the still-active thermal "pulse" would likely have been initiated more than 100,000 years ago.

The Ultimate Resource Potential of the SSGF

Previously published estimates of the long-term (30 yr) electric-power production potential of the SSGF span an order of magnitude (Table 1, overleaf) and range from 2,500 MW_e (Elders, 1989) to 30,000 MW_e (Meidav and Howard, 1979). The estimates are based on the investigators' assessments of reservoir area, thickness, volume, temperature, porosity, permeability, fluid mass and replacement capacity, stored heat, heat recoverability, and heat-to-electricity conversion efficiency. There has been little consensus about these parameters, apart from their pointing to a very large geothermal resource.

Table 1. Published estimates of the ultimate electric-power-production potential of the Salton Sea geothermal field.

MW_e for at least 30 years	Reference
17,500	*Biehler and Lee, 1997*
1,300 to 8,700	*Younker and Kasameyer, 1978*
3,400	*Brook et al., 1979*
30,000	*Meidav and Howard, 1979*
2,500	*Elders, 1989*
2,330	*This paper*

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The most recent of the SSGF resource-potential estimates – the 2500 MW_e of Elders (1989) – could well be the most realistic. Utilizing a wealth of new drilling and reservoir data acquired since that paper was published, we have re-appraised the resource from a different perspective and arrived at a similar value (Table 1; Figure 6). Our approach, hitherto precluded by the proprietary concerns of multiple operators, is solidly based on 30 years' production history in all sectors of the field. We have simply extrapolated the well-established characteristics of this known resource to the rest of the Salton Sea heat anomaly.

We hasten to add that lending institutions may impose more rigorous requirements for resource appraisal than those that have guided our efforts in this regard. Nonetheless, it seems inescapable to us that this field, fully developed, has great potential to one day be the largest, hottest, and most productive in the world.

As we have shown, the SSGF occurs within a 72.4 km^2 thermal-gradient anomaly, constrained by more than 100 shallow boreholes and deep geothermal wells, within which gradients in the depth range 30-80 m exceed 200°C/km. More than 90% of the deep wells completed to date within this anomaly have been actual or potential commercial producers (one or more sidetracks have sometimes been required to find the right combination of productive fractures and intergranular permeability; many wells proven productive have actually been utilized for injection). Some of these producers have immense thermal-fluid outputs; for example, Vonderahe-1, in the southwestern part of the field (Figure 2), supports 45 MW_e of installed capacity by itself. Moreover, in the 30 years since inception of the field, the SSGF has yet to experience significant pressure declines. This fact implies not only copious natural recharge but also a successful re-injection strategy; it also means that the field can likely be sustained for decades (if not longer) to come.

Deep wells in the SSGF have been drilled to date almost entirely within the onshore portion of the shallow thermal-gradient anomaly (Figure 3). The larger offshore, to the west and beneath the Salton Sea, is highly prospective but essentially untested by deep drilling. However, wells at the western edge of the onshore portion of the anomaly are as hot and prolific as those drilled anywhere else in the field. In fact, the hottest well (T_{max} = 389°C) drilled to date is also one of the westernmost. In light of these facts, we can think of no good reason why the productive geothermal reservoir should terminate to the west simply because the rest of the heat anomaly in that direction is sublacustrine.

Only 14.4% of the areal extent of the shallow thermal anomaly has been extensively development drilled (the area supporting the field's current 335 MW_e capacity; Figure 6). Another 24.2% has been sufficiently tested by strategically placed, deep and commercially producible geothermal wells to

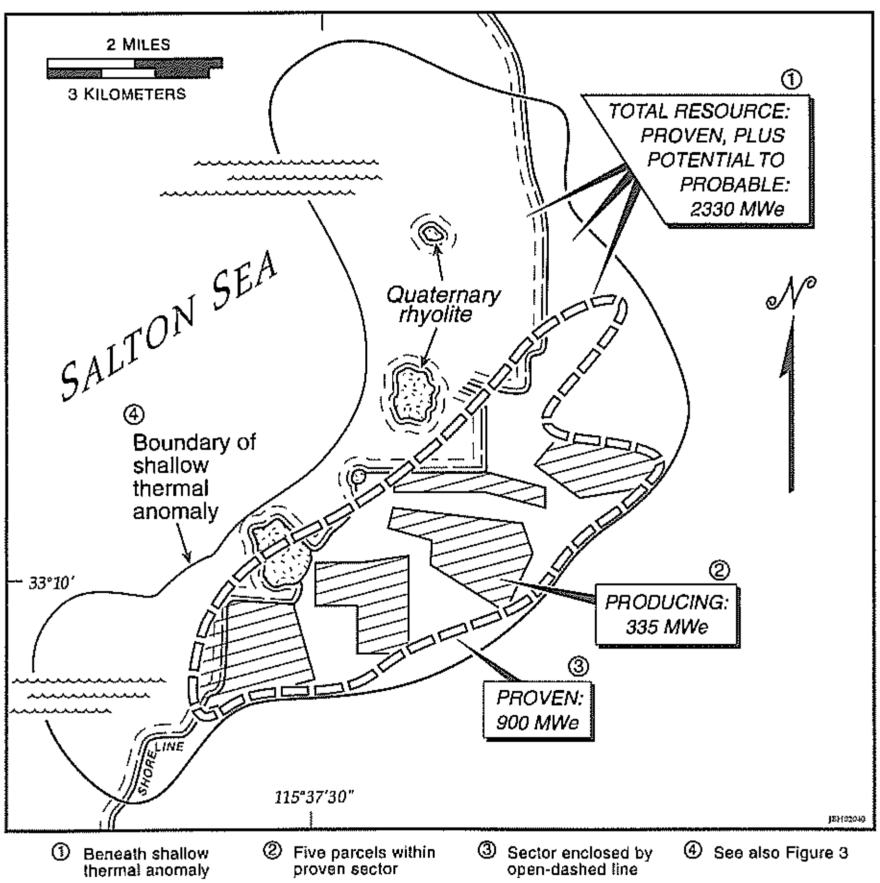

Figure 6. Map showing estimated ultimate conventional resource potential for the Salton Sea geothermal field as of July 2002.

be considered proven resource. Assuming that this 24.2% of the anomaly will be as productive as the 14.4% already developed, it will be capable of supporting another 565 MW_e of installed capacity. This brings the total onshore resource – producing plus proven but undeveloped – to 900 MW_e.

The much larger offshore portion of the thermal anomaly is otherwise unlikely to differ much from its onshore counterpart. Given the stratigraphic monotony of this part of the Salton Trough, it is doubtful that the geologic framework beneath the Salton Sea is substantially different than that beneath the onshore SSGF. In other words, there is good reason to assume that the offshore part of the thermal anomaly will be underlain by a geothermal resource similar to and as productive as the SSGF on land.

The offshore part of the thermal anomaly constitutes 61.4% of its full areal extent. If the 38.6% of the thermal anomaly onshore is underlain by a 900 MW_e resource, then the offshore sector, in proportion, should support an additional 1430 MW_e, for a grand total of 2330 MW_e (Figure 6).

It is conventionally stated that 1 MW_e is sufficient to supply the electrical-energy needs of 1000 standard households, or about 4000 people. By this measure, the SSGF, if developed to its full 2330 MW_e potential, could supply electricity for 9,300,000 individuals, or about a fourth of California's present population.

Acknowledgements

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Nancy Dorfman

From: Lorraine Woodman
Sent: Tuesday, November 29, 2011 1:49 PM
To: Nancy Dorfman
Subject: FW: New SCH EIS-EIR comment from Michael Cohen

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-----Original Message-----
From: DO NOT REPLY [mailto:noreply@cardno.com]
Sent: Friday, October 14, 2011 10:29 AM
To: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Michael Cohen

Michael Cohen has entered a comment.Contact Information:
E-Mail: mcohen@pacinst.org
Affiliation: Pacific Institute
Mailing Address:
2260 Baseline Rd Suite 205

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Attachments:
Comment:
Pacific Institute Comments on the
Salton Sea Species Conservation Habitat Project Draft EIS/EIR submitted 10/14/2011

General Comments
The Pacific Institute was a member of the California Resources Agency s Salton Sea Advisory Committee and provided extensive comments and recommendations on the development of the agency s Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report (PEIR). We endorsed the Period I activities identified by the PEIR, especially the development and construction of shallow pond habitat complexes known in the document as early start habitat.

The proposed SCH project is the most recent incarnation of the PEIR s Period 1 early start habitat. We strongly support the construction of such shallow pond habitat. This current project DEIR comes more than four years after the completion of the PEIR; it is long overdue.

In the interests of maximizing the value of limited Salton Sea funds and accelerating the implementation of much-need constructed habitat at the Salton Sea, we offer a few general comments, followed by specific line-item comments on the Salton Sea Species Conservation Habitat Project Draft EIS/EIR (DEIR).

1.   We strongly support the construction of shallow pond habitat around the Salton Sea. Unfortunately, the DEIR provides insufficient information for us to

determine whether the proposed project will work as intended. Aside from uncertainty as to whether legal rights to divert water from the New or Alamo river can be secured for the project, the DEIR does not assure us that the proposed project will produce fish in sufficient numbers to provide an adequate forage base for piscivorous birds   the project s stated purpose. Neither the description of the alternatives, nor the subsequent environmental analyses, nor any of the appendices include information on projected fish production rates or harvest rates. Section 3.4 states that fish and invertebrates may suffer from seasonal or even daily mortality, due to low concentrations of dissolved oxygen (DO) and low temperatures, but does not offer any estimates of the magnitude of these mortality events or describe how this periodic mortality will affect the overall ability of the project to meet its goals. Section 2.0 describes the alternatives structure but not their operation or ability to achieve their stated function. Although the Reclamation/USGS pilot ponds unintentionally produced very high numbers of desert pupfish, they were small shallow ponds that may not have been representative of conditions at the deeper, larger SCH project. In any case, the comparison between the pilot ponds and the proposed project should have been made explicitly in the DEIR. The function of the ponds, including steps that might need to be taken to improve DO concentrations and avoid lowering winter water temperatures below the tolerance of tilapia (threats noted on p. 3.4-48), should be clearly described in the alternatives section. Simply deferring such decisions to future adaptive management is insufficient assurance that these potential fatal flaws can be overcome and limited Salton Sea funds spent on a project that might not achieve its stated goals.

2. The DEIR neglects to provide any information on costs. How much would it cost to construct each alternative? What are the projected annual operations & maintenance costs of each alternative? How much money is currently available? What additional funds might be obtained? Can the alternatives be scaled back, if full funding is not available? How will this affect the adverse and beneficial impacts analyses?

3. The selection of Alternative 3 as the preferred alternative appears to be pre-decisional, both because of the criteria used to justify the decision (e.g., because it is the largest alternative) and especially because the agencies apparently are already in the 75% design phase for this alternative, even before the comment period has closed and well before the agencies have had the opportunity to review public comments.

4. The preferred alternative could divert more than 50% of the total historic flow of the New River during June, the peak evaporation month. Aside from the fact that future New River flows will be significantly lower in the future, due to water transfers and water conservation efforts in the Imperial Valley and further reductions in flows from Mexico, diverting more than half of the river s flow raises many questions. In addition to the immediate environmental impacts (to the river and riparian corridor downstream and to the estuary formed at the river s mouth), this diversion suggests that a maximum of 7,000 acres of shallow habitat could be constructed near the New River, and perhaps 10,000 acres near the Alamo River, given the volume of water available during June. If this is accurate, what does it say about long-term mitigation strategies for the Salton Sea? Would it be permissible to divert the entire flow of the New River to deliver water to constructed habitat? Or does the preferred alternative represent, in effect, the maximum amount of constructed habitat feasible near the New River?

We strongly support the construction of shallow habitat pond complexes at the Salton Sea. However, the DEIR does not provide sufficient information to determine whether the preferred project would be an effective use of limited Salton Sea funds. More and better information is needed.

Following are specific comments on the DEIR. Page and line numbers are indicated for each as page number: line number(s).

ES-1: 6-7 The SCH Project is intended to serve as a proof of concept for the restoration of shallow water habitat that currently supports fish and wildlife dependent upon the Salton Sea (the Sea)

The DEIR should review a broad range of construction techniques, management strategies, habitat types, salinities, and target species. It would be a waste of time and money to test one limited concept, when it is clear that the Sea will require a portfolio of restoration strategies and techniques.

The DEIR should clearly and explicitly define what is meant by restoration for this project, given the absence of a stable baseline or historic condition.

ES-1: 28 The Salton Sea is currently a hypersaline ecosystem (about 51 ppt)

Slide 5 of the Public Comment Meeting Presentation posted on the Salton Sea program webpage at http://www.water.ca.gov/saltonsea/docs/081711DEIS_EIRcomment_meeting.pptx states that the salinity is 53 ppt. Note that both of these values are wrong: at brackish and higher salinities, g/L TDS (as reported by C. Holdren) are not interchangeable with ppt TDS. The reported salinity of the Sea, at 51.8 g/L, converts to roughly 49.3 ppt, not >50 ppt.

ES-1: 29-31 Without restoration, declining inflows in future years will result in the Sea s ecosystem collapse due to increasing salinity (expected to exceed 60 ppt by 2018, which is too saline to support fish)

This statement contains the following errors: 1) the premise that there is any possibility of restoration of the Salton Sea as a whole is demonstrably false (and has yet to be defined in this document); 2) the Court s invalidation of the Quantification Settlement Agreement (QSA) and the current appeal of that decision mean that the water transfer and future mitigation water deliveries remain uncertain; and 3) categorical determinations of the salinity tolerance of the fish in the Sea have been wrong for more than 40 years and should not be made here. Desert pupfish have demonstrated salinity tolerance well in excess of 60 ppt. Table 3.4-3 notes that the most prevalent species of tilapia in the Sea has a salinity tolerance of 65 ppt.

ES-1: 35-39 Piscivorous birds, on the other hand, are at risk of decline. To address this immediate need, the California Legislature appropriated funds for the purpose of implementing conservation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including adaptive management measurements (California Fish and Game Code section 2932(b))

The agencies exclusive reliance on legislation passed in 2003, and their continued refusal to acknowledge SB 187, enacted in 2008, creating California Fish and Game Code section 2932.3, baffles us. For reasons unclear, the agencies ignore California Fish and Game Code section 2932.3 and California Fish and Game

Code sections 2940 et seq. This failure to recognize existing state law must be corrected.

The agencies selective interpretation of legislative intent, while refusing to follow the clear legislative direction made explicit in California Fish and Game Code section 2932.3 and California Fish and Game Code sections 2940 et seq., suggests pre-decisional actions and a clear lack of administrative and legislative oversight.

In SB 187 (enacted 2008), the Legislature finds The Salton Sea is considered a globally important bird area because of its astounding diversity of bird species, with more than 400 species, the second highest count in the nation, and the very large populations of some species that rely on it for habitat. The legislature did not direct the agencies to focus exclusively on piscivorous birds; instead, it highlights the importance of the Sea to the full range of bird species that use it. As the Sea continues to decline and if water transfers continue, it will rapidly transition through salinities tolerable to invertebrates to concentrations too high for any macro invertebrates. To meet the clear intent of the Legislature, the agencies may soon need to plan projects that produce the large numbers of invertebrates needed to sustain the astounding diversity of bird species found at the Sea. Narrowly assuming   as the Agencies do   that fish habitat can supply the full range of invertebrates found at the Sea will preclude higher salinity habitats that generate extremely high invertebrate numbers, as was demonstrated at the Reclamation/USGS pilot ponds. This proposed Project offers the opportunity to do a true proof of concept, with cascading ponds managed to a broad range of salinities, offering guidance for the much larger habitat projects that will be needed in the future. The very narrow focus on piscivorous birds ignores the broader intent of the Legislature and limits the value of the proposed Project to inform future efforts. This project should be expanded to encompass a broader range of salinities and target species, consistent with the explicit legislative findings in SB 187.

ES-2: 4-5 Goal 1: Develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea.

The goal should be rewritten to be consistent with the explicit project purpose, or the proposed project should be expanded to satisfy the goal. Currently, the proposed project fails to meet this goal.

A more appropriate goal, consistent with the alternatives described in the draft, would be: Goal 1: Develop aquatic habitats that will support fish and piscivorous birds dependent on the Salton Sea. The project does not develop a range of aquatic habitats and is clearly not intended to support the full range of wildlife species dependent on the Salton Sea (despite the legislative language to that effect): it is explicitly focused on fish and piscivorous birds, as shown by the various objectives that follow this goal.

ES-22: 18-21 The Corps has yet to identify its preferred alternative. The draft section 404(b)(1) alternatives analysis will be completed and included in the Final EIS/EIR. Based on this analysis, the Corps will choose the least environmentally damaging practicable alternative as the Corps preferred alternative, which will be subject to public comment.

We look forward to the opportunity to comment on the practicable alternative, defined on p. ES-7: 27-28 as The factors that influence whether an alternative is practicable include cost, logistics, technology, and the ability of the alternative to achieve the overall project purpose. Unfortunately, the current DEIR does not include any information on cost, and does not offer a credible assessment of the ability of any of the listed alternatives to achieve the overall project purpose.

ES-8: 23 Alternative 3 is the Natural Resources Agency s preferred alternative.

For reasons described in the following, we find the Agency s preferred alternative to be flawed and unacceptable, primarily because of conflicts with existing and planned constructed habitat efforts. Instead, a modified version of Alternative 4 should be the preferred alternative. Further, the selection of Alternative 3 as the preferred alternative appears to be pre-decisional, both because of the criteria used to justify the decision (e.g., because it is the largest alternative) and especially because the agencies apparently are already in the 75% design phase for this alternative, even before the comment period has closed and well before the agencies have had the opportunity to review public comments.

ES-13 Impact EN-1: Pumping would require power for the duration of the Project.

This Table should distinguish between baseline power needs of all project alternatives, versus additional energy needed by those alternatives that would also pump river water for delivery to the ponds.

ES-16 Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses.

The preferred alternative directly conflicts with the stated interest of farmers near the west side of the New River delta to reclaim and farm exposed lakebed, as noted in Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use.

ES-19: 10-13 In general, those alternatives with greater acreage would have greater benefits to resources such as biological resources, aesthetics, recreation, and socioeconomics, but also would result in greater impacts on air emissions, energy demand, transportation impacts, and demand for public services.

This statement assumes that the alternatives will be fully funded and constructed to the full acreage described. This neglects funding limitations. An appropriate comparison would describe acreage that could be constructed with unencumbered funds currently existing in the Salton Sea Restoration Fund. Otherwise, any of the six alternatives could be expanded on paper to show greater benefit, even if there are not sufficient funds to construct it as designed.

ES-21: 13-31 The suggestion that Alternative 3 is superior because it is the largest is disingenuous, given that insufficient funds exist to build it as described, and given that any of the other alternatives could have as easily been expanded to be the largest such project, at least on paper. Unless the agencies mean to suggest that the proposed project is the only habitat they intend to construct at the Salton Sea, the reasoning in this referenced paragraph suggests that the agencies will only construct habitat near the New River, since the Alamo River sites have higher selenium loadings and are less geologically stable. As proof of concept, the Project should be constructed at the more challenging site, rather than attempting to test methods and practices at the least challenging site available. A modified version of Alternative 4, which offers the best test of future conditions and parameters for habitat construction at the Sea, should be the preferred alternative.

ES-21: 39-41 The Natural Resources Agency has identified Alternative 3 as the preferred alternative because it would provide greater long-term benefits by restoring the greatest amount of habitat, while minimizing environmental impacts to the extent feasible.

As noted above, this is a misleading basis for determining the preferred alternative, since insufficient funds exist to build the alternative to its designed extent, as acknowledged by the agencies themselves. Would limited funding reduce the size of each of the alternatives by the same percentage? The DEIR does not provide sufficient information to make this determination, since it does not provide general or itemized cost estimates. That is, given the Agency s own stated criterion, it is quite possible that one of the other alternatives would result in more habitat and greater long-term benefits when constructed with available funds. The DEIR should offer specific cost estimates and describe the relative benefits that may be realized with available funds, to offer a more realistic comparison between the alternatives.

1-3: 22-23 The Quantification Settlement Agreement (QSA) is one of the factors contributing to declining inflows to the Salton Sea.

This statement appears to be inconsistent with the State s own filings in the referenced QSA litigation, which generally states that the delivery of mitigation water offsets the impacts of the water transfer, so that the QSA is not one of the factors contributing to declining inflows to the Salton Sea.

1-3 fn. 1 One of those agreements, the QSA/Joint Powers Authority Creation and Funding Agreement, was invalidated on January 10, 2009 in Sacramento County Superior Court on constitutional grounds

This is wrong. On December 10, 2009, the Superior Court invalidated 12 of the 13 agreements. Note also that the QSA refers to more than just this one agreement, as noted on line 28 on this same page.

2-4: 25-28. Adequate Water Supply (this water is lost to evaporation and does not include water that is circulated in the ponds to maintain salt balance or discharged to the Sea to flush ponds)

As noted in the parenthesis above, the stated adequate water supply is in fact not an adequate water supply, which must include the volume of water flowing through the ponds. Each alternative should have a clear water budget that includes peak daily water supply requirements, showing evaporation, surface outflow, and projected inflow requirements for each pond. These water requirements must be identified to correctly size diversion and pumping infrastructure, as well as the size of release gates.

2-6: 17-20 the portion of the alternatives that included Red Hill Bay was eliminated because the United States Fish and Wildlife Service (USFWS) has plans to develop shallow water habitat in this area as part of the Sonny Bono Salton Sea National Wildlife Refuge (NWR).

Thank you for not siting alternatives at Red Hill Bay, avoiding duplication of USFWS planned habitat in that area.

2-6: 20-21 The USFWS also has a planned restoration project at the New River, and DWR and DFG are working in close coordination with NWR staff to avoid any conflicts between the two projects.

This section ignores the joint, on-going IID/USFWS effort that has re-opened a culvert linking the New River to exposed playa to the immediate east of the New River delta. This effort has re-wet exposed playa, providing hundreds of acres of valuable shorebird habitat, with the additional and notable benefit of covering playa that had contributed large amounts of dust to the area. This joint effort, and its benefits, should be clearly described in the draft document. The preferred alternative would eliminate the habitat created by the on-going IID/USFWS effort, reducing the net habitat benefit of the proposed action. The possibility that the scaled-down version of Alternative 3, due to funding limitations, may only replace the existing and planned shallow habitat east of the New River means that agencies might well spend more than $20 million to replace habitat that already exists. This would be a colossal waste of public funds.

2-11: 2.4.1.3 Berms It does not appear that geotubes are being considered for the berms, only as barriers on the outboard side of the berms. Why not?

2-17: 2.4.1.13 Saline Water Supply Pump Station Salton Sea water typically is very turbid will there be some kind of filtration or treatment associated with pumping such water into the ponds? If the pumps draw water from near the sediments, they run the risk of extracting anoxic water, possibly with high concentrations of hydrogen sulfide, posing a risk to life in the SCH ponds. In the near term, the pumps will be fouled by barnacles and other marine life. As the Sea s salinity increases, corrosion will a constant concern, requiring frequent maintenance and replacement. Have these costs been considered?

2-22: 2.4.1.25 Project Compatibility with other Potential Future Land Uses The DEIR appropriately describes compatibility with potential geothermal development, but ignores the existing and potential habitat created atop exposed playa east of the New River delta.

This section also fails to acknowledge potential reclamation of agricultural land to the west of the New River, noted elsewhere as Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use.

2-25: 42 Several permanent employees would be required to manage the ponds.

Since jobs are the catchword of the moment and a key to increasing support for the project, it would be useful to clarify the exact number of permanent employees associated with each alternative.

2-28: 36-27 The basin would be 60 acres and be excavated below ground surface to approximately 20 feet.

Is it possible to excavate 20 feet below the land surface immediately adjacent to the Salton Sea, such as shown in Figure 2-7? Why would a sedimentation basin of this size be necessary? What is the maximum daily river water requirement for the SCH ponds? There appear to be some significant errors in calculation here, leading to a staggering amount of excavation. Simply converting 60 acres at 20 feet deep yields more than 1.9 million cubic yards of material. This is clearly infeasible: strip-mining equipment, which operates at a comparable scale, would quickly sink into the soft soils near the Salton Sea. This scale of excavation is simply not feasible near the Salton Sea. Building such a deep basin near the river would also create a drain for the river itself, as well as surrounding land. Nor is it clear that there is sufficient head between such a deep hole and the nearby ponds, unless the basin were filled, which would raise the water table and interfere with adjacent farming operations. Or is the intent to line the sediment basin? If that is the case, why does it need to be so deep?

2-41: 8 River Water Source We suggest that Alternative 4 be modified to locate a river pump station immediately adjacent to the project site, as shown for Alternatives 5 & 6. This would eliminate the need for an upstream sedimentation basin and 3.5 miles of pipeline, and could be managed conjunctively with the river water source for the USFWS project at Red Hill Bay. This would also avoid the Williamson Act challenges associated with the current configuration. This modified version of Alternative 4 would be similar to Alternatives 5 & 6, but with a cascading pond and less habitat along Wister Beach.

3.2-4: 35 (and 3.2-9: 22 and other locations) With over 5,000,000 acres of harvested commodities should be With over 500,000 acres

3.3 Air Quality Do the temporary negative impacts of SCH construction outweigh the long-term beneficial impacts of reducing fugitive dust emissions? How are these countervailing impacts measured and balanced under NEPA/CEQA?

3.4-48: 22-27 The lower thermal and DO tolerances for fish may be exceeded under certain environmental conditions, but not necessarily at the same time, resulting in fish kills that reduce the population size in the ponds where this phenomenon occurs. The lower DO tolerance for some benthic invertebrate species that provide food for fish may also be exceeded at times in some locations, primarily in the deeper portions of some ponds. The duration of such events is expected to be short with rapid recovery of the fish and invertebrate populations.

The above paragraph provides insufficient information on the threat posed by poor water quality in the SCH. The survival of fish in the ponds, in sufficient numbers to provide a forage base for piscivorous birds, is the explicit goal of the project. It is fundamental to the success of the proposed project. The DEIR provides insufficient information to assess whether the project will achieve this goal. The DEIR should clearly state: 1) under what environmental conditions would lower thermal and DO tolerances for fish be exceeded, and how often this would occur; 2) under what conditions would DO tolerances for benthic invertebrates by exceeded, and how often this would occur; 3) the basis for the assertion that fish and invertebrate populations would recover rapidly.

Is this a fatal flaw in the pond design? Will periodic fluxes in DO, as well as seasonal decreases in temperature, exterminate the forage species the ponds are designed to support? If so, the project will fail to achieve its objectives and must be redesigned. The DEIR fails to provide sufficient information to answer these questions. Has water quality in the ponds been modeled as part of the pond design? It is not sufficient simply to state that The Project is designed to test various pond designs with monitoring to determine what works best to meet the Project goals and objectives (3.4-48: 31-32) if there is a reasonable suspicion that none of the pond designs will protect water quality sufficiently to maintain invertebrate and fish populations. P. 3.11-43 of the DEIR states that periods of anoxia both daily (near dawn due to respiration of all organisms present) and seasonally (especially in spring and fall) will impair the ponds, suggesting that model has in fact been constructed and run, and that more information exists than is presented on p. 3.4-48.

Although Appendix J describes a Fish Tolerance study, this study was very poorly designed and not very relevant to the proposed project. According to the description, the cold temperature tested by the Fish Tolerance study was 52-61 F (J-9: 13). However, Appendix D notes that water temperatures at the SCH are expected to fall below 50 F (D-5: 18-20). A relevant Fish Tolerance study would examine fish tolerance at a range of temperatures below 50 F. Despite this study, we still do not know the expected mortality of fish in the ponds.

The Fish Tolerance study suggests lowering the salinity of the ponds during the coldest months, to reduce stress for the fish and improve their survival rates. However, these coldest months are also the period when New and Alamo river flows are at their lowest levels. The DEIR does not appear to evaluate the availability of river flow during these months.

3.6-1: 6-9 The equipment and vehicles used during construction and maintenance would be the minimum needed to perform the required work, and fuel would not be used in a wasteful manner. Therefore, fuel consumption and electrical demand during construction is not addressed in this section.

While it s comforting to know that fuel would not be used in a wasteful manner, this is not sufficient information for the reader to determine the total energy consumption associated with construction of the proposed project. Given the very large amount of excavation and dredging associated with the described alternatives (including more than 1.9 million cubic yards of excavation just for the sediment basins), presumably a very large amount of fuel will be required, even if it is used efficiently. This section should be re-written to describe and assess the actual amounts of energy consumed for construction. In fact, Table G-1 notes that the preferred alternative would require an estimated 644,000 gallons of diesel fuel, just for on-road activities (off-road activities, such as excavation and dredging, would require additional fuel). It would be useful to include relevant information from the appendices in the analyses sections.

3.6-6: 13-15 The seawater pump would lose efficiency over time because of the hypersaline water being pumped, but would be maintained as appropriate to reduce fouling and would be replaced when needed.

Please provide estimates on how frequently the seawater pumps would need to be replaced, and the associated costs of maintenance and replacement.

Table 3.9-3 and Table 3.9-5 These two tables indicate that the construction of the preferred alternative would generate roughly twice the amount of greenhouse gas emissions of alternatives 4 or 5 (6,650 metric tons of CO_2e versus 3,400 and 3,057 metric tons of CO_2e, respectively), and that operation of the pumps for the preferred alternative would generate at least double the greenhouse gas emissions of alternatives 4 or 5, every year. That is, over a 60-year lifespan, the preferred alternative would generate at least 99,000 metric tons of CO_2e more than either alternative 4 or 5.

3.11-15: 8-10 and Table 3.11-5   This table and text includes a conversion error. At brackish and higher salinities, g/L TDS are not interchangeable with ppt TDS. The reported salinity of the Sea, at 51.8 g/L, converts to roughly 49.3 ppt, not 52 ppt. Note also that 35 g/L is not the same as 35 ppt.

3.11-25: 23-25 For the peak evaporation month (June), the reduction downstream of the diversion would range from 7 percent to 56 percent for the New River and 4 percent to 28 percent of the Alamo River flow.

Diverting more than 50% of the flow of the New River would be a significant impact, with measurable adverse effects on the riparian corridor and delta.

3.11-30: 28-30 The reduction in river flow due to the SCH Project would not adversely affect downstream water users, and this issue is not addressed further in this section. Impacts on biological resources from the reduction in flow are addressed in Section 3.4, Biological Resources.

Presumably, a >50% reduction in river flow would adversely affect downstream biological resources, both within the riparian corridor itself and in the estuary. Note that these impacts are not, in fact, addressed in Section 3.4, which instead focuses on impacts from construction and maintenance, but ignores the potentially significant adverse effects associated with a >50% reduction in river flow.

Appendix D. The spacing of the text suggests an error occurred when converting the document to a pdf, making it difficult to read. Please proofread the document before public release.

Table G-7. Note that the values listed under the CO2 column did not convert properly in the pdf   many of these are not legible.

October 16, 2011

Lanika Cervantes
U.S. Army Corps of Engineers, Los Angeles District
Regulatory Division – San Diego Field Office
ATTN: CESPL-RG-S-2010-00142-LLC
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

SUBJECT: Comments on Draft EIS/EIR, Application for Permit, Salton Sea Species Conservation Habitat (SCH) Project

Dear Ms. Cervantes,

San Diego Chapter of the Audubon Society sincerely appreciates this opportunity to review the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR), Application for Permit, Salton Sea Species Conservation Habitat (SCH) Project. We believe that the U.S. Army Corps of Engineers (ACOE) and California Natural Resources Agency (NRA) have done a fine job of preparing a conservation plan that goes to great lengths to provide for the preservation of habitat for piscivorous sea birds, so that they will continue to forage and reproduce in the area, long after the Salton Sea is no longer able to support fish, due primarily to projected increases in salinity. The impacts of the proposed project to piscivorous fish are well supported in the DEIS/DEIR; however, we believe that it falls far short in addressing impacts to shorebirds, including the Western Snow Plover (*Charadrius alexandrinus nivosus*), which was listed by the U.S. Fish and Wildlife Service as threatened in 1993 (USFWS 2011). The Western Snowy Plover and other shorebird species are directly dependent on shoreline habitats of the Salton Sea that are used as breeding habitat and also support macroinvertebrates, which presumably could also be affected by the anticipated increase in salinity and receding shoreline that would occur in any of the proposed alternatives in the DEIS/DEIR. This important wildlife resource of the Salton Sea is given very superficial treatment in the DEID/DEIR, seemingly because the six action alternatives in the SCH are all very similar in form and function and are primarily oriented toward conserving piscivorous seabird habitat. The result is that the DEIS/DEIR demonstrates positive direct, indirect, and cumulative impacts for piscivorous seabirds, while any such impacts to shorebirds are minor and were arrived at incidentally. Potentially adverse indirect impacts to shorebirds in the form of eventual lost foraging and nesting habitat and food resources appear to have been overlooked as well.

The Salton Sea is widely recognized as an important shorebird breeding and overwintering site. According to Avifauna of Salton Sea: Abundance, Distribution, and Annual Phenology (Shuford, et al. 2000):

> *Shorebird totals at the Salton Sea in some years have exceeded 100,000 individuals in both spring and fall (PRBO and R. McKernan unpubl. data). Regional comparisons indicate the Salton Sea is one of only eight sites in the interior of western North America that holds over 10,000 shorebirds in fall and*

one of five such sites in spring (PRBO unpubl. data). In terms of overall shorebird numbers, the Salton Sea is the most important area in the Intermountain and Desert region of the West in spring and the second most important, after Great Salt Lake, in fall. Shorebird populations at the Salton Sea from 1989 to 1995 averaged 24,000 in December, 90,000 in April, and about 85,000 individuals in August. Shorebird surveys in 1999 provided additional documentation for these patterns and added a total of about 70,000 shorebirds in November, a month for which prior thorough surveys were lacking. Surveys in 1999 confirmed that the Salton Sea supports the largest population of wintering Snowy Plovers in the interior of western North America (Shuford et al. 1995) and is one of a handful of key breeding areas in the interior of California (Page et al. 1991). Surveys in 1999 indicate the Imperial Valley is even more important than previously recognized for the Mountain Plover, as it held about 30% to 38% of the species' entire population of 8000 to 10,000 birds (Anonymous 1999).

The six action alternatives call for the construction of impoundments that would be supplied with brackish water from either the Alamo or New River with hypersaline water added from the Salton Sea in order to maintain an optimal range of salinity. The impoundments would be stocked with fish in order to provide forage for piscivorous birds. Islands would be constructed as colonial nesting areas for terns, and smaller islands would be constructed to serve as roosting areas for other piscivorous species such as cormorants and pelicans. These impoundments would feature deep and shallow water habitats to serve the foraging activities of a range of piscivorous bird species. No features of the impoundments were considered to provide nesting or foraging habitats for shorebirds, including the Western Snowy Plover. Although some shorebirds would undoubtedly use these habitats for roosting areas and possibly some limited foraging, the presence of large predatory birds including gulls and ravens and the lack of critical nesting attributes will not provide suitable nesting habitat for shorebirds and in particular the Western Snowy Plover, who's nesting habitat requirements are well documented. The DEIS/DEIR states in section 3.4 in Table 3.4.4 that the western snowy plover:

Nests primarily in flat open areas, with sandy or saline substrates; less commonly in salt pans, dredged spoil disposal sites, dry salt ponds, and levees. Occurs year-round at the Salton Sea (Shuford and Gardali 2008). The Programmatic Environmental Impact Report (DWR and DFG 2007) noted this species uses the Salton Sea for breeding and wintering. Surveys estimated 221 breeding adults at the Sea in 1999 (Shuford and Gardali 2008).

Likewise, foraging habitats and food resources for Western Snowy Plovers and other shorebirds in the form of macroinvertebrates were not adequately addressed. According to the *Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (Charadrius alexandrinus nivosus) Volume 1 Recovery Plan* (USFWS 2007) pp17:

Western Snowy Plovers forage on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone, in dry sand areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons. They sometimes probe for prey in the sand and pick insects from low-growing plants…Opportunities for foraging are directly dependent on salinity levels. Specifically, salt ponds of medium salinity seem to provide the best quality foraging habitat.

Regarding construction of the proposed impoundments, the DEIS/DEIR states in Section 3.4 pp37 "*Pond construction (primarily the berm on the landward side of the ponds) would cause a small loss of foraging habitat for the western snowy plover, but other foraging habitat would remain outside the Project footprint.*" While this is true for the period during and immediately following project implementation, it does not consider the eventual fate of the Salton Sea, which is expected to retreat seaward, all the while increasing in salinity. The DEIS/DEIR uses the retreating shoreline as a rationale for calling project impacts to potential foraging habitats of the Western Snowy Plover temporary, but does not address any impacts to the Western Snowy Plover once the salinity levels increase to the point that they no longer support the present assemblages of invertebrates and the inevitable loss of the lake and therefore, most of, or all shoreline habitat.

The DEIS/DEIR clearly states the projected acreages of agricultural lands covered under Williamson Act contracts that would be affected, but does not to any meaningful extent provide any estimated impacts of agricultural land conversions to any wildlife, including birds. Agricultural lands are relied upon for foraging and/or nesting by many birds species. Bird use of agricultural lands is of course dependent on the ecology of bird species as well as the crops that are grown and other management practices. Many shorebirds benefit from agricultural lands that are periodically flooded and provide macroinvertebrates. Waterfowl, especially geese benefit from tall grasses that provide nest concealment and from waste grain after harvesting. Western Meadowlarks (*Sturnella neglecta*) often nest in grass fields and Savannah Sparrows (*Passerculus sandwichensis*) commonly use these habitats during winter, particularly where there are windrows or other forms of cover.

Recommendations

The final EIS/EIR (FEIS/FEIR) should include an analysis of potential changes to nesting habitats for shorebirds at the Salton Sea. The analysis should include species that are known to nest at the Salton Sea in large numbers such as the Black-bellied Plover (*Pluvialis squatarola*), Black-necked Stilt (*Himantopus mexicanus*), and American Avocet (*Recurvirostra americana*) as well as special status species, which would include the Western Snowy Plover.

An analysis of potential changes to wintering habitats and macroinvertebrate prey should also be included in the FEIS/FEIR. It is possible that populations of wintering shorebirds could be maintained in the future by increased reliance on adjacent farmlands (which the DEIS/DEIR states will likely increase under any proposed action alternative) and duck clubs for foraging; however, that is not discussed and should be included in the FEIS/FEIR. Impacts to other bird species that would result from the No Action Alternative as well as the alternatives that would affect the acreages and composition of farmlands should be analyzed and discussed in greater detail as well.

New alternatives should be developed if none of the existing alternatives are determined to provide either "no impact" or beneficial impacts to the nesting and foraging activities of resident and overwintering shorebirds.

As a suggestion, if the SCH needs to be amended, the creation of a mix of shorebird habitats, including mudflats, permanent sandy shore, shallow water, and saltpans supporting healthy populations of invertebrate prey species would be highly beneficial for the wide range of shorebird species that depend on the Salton Sea for nesting and foraging. Care should be taken to ensure that any created shorebird nesting habitats are not near perches or roosting areas for predatory birds such as gulls, crows, ravens, and raptors and that if at all possible, they are either protected from, or offer concealment from terrestrial predators such as coyotes, foxes, skunks, and raccoons.

We would like to reemphasize San Diego Audubon's deep appreciation for your efforts to conserve the habitats of the Salton Sea and our willingness to provide assistance in that effort.

Sincerely,

Joe Thompson

Conservation Committee Member

James A. Peugh

Conservation Chair

ENERGY SOURCE
Delivering Renewable Energy

October 17, 2011

Mr. David Elms, DFG Project manager
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Re: Salton Sea Species Conservation Habitat Project

Dear Mr. Elms:

The purpose of this letter is to comment on the Draft Environmental Impact Statement/Report (DEIS/R) for the Salton Sea Conservation Habitat (SCH) Project.

Having been involved with many projects at the Salton Sea over the last 35+ years there is one truism I that I find to be absolute and that is; anytime a map(s) is made such as in the case of shallow habitat at the Alamo River-Morton Bay, it will be adopted by those opposed to any energy development (solar or geothermal) in the area. The writers of this DEIS/R document will point to the various sections that this site is the premier, undeveloped geothermal resource in California and geothermal development can be compatible with SCH. Not one map or exhibit shows the 4000 to 5000 acres of potential geothermal resource development. The Resources Agency recognized the geothermal potential by reserving out this area from the development of habitat.

We suggest that all early start habitat projects be conducted in the area of the New River, giving the area of the Alamo River a chance for geothermal development without the conflict of moving the proposed habitat. This would help to meet the State's goal of 30% renewable energy.

Sincerely,

Larry L Grogan
Senior Vice President, Resource and Development

321 S. Waterman • Suite 200 • El Centro, CA 92243 • *Telephone* 760.312.8000 • *Facsimile* 760.312.8059
www.energysource.us.com

Nancy Dorfman

From: Lorraine Woodman
Sent: Tuesday, November 29, 2011 1:54 PM
To: Nancy Dorfman
Subject: FW: New SCH EIS-EIR comment from Kim Delfino

Lorraine Woodman, Ph.D.
Senior Consultant / Environmental Planning Cardno ENTRIX
201 North Calle Cesar Chavez, Suite 203, Santa Barbara, CA 93103
Phone: 805 962 7679   Direct: 805 963 0468   Mobile: 805 284 1878   Fax: 805 963 0412

-----Original Message-----
From: DO NOT REPLY [mailto:noreply@cardno.com]
Sent: Monday, October 17, 2011 9:53 PM
To: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Kim Delfino

Kim Delfino has entered a comment.Contact Information:
E-Mail: kdelfino@defenders.org
Affiliation: Defenders of Wildlife
Mailing Address:
1303 J Street, Suite 270

Sacramento, CA 95814

Attachments:
Comment:

October 17, 2011

Via Electronic Mail (Hard Copy in the Mail)

Lanika Cervantes
U.S. Army Corps of Engineers, Los Angeles District Regulatory Division   San Diego Field Office
ATTN: CESPL-RG-S-2010-00142-LLC
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

David Elms
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Re: Salton Sea Species Conservation Habitat Project Draft EIS/EIR
Public Notice CESPL-RG-S-2010-00142-LLC
State Clearinghouse No. 2010061062

Dear Ms. Cervantes and Mr. Elms:

On behalf of Defenders of Wildlife and our more than 140,000 members and supporters in California, I am writing to provide comments on the propose Salton Sea Species Conservation Habitat Project Draft Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) (hereinafter referred to as Salton Sea SCHP). In addition to these comments, Defenders joins in the more detailed and comprehensive comments submitted by the Pacific Institute on October 14, 2011.

Defenders has been engaged in Salton Sea efforts for more than 8 years and served as a member of the California Resources Agency s Salton Sea Advisory Committee and has provided extensive comments and recommendation on the California Natural Resources Agency s Salton Sea Ecosystem Restoration Program Programmatic EIR. As part of that document, we endorsed Period 1 activities, including the development and construction of shallow pond habitat complexes known in the document as early start habitat.

The current proposed Salton Sea SCHP is the most recent version of this early start habitat and is long overdue given current conditions at the Salton Sea.

1. The DEIR provides insufficient information about the project.

As mentioned above, Defenders strongly supports the construction of shallow pond habitat around the Salton Sea. Unfortunately, the DEIR provides insufficient information for us to determine whether the proposed project will work as intended. First, there is no information or certainty that the state has the legal right to divert any amount of water from the New or Alamo Rivers for this project. Second, the DEIR provides little information to show that the proposed project will produce fish in sufficient numbers to provide an adequate forage base for piscivorous birds the project s stated purpose. For example, there is nothing in the description of the alternatives, the subsequent environmental analyses, or any of the appendices that provides information on projected fish production rates or harvest rates. Section 3.4 states that fish and invertebrates may suffer from seasonal or even daily mortality, due to low concentrations of dissolved oxygen (DO) and low temperatures, but does not offer any estimates of the magnitude of these mortality events or describe how this periodic mortality will affect the overall ability of the project to meet its goals.

Third, the DEIR neglects to provide any information on costs. How much would it cost to construct each alternative? What are the projected annual operations & maintenance costs of each alternative? How much money is currently available? What additional funds might be obtained? Can the alternatives be scaled back, if full funding is not available? How will this affect the adverse and beneficial impacts analyses? Given the fact that the state agencies have used up more than half of the bond funds for Salton Sea Restoration and the state has no funding plan in place for how to deal with its current mitigation obligations at the Sea, the issue of how any project is going to be funded is critical. Any final project should be designed to be built and operated on existing funds with the ability to be expanded if new funding is secured. Currently, that does not appear to be one of the criteria for this project.

2. The Preferred Alternative is flawed.

As noted above, given that no water has been secured to operate this habitat project, determining the correct amount of water necessary to run this project is critical. According to the DEIR, the preferred alternative could divert more than 50% of the total historic flow of the New River during June, the peak evaporation month. Aside from the fact that future New River flows will be significantly lower in the future, due to water transfers and water conservation efforts in the Imperial Valley and further reductions in flows from Mexico, diverting more than half of the river s flow raises many questions. In addition to the immediate environmental impacts (to the river and riparian corridor downstream and to the estuary formed at the river s mouth), this diversion suggests that a maximum of 7,000 acres of shallow habitat could be constructed near the New River, and perhaps 10,000 acres near the Alamo River, given the volume of water available during June. If this is accurate, what does it say about long-term mitigation strategies for the Salton Sea? Would it be permissible to divert the entire flow of the New River to deliver water to constructed habitat? Or does the preferred alternative represent, in effect, the maximum amount of constructed habitat feasible near the New River?

Furthermore, the selection of Alternative 3 as the preferred alternative appears to be pre-decisional, both because of the criteria used to justify the decision (e.g., because it is the largest alternative) and especially because the agencies apparently are already in the 75% design phase for this alternative as opposed to the other alternatives, even before the comment period has closed and well before the agencies have had the opportunity to review public comments.

For the reasons described above and more fully in the comment letter submitted by the Pacific Institute, the preferred alternative is flawed. Instead, a modified version of Alternative 4 should be considered as the preferred alternative as it offers the best opportunity to test future conditions and parameters for habitat construction at the Salton Sea.

Thank you for the opportunity to provide comments to you on this important project. If you have any further questions, please do not hesitate to contact me at (916) 313-5800 ex. 109.

Sincerely,

Kim Delfino
California Program Director

CENTER for BIOLOGICAL DIVERSITY

VIA ELECTRONIC SUBMISSION

October 17, 2011

Lanika Cervantes
U.S. Army Corps of Engineers, Los Angeles District
Regulatory Division – San Diego Field Office
ATTN: CESPL-RG-S-2010-00142-LLC
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

David Elms
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

Submitted electronically at http://saltonsea.entrix.com/

Re: Salton Sea Species Conservation Habitat Project Draft EIS/EIR, Public Notice CESPL-RG-S-2010-00142-LLC, State Clearinghouse No. 2010061062

Dear Ms. Cervantes and Mr. Elms:

These comments on the Salton Sea Species Conservation Habitat Project Draft EIS/EIR, Public Notice CESPL-RG-S-2010-00142-LLC, State Clearinghouse No. 2010061062 are submitted on behalf of the Center for Biological Diversity (the "Center").

The Center is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. These comments are submitted on behalf of the Center's 320,000 staff, members and online activists throughout California and the western United States many of whom live in southern California and who are concerned with the conservation of the many imperiled, rare, and special status species that depend on the Salton Sea habitat for survival.

The Center joins with and incorporates by reference herein the comments provided by Defenders of Wildlife and the Pacific Institute regarding the proposed project.

The Center supports the overall goals of the proposal to begin the process of habitat restoration in the Salton Sea and specifically to provide early start shallow pond habitat in key areas. However, we are concerned that the DEIS/EIR fails to fully explore the impacts of the proposed project on existing habitat and species and fails to examine how the overall goals of the proposal can best be accomplished through a robust alternatives analysis.

Arizona • California • Nevada • New Mexico • Alaska • Oregon • Montana • Illinois • Minnesota • Vermont • Washington, DC

Lisa T. Belenky •Senior Attorney • 351 California St., Suite 600 •San Francisco, CA 94104
tel: (415) 436.9682 ext. 307 *fax:* (415) 436.9683 lbelenky@biologicaldiversity.org *www.BiologicalDiversity.org*

For example, the environmental review documents fail to explain how critical water resources will be obtained and the status of funding for the proposed project to ensure it will be completed and have the best chance to provide the needed conservation. Because the proposal is envisioned as part of a series of likely future restoration projects in the Salton Sea, it is critical to ensure that the design reflects that fact and that sufficient monitoring and data collection regarding the effect of the project is also funded so that information can be used to inform future proposals.

While the focus of the proposed project on restoring habitat for some species may be reasonable, that does not however excuse the DEIS/EIR from failing to fully explain the potential impacts of the proposed project on other species and habitats particularly from the proposed changes in water diversions. The environmental documents also fail to clearly define the goals for the proposed project in the context of an unstable baseline and historic condition as well as the likely future conditions at the Salton Sea. Given the complexity of the problem, the Center supports the development of innovative proposals to meet the short-term and long-term goals for conservation and restoration of habitat in the Salton Sea and the Center also recognizes that implementation of well designed conservation and restoration projects for the Salton Sea habitats are essential for the many species that depend on the sea for their survival.

Thank you for the opportunity to provide comments on the DEIS/EIR for the proposed species conservation habitat project. The Center looks forward to reviewing revised environmental documents for this proposal.

Sincerely,

Lisa T. Belenky, Senior Attorney
Center for Biological Diversity
351 California St., Suite 600
San Francisco, CA 94104
(415) 436-9682 x307
lbelenky@biologicaldiversity.org

Individuals

Nancy Dorfman

From: Lorraine Woodman
Sent: Tuesday, November 29, 2011 1:50 PM
To: Nancy Dorfman
Subject: FW: New SCH EIS-EIR comment from Paul Wertlake MD

Lorraine Woodman, Ph.D.
Senior Consultant / Environmental Planning Cardno ENTRIX
201 North Calle Cesar Chavez, Suite 203, Santa Barbara, CA 93103
Phone: 805 962 7679   Direct: 805 963 0468   Mobile: 805 284 1878   Fax: 805 963 0412

-----Original Message-----
From: DO NOT REPLY [mailto:noreply@cardno.com]
Sent: Thursday, September 01, 2011 9:34 AM
To: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Paul Wertlake MD

Paul Wertlake MD has entered a comment.Contact Information:
E-Mail: pwertlake@verizon.net
Affiliation: Vistas By Paul
Mailing Address:
79-190 Liga St

La Quinta, CA 92253

Attachments:
Comment:
Page 1, Line 1

This is a simple statement by an interested and concerned person living in the Coachella Valley. An agreed plan, ONE, must be adopted. I believe it must be made a mandatory bench mark although exceedingly difficult to reach due to the diverse factors and views. The many differing views that have been proposed publicly lead to a division of effort, focus, interest and intent. Absent a single cohesive message and plan I fear failure.

Lorraine Woodman

From:	Nelson, Kent [knelson@water.ca.gov]
Sent:	Thursday, October 20, 2011 10:37 AM
To:	Lorraine Woodman
Subject:	FW: Salton Sea

A comment on the SCH DEIS/R

Kent Nelson
Program Manager
Salton Sea Restoration Program
CA Department of Water Resources
916.653.9190
knelson@water.ca.gov

-----Original Message-----
From: Stephen Boland [mailto:sboland2@san.rr.com]
Sent: Monday, September 05, 2011 9:53 PM
To: Salton Sea
Subject: Salton Sea

Boland-1

Maybe you could make a canal from the Colorado river into and out of the Salton Sea to bring in fresh water and control the level of the water for wildlife habitat. It would be a more long term solution.
Sincerely
Steve Boland

Ryan-1

"The Coolest Place to Stay in Josh

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P.O. Box 1092,
Joshua Tree, CA 92252
760-366-9124
www.deserthideaway.com

How disheartening to read the report sent to us re: the Salton Sea VS the Army Corps of Engineers; i.e. page 3 - "the Corps will evaluate impacts on the environment" - fox in the hen house here! This group of creates environmental disasters: Immediately come to mind - Idaho TETON dam, Miss. levees in N.O. LA. Spare us this group! M. Ryan

David Elmo
78 078 Country Club Dr.
Suite 109
Bermuda Dunes
Ca. 92203

James H. Eric Freedner
11157 Leadwell Street
Sun Valley, CA 91352
(818) 982-2174 or (310) 553-8533
JHFreedner@yahoo.com

September 8, 2011

RECEIVED
SEP 13 2011
REGULATORY BRANCH
CARLSBAD FIELD OFFICE

Lanika Cervantes
U. S. Army Corps of Engineers – Los Angeles District
Regulatory Division – Carlsbad Field Office
Attn.: CESPL-RG-S-2010-00142-LLC
6010 Hidden Valley Road, #105
Carlsbad, CA 92011

Re: Application No.: SPL-2010-00142-LLC
My Parcel No.: 020-040-077-000

Dear Sirs:

I own the above-referenced real property located approximately one half mile due west of the spillway of Canal S, vicinity of Niland, per the old shore line of 1964. My property is within the proposed Alamo River alternative portion of this project.

To the extent that any waters would be added to or diverted into the Salton Sea from natural rivers or artificially-created ponds onto or over my property, I oppose the proposal and its draft environmental impact report. It appears from the plan that a greater volume of water may permanently be diverted onto my property. The EIR has not addressed the subject of impacted private land ownership in the Alamo River project. The change to my property would not be merely an "economic" one ("changing land values"), but would be a "taking" of my land without reasonable compensation therefore, in violation of the State and Federal Constitutions. Freedner-1

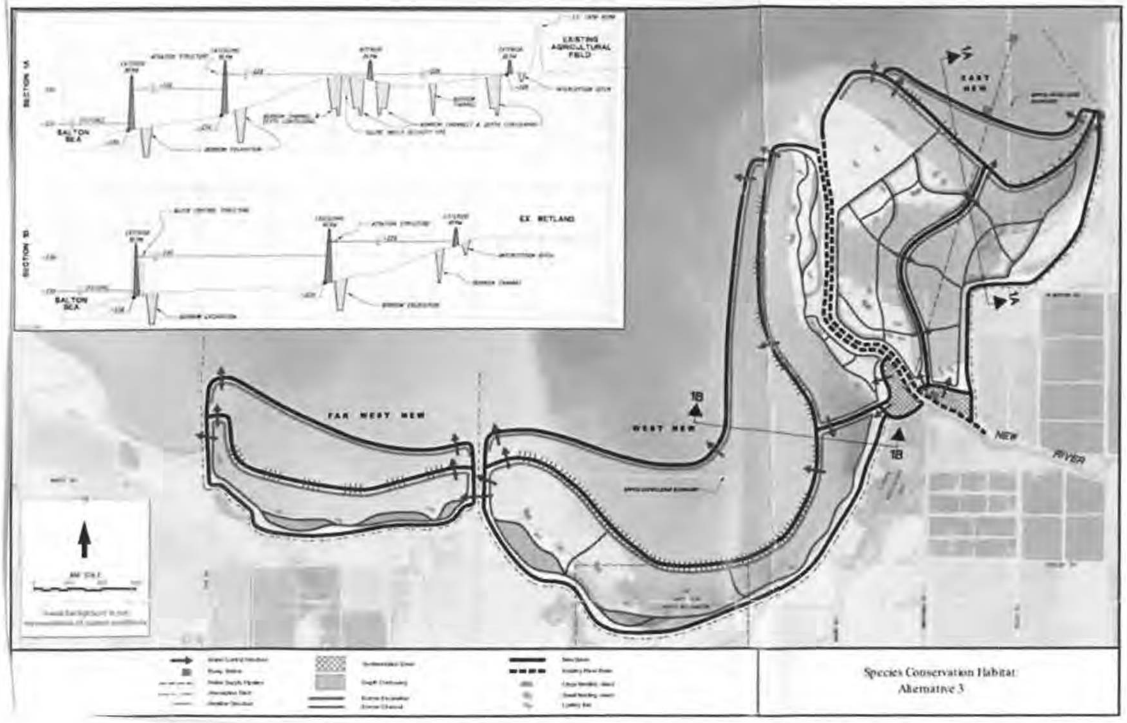
As a separate concern with this project, creating fresh-water lakes and stocking them with fish would not resolve the problem of migratory birds coming into contact with saline and polluted waters of the Salton Sea itself, as they would not necessarily remain in the fresh-water ponds but would roam over the Sea. The fresh-water ponds would quickly be fouled with feathers and excrement and become themselves polluted. A similar attempt to provide refuge for birds was put into place near Malibu Surfrider Beach here in Los Angeles County. As a result, the bacteria content of the public beach increased to the point where Surfrider Beach received an "F" grade on numerous occasions as to water safety. Here, while there is apparently no swimming taking place in the Salton Sea, the added bacterial content and conveyance of foul waters would diminish from the quality and value of the Sea. Freedner-2

It would better serve the area to let the Sea dry up in the due course of nature. You are requested to enter this protest and comments into the official record on the Draft EIS/EIR, and you may copy and disseminate it as you see fit. Should you wish to contact me, I may be reached at the above address. Freedner-3

Very truly yours,

James Eric Freedner

James Eric Freedner



This is the best one!

Alternative 3 – New River, Pumped Diversion + Cascading Ponds: 3,770 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped diversion of river water, and independent ponds extended to include Far West New and cascading pond units. This is the Natural Resources Agency's preferred alternative.

Sept. 1, 2011
Thursday

Salton Sea
Dept. of Fish and Games
78-078 Country Club Drive
Suite 109
Bermuda Dunes, CA, 92203
92203

Dear Sirs:

I received your Six Project alternatives in your Draft EIS/EIR.

Niswander-1

After studying them, I really can find no reason not to accept the alternative 3, which is the prefered alternative of The Natural Resources Agency. It seems to be the best one! Thank you for sending me the alternatives.

Most Sincerely,
M. Ruth Niswander

M. Ruth
Mrs. Niswander
622 Barbera Pl
Davis, CA 95616

Nancy Dorfman

From:	Lorraine Woodman
Sent:	Tuesday, November 29, 2011 1:50 PM
To:	Nancy Dorfman
Subject:	FW: New SCH EIS-EIR comment from Chris Cockroft

Lorraine Woodman, Ph.D.
Senior Consultant / Environmental Planning Cardno ENTRIX
201 North Calle Cesar Chavez, Suite 203, Santa Barbara, CA 93103
Phone: 805 962 7679   Direct: 805 963 0468   Mobile: 805 284 1878   Fax: 805 963 0412

-----Original Message-----
From: DO NOT REPLY [mailto:noreply@cardno.com]
Sent: Saturday, September 17, 2011 9:44 AM
To: Lorraine Woodman; Sarah Bumby; Rob Wurgler; Robert M. Wood
Subject: New SCH EIS-EIR comment from Chris Cockroft

Chris Cockroft has entered a comment.Contact Information:
E-Mail: chris@cockroft.org
Affiliation:
Mailing Address:
1020 Palm Ave. South Pasadena, California
22925 Rudderow Lane
Sky Valley, California 91030

Attachments:
Comment:
The Dept held one meeting several years ago on the plan to restore the Salton Sea. It flopped and no money was appropriated by the Legislature.

Last year (june 2010) after the QSA was voided by Judge Roland Candee two very junior reps came to Palm Desert and gave an extremely vague presentation with no stenographer, (no comments were recorded) and no period for comment by the audience.

This time, we--the residents of the valley in which the Sea exits--were handed this project as a "proof of concept" for restoration of the Sea.

The California Legislature intended to restore the Sea, fix it, as it were. It envisioned an 8 billion dollar project.
The idea went nowhere because it was deeply flawed.

Now you are calling this a proof of concept, as though it will lead to many other similar projects.

This project does nothing for brown pelican, Yuma clapper rail, desert pupfish, peregrine falcon, and bald eagle--all endangered and protected species that must be protected.

Change the name of your project. Don't call it a proof of concept because it isn't.

It establishes a few ponds to mitigate the problem.

September 20, 2011

Mr. Kent Nelson
Program Manager,
Salton Sea Ecosystem Restoration Program
California Department of Water Resources
PO Box 942836
Sacramento, CA 94283

Dear Mr. Nelson:

You are a person of vision and I hope that you will approve of my attached plan for saving the Salton Sea. Feliz-1

Perhaps you may present this plan to the appropriate authorities and encourage its accomplishment.

Sincerely,

Jack M. Feliz

Jack M. Feliz
2110 Southridge Drive
Palm Springs, CA 92264

760/328-3860

One of the principal merits of this plan to save a dying Salton Sea and restore the Sea to its original level can be accomplished at <u>**NO COST**</u> to the general public or government entities.

First, you must get permission from the Mexican government to lay a pipeline from the Sea of Cortez through their country and then terminating at the Salton Sea.

Second, you should request an opinion from the US Army Corps of Engineers regarding the largest wattage output from a turbo electric generator that can be produced from the 228 foot seawater column. And also what is the recommended diameter of the proposed pipeline that will supply water from the Sea of Cortez. And further, what would be the estimated dollars per year output from the above selected turbine electric generator? (Please recommend a reliable manufacturer of the selected turbine electric generator and its approximate cost.)

Third, you should get at least three pipeline companies to bid on the cost to build the pipeline and the time to complete the project.

Fourth, you would need to obtain financing with a 30-year payback period. The funds to pay back the loan would come from the sale of electricity generated from the turbo electric generator attached to the discharge end of the pipeline.

Fifth, after concluding a contract with the Southern California Edison Company, the electricity generated will pass through an electric meter thence into the Southern California Edison electric grid. A meter reader will read the meter each month and Southern California Edison Company will send a check for the electricity received each month to the loan company to pay down the loan.

It is imperative that the loan be paid off <u>before</u> the Salton Sea reaches its maximum desired level.

The following are some of the features that should be considered in developing the pipeline. The pipeline will be approximately 178 miles long. The pipe should be made of steel. The interior of the pipe should be coated with a cement slurry or a petroleum base as rust inhibitors. Each joint should be electric welded. After each joint is welded one of the above rust inhibitors should be applied to the interior of each joint. When the maximum Salton Sea level is reached, the pipeline flow may be stopped by closing the discharge valve on the end of the pipeline. The system can be started periodically to replenish the Salton Sea due to water loss from evaporation and seeping into the surrounding soil. Where the pipeline crosses a road or a stock trail, the pipeline should be buried below the surface of the road or trail.

A suitable pier should be installed at each end of the pipeline. A steel flange shall be welded at each end of the pipeline. The flange shall be provided with bolt holes to match the holes in the bronze gate valve to be installed at each end of the pipeline. An air vent valve shall be bolted to a pipe riser which is welded over a hole cut in the inlet pipe near the inlet valve. This air vent valve permits the air to escape as the pipeline is filled with water. A combination vacuum and pressure gauge is connected to the air vent riser.

Three double sets of screens shall be installed in front of the inlet bronze gate valve and to each side of the inlet gate valve; to filter out seashells, barnacles, kelp, dead fish and birds, and to prevent a careless human from being sucked into the pipeline. The double screens permit the removal of the outer screen for periodic cleaning. A couple of Nationals should be hired to do the cleaning. Provide them with wire brushes and a shaded shelter where they can remove the debris. The second screen provides security to prevent any unwanted articles from entering the pipeline while the front screens are being cleaned.

The bottom of the screened cube hereinafter called the cube shall have a brass sheet secured to the bottom of the cube to prevent rocks and sand from being sucked into the pipeline. The top of the cube shall have several crossbars secured thereon to support a quarter inch brass plate and the weight of a man as he changes the screens. The cube shall have a bracket welded on each side with two bolt holes to match the holes in the inlet valve for bolting the cube to the inlet valve.

A steel faceplate shall be provided with bolt holes to match the inlet valve holes and bolted to the inlet valve. The faceplate shall have two angle irons welded thereon to support the electric pump motor to keep the motor above high tide. The bolts and nuts shall be made of brass.

Rent an electric motor driven pump which will be bolted to the faceplate. Cut a hole in the faceplate large enough to permit water to pass from the pump into the pipeline. Rent a diesel driven engine connected to an electric generator mounted on a trailer or mounted on a flatbed truck. The generator should be stationed near the inlet valve with electrical wires connected to the motor driven pump. At the discharge end of the pipeline at the Salton Sea a bronze gate valve is bolted to the flange on the outlet end of the pipeline. A turbine driven electric generator is bolted to the discharge side of the bronze gate valve.

In order to compensate for the expansion and contraction of the pipeline, at least one expansion joint and possibly more should be installed in the pipeline. A pressure gauge shall be installed on the last section of the pipeline near the discharge valve.

The Salton Sea is 228 feet below the Sea of Cortez. By opening the discharge valve located on the Salton Sea end of the pipeline, the escaping water will create a vacuum in the pipeline. In addition, the atmospheric pressure on the Sea adjacent to the inlet valve will help to cause a siphon effect in the pipeline and will suck in the water from the Sea of Cortez and will flow indefinitely without any further assistance.

In view of the high tidal fluctuations at the Sea of Cortez it may be prudent to dredge a channel up to the inlet valve to insure an adequate supply of water at all times. If you lose suction due to low water, you would have to refill the pipeline again using the same method of filling the pipeline as the first filling. It is recommended that a scuba diver be hired to install and remove the bolts from the faceplate which will be under the surface of the water.

The subject water column will provide a very strong force to drive the turbo electric generator at the same time the discharged water will raise the level of the Salton Sea, which is the primary reason for installing this system. There are a few preliminary tasks to accomplish before you can start up this system.

First, the cubed screen shall be bolted to the inlet valve.

Second, the discharge valve at the Salton Sea must be closed and the inlet valve must be open. Next the diesel driven generator is started up and the water pump is also started, pumping water into the pipeline. The air vent valve should be opened to allow the air to escape as the water displaces the air in the pipeline. It will take several days to fill the pipeline. When the pipeline is filled, close the inlet valve and air vent valves.

Remove the faceplate with assistance from a scuba diver. The rental equipment can be returned to the rental agency. The faceplate and bolts are sent to a storage shed near the discharge valve for possible future use.

In order to start the system operating, communicate with the valve operator of the discharge valve at the Salton Sea. Tell him to open his discharge valve. Shortly thereafter a vacuum should show on the vacuum gauge, and then you should start opening the inlet valve until it is fully opened.

PRESTO! You start producing electricity for sale to pay off the loan and filling up the Salton Sea at the same time. I don't believe that it will likely get much better than that.

Jack M. Feliz

Jack M. Feliz
2110 Southridge Drive
Palm Springs, CA 92264
760/328-3860

October 7, 2011

Ms. Lanika Cervantes, Corps Project Manager
U.S. Army Corps of Engineers, Los Angeles District

And

Mr. David Elms, CDFG Project Manager
California Department of Fish and Game

REF: PUBLIC COMMENTS BY JEFF GERACI ON THE SALTON SEA SPECIES HABITAT CONSERVATION PROJECT (SHCP), DRAFT EIR

My name is Jeff Geraci, I am a resident of Cathedral City, California, and I am also an environmental scientist. I have reviewed the proposed environmental impact report (EIR) for the Salton Sea Species Habitat Conservation Project Draft EIR, and I have some concerns pertaining to the local barnacle population, *Balanus Amphitrite Saltonensis,* which is a sub-species of *B. Amphitrite Amphitrite*. These comments are in addition to those comments I made in person at the public meeting held on September 15, 2011 at the UC Riverside campus in Palm Desert, California.

B. Amphitrite Saltonensis was first described a sub-species in 1949 by F.L. Rogers and later retained as valid by Henry & McLaughlin in 1975. In 1992, P.T. Raimondi reaffirmed this statement after detecting differences in larval morphology and development. This unique sub-species of *B. Amphitrite Saltonensis* exists nowhere else in the world but at the Salton Sea, which leaves me baffled as to why there is no mention of preserving, protecting, or otherwise assessing the potential impacts on this isolated and unique sub-species of barnacle.

Barnacles are filter feeders, and in high densities they can have a positive impact on water quality and water clarity, as well as the Salton Sea's food web. Barnacle colonies provide critical habitat for a variety of other benthic organisms that comprise the base of the Salton Sea's food web. As I stated, in reviewing the EIR for this project, I found that there is no mention of *B. Amphitrite Saltonensis* in the CEQA section of potential impacts; the only mention of this barnacle that I found in the EIR is in the context of shoreline composition (i.e. dead barnacle shells) and salinity. This concerns me very much, because the survival of this barnacle population will be significantly threatened by the current design of this project, as will other vital organisms found in and around the Salton Sea, yet *B. Amphitrite Saltonensis* has apparently been overlooked. I have attached my comments to this letter, for a total of 3 pages including this page. Thank you.

Jeff B. Geraci
69444 Shawnee Ct
Cathedral City, CA 92234
jeffgeraci@aol.com

Specifically, my concerns are:

I. Chemical composition and hydrodynamics (SHCP appendix J**)**

This concern applies to all aquatic organisms found within the Salton Sea, not just the barnacle population. As noted, this project is to be implemented in phases, and the initial phase of the project will create a relatively small waterbody as habitat, in comparison to the size of the current sea. This could present significant problems for the biota, since the response of small waterbodies to environmental stressors (e.g. pollution, temperature distribution, nutrient loading, oxygen depletion) is much faster and more severe than with larger waterbodies. With larger waterbodies, the changes are more gradual, there is more potential for dilution and dispersal, and in some cases organisms can flee to a more suitable area within the waterbody- that is not possible within a smaller waterbody such as with the proposed project design.

In addition, the change in hydrodynamics will be perhaps one of the most significant impacts of the project as a whole. The hydrodynamics of water movement within the proposed initial phase will result in enormous impacts based on the morphometry of the basin, its stratification structure, and the reduced amount of surface area exposed to the wind.

Finally, suspended silts and sediments are often deadly to barnacle populations, interfering with propagation, respiration, settlement of cyprids and filter feeding. Construction and maintenance of the berms, as proposed, will have a very significant short and long term impact on barnacle colonies in terms of excessive suspended silt and sediment, and these impacts must be mitigated.

The initial phase of the project, as proposed, is insufficient in size. There must be substantial acreage added to the initial phase, as well as additional acreage designated for deep water habitat that will allow fauna to escape hostile conditions and will facilitate dilution, flow, and distribution of temperature. Deep water habitat is also crucial for maintaining much needed diversity in such a small ecosystem. There must be a substantial increase in the total volume of water of the initial phase, and the barnacle populations must be protected from the highly turbid water that would result from berm construction and maintenance.

II. A lack of suitable substrate

Barnacles require suitable substrate for settlement, which includes hard or otherwise rigid materials, preferably in close proximity to the waters surface where there is plentiful oxygen exchange and water movement. Note also that once a barnacle is settled, that settlement is permanent and it is impossible for the organism to detach and migrate should environmental conditions become unsuitable. Having said that, there is nothing noted in the EIR that suggests there will be suitable substrate for the barnacle population to even exist, let alone thrive. It is not a valid argument to assume that the barnacles will simply “find a way” to survive, given that they are sometimes considered a “nuisance” or “bio-fouling” organism; that is not good science and it is not an acceptable form of mitigation under CEQA.

Mitigation measures must be implemented to ensure the survival and continuation of the sub-species *B. Amphitrite Saltonensis.*

Mitigation measures must be proposed for creating suitable artificial substrate within the project, beginning with the initial phase. This substrate should be strategically located at specific depths to ensure both optimal oxygen levels and flow rates for feeding and settling. Substrate could take the form of quarried rocks situated on the proposed berms as rip-rap, or as partially submerged rock formations on the shoreline, provided the threat of high suspended solids is mitigated as well.

III. Consequential impact on other species

Impacts to the Salton Sea's barnacle population could have serious detrimental repercussions on other sea life, and therefore, those impacts must be adequately mitigated under CEQA. Barnacle colonies within the Salton Sea can be considered an "umbrella" species that provides habitat not just for itself but for other benthic fauna as well. For example, the native pileworm (*Neanthes Succinea*) is a vital food staple for fish, and for both the native bird population and seasonal birds who migrate along the pacific flyway (some of which are listed in the ESA). Barnacle colonies provide ideal habitat for many benthic organisms including pileworms, amphipods, ostracods, etc., offering both shelter and a renewable food source. Salton sea barnacle colonies host a diverse community of benthic organisms whose symbiotic relationship with other Salton Sea organisms must be protected and preserved.

There is the need to incorporate mitigation measures into the SHCP project to preserve and protect the *B. Amphitrite Saltonensis* population, including but not limited to, incorporating suitable artificial substrate and re-designing the water basins to optimize the hydrodynamics of the proposed basins.

IV. Unique Sub-species requires preservation

As I mentioned above, this sub-species of barnacle (*B. Amphitrite Saltonensis)* was first described a sub-species in 1949 by F.L. Rogers and later retained as valid by Henry & McLaughlin in 1975. In 1992, P.T. Raimondi reaffirmed this statement after detecting differences in larval morphology and development when comparing to *B. Amphitrite Amphitrite*. This unique sub-species of *B. Amphitrite Saltonensis* exists nowhere else in the world but at the Salton Sea, and without adequate mitigation, the public could lose this unique and valuable resource.

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OCT 20 2011
DEPARTMENT OF FISH & GAME
STATE OF CALIFORNIA

SALTON SEA SPECIES CONSERVATION HABITAT PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT/REPORT

Your Comments Please

Name: DON HEDGEPETH
Address: 71757 MAGNESIA FALLS DR. RANCHO MIRAGE CA 92270
Date: 10/9/11 **Email:** RED63 AVANTI @ VERIZON.NET

Comments: I THINK ALTERNATIVE 3 IS THE BEST OF THE ~~FOUR~~ SIX ALTERNATIVES

THANK YOU FOR HOLDING THE MEETING IN PALM DESERT ON SEPT 15, 2011

Hedgepeth -1

This form may be used to submit comments at today's meeting or by mailing to:

Ms. Lanika Cervantes, Corps Project Manager
U.S. Army Corps of Engineers
Los Angeles District, Regulatory Division
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011

OR

Mr. David Elms, DFG Project Manager
California Department of Fish and Game
78078 Country Club Drive, Suite 109
Bermuda Dunes, CA 92203

To submit written comments after today's meeting, please use the electronic comment form found on the Department of Water Resources' Salton Sea website: http://www.water.ca.gov/saltonsea/ Click on 'DEIS/EIR Comment Form'

Comments Need to be Received by October 17, 2011

Public Hearing Transcripts

Transcript of Proceedings

Salton Sea Species Conservation Habitat Project

Draft Environmental Impact Study/

Environmental Impact Report

Wednesday, September 14, 2011

1:00 p.m.

Calipatria Inn and Suites

700 North Sorenson Avenue

Calipatria, California

Reported By:

Terri L. Emery

CSR No. 11598

A P P E A R A N C E S

MODERATOR:

Rick Davis, The Davis Group

SPEAKER PANEL:

Kent Nelson, Department of Water Resources

Lorraine Woodman, Entrix

Lanika Cervantes, U.S. Army Corps of Engineers

David Elms, California Department of Fish and Game

Vince Thompson, Ducks Unlimited

MR. MORGAN: Mike Morgan. I'm an adjacent farmer to the preferred project being part of the State's PEIR previous process on the Salton Sea. One question I would have, have you and this project affirmed and created a right of water for the use in this project? As you know, the New River is claimed by Metropolitan Water District and possibly the IID.

MR. DAVIS: We'll get to the -- we can do Q and A. For now if you want to make that as a comment that you're concerned about whether there's a water right.

MR. NELSON: So for instance --

MR. MORGAN: So how do you comment if you can't get a question answered?

MR. NELSON: So your comment would be it's important that the State consider either obtaining or addressing a water right in order to secure the long-term operation of the pond.

MR. MORGAN: I think part of an EIR you have to have a -- if you're planning to use water in a project, you have to have it -- you have to obtain -- you have to own it. You have to be able to secure it. You can't just take it. And so I just didn't know if that was addressed yet in this project.

MR. NELSON: It is. It's in the document. I don't know, Lorraine, if you want to speak to where we talked about that.

MS. WOODMAN: It's discussed in the project description and perhaps in the hydrology section too.

MR. THOMPSON: Hydrology and water quality section. There's a detailed discussion in the hydrology and water quality section of the document that talks about the water rights, Metropolitan's water right, application and what the -- and the use of water that's proposed by this project.

MS. WOODMAN: It's also the cumulative impacts.

MR. MORGAN: Would the project be using Metropolitan's claimed water right than affirming their water right by putting it to beneficial use or would it be using someone else's right?

MR. NELSON: Again, I know everybody has a strong urge to want to get questions answered about the project, but what Rick has said first, what we need to do is go through the formal process of taking comments and then once the formal comment period is closed, we can have an informal discussion after, but we can't -- we're actually required by law to go through a formal process where we accept comments, close the comments section of the meeting, the stenographer stops taking notes, that's the end of the record for the meeting, and then afterwards if you want to talk about other specifics, we can do that.

MS. WOODMAN: And we will respond to the comments that you make now in the final EIS/EIR too and one of the reasons, not to just -- you know, we can answer this question, but a lot of these comments require a lot of thought and analysis and input from experts and we don't want to give out answers without really having time to thoroughly consider them and run them through the appropriate people.

MR. DAVIS: Before we leave, I'm sure Lorraine can give you the exact sections that address this in the document.

MS. WOODMAN: I can show you in the document.

MR. DAVIS: As Kent said, we can kick that around a little more after we're done with this portion. I know I saw another hand pop up for Mike. Someone else? Scare you away already?

MR. VAN CLEEF: Mine was more contextual, which is is this the same project as Quick Start?

MR. DAVIS: Early Start?

MR. VAN CLEEF: Early Start.

MR. DAVIS: Yes. It's completely --

MR. NELSON: Well, what I can say about that, it's consistent with the principles that are outlined as Early Start Habitat in the PEIR, but this is not a piece of the PEIR. All of this is authorized under a separate piece of Fish and Game Code that allows Fish and Game to do this type of early habitat restoration work at the Salton Sea. So this is not an implementation step of the PEIR, but the actions are consistent with the principles of Early Start Habitat.

MS. WOODMAN: Be sure to give your name so we can have it for the record.

MR. DAVIS: Could you add your name?

MR. VAN CLEEF: Dave Van Cleef.

MR. DAVIS: Dave Van Cleef. Thank you. Other comments we want to make about the draft EIS/EIR?

MR. WILCOX: Bruce Wilcox. This is just a general comment. The IID board has already affirmed its support of this project with the board memo and we appreciate the level of coordination that we've seen from the State and from the consultant team in developing this, and we're really pleased with the progress you've made in the last year.

MR. DAVIS: That was a wonderful comment.

MR. WILCOX: I've been practicing.

MR. DAVIS: Other comments? I think

everybody wants to do Q and A, Kent.

MR. NELSON: Does anybody have any written comments they want to submit or have they submitted them in the comment box? Because that's an opportunity as well.

MR. DAVIS: The forms, like I said, are right here if you grab one, and there's a little box there and additionally the address is there if you can't finish it before your --

MR. SCHONEMAN: I can turn my question into a comment.

MR. DAVIS: Great.

MR. SCHONEMAN: For the record, Chris Schoneman, Salton Sea National Wildlife Refuge. It would be, I think, convenient if the project was built kind of in a modular fashion so that in the future, assuming everything works out very well here and water levels continue to decline, maybe it even states this in the document, that the pumping capacity can be increased so that it can be built out further down the stream and extend the benefits of the habitat that's already out there.

MR. DAVIS: Good. Thank you. Anyone else, other formal comments? Okay. Great. We can end that portion of the meeting then, Kent and everyone, and like I said, there are forms if you have things that come to mind afterwards, you can send them in or go online.

(Proceedings concluded at 1:41 p.m.)

REPORTER'S CERTIFICATION

I, Terri L. Emery, Certified Shorthand Reporter, in and for the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that the proceedings were reported stenographically by me and later transcribed into typewriting under my direction; that the foregoing is a true record of the proceedings taken at that time.

IN WITNESS WHEREOF, I have subscribed my name this 26th day of September, 2011.

____

Terri L. Emery, CSR No. 11598

Transcript of Proceedings

Salton Sea Species Conservation Habitat Project

Draft Environmental Impact Study/

Environmental Impact Report

Wednesday, September 14, 2011

6:00 p.m.

Brawley Elks Lodge #1420

161 South Plaza

Brawley, California

Reported By:

Terri L. Emery

CSR No. 11598

A P P E A R A N C E S

MODERATOR:

Rick Davis, The Davis Group

SPEAKER PANEL:

Kent Nelson, Department of Water Resources

Lorraine Woodman, Entrix

Lanika Cervantes, U.S. Army Corps of Engineers

David Elms, California Department of Fish and Game

Vince Thompson, Ducks Unlimited

MR. DAVIS: If anybody has comments they would like to make, Terri will just get them down with those fast little fingers. So are there comments out there based on the presentation or based on the EIR that you've seen that you'd like to make? Okay. No comments. Just kidding. Do you want to start, sir?

MR. BAILEY: I'm Frank Bailey. I'm with the Imperial County Fish and Game Commission and I've been following some of the developments that have gone on around the sea, and during the last -- you know, some of the projects that were suggested to save the sea and I just, you know, I am kind of -- I think it's wonderful. I think you've come up with some great ideas, but how likely are we going to find the funding to be able to complete one of these projects? I would love to see some of these wetlands habitat go in. I've been asking for something, we've been -- when they were first developing some of the projects around the sea, I was asking them why don't we do something and try to save some of this habitat.

The sea is declining at a rate of about six inches per year, and so this has gone on for probably eight years that I know of. I worked for Imperial Irrigation District. I've seen the reports that show how the sea is declining. So that's my first question.

The second question, you know, being with funding, why was the number three alternative the preferred alternative and what are we looking at? In these projects do we have the funding to do any of this?

MR. DAVIS: Well, we really appreciate the comments. Thank you. And we can, I'm sure, get to some of the heart of those issues after the comment period. I think you had a comment back here, sir.

MR. SANTIAN: My name is Daniel Santian. I live in Calexico, but I'm originally here from Brawley. My interest in this are jobs. I passed out this with -- I met several years ago an engineer from Holland at a company that has 500 years' experience in dredging and working in -- and the Imperial Group. Later we met him in Imperial County and the original Plan A was a cascade plan and they talked that they were going to hire approximately a thousand workers and after the project was done that a hundred workers would remain to maintain it and the other 900 workers that were willing to relocate and to travel, they could stay with the company. And he also said that they would fill as many positions as possible with residents of Imperial Valley and that it would reflect the demographics, and that was my main concern.

And so he asked me if I thought that if the Mexican community in Imperial County would be up for a task like that, so I told him how long did you say your company has been around? And he said 500. And I told him that a thousand years ago the, Aztecas dredged the lake in Mexico -- because it's now -- Mexico City was built over that lake. So this is my only interest to make sure that Imperial Valley residents will be considered first for jobs.

Other than that, you know, when you start talking as Mohammed Ali said about millions and millions of dollars, my mind can only hang calculate up to $50,000. After that once you start talking about millions and billions, I don't know what you're talking about. Thank you for your time.

MR. DAVIS: Thank you for the comments. Your comments are submitted in writing. Other comments from the group here? Andy, do you have one?

MR. HORN: I have a comment. My name is Andy Horn from the County of Imperial. I hate to sound like the proverbial broken record, but I've been to a number of these meetings and I'm just going to say the same things I said before, and I know Kent was up there a minute ago and said that you're -- through the work you've done, you've confirmed that this project is compatible with geothermal development out there. I'm sitting back here between two geothermal developers and I'm not sure that I see a great look of comfort or haven't heard those comments, and I've talked to a number of people who still have some concerns about this project and the potential of that to interfere or prevent some maximization of geothermal energy production in that area.

I know you guys are aware of it, you've got it up on the board, but I think we need to do some more assuring of the geothermal people and people that rely on income from those sources and so it's going to see that you have taken it into consideration, but I just recall back from the first meeting I went to and they said don't worry, we're going to construct causeways out there that will support heavy vehicles and they can get out there and access for drilling and maintenance and so forth of geothermal facilities, and the second time and third time we went to the meeting and they said, oh, no, we've abandoned that, it's too expensive, and the commentary was that they're going to use native soils and those soils would not support heavy equipment. And I don't know what the design criteria are today, but I think we need to add a little more dialogue.

These are just some off-the-cuff comments. The County will submit comments as part of the process.

MR. DAVIS: Thank you, Andy. Yes.

MR. GROGAN: I'm Larry Grogan. I'm with Energy Source. I've been around the Salton Sea and geothermal for probably about 35 years.

One of the things that bothers me when we see these plans that come in after we've done the huge Salton Sea Authority Plan with the State as part of the QSA, I think in three volumes, is there's not one mention of that in this document. And certainly when the final preferred design was made, 4200 acres was carved out of that as an overlay or whatever it is for geothermal development because they do recognize it.

For those who have traveled down here and looked at the Salton Sea probably for the first time, the area that you are in -- the Salton Sea area there north of the Alamo River just around Red Hill would give you an idea of what that resource is like. The hottest well ever drilled in the valley had a bottom temperature of over 700 degrees. So you've got some real high temperatures all through Red Hill, north of -- east to obviously Davis Road, up to past the wildlife area. You've got a tremendous potential for undeveloped geothermal.

Somewhere in all these exhibits there should be at least some recognition of what the resource area is so that we have something five years from now when we come back and everybody in the world is saying yeah, but this is what we approved because it was preferred Alternative Number 2A and there's nothing in there about geothermal. It's in the dialogue, but this is our plan, we plan to put these dikes out there, we plan to put this well, this pond here, we're going to put this fishing pond over here. Some of those fishing ponds that you show on the area there basically right now have a surface manifestation of boiling water at the surface. This is just south of Mullet Island and you have that entire fault zone through there that I would hate to have to put any type of wildlife habitat and depend on it staying necessarily with CO_2 coming up and certainly with the possibility of hot springs coming up through that area.

But other than that, can they be compatible, the answer is yes, but when you start putting plans with dikes, with causeways or whatever it is right now without having really a dialogue with the industry how we could develop it, then we've set ourselves up for problems in the future.

As far as mitigation, let's face it. The

State has almost no money to develop this thing, so you're going to be looking for someone to contribute to actually do some type of offsets. We don't mind that, but we'd like to be a part of the thing more up front before you put these lines on the map. Thank you.

MR. DAVIS: Thank you, Larry. Other comments?

MR. MARTIN: I'm Ted Martin, just general person standing around. My question is why are we taking virgin land which we can make into geothermal? The wildlife preserve and state and the federal wildlife preserve, why can't we use those ponds that we already have and use that with the same thing? They're right along the Alamo River. Some of these guys know what I do for the district, but I'm not representing the district. I'm representing myself. Why can't we use the resources we already have? The ponds are there. I know these ponds need to be improved upon anyway. What is the problem with the land we already have instead of taking new land and taking this land out of production for geothermal and put it in that way?

MR. DAVIS: Well, we appreciate the comment and we can address a little bit about why that is when we get through the comment period.

MS. LANE: Thank you. My name is Terra Lane. I work for the Desert Protective Council, the Imperial County conservation projects leader, and I have to admit I was not here in August, I was on the east coast, out of town, and I hadn't waded into the document at all except for the overview. So I think for a lot of us here who might not have read the entire document, it would be helpful if you would answer questions rather than save it for individual conversations after the meeting. I think we would all benefit from hearing the answers instead of having to listen in on somebody else's.

MR. DAVIS: We'll answer questions.

MS. LANE: I had a question. When -- how long are you accepting written public comments on the website?

MR. DAVIS: The comment period is through October 17th, so you have some time.

MS. LANE: Okay. All right. Thank you.

MR. DAVIS: You're welcome. Like I said earlier, we will entertain some dialogue from up here. It won't be just one-on-one. We can do one-on-ones too. Do we have other comments? I know I joked at the beginning we didn't have any. Maybe now we don't, but we got a lot. That's helpful. Anyone else want to put something on the record? We'll close the record if we have no more comments and then we'll have some Q and A time. Okay. No more comments then.

Thank you very much, and like I said, I think there's a couple of questions that I think are existing, but if anyone wants to reiterate those or ask questions now, the team here will do their best to answer it. If we don't have the answer or if it's kind of outside the realm of where we're at right now, we'll certainly tell you that and try and formulate an answer and get it back to you.

(Proceedings concluded at 6:53 p.m.)

REPORTER'S CERTIFICATION

I, Terri L. Emery, Certified Shorthand Reporter, in and for the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that the proceedings were reported stenographically by me and later transcribed into typewriting under my direction; that the foregoing is a true record of the proceedings taken at that time.

IN WITNESS WHEREOF, I have subscribed my name this 26th day of September, 2011.

____

Terri L. Emery, CSR No. 11598

Transcript of Proceedings

Salton Sea Species Conservation Habitat Project

Draft Environmental Impact Study/

Environmental Impact Report

Thursday, September 15, 2011

1:00 p.m.

University of California Riverside

75-080 Frank Sinatra Drive, Room B200

Palm Desert, California

Reported By:

Terri L. Emery

CSR No. 11598

A P P E A R A N C E S

MODERATOR:

Rick Davis, The Davis Group

SPEAKER PANEL:

Kent Nelson, Department of Water Resources

Lorraine Woodman, Entrix

Lanika Cervantes, U.S. Army Corps of Engineers

David Elms, California Department of Fish and Game

Vince Thompson, Ducks Unlimited

MR. GRAJCER: It's hard to limit what you have to say, but my name is Dov Grajcer. I'm a Ph.D. in fisheries as well as a master's from the University of British Columbia, from the University of Washington in Washington in Seattle. All my life growing fish, work for our government and other places. I have had fish farming in this valley for 37 years and I remarked in all the meetings on some of the meetings and I am surprised first about the choice of the fish which is not local, Tilapia, it's not of the American continent, it's not North American, not South American. And why we choose a fish that doesn't belong here, we should try to get them out of here. Why do we choose that fish as our model in our experimentation.

I want to also correct something. I know that you get your money not only from the federal and the state but you get a lot of money, $25 million from my water district, and that's my money, that's our money, local money, and our ratepayer has a lot to say and a lot to lose on it. You get also $25 million from IID and $25 million from San Diego. So the money is not entirely government, a lot of it is ratepayer money. Okay.

You choose Tilapia because it happens to be around and despite the Fish and Game trying to keep them out of here. The Fish and Game then was told the Tilapia will take over any other species in the Salton Sea because they can go to higher salinity and lower salinity. You chose Tilapia because it can take the temperature, the high temperature, not the low, but you don't have enough people who knows fisheries. There is good schools in this country like Auburn and Alabama, Texas A and M in Texas, the Marine Institute in Maryland, and you didn't ask for any experts. Your experts are usually people from fish -- from game, not from fish and they know very little about fish.

Now, we have a local fish who is a native to the Salton Sea, can take higher salinity, much higher, to 8.5, they can take the temperature a lot better than the Tilapia, and with the help of all the institutions that we have around here, we manage to eliminate forcibly out of the Salton Sea by mistake because we didn't know or people didn't know the fish travels up river then down river and is native to the Salton Sea, and we had the commercial fishery here in '42 of that abundant fish, not only that the fish is specialized in eating detritus, in other words it cleans the water.

MR. DAVIS: Sir, maybe you could get to the specific point of the comment. It would be very helpful. Thank you.

MR. GRAJCER: Okay. We are building ponds which are not -- if the Corps of Engineering is looking over it, engineering would be fine, but what are you going to do with it? Because I expect to have the same problem that we had always in the Salton Sea of having algae bloom. With Tilapia you have algae bloom. Without Tilapia we will have algae bloom. The only thing that might stop it is Mullet. You have algae bloom, you'll have fish kills, the same as you have now, you'll have smells and you'll be sued for it, you'll have H2S, which is dangerous to people living on fish, and if you don't take care of it, those beautiful ponds that you're building are beautiful and I know the Corps of Engineer will do a beautiful job for us, but we'll have nothing but trouble. We'll have to aerate it and you don't have any provisions for it. Of course -- it back and be expensive because now you have to bring it back. You'll have to have hatcheries to grow monitor, fishery to start them, put them in the Salton Sea and you can save the whole Salton Sea, not only the button. Mullet can take 8.5 percent salt. You can look it up in the literature. I don't have to do it for you.

MR. DAVIS: Sir, thank you for the comment. It would be helpful if we could get some others, and then if you want to make another comment after, that would be great. Thank you. In the back.

MR. BOGART: Hi. About two years ago --

MR. DAVIS: Could we get your name, please?

MR. BOGART: Chris Bogart. I live in Sky Valley. I live at the sea every day. I'm secretary of the Friends of the Desert here. I would just like to say I've been trying to come to the meetings over the past two years on this process. The last meeting was very vague and it was really very not very informative and poorly handled. The one before that was just a general introduction. Intervening time between the second meeting and today there has been very little sent to us informationally in the process.

I got a Corps of Engineers thing. I read the website occasionally. I would like to protest the fact that the people and the public in this community are really not being included in this to the extent that they should.

MR. DAVIS: All right. Maybe you can just stay with the mic. Other comments? Up here in the front we have one.

MR. KARIOTIS: John Kariotis, Salton City, West Shores Salton Sea Growth Association. One of the comments, I think I can answer some of the people's questions, especially Dale's. This is for fish and birds and does not affect anything in the way of what the Salton Sea Authority's plans would have done in the way of people and economic development for the Salton Sea.

MR. DAVIS: Thank you.

MR. BERMAN: Carrie Berman. Just curious. Are there any considerations for different species of fish outside of the Tilapia?

MR. DAVIS: You know what, we'll come back to that. I've got a note about species up there, so we'll make sure we cover that at the end. Thank you.

MR. BORUNDA: I wanted to talk because I've been wanting to go come to these meetings and I should have been already.

MR. DAVIS: Use the microphone so Terri can hear, and then your name, and if you want to tell us where you're from, that kind of thing.

THE WITNESS: My name is Leo Borunda, B-o-r-u-n-d-a. Leo Borunda. I have Rancho La Playa. Rancho La Playa is a very big ranch, 152 acres and about one mile water front. You can hear me. I don't have. Go ahead. I'll do the mic for you. So I've got one mile of water front. The water front is going down. Don't let that happen. Let's save the Salton

Sea. Never mind all these other plans and put ponds here and ponds there and ponds over there. We don't need that. We need to save the Salton Sea. It's a beautiful body of water.

I've been at the Salton Sea a little over 15 years and made over $10 million at the Salton Sea and I've got ten properties and I've got the big ranch, 152 acres of land. So the thing is that the Salton Sea is ready to help us all and do things for us, but we've got to do things for the Salton Sea, not on the basis of putting a pond here and there and pond there. That's not necessary. If we did something and gave the water rights to San Diego a long, long time ago, this is a long time, it should be argued now that that was a mistake and it should not be done, and if we can't get that, let's get water from someplace, but let's not let the Salton Sea die, please. Let's not let it die. It's a beautiful beautiful body of water and it should not be destroyed.

MR. DAVIS: Thank you. We appreciate that.

MR. BORUNDA: Wait. I have my ranch open to anybody that wants to use it some way, 152 acres on the beautiful water front, six boats there. If somebody wants to use the boats, they can use them. So the thing is that let's enjoy the Salton Sea and not let all these plans that cut it this way and cut it the other way, that's not the -- save the Salton Sea. That's the most important. Please, please, everybody save the Salton Sea for your benefit and everybody else's benefit and for the future. Thank you.

MR. DAVIS: Thank you for the comment.

MR. WASIF: Hello. My name is Mohammed Wasif.

MR. DAVIS: Could you spell it for us, please?

MR. WASIF: I'm a small landowner up there in Salton City, but I'm so glad that I've attended so many meetings of all progress of things like. Are we going to do something with the whole sea, the Salton City, and I think what we are doing actually right now with 3700 acres, one of the best things that can ever happen, at least let's start with something, not to try and drag this and take this miles and miles across and say we are going to do this. This is not nothing manic that we can turn around. It requires millions and millions of dollars. And the salinity, desalinization is not an easy thing because you can't do it straight away. No, two years, I think it's one of the greatest things that has ever happened. I'm so glad and the engineer and gentleman who explained everything is absolutely -- you know, I'm really proud of the fact at least something is happening instead of just going on, you know, and I don't know how non-profit organization complaint, but I personally feel that we must have some sort of a lottery, Salton City lottery so that the people can put some money in and raise funds, maybe five years, ten years, whatever it takes, and then use that money and then we can have, you know, exit from Salton City into the sea by having, you know, exit by huge sort of pipes, maybe five, ten pipes or something like that to the shortest distance and that would be really remarkable, but they take time.

But you know, I think I personally feel that what you people are doing right now with this meeting, it's wonderful. I'm so proud of you. Thank you.

MR. DAVIS: Sir, before you pass the Mike could you spell your name for the our Terri here for the record.

MR. DAVIS: Thank you.

MR. WASIF: I can do that. W-a-s-i-f, M-o-h-a-m-m-e-d.

MR. DAVIS: Thank you.

MR. NORMAN: Paul Norman. I'm here in the valley, kind of watching if for the last four or five years attending the meeting the. There's another water source and that's the Artesian wells going to the lake. Is there anybody doing that or thinking about establishing any parameters around those for water? That's fresh water.

MR. DAVIS: We'll put that on our question list. Other comments out there?

MS. BEAL: My name is Linda Beal and I volunteer right now with the Salton Sea Visitors' Center. I was volunteering at the Salton Sea History Museum and the beautiful North Shore Beach and Yacht Club before that was closed. I just had a couple thoughts too along some of the same line. Is there a different kind of fish that could do better in the sea. Also could we -- if we get so many Tilapia, they're just breeding like crazy, is there a way we could harvest Tilapia at different times that could help the sea in some way. I don't know. They could be harvested in a big way so we wouldn't have so many die-offs and things like that.

Also, what will this project do for the rest of the sea, how will it impact the rest of the sea? I know this is going to be good for the birds to eat different fish or whatever you may have in these other little ponds and things and is there any other kind of thing besides fish that you might be raising in these ponds for the wildlife.

MR. GRAJCER: Those ponds are to give them license to hide the Salton Sea. Don't you understand it?

MS. BEAL: That's all I have to say. Thank you.

MS. CRONEMEIER: Hi. Name is Kathy Cronemeier. I'm a retired teacher in the area, and for the past ten years I have been helping educational programs for children on how valuable the Salton Sea is to our survival in the Coachella Valley, that without it we won't have good air to breathe and we won't have safety for animals. So I, going along with what Linda was just saying, I want to know what the impact of your project on the Salton Sea will be, if it will be taking down the water level and creating more air pollution because as it dries up, we know that the air pollution is going to be horrendous for the Coachella Valley.

And I'd also like to take a moment to push I just won a Pepsi challenge to offer classes for children on how to save the Salton Sea and we're going to do it through plays and other kinds of visits, so I have papers if anybody wants to get them at the end. I need votes.

MS. CHIRACO RESHAY: Margit Chiraco Reshay, Chiraco Summit, California. Long time northern neighbor of the Salton Sea and long time visitor of the Salton Sea, especially as a child, great memories. I agree with Mr. Borunda. I think we ought to emphasize save the Salton Sea and not have all these little bitty things going on around it unless you can really prove to us that it's going to be a part of saving the Salton Sea. So I just really believe that we need to save that beautiful body of water. We go down there, we go around it, we enjoy looking at it, and it is indeed a visual treat for those of us in the desert and I would hate to see it go away. Thank you. PD-18

MR. DAVIS: Thank you for the comment. One up here in the front, Vince, and then we'll get you next. In the second to the back row.

MR. KARIOTIS: My name is Imari Kariotis. I'm with the West Shore Salton Sea Growth Association. I want to echo what the Friends of the Desert secretary said. Mr. Davis I had a talk to you on the phone and so did my husband about holding a meeting on the west shores. Most of the state meetings have been on the west shores. There are several buildings you guys could have held a meeting in. Most of the people in our membership felt sleighted that there wasn't one. PD-19

There hasn't been very much communication between the PD-20

State and the people. Now, IID, CCWD, yes, DWR, but you haven't come to the small people and we want you guys to do that because we have ideas and you really can't do it in an hour and a half. PD-20 Cont.

MR. DAVIS: Okay. Thank you.

MS. WEBER: Candace Weber. I teach at College of the Desert.I teach natural resources and teach about the Salton Sea. It's a big passion of mine for habitat, wildlife, all these things. So I think the ponds are a great start. I think -- I don't know if this has been stated or not, but a big, big issue is I see with my students who to me represent the public in general to a certain degree is a lot of lack of information, misinformation, the belief of the myths about the Salton Sea that it's toxic, it's a wasteland, it does have a smell to it, they don't understand why, all these things that we already know about, and I don't -- I think my purpose -- my point of this is is there some way that we or the agencies, Fish and Wildlife can partner with the local news agencies, the Desert Sun, the Nightly News, and get the correct information out there. PD-21

The water transfers are a big issue for the Salton Sea, so that's why the ponds are a great way to start to figure out how to save habitat to save the PD-22

PD-22 Cont.

whole Salton Sea. I honestly hadn't heard it's possible to save the whole sea because of the QSA and the public doesn't understand the issue of water out here in the west. The CVWD, all how there's an over-demand for the Colorado River. We just don't know. People just don't know. If you want people to get behind the Salton Sea and help push for state funding to get these plans and these ponds set, you need a public who is educated, not just the few in the room here. You know what I'm saying. So there's some way we have to partner with the public news agencies and get correct information out there and get the reporters to care about it. That's all I have to say. Thank you.

MR. DAVIS: Very good. Thank you. We'll get back to you. We have one over here from Mr. Nelson.

MR. NELSON: My name is Peter Nelson. I reside at -- my mailing address so you can send an answer, P.O. Box 109, Thermal, California, 92274. I'm a resident of La Quinta. My question -- and this is kind of a dynamic thing going on, but my question relates to a recent development. Tuesday the IID board resolved to ask the State Water Board to allow it to stop putting QSA mitigation water into the sea thereby setting the stage to sell nearly 400 or 5,000 acre feet

PD-23

PD-23 Cont.

of additional water to coastal communities.

How would that action affect this project, either positively or negatively, and as Secretary John Lehr described this project not as species conservation habitat but as Early Start habitat, how would that action affect any future projects positively or negatively. Thank you.

MR. DAVIS: Thank you. We'll try and turn on that when we get to question and answer. That's a pretty big question. We'll get back to the gentleman one more time. I promised you one more.

MR. GRAJCER: This one is very short because people ask the question a number of times. Everybody knows or should that the Salton Sea at the moment evaporates nearly two million acre foot of water a year. That affects the climate of the whole valley. Without it, we're being exempted because we have the same conditions as Death Valley. Without it would be 130 degrees in the summer, not 120, and I don't know about -- education just to be sure, but remember that it's 2 million acre feet evaporates and that affects the temperature very heavily, both in the summer and in the winter.

PD-24

MR. DAVIS: Are there other comments still?

MR. WASIF: I would like to make one more comment.

MR. DAVIS: We have your name, so it's okay.

MR. WASIF: I've got to point out the federal government has got to take interest in this. We have money funds to go Iraq and all the places in the world. We don't have money to spend in our own home. This body of water is one of the best things that can ever happen in California. So close to San Diego, so close to so many places. It could be absolutely a central beautiful area with, you know, thousands and thousands of people coming, only the water would be used. So I think somebody has got to bring the President over here and say this is a body of water we have and you know, the only thing is it's dead water. Then he would say what can we do about it. So we've got to find some way of raising funds for this area. That is the only thing I would wish the people -- and I'm very proud of the fact, but we should progress more and do it more. And right now I know China is taking interest in everything in the world. You go to Saudi Arabia, they're doing thousands of acres of land, they're doing railway, doing hundreds and thousands of things. Go to Kuwait, you go everywhere, China. Give us a bid on it to desalinize this area. Tell us about it. Then we go to

-25

PD-25 Cont.

the federal government. Thank you.

MR. DAVIS: Thank you. Do we have any more comments that would be for the public record? As I noted, we can take some time to answer some other questions.

MR. BERMAN: Here's the question. Are we just going to address these questions here?

MR. DAVIS: As well as others if you'd like.

MR. BERMAN: And then can we go ahead and comment or question?

MR. DAVIS: Yes. It would be like a question-and-answer, but it would be off the formal record. You want to make a formal comment then?

MR. BERMAN: Kerry Berman, Desert Tours, K-e-r-r-y, B-e-r-m-a-n. Since the we have 4.4 billion acre feet of water coming from the Colorado River and there is an agreement with the Metropolitan Water District and the Coachella Valley Water District up until about 2035, but right now we're overdrafting the aquifer by 16 to 30 percent a year as a consequence. I would like to know what affect that's going to have on the pumping stations in creating these new water environments.

PD-26

MR. DAVIS: We can get to that. So overdrafting. Other comments before we close out the public record one more time? Okay.

MR. BORUNDA: I just wanted to tell you about the fish, lots and lots of Tilapia, beautiful, delicious tasting Tilapia. My men, my workers will go in there and bring 60, 70 fish and cook them out there. It's fantastic. So the Salton Sea is very much alive, very beautiful, and it needs help to bring it back up again. We have destroyed it and we've allowed that the water -- so if you've got to take and do everything to preserve the Salton Sea and the wonderful fish. Very tasty, very delicious. Like I say, my men go out there and get 50, 60 fish and prepare them on the patio, wow, tremendous. Now we've got the water way down about half a mile from my land now. I'm still into the water because I go one mile into the water, but at the same time the water is -- beach is farther out, so the fish don't come as close, but the thing is anything we can do to preserve the Salton Sea is the most important thing. PD-27

And building ponds and all sorts of things, I don't know if you know, but the Salton Sea at one time was part of the San Francisco Bay and it was a part of Baja, California, southern California. So it's something that has been there for a long, long time and then it dried up for a while and then in 1904 up again PD-28 into a beautiful body of water. Let's preserve it. PD-28 Cont. Thank you very much. If I can help in any way, my ranch, 152 acres, Highway 86 frontage, about four city blocks, stop by any time. We'll talk about it and write letters or pay for it or whatever.

MR. DAVIS: Thank you. Yes.

MR. WILCOX: Hi. My name is Bruce Wilcox from IID. First I want to say we support the species conservation habitat and have from the beginning. We think it's a great start for restoration of the Salton Sea. PD-29 I would be happy to try to answer some of the questions about the mitigation water if you would promise to move that question to the first question because I have to go pretty soon.

MR. DAVIS: Thank you. One more behind you, Vince.

UNIDENTIFIED SPEAKER: This is just a procedural thing. I think it would be good if you would allow people to ask questions, not completely close the comment period in case the questions bring up some kinds of comments that might be incorporated in the record and broaden it.

MR. DAVIS: You know, we have some legal parameters that we have to deal with here, so I'll tell you we can -- there's many ways for you to add comments after this comment period is over. As I noted before, there's the written comment form, there's the website. So the comment period isn't over. It lasts until October 17th, but it --

UNIDENTIFIED SPEAKER: What is the legal justification for that? Can you explain that?

MR. DAVIS: Legally we're supposed to take comments and it's not supposed -- it's not supposed to be a discussion. It's to receive comments. But we don't want to leave here without answering questions. So the point is we -- you know, we end the public record portion, we'll stay and have discussion, and then if that spurs further comments, as I said, there's the website and also the comment forms, et cetera. Okay. Terrific. Thank you. Yes. Is that a comment here? Hang on one second.

MR. GERACI: My name is Jeff Geraci. I'm with the Water Quality Control Board in Palm Desert. We are in approval of the project, of course. PD-30

I had a question about barnacles. I know that barnacles in high density can actually improve water quality, if not water clarity, allowing sunlight to penetrate and dry the ecosystem. I was wondering are there any mitigation efforts to preserve or protect the barnacle population which is actually a subspecies PD-31 of B. amphitrite amphitrite, which is found on the California coast because this is a unique subspecies of the barn that exists only in the Salton Sea. So I was wondering are you going to have any kind of tide pools or any kind of mitigation to preserve those barnacles or are we just going to let them go. That's all. PD-31

MR. DAVIS: I think when we wrap this up and take care of the mitigation question, our biologists there in the back are going to be itching to answer that one; aren't you, Jack?

MR. CRAYON: Karen handles barnacles.

MR. DAVIS: Karen is the barnacle expert. We will get to it. Thank you. Other comments?

MS. ROBSON: My name is Lucinda Robson. I don't know if this is a comment, probably more of a question. Actually, two questions. Are all the cities in the Coachella Valley aware of the situation with the environment if something happens to the Salton Sea and are they on board with helping save their own town and their own tourism and their own environment? And is the State aware or is the State taking care of the population in the Coachella Valley from this potential hazardous environment that could result if the Salton Sea is not saved? PD-32

MR. DAVIS: Okay. We'll put that on the

comments and we can try to address that. Any other questions? Or rather comments. I'm sorry. I know we've got a bunch of questions. Okay. We're going to end the formal public comment section of this and then I've made some notes up here about some questions that arose. They're probably are going to need a little more clarification. Bruce did indicate he was willing to talk about the first question that Mr. Nelson brought up which was down here, impacts of the mitigation water.

(Proceedings concluded at 2:14 p.m.)

REPORTER'S CERTIFICATION

I, Terri L. Emery, Certified Shorthand Reporter, in and for the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that the proceedings were reported stenographically by me and later transcribed into typewriting under my direction; that the foregoing is a true record of the proceedings taken at that time.

IN WITNESS WHEREOF, I have subscribed my name this 26th day of September, 2011.

____

Terri L. Emery, CSR No. 11598

ATTACHMENT 2

Jurisdictional Delineation Report

JURISDICTIONAL DELINEATION REPORT
FOR THE SALTON SEA
SPECIES CONSERVATION HABITAT PROJECT

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SECTION 1.0 – INTRODUCTION

The California Natural Resources Agency (Agency) proposes to develop and conduct restoration activities and develop adaptive management techniques as part of the Salton Sea Species Conservation Habitat (SCH) Project (Project). The Project is located at the southern portion of the Salton Sea in Imperial County, California (site). Chambers Group, Inc. (Chambers Group) was retained to perform a Jurisdictional Delineation (JD) for the purpose of identifying and delineating potential jurisdictional wetlands and waterways located at the Project site that are subject to the regulatory jurisdiction of the United States Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA), the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the CWA, and the California Department of Fish and Game (CDFG) pursuant to Section 1602 of the Fish and Game Code.

A jurisdictional delineation report based upon the field work conducted by Chambers Group, including maps and geographic information systems (GIS) shapefiles, was published by Chambers Group, after review by Agency, Dudek, and Cardno ENTRIX in January 2012. Upon further review of the report, the USACE determined that a further review of portions of the delineation was warranted. With guidance from the USACE, Dudek revised the delineation for the entire Project. This report represents the final jurisdictional delineation based upon the combined field efforts of Chambers Group and Dudek coupled with guidance from USACE. Chambers Group prepared the original report and Dudek revised the following sections (i.e., these sections were jointly prepared): Section 2.1 United States Army Corps of Engineers, 3.1 Literature Review, 3.2 Field Survey, 3.4 Hydrology, 4.0 Results, and Appendix B; all other sections and appendices are solely prepared by Chambers Group.

1.1. PROJECT BACKGROUND

The Salton Sea is located more than 200 feet below sea level in a desert basin in Riverside and Imperial Counties, California. The Salton Sea has no natural outlet and receives additional hydrology from the surrounding landscape and agricultural practices. The Salton Sea serves as foraging grounds for resident and migratory birds, numerous fish species, and a variety of other wildlife. Salinity concentrations within the sea have become a concern for the future of the habitat conditions present in and around the sea, and may compromise the health and survivorship of the wildlife that utilize the sea. Salt that enters the sea becomes trapped and concentrations are on the rise due to the approval of the Quantification Settlement Agreement that will result in a significant decrease in water inflow to the sea. The reduction in inflow will result in a size decrease of the sea and the increase in salinity concentrations.

The current effort by the Agency is the latest attempt to develop a permanent solution to continued degradation of the environmental values of the Sea.

1.2. PROJECT OBJECTIVES

The Agency proposes restoration in an effort to develop a range of aquatic habitats that will continue to support fish and wildlife species that utilize the Salton Sea. These aquatic habitats are planned to support piscivorous bird species with foraging and other habitat needs, a sustainable aquatic community, suitable water quality for fish species, minimize adverse effects to State- and Federally-listed desert pupfish (*Cyprinodon macularius*), minimize the risk of the bioaccumulation of selenium, and minimize the risk of disease and toxicity to wildlife and plants. The Project will also develop an adaptive management strategy through the development and implementation of a monitoring plan, development of a decision-making framework, and through the proof of concept for future restoration effort to occur at the Salton Sea.

1.3. PROJECT LOCATION

The Project site is located at the southern end of the Salton Sea in Imperial County, California (Figures 1 and 2). The Project is partially located within the Sonny Bono Salton Sea National Wildlife Refuge. The Project is located in United States Geological Survey (USGS) Westmorland West and Obsidian Butte Quads, in Township 12 South, Range 12 East and Sections 13, 14, 23, 24, 25, 26, 27, 28 and 29 of the San Bernardino Meridian.

For the purposes of this report, the study area of the Project is defined as Alternative 3, as discussed and presented in the Salton Sea Species Conservation Habitat Project Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) as prepared by the USACE and the Agency dated August 2011. There are six staging areas identified in association with Alternative 3. In addition, two distribution lines are identified and included in this study area; one that extends approximately one mile south from the New River along Bruchard Road and the other that extends approximately 0.7 miles south from the New River along Pellet Road.

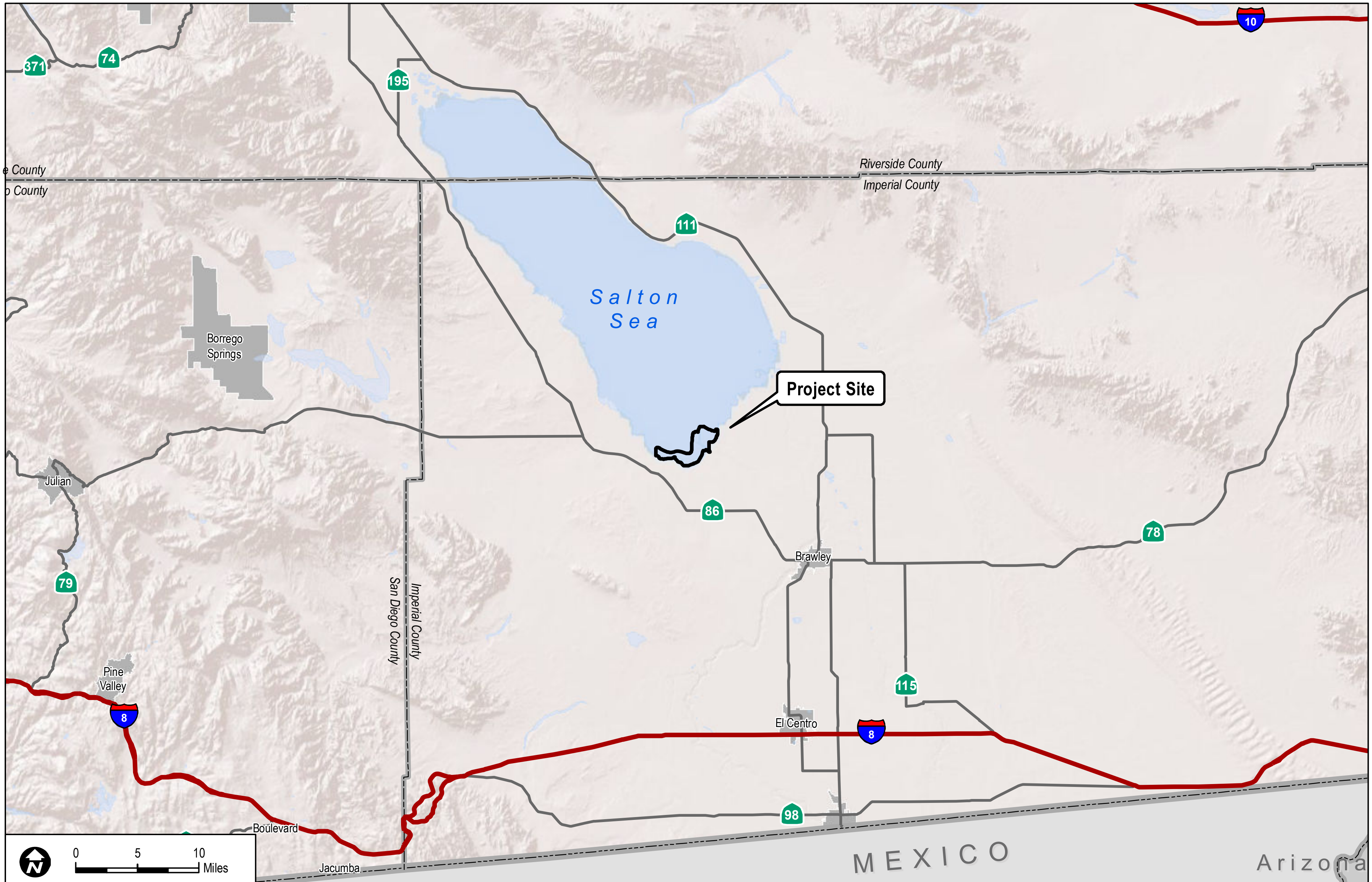

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FIGURE 1

Regional Map

SALTON SEA SPECIES CONSERVATION HABITAT - FINAL JURISDICTIONAL DELINEATION REPORT

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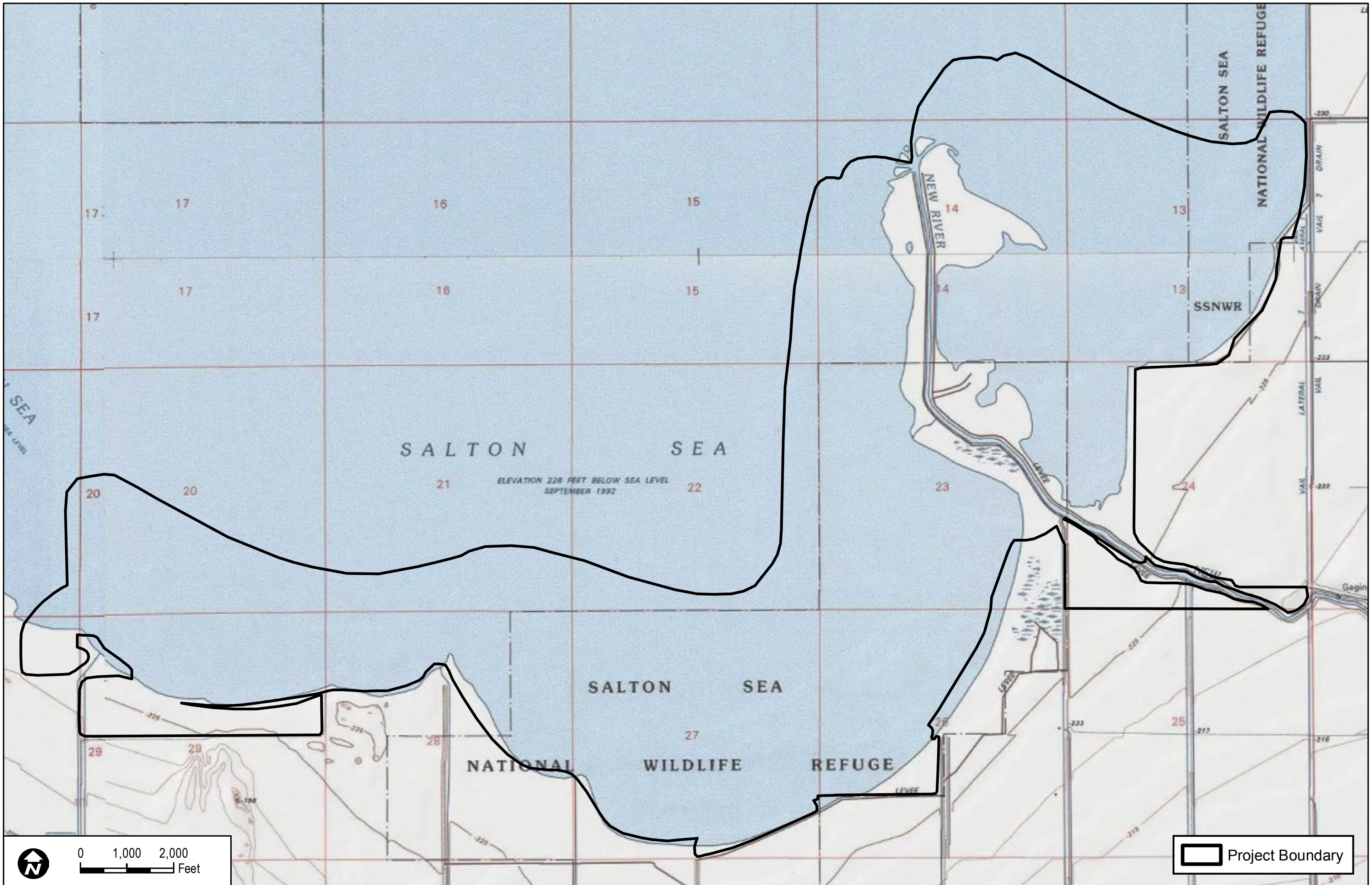

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SOURCE: USGS 7.5-Minute Series Calipatria SW, Kane Spring and Obsidian Butte Quadrangles.

FIGURE 2

Vicinity Map

SALTON SEA SPECIES CONSERVATION HABITAT - FINAL JURISDICTIONAL DELINEATION REPORT

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SECTION 2.0 – JURISDICTIONAL CRITERIA

2.1. UNITED STATES ARMY CORPS OF ENGINEERS

Pursuant to Section 404 of the CWA, the USACE regulates the discharge of dredged and/or fill material into waters of the United States. Waters of the United States include navigable waterways and wetlands adjacent to navigable waterways and non-navigable waterways and wetlands adjacent to non-navigable waters that are contiguous with navigable waterways. The term "waters of the United States" is defined by 33 Code of Federal Regulations (CFR) Part 328 and currently includes: (1) all navigable waters (including all waters subject to the ebb and flow of the tide), (2) all interstate waters and wetlands, (3) all other waters (e.g., lakes, rivers, intermittent streams) that could affect interstate or foreign commerce, (4) all impoundments of waters mentioned above, (5) all tributaries to waters mentioned above, (6) the territorial seas, and (7) all wetlands adjacent to waters mentioned above. The waters of the U.S. do not include (1) waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA, and (2) prior converted cropland.

Wetlands are defined by 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support … a prevalence of vegetation typically adapted for life in saturated soil conditions." In 1987, the USACE published a manual to guide its field personnel in determining jurisdictional wetland boundaries. This manual was amended in 2008 by the USACE 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Currently, the 1987 Wetland Manual and the 2008 Arid West Supplement provide the legally accepted methodology for identification and delineation of USACE-jurisdictional wetlands in southern California.

The methodology set forth in the 1987 Wetland Manual and updated by the Arid West Supplement generally requires that, in order to be considered a wetland, the vegetation, soils, and hydrology of an area must exhibit at least minimal hydric characteristics. While the manual provides great detail in methodology and allows for varying special conditions, a wetland should normally meet each of the following three criteria:

- More than 50 percent of the dominant plant species at the site must be typical of wetlands (i.e., rated as facultative or wetter in the 1988 National List of Plant Species that Occur in Wetlands [Reed 1988]). These plants are known as "hydrophytic vegetation."

- Soils must exhibit physical and/or chemical characteristics indicative of permanent or periodic saturation (e.g., a gleyed color or mottles with a matrix of low chroma indicating a relatively consistent fluctuation between aerobic and anaerobic conditions). Such soils, known as "hydric soils," have characteristics that indicate they are developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season.

- Hydrologic characteristics must indicate that the ground is saturated to within 12 inches of the surface for at least five percent of the growing season during a normal rainfall year. For most of low-lying southern California, five percent of the growing season is equivalent to 18 days.

Although the most reliable evidence of wetland hydrology may be provided by a gauging station or groundwater well data, such information is often limited for most areas. Thus, most hydrologic indicators are those that can be observed during field inspection. The following indicators provide some evidence of hydrology: (1) standing or flowing water; (2) water-logged soils during the growing season; (3) water marks present on trees or other objects associated with a drainage; (4) drift lines, or small piles of debris oriented in the direction of water movement through an area; (5) shelving; (6) destruction of terrestrial vegetation; and (7) thin layers of sediments deposited on leaves or other objects. The 2008 Arid West Supplement includes additional indicators such as surface soil cracks, inundation visible on aerial imagery, salt and biotic crusts, aquatic invertebrates, hydrogen sulfide odor, and evidence of oxidation/reduction reactions within the soil profile. In general, a combination of hydrologic indicators identifies a more defined hydrological system.

In the absence of wetlands, the limits of USACE jurisdiction in non-tidal waters, including intermittent Relatively Permanent Water (RPW) streams, extend to the Ordinary High Water Mark (OHWM), which is defined by 33 CFR 328.3(e) as:

> *… that line on the shore established by the fluctuation of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

On January 9, 2001, the U.S. Supreme Court ruled (in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*) (SWANCC) that the USACE jurisdiction does not extend to previously regulated isolated waters, including but not limited to isolated ponds, reservoirs, and wetlands. Examples of isolated waters that are affected by this ruling include vernal pools, stock ponds, lakes (without outlets), playa lakes, and desert washes that are not tributary to navigable or interstate waters or to other jurisdictional waters.

A joint guidance by the U.S. Environmental Protection Agency (EPA) and the USACE was issued on June 5, 2007, to clarify circumstances where a CWA Section 404 permit would be required before conducting activities in wetlands, tributaries, and other waters. This guidance is consistent with the Supreme Court's decision in the consolidated cases *Rapanos v. United States* and *Carabell v. United States* (126 S. Ct. 2208 [2006]) (*Rapanos*), which address the jurisdiction over waters of the United States under the CWA (33 U.S.C. §1251 et seq.). This *Rapanos* guidance does not supersede the 2003 guidance interpreting SWANCC (68 FR 1991), and the agencies will continue to evaluate jurisdiction over isolated waters on a case-by-case basis.

The USACE will continue to assert jurisdiction over traditional navigable waters (TNW), wetlands adjacent to traditional navigable waters, non-navigable tributaries of TNW that are relatively permanent (RPW) where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months), and wetlands that directly abut such tributaries. The USACE generally will not assert jurisdiction over swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) or ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The USACE does not generally consider non-tidal drainage ditches excavated on uplands to be waters of the United States. The USACE defines a drainage ditch as:

> *A linear excavation or depression constructed for the purpose of conveying surface runoff or groundwater from one area to another. An "upland drainage ditch" is a drainage ditch constructed entirely in uplands (i.e., not in waters of the United States)*

and is not a water of the United States, unless it becomes tidal or otherwise extends the ordinary high water line of existing waters of the United States.

Furthermore, the USACE generally does not consider "Artificially irrigated areas which would revert to upland if the irrigation ceased" to be subject to their jurisdiction. These irrigation ditches are linear excavations constructed for the purpose of conveying agricultural water from the adjacent fields. Therefore, these agricultural ditches are not considered to be subject to USACE jurisdiction.

The USACE will use fact-specific analysis to determine whether waters have a significant nexus with TNW for non-navigable tributaries that are not relatively permanent (non-RPW), wetlands adjacent to non-navigable tributaries that are not relatively permanent, and wetlands adjacent to, but that do not directly abut, a relatively permanent non-navigable tributary. According to USACE, *"a significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters,"* including consideration of hydrologic and ecologic factors. A primary component of this determination lies in establishing the connectivity or lack of connectivity of the subject drainages to a TNW; therefore, the drainages of the project site must be analyzed from their origins to their terminus for any USACE jurisdictional determination.

In May 2007, the USACE and EPA jointly published and authorized the use of the *Jurisdictional Determination Form Instructional Guidebook* (USACE 2007). The form and guidebook define how to determine if an area is USACE jurisdictional, and if a significant nexus exists per the Rapanos decision. A nexus must have more than insubstantial and speculative effects on the downstream TNW to be considered a significant nexus.

In addition to standard references for a jurisdictional delineation (e.g., 1987 USACE Wetlands Delineation Manual and 2008 USACE Arid West Supplement) and applicable state and federal statutes as listed above, the USACE referenced the USACE Regulatory Guidance Letter 05-05 "Ordinary High Water Mark Identification" (2005) and USACE Regulatory Guidance Letter 82-02 "Clarification of 'Normal Circumstances' in the Wetland Definition" (1982) when reviewing the original jurisdictional delineation. This guidance was applied during the re-evaluation of the original jurisdictional delineation.

USACE Regulatory Guidance Letter 05-05 states that "where the physical characteristics are inconclusive, misleading, unreliable, or otherwise not evident, districts may determine the OHWM by using other appropriate means that consider the characteristics of the surrounding areas, provided those other means are reliable. Such other reliable methods that may be indicative of the OHWM include, but are not limited to, lake and stream gage data, spillway height, flood predictions, historic records of water flow, and statistical evidence" (USACE 2005). The physical characteristics seen at the Salton Sea can be considered unreliable because they may represent relic hydrology indicators left as the Sea continues to recedes.

A normal circumstance in the Project area is the annual receding of the Salton Sea which is exposing an increasing amount of playa each year. Receding water is not a temporary situation but is a permanent circumstance and therefore this is considered the new normal. Since this is how the aquatic system currently exists, wetlands that may have existed over a record period of time in this location should not be regulated under Section 404. To be considered a wetland in normal circumstances, existing wetlands are required to be an area that is inundated or saturated by water at a frequency and duration sufficient to support aquatic vegetation (USACE 1982). The intent of Section 404 is to regulate discharges of dredged or fill material into the aquatic system as it exists and not as it may have existed over a record period of time.

2.2. REGIONAL WATER QUALITY CONTROL BOARD

The State of California (State) regulates discharge of material into waters of the State pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act (California Water Code, Division 7, §13000 et seq.). Porter–Cologne reserves the right for the State to regulate activities that could affect the quantity and/or quality of surface and/or ground waters, including isolated wetlands, within the State. Waters of the State determined to be jurisdictional for these purposes require, if impacted, waste discharge requirements and a 401 Certification (in the case of the required USACE permit). The State Water Resources Control Board (SWRCB) and the local Regional Water Quality Control Boards (RWQCB) are the relevant permitting agencies. Limits of jurisdiction include wetland boundaries and the OHWMs of TNWs, RPWs, non-RPWs.

2.3. CALIFORNIA DEPARTMENT OF FISH AND GAME

Pursuant to Division 2, Chapter 6, Sections 1600-1602 of the California Fish and Game Code, CDFG regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife.

CDFG defines a “stream” (including creeks and rivers) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation.” CDFG’s definition of “lake” includes “natural lakes or man-made reservoirs.” CDFG limits of jurisdiction include the maximum extents of the uppermost bank-to-bank distance or riparian vegetation dripline.

SECTION 3.0 – METHODS

3.1. LITERATURE REVIEW

Chambers Group scientists researched available maps and documents that pertain to the Project. The search consisted of a review of the USGS 7.5-minute topographic quadrangle containing the site (USGS 2011a), the United States Fish and Wildlife (USFWS) National Wetlands Inventory (NWI) maps (USFWS 2011), the United States Department of Agriculture, National Resource Conservation Science (USDA-NRCS) Web Soil Survey and National List of Hydric Soils (USDA-NRCS 2009 and 2011, respectively), and a review of aerial photographs. Information from the California Natural Diversity Database was reviewed for potential habitats and species that may be present within or in the vicinity of the Project site (CDFG 2011). In addition, a review of the Salton Sea SCH Project DEIS/EIR including the Project drawings and maps was performed (USACE/Agency 2011).

In addition to conditions observed and recorded in the field by Chambers Group and Dudek, and the above listed references, a number of additional data sources, as listed below, were utilized during the process of revising the delineation:

- Topographic mapping (Ducks Unlimited 2012)
- Salton Sea Water Surface Elevation – Westmorland Gage Station #10254005 (USGS 2010, 2011b, 2012a)
- New River Water Surface Elevation – Westmorland Gage Station #10255550 (USGS 2012b)
- Precipitation Records – Imperial Weather Station ID-IPL (NOAA 2009, 2010, 2011)
- Hydrologic Rating Curve for New River (Cardno ENTRIX 2012)
- Flood Insurance Rate Map for New River (FEMA 2008)
- Information Memo #2 (DSOD 2012)

3.2. FIELD SURVEY

Chambers Group scientists Michael Simmons, Rebecca Alvidrez, Ivy Watson and Maya Mazon performed the original field investigation during the week of August 15 to August 19, 2011, to determine the presence of, characterize and, if necessary, delineate on-site wetland and streams. The weather during the field investigation was sunny with afternoon air temperatures ranging from 110 to 114 degrees Fahrenheit. In the week leading up to the investigation, there was no precipitation recorded for Brawley, California (Accuweather 2011). A photographic record of Project site was collected and is included in Appendix A – Site Photographs.

Potential USACE / RWQCB / CDFG jurisdictional areas were field-checked for the presence of definable channels and/or wetland vegetation, riparian habitat, soils, and hydrology. The lateral extent of a jurisdictional drainage features were measured depending on drainage conditions. In the absence of a defined wetland, the USACE and the RWQCB traditionally use the determination of the presence of a bed and bank to the upper limit of the OHWM. Under the Rapanos court decision, the USACE now requires a fact-specific significant nexus analysis to be performed for dry or ephemeral washes (non-

RPWs) in southern California to determine the extent of USACE jurisdiction on a given project site. Connectivity was investigated and determined through a "desktop" study by utilizing the DEIS/EIR drawings and maps (USACE/Agency 2011), USGS topographic maps (USGS 2011a), NWI maps (USFWS 2011), and Google Earth images (Google 2011).

Potential wetland habitats were evaluated using the methodology set forth in the 1987 Corps of Engineers Wetlands Delineation Manual (1987 Manual) and the 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Arid West Supplement) (USACE 1987, 2008). Potential wetland habitat features were also investigated for potential CDFG jurisdiction by utilizing the USFWS one-parameter method. Features with no evidence of wetland hydrology and that supported only upland vegetation were evaluated for the upward limits of jurisdiction and not exclusively for wetland parameters.

Wetland data was recorded onto standardized Wetland Determination Data Forms – Arid West Region data forms. In order to formally determine the presence or absence of wetlands, upland features were also recorded onto the standardized data sheets. Sample plots were established and recorded data included plant species with estimated percent areal coverage within each vegetation stratum (i.e., tree, sapling/shrub, herb, woody vine), soil profiles investigated in soil pits, and evidence of hydrology. The Wetland Determination Data Forms are included in Appendix B.

The RWQCB jurisdictional limits includes USACE jurisdictional areas, OHWMs in non-RPWs, isolated wetlands, and other features that have an effect on surface or subsurface water quality within California.

The CDFG claims jurisdiction to the top of the bank on either side of the drainage or to the outer edge of all riparian vegetation, whichever measurement is greater, and including associated riparian wetlands that can be defined using the one-parameter USFWS methodology for wetland habitat identification. This edge, as determined by the "dripline" of the riparian canopy, is used as the line of demarcation between riparian and upland habitats. On smaller streams or dry washes with little or no riparian habitat, the top of the bank is used to mark the lateral extent of CDFG jurisdictional drainage. Drainage widths were measured for jurisdictional acreage calculations.

Lastly, the OHWM of the Salton Sea was determined to be located at the -231-foot below sea level elevation. This elevation is based on the average elevation of the water level within the sea from June 21, 2009 through June 20, 2010. The -231-foot below sea level elevation, for the purposes of presenting its location on Project figures and for calculating potential impact acreages, was provided by Ducks Unlimited. That data for the elevation contour was modified for the purposes of GIS analysis. The elevation contour was "traced" at a 1:600 ratio using ArcGIS so that it could be incorporated into the data that was collected in the field. This methodology was discussed and confirmed with DUDEK.

On March 30, 2012, a conference call attended by USACE, CDFG, Department of Water Resources (DWR), Cardno ENTRIX, and Dudek staff included discussion of the jurisdictional delineation and, in particular, the lack of current indicators of hydrology within much of the Project. On April 11, 2012, staff from USACE, CDFG, Cardno ENTRIX, and Dudek conducted a site visit to review the original jurisdictional delineation. During this field visit, the team reviewed several areas included in the original delineation, such as exposed playa, original soil pits, and staging areas. Additional data was collected in areas where the delineation was called into question. The additional Wetland Determination Data Forms from this site visit are included in Appendix B.

3.3. VEGETATION

For the purposes of wetland delineation, plants are categorized according to their probabilities to occur in wetlands versus non-wetlands in accordance with the categories in the *National List of Species that Occur in Wetlands* (Reed 1988). More specifically, the California Land Resource Region (Region 0) wetlands plant list is used, which is a regional adaptation of the *National List*. The wetland species categories are:

I. **Obligate Wetland (OBL)** – Occur almost always (estimated probability >99 %) under natural conditions in wetlands.

II. **Facultative Wetland (FACW) –** Usually occur in wetlands (estimated probability 67 % to 99 %), but occasionally found in non-wetlands.

III. **Facultative (FAC) –** Equally likely to occur in wetlands or non-wetlands (estimated probability 34 % to 66 %).

IV. **Facultative Upland (FACU) –** Usually occur in non-wetlands (estimated probability 67 % to 99 %), but occasionally found in wetlands.

V. **Obligate Upland (UPL) –** May occur in wetlands in another region, but occur almost always (estimated probability >99 %) under natural conditions in non-wetlands in southern California. All species not listed on the *National List of Species that Occur in Wetlands* (Reed 1988) are considered to be UPL.

VI. **No Indicator (NI)** – NI is recorded for those species for which insufficient information was available to determine an indicator status.

Plant species and absolute percent covers are recorded by stratum (i.e., tree, sapling/shrub, herb, woody vine) and evaluated for dominance and prevalence according to guidelines in the 1987 Manual and Arid West Supplement. Naming conventions follow the Jepson Manual (Hickman 1993).

3.4. HYDROLOGY

During the original Chambers Group delineation, typical hydrologic indicators were observed per the 1987 Manual and Arid West Supplement guidelines and recorded. Indicators identified included surface water, saturation, sediment deposits, drift deposits, surface soil cracks, water-stained leaves, biotic crust, aquatic invertebrates, and oxidized rhizospheres along living roots. Climate and flow frequency was considered when observing watermarks and drift lines. For the purpose of determining hydrologic connectivity to a TNW, aerial photos, NWI maps, and USGS quadrangle maps were referenced; and features were inspected in the field on- and off site for true connectivity.

Further review of the hydrologic dynamics of the Salton Sea was necessary to determine the extent of jurisdictional features within the Project area. Jurisdiction over relatively extensive areas of exposed Salton Sea playa (i.e., former seabed) was determined through field investigations and an evaluation of numerous hydrologic data. Areas of currently exposed playa are due to the continued, gradual but consistent, receding water surface elevation of the sea. These areas were specifically investigated to determine the extent of jurisdictional areas. As discussed above, hydrology from the Salton Sea is based on gage station data which shows that the water surface elevation of the sea is consistently receding since at least 2006. In addition, the potential for storm events to provide hydrology to the exposed playa was evaluated through review of a Flood Insurance Rate Map, a hydrologic rating curve, and an information memo for the New River (FEMA 2008; Cardno ENTRIX 2012; DSOD 2012).

3.5. SOILS

The USDA-NRCS Web Soil Survey (USDA-NRCS 2009) was referenced for soil types found within and in the vicinity of the Project site. In the field, soil pits were investigated in representative delineated features within the Project site, and were evaluated according to guidelines in the 1987 Wetland Manual and Arid West Supplement. Soil layers were examined for the presence or absence of hydric soil indicators and oxidation/reduction features indicative of historic saturated soil conditions.

SECTION 4.0 – RESULTS

The results presented below represent the site conditions at the time of the investigation. This site investigation was performed under normal environmental conditions for the time of the year. The vegetation was assessed during the growing season, and there were no recent storm events or other indications that vegetation or soil condition had been altered.

4.1. LITERATURE REVIEW

The USFWS NWI online mapper indicates the presence of multiple classes of wetlands and one named blue line within the Project area (NWI 2011). The named blue line feature is identified as the New River. Lacustrine wetlands constitute the largest portion of wetland classes throughout much of Project area with lesser amounts of palustrine freshwater wetlands along the peninsula associated with the New River, and riverine wetlands associated with the New River (NWI 2011). The USDA-NRCS Web Soil Survey indicates 11 soil types within the Project site (USDA-NRCS 2009). The soil types include:

- Fluvaquents, saline
- Holtville silty clay, wet
- Imperial silty clay, wet
- Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes
- Indio lam, wet
- Indio-vint complex
- Meloland very fine sandy loam, wet
- Meloland and Holtville loams, wet
- Rositas fine sand, wet, 0 to 2 percent slopes
- Vint loamy very fine sand, wet
- Water

Fluvaquents, saline is listed as a hydric soil on the National Hydric Soils List (USDA-NRCS 2011a).

Additional literature review was conducted to assess hydrology; the results of this review are presented in Section 4.3.4.

4.2. VEGETATION COMMUNITIES

There were five vegetation communities observed within the Project area that included tamarisk scrub, iodine bush scrub, common reed marshes, cismontane alkali marsh, and ruderal/disturbed. These communities are described below. Other habitat types observed, but were unvegetated within the Project area included open water, exposed playa and drainage ditches. Additionally, agricultural practices were observed adjacent to the Project area.

4.2.1 Tamarisk Scrub

Tamarisk Scrub is characterized as a weedy monoculture of any of several Tamarisk species (*Tamarix* spp.) usually replacing native vegetation following major disturbance. This vegetation community can be found on sandy or gravelly braided washes or intermittent streams, often in areas where high evaporation increases the stream's salinity. Tamarisk is a prolific seeder and strong long-rooted plant that absorbs water from the water table or the soil above it. These characteristics make this species an aggressive competitor in disturbed riparian corridors (Holland 1986). Tamarisk scrub was the predominant vegetation community observed throughout much of the wetland portion of the Project area. This vegetation community was observed within the exposed playa and upper extent of the shoreline of the Salton Sea, above the -231-foot below sea level elevation. Tamarisk scrub was also closely associated with the drainages within the Project area, and the riparian vegetation of the New River.

4.2.2 Iodine Bush Scrub

Iodine Bush Scrub is dominated by iodine bush (*Allenrolfea occidentalis*). Shrubs in this community are typically less than 7 feet in height with an open to continuous canopy. The herbaceous layer is variable and may include salt grass (*Distichlis spicata*) and alkali sacaton (*Sporobolus airoides*). This community can be found on dry seabed margins, hummocks, playas perched above current drainages, and seeps (Sawyer and Keeler-Wolf 2009). Iodine bush scrub was also a common vegetation community throughout the Project area but to a lesser extent than that of Tamarisk Scrub. Similar to what was reported in the DEIS/EIR, iodine bush scrub was observed in relatively open stands on the shores and exposed playa of the Salton Sea, and primarily above the -231-foot below sea level elevation (USACE 2011). This community was observed along some of the agricultural drainages, within former agricultural fields, and at the outlet/mouth of the New River.

4.2.3 Common Reed Marshes

Common Reed Marshes are dominated by common reed (*Phragmites australis*). Herbs are less than 13 feet in height with a continuous canopy. This community is found in semi-permanently flooded and slightly brackish marshes, ditches, impoundments. Soils have high organic content and are poorly aerated (Sawyer and Keeler-Wolf 2009). Common reed marshes occurred much less frequently throughout the Project area. The community was well established in association with the New River in the Project area. Other areas of common reed marshes were observed at a lesser extent than the tamarisk scrub or iodine bush scrub throughout the Project area above the -231-foot below sea level elevation, primarily associated with the agricultural drainage portions of the Project area.

4.2.4 Cismontane Alkali Marsh

Cismontane Alkali Marsh is dominated by perennial, emergent, herbaceous monocots up to 7 feet in height. Cover is often complete and dense. This community is characterized by standing water or saturated soil present during most of all of the year. High evaporation and low input of fresh water render these marshes somewhat salty, especially during the summer. Cismontane Alkali Marshes can be found on margins of lakebeds and occasionally near the Colorado River in eastern Riverside and Imperial Counties. This community is now much reduced in area by drainage and cultivation. There was one area of this vegetation community observed within the Project area, in association with Drainage 3 along the upper extent of the Salton Sea shoreline. Drainage 3 is located in the Far West New portion of the Project area as identified in the DEIS/EIR (USACE 2011).

4.2.5 Ruderal/Disturbed

Areas classified as Ruderal are dominated by pioneering herbaceous species that readily colonize disturbed ground and are typically found in temporary, often frequently disturbed habitats (Barbour *et al.* 1999). The soils in Ruderal areas are characterized as heavily compacted or frequently disturbed. The vegetation in these areas is adapted to living in compact soils where water does not readily penetrate the soil. Disturbed areas are those areas that are either devoid of vegetation (cleared or graded), such as dirt roads, or those areas that are dominated by non-native weedy species. Disturbed areas were concentrated in the southeastern-most extent of the Project area (East New area as described in the DEIS/EIR (USACE 2011) due to the dominance of agriculture adjacent to the Project area. Other areas of disturbed community were observed in the western portion of the Project area, the western end of Drainage 15, and the various access roads within the Project area.

4.3. WATERS OF THE UNITED STATES

The Project area includes three jurisdictional types: non-wetland waters, vegetated wetlands, and unvegetated wetlands.

4.3.1 Non-Wetland Waters

Non-wetland waters include two types:

1. Lacustrine Waters—areas below the OHWM of the Salton Sea and
2. Riverine Waters—areas below the OHWM of the New River or one of several agricultural drains within the Project area.

4.3.1.1 Lacustrine OHWM Determination

As previously discussed, the physical characteristics normally used to determine OHWM seen at the Salton Sea can be considered unreliable because they are likely relic hydrology indicators left as the Sea continues to recedes. USACE Regulatory Guidance Letter 05-05 allows for the use of other reliable methods to determine the OHWM where physical characteristics are misleading. Therefore the OHWM of the Salton Sea is defined by the recorded high water surface elevation for the most recent period representing “normal circumstances” for purposes of this delineation by excluding records during potential drought periods, per USACE guidance (USACE 1982). The most recent period of normal circumstances was determined using the nearest WETS station data collected and published by the United States Department of Agriculture (USDA 2012). The WETS program uses recorded rainfall (from 1928 to 2002) and determines the amount of rainfall that has a 30% chance of falling on a given month or an annual basis. For example, the nearest WETS station to the Project is the Brawley 2 SW station. The station data indicates that on an annual basis there is a 30% chance of receiving less than 1.64 inches and a 30% chance of receiving greater than 3.77 inches of precipitation. This thus represents the range of normal conditions. The National Weather Service also provides precipitation records including annual total based on water years (October-September) and a comparison of that total to the average recorded precipitation (percent of average) (NOAA 2009, 2010, 2011). The nearest National Weather Service station to the project is Imperial which had the following recorded rainfall:

- 1.39 inches (46% of normal) for the 2009 water year,

- 3.98 inches (132% of normal) for the 2010 water year, and
- 2.57 inches (85% of normal) for the 2011 water year.

Thus, the 2010 and 2011 water years would represent normal conditions, with regards to rainfall, whereas the 2009 water year would represent a drought condition. The following is the corresponding high water surface elevation recorded USGS Westmorland gage station for the Salton Sea (2010, 2011, 2012a):

- A maximum elevation of 230.0 feet below sea level for the 2009 water year
- A maximum elevation of 230.6 feet below sea level for the 2010 water year
- A maximum elevation of 231.1 feet below sea level for the 2011 water year

Based on these data and given that topographic data for the Project is available at 1-foot contours, the -231 foot below sea level elevation was determined to be the current OHWM of the Salton Sea. All areas below -231 foot sea level are considered jurisdictional waters. These jurisdictional areas occupy the downstream (i.e., northern and western) portion of the Project area.

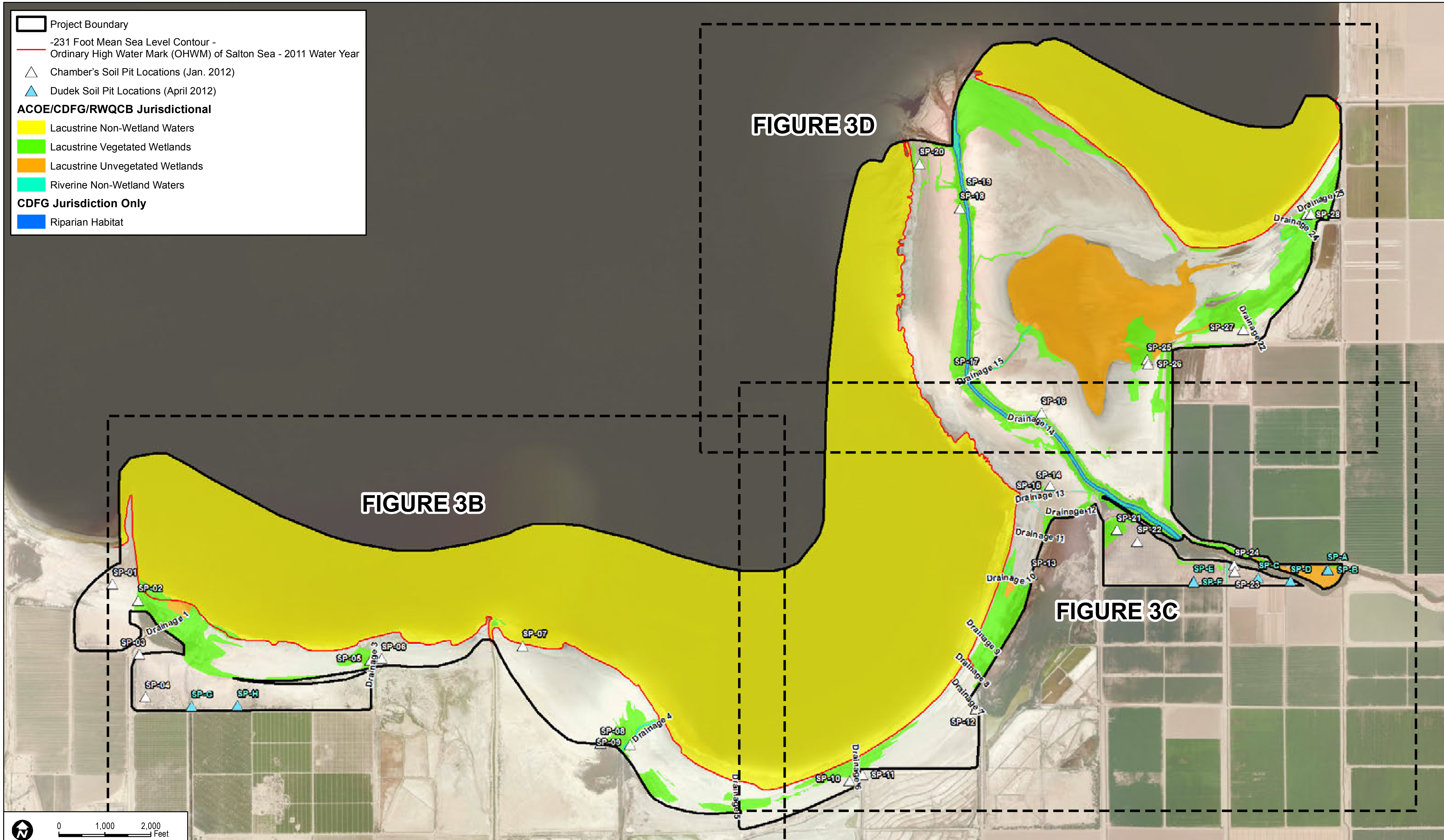
The total lacustrine non-wetland Waters of the U.S. present in the Project area is 2,188 acres.

4.3.1.2 Riverine OHWM Determination

There were 25 drainages observed within the Project area that channel water in the general direction of and discharge into the Salton Sea. Each drainage exhibited signs of an OHWM, and the OHWM widths ranged from 2 feet up to 30 feet. The drainages demonstrated unvegetated channels within the OHWM and many had associated wetland vegetation. The drainages receive hydrology primarily from agricultural runoff, and receive additional hydrology from direct precipitation and local stormwater runoff. A summary table of data associated with the 25 drainages is presented in Appendix C. Figures 3A-D depict the location of the drainage features.

New River

The New River (Drainage 14) is a perennial waterway with an OHWM of approximately 30 feet in width that was unvegetated and appeared to have a mud bottom. The banks of the river contained associated riparian vegetation that was dominated by southern cattail (*Typha domingensis*) and common reed (*Phragmites australis*). The river is separated from the sea by a berm that has been constructed for access purposes. The berm is approximately 5 to 7 feet in height (from the water level at the time of the survey) and an access road runs along the top of the berm. The river flows north through the Project area and discharges into the Salton Sea. Prior to discharging into the sea, the New River crosses through mixed-use agricultural lands and runoff from the agricultural lands contributes hydrology to the system. Direct precipitation and local stormwater runoff also contribute hydrology to the New River system. The New River is approximately 11,480 linear feet in length and encompasses approximately 11 acres within the Project area.



DUDEK

6575

SOURCE: Chambers 2012; Duck Unlimited Inc. 2012; Bing Maps

FIGURE 3A

Index Map

SALTON SEA SPECIES CONSERVATION HABITAT - FINAL JURISDICTIONAL DELINEATION REPORT

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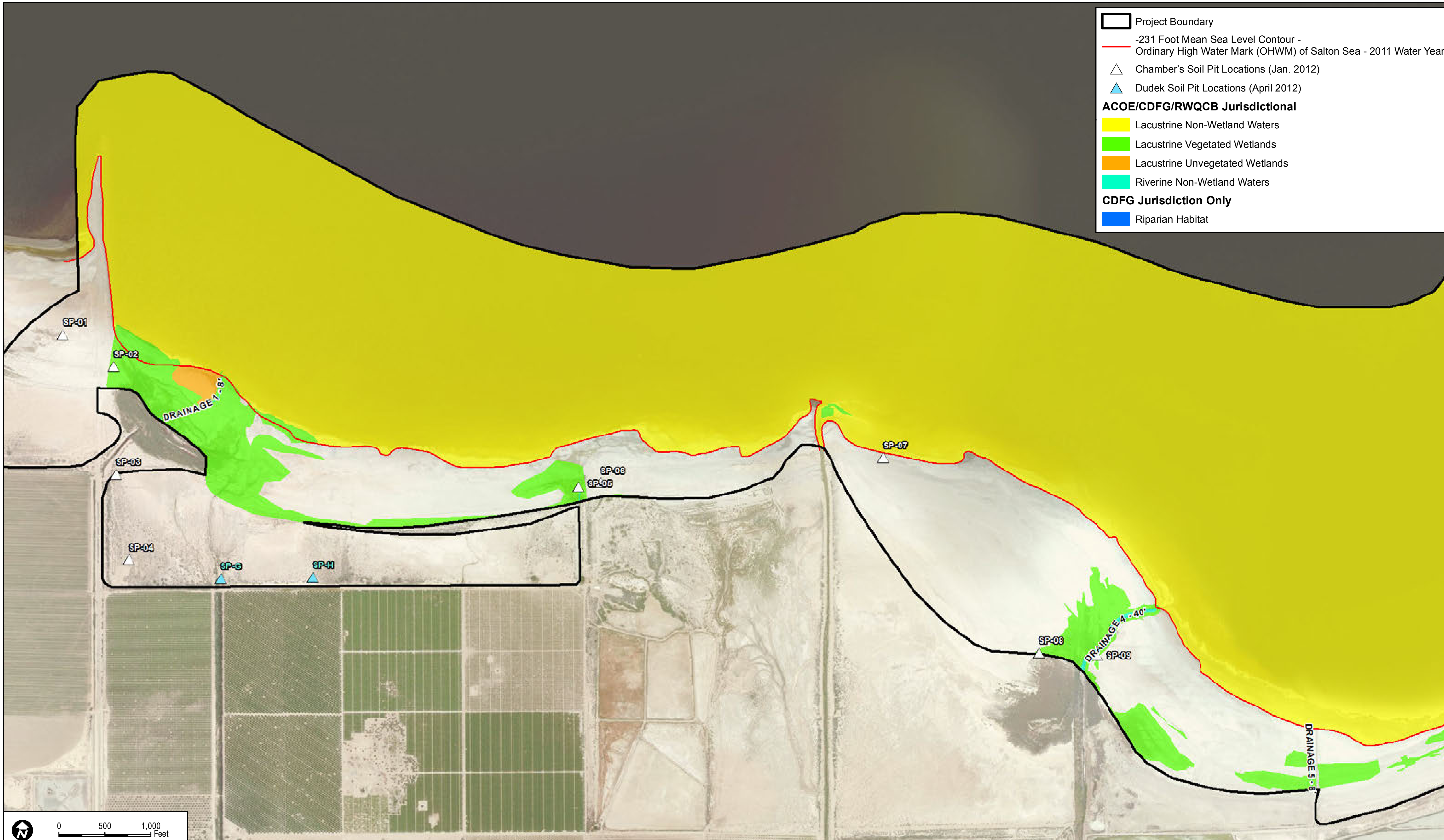

DUDEK

6575

SOURCE: Chambers 2012; Duck Unlimited Inc. 2012; Bing Maps

FIGURE 3B

Final Jurisdictional Delineation Map

SALTON SEA SPECIES CONSERVATION HABITAT - FINAL JURISDICTIONAL DELINEATION REPORT

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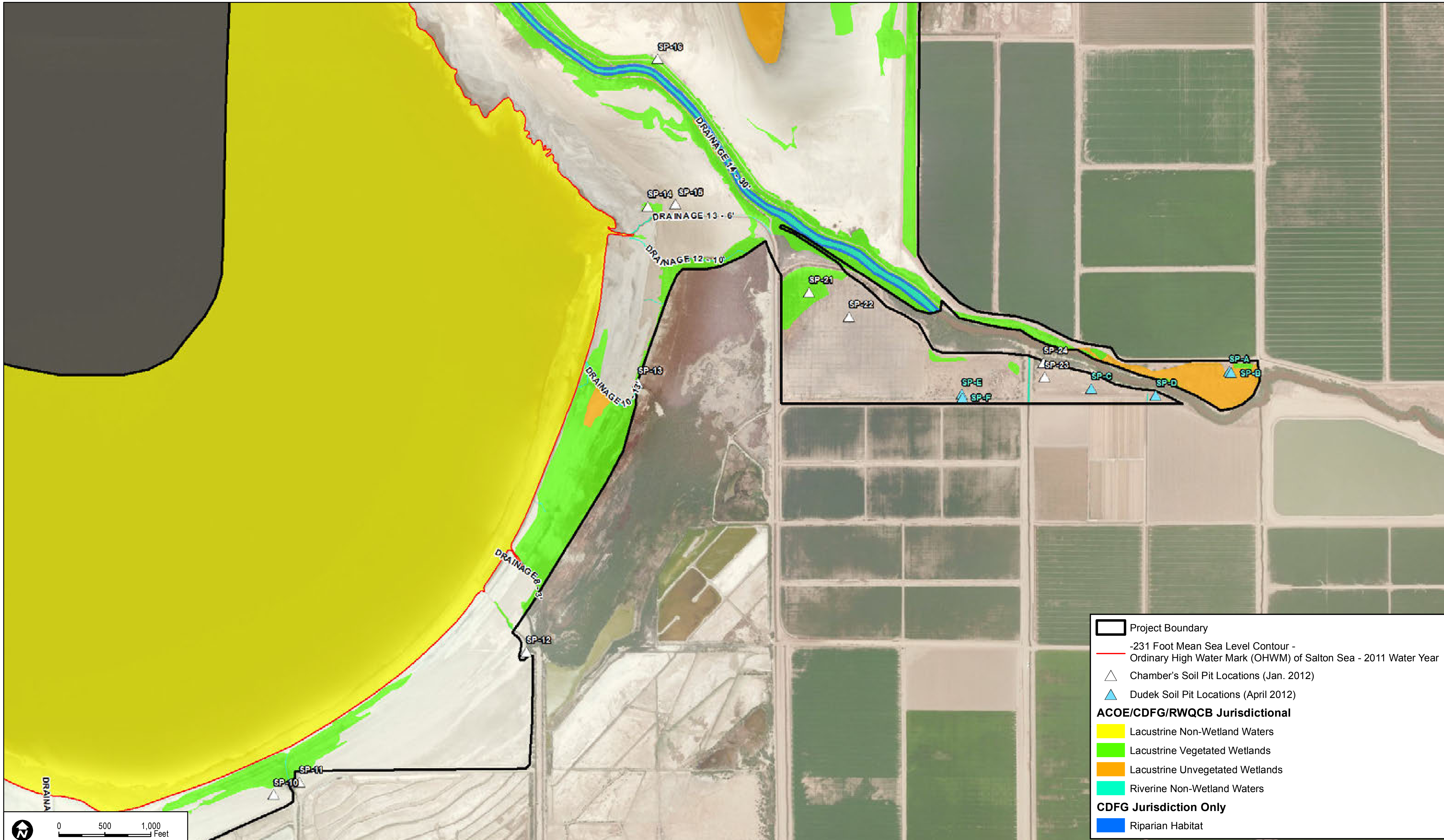

DUDEK

6575

SOURCE: Chambers 2012; Duck Unlimited Inc. 2012; Bing Maps

FIGURE 3C

Final Jurisdictional Delineation Map

SALTON SEA SPECIES CONSERVATION HABITAT - FINAL JURISDICTIONAL DELINEATION REPORT

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DUDEK

6575

SOURCE: Chambers 2012; Duck Unlimited Inc. 2012; Bing Maps

FIGURE 3D

Final Jurisdictional Delineation Map

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Agricultural Drainages

The remaining 24 drainages are ephemeral waterways that demonstrated signs of an OHWM, and contained unvegetated bottoms. Many of the drainages discharge directly into the Salton Sea. There were seven drainages that are utilized for agricultural purposes and concrete-lined; however those drainages demonstrated a definable OHWM and are hydrologically connected to drainages that discharge directly into the Salton Sea. The 24 drainages directed both seasonal stormwater runoff and agricultural runoff directly to the sea. Of the 24 drainages, seven were named according to the USDA-NRCS Web Soil Survey (USDA-NRCS 2009), and included; Poe Lateral (Drainage 1), Trifolium Drain 1 (Drainage 4), Thistle Lateral 8 (Drainage 7), Trifolium Lateral 12 (Drainage 13), Trifolium 12 Drain (Drainage 16), Trifolium Lateral 11 (Drainage 19), and Trifolium 11 Drain (Drainage 20). The 24 ephemeral drainages total approximately 12,820 linear feet and encompass approximately 4 acres with the Project area.

4.3.2 Wetlands

Positive indicators for all three wetland parameters (hydrophytic vegetation, hydric soils and wetland hydrology) were present as patches throughout the Project area. Vegetation was not present throughout the entirety of the wetland; however, the vegetation that existed within the wetlands was established with dense areal coverage.

To determine the extent of wetlands which rely on the Sea as the sole source of hydrology, the WETS station data, as discussed in Section 4.3.1.1, was reviewed to determine when the last "normal rain event" occurred within the Project area. Review of this data has determined that for the past 3 years, the Salton Sea has not inundated areas above -231 foot sea level. Therefore, all hydrologic indicators in areas above the last normal rain year line (-231 foot sea level), and areas that do not receive hydrology from a secondary source (i.e. drainage outfall), are considered relic hydrology indicators. Based on the new normal circumstances that the Sea is gradually, but consistently, receding, these areas will not receive hydrology from the Sea in the future.

Because these areas are considered to have relic hydrology, the hydric soils that are also observed within these areas are considered to be relic soils. Areas above the -231 foot sea level were part of the Sea's bottom for over 100 years, and since 2006 the Sea has been recorded as gradually receding and exposing these areas. The new normal circumstances are that these areas have not received hydrology from the Sea for at least 3 years and will not receive hydrology from the Sea in the near future. Therefore, areas above the -231 line that do not receive hydrology from sources other than the Sea were determined to be non-jurisdictional upland playa areas.

Several wetlands within the Project area may receive their hydrology from the drainages located throughout the site. Hydrophytic vegetation was largely associated with the outlets of these drainage features and therefore the outlets to these drainages are assumed to contained recent and continuous hydrology and met the 3-parameter wetland test.

Figures 3A-D depicts the wetland boundary, the location of the sample plots established during the field delineations, and the vegetated wetland areas that were observed within the Project site.

Vegetated Wetlands

Vegetated wetlands are based observation of current indicators of hydrophytic vegetation, hydric soils, and hydrology (i.e., three criteria per the USACE manual and supplement [USACE 1987, 2008]) during field investigations conducted by Chambers and Dudek. These jurisdictional areas were mapped around several agricultural drain outlets along the Salton Sea shoreline as well as lands adjacent to the New River. These wetlands are mostly located above the OHWM of the Salton Sea; however some areas extend below the OHWM.

Vegetation was dominated by iodine bush (FACW), tamarisk (FAC), with lesser amounts of saltbush (*Atriplex* spp., FAC), southern cattail (OBL), and salt grass (FACW). Young, emergent iodine bush and tamarisk was also observed throughout much of the wetland, but at lower densities and areal coverage. Evidence of hydrology within vegetated wetlands included saturation, inundation visible on aerial imagery, drift deposits, and hydrogen sulfide odor as the primary indicators. Drainage patterns were observed as a secondary indicator of hydrology.

A total of 29 soil pits were explored throughout the Project area during the Chambers Group delineation and 8 during the Dudek delineation. Many of the soil pits explored revealed a multi-layer soil profile of clay, silt, loam, and sand textured soils. Soil colors were varied and consisted of 5Y, 2.5Y, 10 YR, and 7.5 YR with values ranging from 3 to 6, and chromas primarily between 3 and 1 (GretagMacbeth 2009). Prominent and distinct redoxomorphic features were observed in many of the wetland soil pits, and many met the conditions of the F3 – Depleted Matrix indicator for hydric soils. Gleyed matrices were also observed within the soil pits, and met the hydric soil indicator F2 – Loamy Gleyed Matrix. Soil data collected during the delineation can be found in the Wetland Determination Data Forms – Arid West Region presented in Appendix B.

The vegetated wetlands comprise approximately 349 acres of the Project area (Figures 3A-D).

Unvegetated Wetlands

Unvegetated wetlands include a few specific areas that have recent indicators of hydric soils and hydrology (similar to those listed above for vegetated wetlands) but may not support vegetation due to historical or current disturbance, including high salinity. A bay-like area is present north of the New River where a gate control structure has been placed by the USFWS in the north bank of the New River allowing a drainage to form (Drainage 15, Figure 3D) and water to be conveyed into an area that would otherwise likely be an exposed playa. The lack of hydrophytic vegetation in this area is likely due to high salinity. The extent of unvegetated wetlands in this area was determined through interpretation of a 2012 aerial photograph (Bing Maps 2012). Additional areas along the Salton Sea include exposed playas surrounded by wetland vegetation and proximate to agricultural drains. In the potential staging areas, unvegetated wetlands include a wide drainage ditch and portions of agricultural fields that support hydric soils and are proximate to the New River, thus providing a potential source of hydrology.

Unvegetated wetlands occupy 196 acres of the Project area.

Non-jurisdictional Exposed Playa

Areas that did not support wetlands vegetation often had relic indicators of hydrology and hydric soils, as discussed above. These indicators included surface soil cracks, drift deposits, salt crust, aquatic invertebrates and fish skeletal remains. Although the above are signs of hydrology, when compared to historical data and the references cited in Section 3.0 Methods, it was determined that many of these indicators were from previous years of hydrological activity and do not represent current hydrological conditions.

Although hydric soil indicators were present within many of the areas sampled, some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, where hydrophytic vegetation and indicators of current hydrology are lacking, hydric soil indicators are considered to be relic and not an indicator of current wetness.

There are approximately 1,260 acres of non-jurisdictional exposed playa within the Project area.

4.3.3 Hydrologic Connectivity

The Salton Sea is a TNW (USACE 2011), and drainages that were observed within the Project area were evaluated for their connectivity to the sea.

The Salton Sea is recognized as a TNW, and the New River as an RPW flowing directly into a TNW (USACE 2011); therefore both are Waters of the U.S. The remaining 24 drainages demonstrated signs of an OHWM and flow in the direction of the Salton Sea from and through the Project area, directly discharging into the Salton Sea, a TNW. Many of the drainages are non-navigable RPW tributaries to a TNW.

A significant nexus was determined to exist for the Project based on the following facts:

- The 24 drainages are RPW and are hydrologically connected to a TNW (Salton Sea). RPWs, by definition, are USACE-jurisdictional;
- The drainages have the capacity to carry pollutants, nutrients, and organic carbon to the nearest TNW. Agricultural practices were immediately adjacent to the banks of the drainages that likely result in direct surface runoff for pollutants;
- The nutrients and organic carbon support in-stream and downstream food webs; and
- The 24 drainages effectively contribute to interstate commerce by channeling water towards the Salton which is used for boating, fishing, other recreation, and agricultural practices. Water quality is vital to the success of recreational and business opportunities that the Salton Sea presents to the public and to private residents.

4.3.4 Hydrology Potentially Supporting Wetlands above OHWM

At the request of the USACE, Dudek and Cardno ENTRIX conducted a review of the hydrology of the New River to determine the potential for the New River to provide storm flows that could support wetlands. Wetlands are areas that are flooded or ponded or have soils that are saturated with waters for long periods during the growing season in most years. Generally wetlands are inundated or saturated in most years (at least 5 years in 10, or 50% or higher probability) (USACE 2008). The relevant gage data (USGS 2012b) was used to develop a hydrologic rating curve (Cardno ENTRIX 2012). This rating curve provides stage heights for various project storm events (Table 1).

Table 1: Result of Hydrologic Rating Curve for New River

Return Period / Storm Event	Q / Flow Rate (cubic feet per second)	Stage Height (feet)
2-Year	883	7.24
5-Year	1,141	9.23
10-Year	1,404	11.26
25-Year	1,864	14.80
50-Year	2,320	18.31
100-Year	2,894	22.73

Source: Cardno ENTRIX 2012

The cross-sections of the berms on the New River at the Project site indicate that the berm height is approximately between 15 and 17 feet in height from channel bottom (DSOD 2012). Thus, the analysis indicates that a greater than 25-year storm event is necessary for flows to breech the New River and inundate adjacent areas. If the breech were to occur, it would first occur on the western bank and therefore flood the southern/western portions of the Project area). In the arid west the ordinary storm frequency is generally the 5-10 year rain event and the likelihood that a 25-year rain event would occur at a regular frequency to continuously inundate the adjacent playas is low. Therefore, the New River was not considered a secondary hydrology source for the playas. Only the areas at the New River weir and the outlet of the New river continuously receive hydrology from the river.

4.4. WATERS OF THE STATE

4.4.1 Regional Water Quality Control Board

The limit of the RWQCB jurisdiction includes the Salton Sea and associated vegetated and unvegetated wetlands, and the area within the OHWM of the 25 observed drainages, which are RPWs that are hydrologically connected to a TNW. An area of approximately 2,733 acres is Waters of the State under the jurisdiction of the RWQCB (Table 2).

4.4.2 California Department of Fish and Game

Waters of the State under the jurisdiction of the CDFG were field-delineated as the area within the top of the banks and an associated vegetation dripline, and the Salton Sea and associated wetlands. For drainages, CDFG jurisdiction extends to the top of the bank and includes a vegetation dripline. The New River is the only drainage within the Project area that contains associated riparian vegetated banks due to the berms that separate the river from the sea. The width of the bank-to-bank field delineation measurement of the vegetated banks of the New River was approximately 80 feet, and the area of additional CDFG jurisdiction on the New River as riparian habitat is approximately 15 acres. The jurisdiction of CDFG for the lake and streambed, and associated wetlands is 2,733 acres.

Table 1 below summarizes the area of Waters of the State under the jurisdiction of the CDFG to be impacted by this Project.

Table 2: Summary of Jurisdictional Waters

Authority	Non-wetland Waters of the U.S. (acres)	Vegetated Wetland (acres)	Non-vegetated Wetland (acres)	Riparian Habitat	Total Acres of Jurisdictional Waters
USACE	2,188	349	196	—	**2,733**
RWQCB	2,188	349	196	—	**2,733**
CDFG	2,188	349	196	15	**2,748**

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APPENDIX A – SITE PHOTOGRAPHS

APPENDIX A – SITE PHOTOGRAPHS

SITE PHOTOGRAPHS

Photo 1: Overview of eastern shores of the Salton Sea facing North.

Photo 2: Overview of southern portion Salton Sea where numerous emerging shrubs are present within the surface soil cracks.

Photo 3: Overview of Sample Plot 3 facing southeast.

Photo 4: Overview of Sample Plot 4 facing south.

Photo 5: Overview of Sample Plot 5 facing east.

Photo 6: Overview of Sample Plot 6 facing east.

Photo 7: Overview of Sample Plot 7 and western portion of Project area facing east.

Photo 8: Overview of Sample Plot 8 facing northeast.

Photo 9: Overview of Sample Plot 9 facing southwest.

Photo 10: Overview of Sample Plot 10 and western portion of the Project area facing northeast.

Photo 11: Overview of Sample Plot 11 facing northeast.

Photo 12: Overview of Sample Plot 12 facing southwest.

Photo 13: Overview of Sample Plot 13 facing southeast.

Photo 14: Overview of Sample Plot 18 facing southwest.

Photo 15: Overview of Sample Plot 19 facing northeast.

Photo 16: Overview of Sample Plot 20 and western side of the central peninsula of Project area facing south.

Photo 17: Overview of Sample Plot 21 facing south.

Photo 18: Overview of Sample Plot 22 and disturbed area facing east.

Photo 19: Overview of Sample Plot 23 facing east.

Photo 20: Overview of Sample Plot 24 facing north.

Photo 21: Overview of Drainage 5 and associated vegetation facing southwest.

Photo 22: Overview of Drainage 8 facing southeast.

Photo 23: Overview of Drainage 9 facing southeast.

Photo 24: Overview of Drainage 10 facing southeast.

Photo 25: Overview of Drainage 11 facing southeast.

Photo 26: Overview of Drainage 12 facing west.

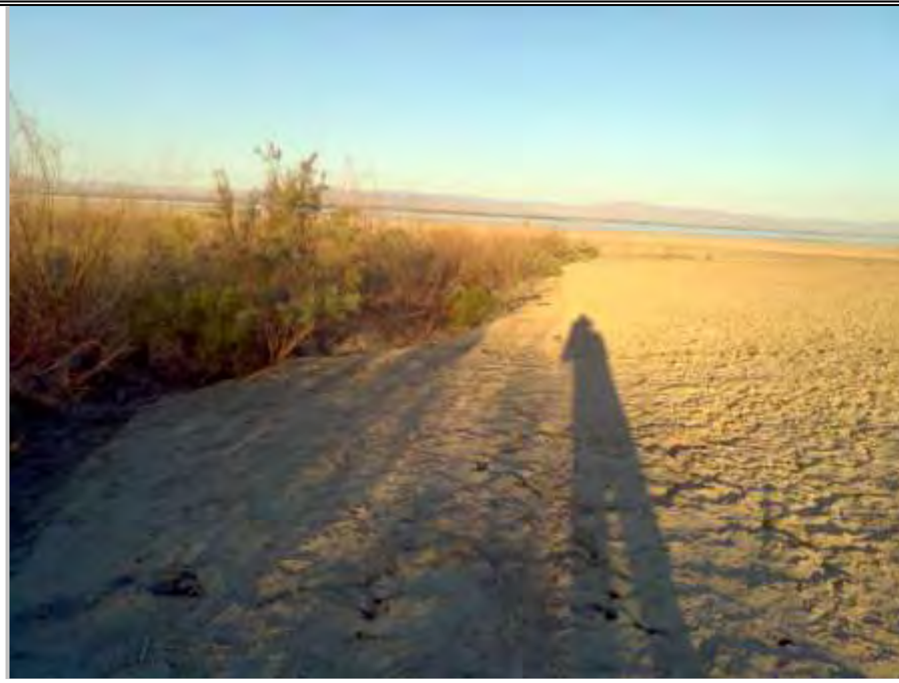

Photo 27: Overview of Drainage 13 facing west.

Photo 28: Overview of Drainage 14 facing west.

Photo 29: Overview of the disturbed area at Drainage 17 facing southwest.

Photo 30: Overview of Drainage 20 facing south with the existing Pellet Road transmission line visible to the east of the road.

Photo 31: Overview of Drainage 21 facing north with the existing Pellet Road transmission line visible to the west of the road.

Photo 32: Overview of Drainage 22 facing east.

Photo 33: Overview of Drainage 23 facing northwest.

Photo 34: Overview of Drainage 24 facing east.

Photo 35: Overview of Drainage 25 facing east.

Photo 36: Overview of Drainage 26 facing northwest.

APPENDIX B – WETLAND DETERMINATION DATA FORMS – ARID WEST REGION

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project | City/County: Imperial | Sampling Date: 4-11-12

Applicant/Owner: CDFG | State: CA | Sampling Point: SP-A

Investigator(s): Vipul Joshi | Section, Township, Range: 24/12S/12E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): none | Slope (%): 0-1

Subregion (LRR): D - Interior Deserts | Lat: 33.104981 | Long: 115.667703 | Datum: NAD 83

Soil Map Unit Name: Holtville Silty Clay, Wet | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☒ Soil ☒ or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: Historical agricultural area. Hummocks and depressions throughout the area. Remnant tile drains. Sampling point is on outer edge of depressional area, adjacent to the roadway.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % | % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	(A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: No vegetation present. Perhaps soils are too salty and/or compacted to allow vegetation to grow.

SOIL

Sampling Point: SP-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	10 YR 4/4	100	5 Y 7/1	5		M	clay	5 Y 7/1 appear as streaks
8-x								highly compacted clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of hydrology, no depressions and very limited soil cracks.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project | City/County: Imperial | Sampling Date: 4-11-12

Applicant/Owner: CDFG | State: CA | Sampling Point: SP-B

Investigator(s): Vipul Joshi | Section, Township, Range: 24/12S/12E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): none | Slope (%): 0-1

Subregion (LRR): D - Interior Deserts | Lat: 33.104929 | Long: -115.667638 | Datum: NAD 83

Soil Map Unit Name: Holtville Silty Clay, Wet | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☒ Soil ☒ or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	◉	○
Wetland Hydrology Present?	◉	○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks: Historical agricultural area. Hummocks and depressions throughout the area. Remnant tile drains. Sampling point is on outer edge of depressional area, adjacent to the roadway but slightly lower than SP-A. Lack of vegetation may be due to high soil salinity and therefore area is considered a wetland, despite lack of hydrophytic vegetation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % | % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	(A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: No vegetation present. Perhaps soils are too salty to allow vegetation to grow.

SOIL

Sampling Point: SP-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	10 YR 4/3	100	2.5 YR 3/6	5	RM	M	clay	salt crusts, cracked soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [x] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [x] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [x] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ( )	No (●)	Depth (inches):
Water Table Present?	Yes ( )	No (●)	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ( )	No (●)	Depth (inches):

Wetland Hydrology Present? Yes (●) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Salt crusts are common in the region; however oxidized rhizospheres are considered to be an indicator of hydrology.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 4-11-12

Applicant/Owner: CDFG State: CA Sampling Point: SP-C

Investigator(s): Vipul Joshi Section, Township, Range: 24/12S/12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.104484 Long: -115.672707 Datum: NAD 83

Soil Map Unit Name: Meloland and Holtville Loams, Wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [X] or Hydrology [X] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Historical agricultural area. Mostly flat and unvegetated, with some tire track depressions.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	0	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	(A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: No vegetation present. Perhaps soils are too salty to allow vegetation to grow.

SOIL

Sampling Point: SP-C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	7.5 YR 4/3	100					sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No clear evidence of hydrology. Soil cracks mainly limited to tire track depressions. Salt crusts are common throughout the region.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project   City/County: Imperial   Sampling Date: 4-11-12

Applicant/Owner: CDFG   State: CA   Sampling Point: SP-D

Investigator(s): Vipul Joshi   Section, Township, Range: 24/12S/12E

Landform (hillslope, terrace, etc.): terrace   Local relief (concave, convex, none): none   Slope (%): 0-1

Subregion (LRR): D - Interior Deserts   Lat: 33.104271   Long: -115.670312   Datum: NAD 83

Soil Map Unit Name: Indio Loam, Wet   NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ◯ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☒ significantly disturbed?   Are "Normal Circumstances" present? Yes ◉ No ◯

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ◯
Hydric Soil Present?	Yes ◯	No ◉
Wetland Hydrology Present?	Yes ◯	No ◉

Is the Sampled Area within a Wetland? **Yes** ◯ **No** ◉

Remarks: Previous agricultural area. Mostly flat, unvegetated area with sparse tamarisk.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tamarisk ramosissima*	5	No	FAC
2.			
3.			
4.			
Total Cover:	5 %		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ %   % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	0	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	5	x 3 =	15
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	5	(A)	15 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ◉ **No** ◯

Remarks: Tamarisk present as seedlings.

SOIL

Sampling Point: SP-D

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	7.4 YR 4/3	100					sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):
Water Table Present? Yes ○ No ● Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No clear evidence of hydrology. Soil cracks mainly limited to tire track depressions. Salt crusts are common throughout the region

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project | City/County: Imperial | Sampling Date: 4-11-12
Applicant/Owner: CDFG | State: CA | Sampling Point: SP-E
Investigator(s): Vipul Joshi | Section, Township, Range: 24/12S/12E
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): none | Slope (%): 0-1
Subregion (LRR): D - Interior Deserts | Lat: 33.104332 | Long: -115.677188 | Datum: NAD 83
Soil Map Unit Name: Indio Loam, Wet | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [X] or Hydrology [X] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	●	
Hydric Soil Present?		●
Wetland Hydrology Present?		●

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Historical agricultural area. Sampling point is adjacent to unvegetated depression.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tamarisk ramosissima*	5	Yes	FAC
2.			
3.			
4.			
Total Cover:	5 %		
Sapling/Shrub Stratum			
1. *Atriplex lentiformus*	5	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	5 %		
Herb Stratum			
1. *Salsola tragus*	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	5 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	10	x 3 =	30
FACU species	5	x 4 =	20
UPL species		x 5 =	0
Column Totals:	15 (A)		50 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Plants are scattered sparsely within a large historical field area.

SOIL

Sampling Point: SP-E

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	10 YR 4/3	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of hydrology. Salt crusts are common in the region and are not a distinguishing indicator of hydrology for this area.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 4-11-12

Applicant/Owner: CDFG State: CA Sampling Point: SP-F

Investigator(s): Vipul Joshi Section, Township, Range: 24/12S/12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.104235 Long: -115.677177 Datum: NAD 83

Soil Map Unit Name: Indio Loam, Wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [X] or Hydrology [X] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	(●)	( )
Wetland Hydrology Present?	(●)	( )

Is the Sampled Area within a Wetland? Yes (●) No ( )

Remarks: Historical agricultural area with depressions which pond following rain event. Lack of vegetation may be due to high soil salinity and therefore area is considered a wetland, despite lack of hydrophytic vegetation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	x 1 =	0
FACW species	x 2 =	0
FAC species	x 3 =	0
FACU species	x 4 =	0
UPL species	x 5 =	0
Column Totals:	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: No live vegetation present. Some dead ice plant present at approximately 20% cover. Does not appear to be annual vegetation, appears to be remnant, historical vegetation and conditions are no longer suitable.

SOIL

Sampling Point: SP-F

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	7.5 YR 4/3	100	2.5 Y 3/6	1		M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [x] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [x] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [x] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ( )	No (●)	Depth (inches):
Water Table Present?	Yes ( )	No (●)	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ( )	No (●)	Depth (inches):

Wetland Hydrology Present? Yes (●) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is a depression within a field adjacent to the New River and Salton Sea. Does not appear to receive flood waters, but does collect runoff and clay soils likely are easily saturated resulting in some ponding.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 4-11-12

Applicant/Owner: CDFG State: CA Sampling Point: SP-G

Investigator(s): Vipul Joshi Section, Township, Range: 29/12S/12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.097133 Long: -115.749374 Datum: NAD 83

Soil Map Unit Name: Vint Loamy very find sand, Wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☒ Soil ☒ or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	○	◉
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: Historical agricultural area.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: Unvegetated with margins of the field supporting approximately 50% cover of Allenrolfea occidentalis.

SOIL

Sampling Point: SP-G

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	10 YR 4/3	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: Layers of organic matter present throughout soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):
Water Table Present? Yes ○ No ◉ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of hydrology. Salt crusts and cracked soils are present in some area but may be historic and are typical of the region.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 4-11-12

Applicant/Owner: CDFG State: CA Sampling Point: SP-H

Investigator(s): Vipul Joshi Section, Township, Range: 29/12S/12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.097158 Long: -115.745108 Datum: NAD 83

Soil Map Unit Name: Vint Loamy very fine sand, Wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☒ Soil ☒ or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	○	◉
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: Historical agricultural area.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	(A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: Unvegetated with margins of the field supporting approximately 50% cover of Allenrolfea occidentalis.

SOIL

Sampling Point: SP-H

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	10 YR 4/3	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: Layers of organic matter present throughout soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches): 18

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of hydrology. Salt crusts and cracked soils are present in some area but may be historic and are typical of the region.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-01

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 30 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D- Interior Deserts Lat: 33.104448 Long: -115.7539605 Datum: Nad 83

Soil Map Unit Name: Meloland very fine sandy loam, wet NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___	Is the Sampled Area within a Wetland? Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1. Allenrolfea occidentalis	60	yes	FACW
2.			
3.			
4.			
5.			
= Total Cover	60		
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: SP-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5 YR 5/2	100						
2-12	2.5 YR 5/1	90	10 YR 5/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? **Yes** ______ **No** ✓

Remarks:

Some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, soils on site are considered to be relic and do not portray current conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ✓ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ______	No ✓	Depth (inches): ____________
Water Table Present?	Yes ______	No ✓	Depth (inches): ____________
Saturation Present? (includes capillary fringe)	Yes ______	No ✓	Depth (inches): ____________

Wetland Hydrology Present? **Yes** ______ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-18-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-02

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 29 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.103483 Long: -115.752133 Datum: Nad 83

Soil Map Unit Name: Meloland and Holtville loams, wet NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

No vegetation present likely resulting from natural fluctuations in the water level of the Salton Sea, drought conditions typical of the region, the increasing salinity of the sea water present within the wetland and soils, and the runoff from the surrounding agricultural practices.

SOIL

Sampling Point: SP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 6/2	70	10 YR 5/6		C			
8-14	Gley1 4/N				C			

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ______ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-03

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 29 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.10026 Long: -115.75207 Datum: Nad 83

Soil Map Unit Name: Vint loamy very fine sand, wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? **Yes** ___ **No** ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1. Allenrolfea occidentalis	20	yes	FACW
2.			
3.			
4.			
5.			
= Total Cover	20		
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

The Allenrolfea occidentalis proved to be very prolific at this site.

SOIL

Sampling Point: SP-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 3/4							
5-12	10 YR 4/3							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No ✓

Remarks:

Soils were dry and did not exhibit signs of hydric soils or developing hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
✓ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ______ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-04

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 29 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.09769 Long: -115.75163 Datum: Nad 83

Soil Map Unit Name: Meloland and Holtville loams, wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓
Is the Sampled Area within a Wetland?		✓

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Allenrolfea occidentalis	60	yes	FACW
2.			
3.			
4.			
5.			
= Total Cover	60		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

The Allenrolfea occidentalis proved to be very prolific at this site.

SOIL

Sampling Point: SP-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 3/4							
5-12	10 YR 4/3							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No ✓

Remarks:

Soils were dry and did not exhibit signs of hydric soils or developing hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-18-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-05

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 29 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D - Interior deserts Lat: 33.0998 Long: -115.7356 Datum: Dec. deg.

Soil Map Unit Name: Vint loamy very fine sand, wet NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ✓	No ___

Is the Sampled Area within a Wetland? **Yes ✓ No ___**

Remarks:

VEGETATION – Use scientific names of plants.

Stratum / Species	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1. Tamarix ramosissima	10	yes	FAC
2.			
3.			
4.			
5.			
= Total Cover	10		
Herb Stratum (Plot size: ___)			
1. Typha domingensis	10	no	OBL
2. Distichlis spicata	40	yes	FACW
3. Carex sp.	10	no	
4.			
5.			
6.			
7.			
8.			
= Total Cover	60		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✓ No ___**

Remarks:

SOIL

Sampling Point: SP-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	gley 1 6/5 GY	100					silty/sand	
4-12	5Y 5/2	100					silty/sand	
12-18	5Y 5/2	100					silt/sandp	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ✓ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ✓ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

algal blooms were present in this SP.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-18-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-06

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 28 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.0999 Long: -115.73488 Datum: Nad 83

Soil Map Unit Name: Indio-vint complex NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No ✓	Is the Sampled Area within a Wetland? Yes ___ No ✓
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ___ (A)

Total Number of Dominant Species Across All Strata: ___ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ___ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: SP-06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	5Y 6/3	70	5Y 6/1	15	C		sandy cla	clay 80%
	5Y 6/3	70	2.5 YR 5/8	15	C			
6-12	5Y 6/1	95	2.5 Y 5/8	5	C		silty sand	clay 0% loam
12-18	5Y 6/1	95	2.5 Y 5/8	5	C		silty sand	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
✓ Salt Crust (B11)
___ Biotic Crust (B12)
✓ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______

Water Table Present? Yes ______ No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-18-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-07

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 28 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.100637 Long: -115.724832 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?**	**Yes ____ No ✓**
Hydric Soil Present?	Yes ____ No ✓		
Wetland Hydrology Present?	Yes ____ No ✓		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Atriplex lentiformis	10	yes	FAC
2. Allenrolfea occidentalis	5	yes	FACW
3.			
4.			
5.			
= Total Cover	15		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3							sand	
3-6							sand	numerous invertebrates
6-14	2.5 Y 5/2	80	10 YR 5/8	20	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

Some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, soils on site are considered to be relic and do not portray current conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ✓ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-18-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-08

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 28 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.09479 Long: -115.71934 Datum: Nad 83

Soil Map Unit Name: Meloland very fine sandy loam, wet NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	30	yes	FAC
2. Allenrolfea occidentalis	30	yes	FACW
3.			
4.			
5.			
= Total Cover	60		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	5 Y 5/2	85	10 YR 5/8	15	C	M, PL		
5-12	2.5 Y 6/2	80	10 YR 5/6	20	C	M, PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
✓ Drift Deposits (B3) (**Nonriverine**)
✓ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
✓ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
✓ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________
Water Table Present? Yes ______ No ✓ Depth (inches): ____________
Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-18-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-09

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 28 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.094715 Long: -115.717268 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ✓	No ____
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? Yes ✓ No ____

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	80	yes	FAC
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5 Y 6/2	80	10 YR 5/6	20	C	M	clay	
10-16	Gley1 4/N	100					silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?		✓	
Saturation Present? (includes capillary fringe)	✓		10

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-16-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-10

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 27 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.09246 Long: -115.70169 Datum: Nad 83

Soil Map Unit Name: Imperial silty clay, wet NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	____ = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5 Y 5/2	80	2.5 YR 4/8	20	C	M	sandy silt	
6-12	2.5 Y 5/2	55	gley2 4/5	40	C	M	silt/clay	clay 70%
6-12	2.5 Y 5/2	55	2.5 YR 4/8	5	C	M	silt/clay	
12-15	2.5 Y 5/2	75	gley2 4/5	25	C	M	silt/clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay

Depth (inches): 12

Hydric Soil Present? Yes ______ No ✓

Remarks:

Some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, soils on site are considered to be relic and do not portray current conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ✓ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______

Water Table Present? Yes ______ No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 12

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Layer of aquatic invertebrate shells (dead) @ 3 inches

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-16-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-11

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 26 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D- Interior Deserts Lat: 33.09284 Long: -115.700786 Datum: Dec. deg.

Soil Map Unit Name: Imperial silty clay, wet NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Allenrolfea occidentalis	60	yes	FACW
2.			
3.			
4.			
5.			
= Total Cover	60		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5 Y 6/2	80	7.5 YR 5/8	25	C	M	silty clay	
8-16	5 Y 6/2							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ______ No ✓

Remarks:

Some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, soils on site are considered to be relic and do not portray current conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-12

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 26 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D- Interior Deserts Lat: 33.0967111 Long: -115.692708 Datum: Nad 83

Soil Map Unit Name: Imperial-glenbar silty clay loams, wet, 0 to 2 percent slopes NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are “Normal Circumstances” present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ____	No ✓
Wetland Hydrology Present?	Yes ____	No ✓

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	60	yes	FAC
2. Allenrolfea occidentalis	10	no	FACW
3.			
4.			
5.			
= Total Cover	70		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 5/2	100	none	0	C	M	silty clay	
4-8	10 YR 5/1	80	10 YR 5/8	20	C	M	silty clay	
8-16	10 YR 5/1	75	10 YR 5/8	25	C	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No ✓

Remarks:

Some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, soils on site are considered to be relic and do not portray current conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
✓ Drift Deposits (B3) (**Nonriverine**)
✓ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
✓ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______
Water Table Present? Yes ______ No ______ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-13

Investigator(s): M. Simmons Section, Township, Range: 26 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D- Interior Deserts Lat: 33.1047217 Long: -115.688695 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: SP-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5 Y 5/1	80	10 YR 5/8	20	C	M	clay loam	
8-16	2.5 Y 5/2	80	7.5 YR 4/6	20	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes ______ No ✓

Remarks:

Some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, soils on site are considered to be relic and do not portray current conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
✓ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
✓ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______________

Water Table Present? Yes ______ No ✓ Depth (inches): ______________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-14

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 23 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.11030 Long: -115.68786 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Allenolfrea occidentaris	60	yes	FACW
2. Atriplex lentiformis	5	no	FAC
3.			
4.			
5.			
= Total Cover	65		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	5 Y 4/3	60	2.5 YR 4/8	30	C		silt/clay	clay 90% loam
0-5	2.5 Y 5/2	10			C			
5-10	2.5 Y 5/2	90	2.5 YR 4/8	10	C		silty/sand	clay 10% loam
10-12	2.5 Y 5/2	95	2.5 YR 4/8	5	C		silty/sand	clay 0% loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ______

Water Table Present? Yes ___ No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-15

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 23 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior deserts Lat: 33.11051 Long: -115.68727 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?	✓	
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: SP-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	5 Y 6/2	70	2.5 YR 4/8	30	C		silt/clay	loam clay 30%
6-12	5 Y 6/2	70	2.5 YR 3/4	5	C		silty/clay	clay 90% (loam)
6-12	5 Y 6/2	70	gley 1 3/10 GY	25	C			
12-18	5 Y 6/2	40	gley 1 3/10 GY	60	C		silty/clay	clay 30% (loam)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
✓ Salt Crust (B11)
___ Biotic Crust (B12)
✓ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______
Water Table Present? Yes ______ No ______ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-16-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-16

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 23 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.11438 Long: -115.68777 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ✓	No ____
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? **Yes** ✓ **No** ____

Remarks:

outer edge of access road on east side

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix ramosissima	10	yes	FAC
2.			
3.			
4.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	30	yes	FAC
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: SP-16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	5 Y 5/6	75					sandy/lo[redacted]m	
4-17	Gley 2 2.5/10B	80					clay loam	mucky
17-18	Gley 2 4/5 PB	10					clay loam	mucky

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
✓ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
✓ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
✓ Saturation (A3)
✓ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
__ Drift Deposits (B3) (**Nonriverine**)
✓ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
✓ Salt Crust (B11)
__ Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
✓ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ____
Water Table Present? Yes ___ No ✓ Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ____

Wetland Hydrology Present? Yes ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-16-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-17

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 23 / 12E / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D- Interior Deserts Lat: 33.1168 Long: -115.69276 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ✓	No ____
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? **Yes ✓ No ____**

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	100	yes	FAC
2.			
3.			
4.			
5.			
= Total Cover	100		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✓ No ____**

Remarks:

SOIL

Sampling Point: SP-17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 4/3	100	10 YR 5/6	10	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ______ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-18

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 14 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D- Interior Deserts Lat: 33.12667 Long: -115.69362 Datum: Dec. deg.

Soil Map Unit Name: Not available NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	60	yes	FAC
2.			
3.			
4.			
5.			
= Total Cover	60		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: SP-18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 4/2	93	10 YR 5/6	7	C	M	clay loam	
4-14	7.5 YR 4/2	80	7.5 YR 5/8	10	C	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ✓ **No** ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
✓ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
✓ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______
Water Table Present? Yes ______ No ✓ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 6

Wetland Hydrology Present? **Yes** ✓ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-16-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-19

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 14 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D- Interior Deserts Lat: 33.12754 Long: -115.69314 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ✓	No ____
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? Yes ✓ No ____

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	55	yes	FAC
2.			
3.			
4.			
5.			
= Total Cover	55		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 YR 4/3	80	5 YR 4/6	20	C	M	silty clay	
6-14	7.5 YR 4/3		2.5 YR 3/6		C	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ✓ **No** ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?			
Water Table Present?		✓	
Saturation Present? (includes capillary fringe)	✓		4

Wetland Hydrology Present? **Yes** ✓ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR State: CA Sampling Point: SP-20

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 14 / 12S / 12E

Landform (hillslope, terrace, etc.): shoreline Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): D- Interior Deserts Lat: 33.12933 Long: -115.696483 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✓
Hydric Soil Present?	Yes ✓	No ___	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ___ (A)

Total Number of Dominant Species Across All Strata: ___ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ___ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks:

SOIL

Sampling Point: SP-20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 4/3	100	none	0	C	M	loamy sand	
2-12	10 YR 4/2	75	10 YR 5/8	25	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ✓ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 8

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-21

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 24 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.107948 Long: -115.682904 Datum: Nad 83

Soil Map Unit Name: Fluvaquents, saline NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20 ft)			
1. Tamarix ramosissima	15	yes	FAC
2.			
3.			
4.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 20 ft)			
1. Allenolfrea occidentalis	25	yes	FACW
2. Tamarix ramosissima	45	yes	FAC
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 30 ft)			
1. Allenolfrea occidentalis	45	yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	45 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: SP-21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 4/3	100					silty loam	clay 50%
6-10	7.5 YR 4/4	100					clay	clay 100%

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ✓ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay

Depth (inches): 10

Hydric Soil Present? Yes ✓ No ______

Remarks:

Soils in this SP are subject to disturbance from ongoing agricultural practices in the area that create berms for access to agricultural fields and recreational areas. The area within this SP is likely a recently developed wetland based on recent berm-creating activities in the area. Local topography allows water to migrate to the outer edge of bermed area; therefore leading to the proper vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ____________

Water Table Present? Yes ______ No ______ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ____________

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

algal crust
general dominant (tamarisk, allenrolfrea)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: Cardno Entrix State: CA Sampling Point: SP-22

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 24 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): ______

Subregion (LRR): D - Interior Deserts Lat: 33.106754 Long: -115.681158 Datum: Nad 83

Soil Map Unit Name: Imperial-glenbar silty clay loams, wet, 0 to 2 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No ✓	**Is the Sampled Area within a Wetland?** Yes ______ No ✓
Hydric Soil Present?	Yes ______	No ✓	
Wetland Hydrology Present?	Yes ______	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Chenopodium spp.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 75 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

dead veg. chenopodium (sp) - cannot identify

SOIL

Sampling Point: SP-22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 4/3						silty loam	clay 10%
4-10	7.5 YR 4/3						silty clay lo	clay 75%

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay

Depth (inches): 10

Hydric Soil Present? Yes ___ No ✓

Remarks:

Soils in this SP are subject to disturbance from ongoing agricultural practices in the area that create berms for access to agricultural fields and recreational areas. The area within this SP is likely a recently developed wetland based on recent berm-creating activities in the area. Local topography allows water to migrate to the outer edge of bermed area; therefore vegetation does not develop in central portion.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-23

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 24 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior deserts Lat: 33.105261 Long: -115.67429 Datum: Nad 83

Soil Map Unit Name: Indio loam, wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix ramosissima	10	yes	FAC
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft.)			
1. Allenrolfea occidentalis	65	yes	FACW
2.			
3.			
4.			
5.			
	65 = Total Cover		
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	___ = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: SP-23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 4/3	100					clay/silt	clay 95% loam
6-12	10 YR 4/3	100					clay silt loa	clay 95%

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay

Depth (inches): 12

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ___	No ✓	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-24

Investigator(s): R. Alvidrez, M. Mazon Section, Township, Range: 24 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior deserts Lat: 33.104835 Long: -115.674253 Datum: Nad 83

Soil Map Unit Name: Indio loam, wet NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ___ (A)

Total Number of Dominant Species Across All Strata: ___ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ___ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks:

SOIL

Sampling Point: SP-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5 YR 4/2	100					silty/sandy	
6-10	7.5 YR 4/3	100					clay	clay 100%

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay

Depth (inches): 8

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-17-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-26

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 24 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.1173179 Long: -115.6803202 Datum: Nad 83

Soil Map Unit Name: Not available NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?	✓	
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: SP-26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	5 Y 5/2	90	10 YR 5/6	10	C	M		
6-12	Gley1 2.5/N	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ✓	No ___	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-27

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 24 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.1193387 Long: -115.6735804 Datum: Nad 83

Soil Map Unit Name: Holtville silty clay, wet NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? **Yes** ___ **No** ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ___ (A)

Total Number of Dominant Species Across All Strata: ___ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ___ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks:

SOIL

Sampling Point: SP-27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5 Y 4/2	90	10 YR 4/6	10	C	M		
8-14	2.5 Y 5/2	75	10 YR 5/8	25	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ______ No ✓

Remarks:

Some soils in the Arid West exhibit redoximorphic features and hydric soil indicators that formed in the recent or distant past when conditions may have been wetter than they are today. These features have persisted even though wetland hydrology may no longer be present. Therefore, soils on site are considered to be relic and do not portray current conditions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ✓ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The hydrology indicators observed are considered relic from previous years hydrology and not an indicator of recent hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-28

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 13 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.1261896 Long: -115.6690076 Datum: Nad 83

Soil Map Unit Name: Imperial-glenbar silty clay loams, wet, 0 to 2 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ✓	No ____
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? Yes ✓ No ____

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Tamarix ramosissima	50	yes	FACW
2. Allenrolfea occidentalis	30	yes	FACW
3.			
4.			
5.			
= Total Cover	80		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-28

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5 Y 4/2	93	10 YR 5/8	7	C	M		
4-14	2.5 Y 4/1	80	10 TY 5/8	20	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
_✓_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes _✓_ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
_✓_ High Water Table (A2)
_✓_ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
_✓_ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
_✓_ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
_✓_ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No _✓_ Depth (inches): ______
Water Table Present? Yes _✓_ No ___ Depth (inches): 4
Saturation Present? (includes capillary fringe) Yes _✓_ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes _✓_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Salton Sea SCH Project City/County: Imperial Sampling Date: 8-19-11

Applicant/Owner: CDFG, CDWR, USACE State: CA Sampling Point: SP-29

Investigator(s): M. Simmons, I. Watson Section, Township, Range: 13 / 12S / 12E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): D - Interior Deserts Lat: 33.1262407 Long: -115.6687174 Datum: Nad 83

Soil Map Unit Name: Imperial-glenbar silty clay loams, wet, 0 to 2 percent slopes NWI classification: L1UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland?	Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___		
Wetland Hydrology Present?	Yes ✓ No ___		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ___ (A)

Total Number of Dominant Species Across All Strata: ___ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ___ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

No vegetation present likely resulting from natural fluctuations in the water level of the Salton Sea, drought conditions typical of the region, the increasing salinity of the sea water present within the wetland and soils, and the runoff from the surrounding agricultural practices.

SOIL

Sampling Point: SP-29

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5 Y 4/2	90	10 YR 5/6	10	C	M		
8-14	2.5 Y 5/2	85	10 YR 4/6	15	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** ✓ **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
✓ Drift Deposits (B3) (**Nonriverine**)
__ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
✓ Salt Crust (B11)
__ Biotic Crust (B12)
✓ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ______
Water Table Present? Yes ____ No ✓ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ______

Wetland Hydrology Present? **Yes** ✓ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX C – JURISDICTIONAL DATA SUMMARY TABLE

APPENDIX C – JURISDICTIONAL DATA SUMMARY TABLE

Appendix C – Jurisdictional Data Summary Table

Drainage	Drainage Name	Jurisdictional Feature	OHWM	Bank to Bank	Drainage Habitat Type[1]	Hydrology
Drainage 1	Poe Lateral	Ephemeral	4	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 2	Unnamed	Ephemeral	2	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 3	Unnamed	Ephemeral	4	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 4	Trifolium Drain 1	Ephemeral	40	----	Tamarisk scrub	Irrigation-related waters flowing from the direction of agricultural lands to the Salton Sea.
Drainage 5	Unnamed	Ephemeral	4	----	Iodine bush scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 6	Unnamed	Ephemeral	8	----	Iodine bush scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 7	Thistle Lateral 8	Ephemeral	16, 4	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 8	Unnamed	Ephemeral	4	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.

Appendix C – Jurisdictional Data Summary Table

Drainage	Drainage Name	Jurisdictional Feature	OHWM	Bank to Bank	Drainage Habitat Type[1]	Hydrology
Drainage 9	Unnamed	Ephemeral	4	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 10	Unnamed	Ephemeral	10	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 11	Unnamed	Ephemeral	10	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 12	Unnamed	Ephemeral	10	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 13	Trifolium Lateral 12	Ephemeral	7	----	Agriculture dominates the upstream portion of the New River, while Tamarisk Scrub and Common Reed Marshes dominate the downstream portion.	Irrigation-related waters flowing from the direction of agricultural lands to the Salton Sea.
Drainage 14	New River	Perennial	30	80	Agriculture dominates the upstream portion of the New River, while Tamarisk Scrub and Common Reed Marshes dominate the downstream portion within the Project boundary.	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 15	Unnamed	Ephemeral	14	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.

Appendix C – Jurisdictional Data Summary Table

Drainage	Drainage Name	Jurisdictional Feature	OHWM	Bank to Bank	Drainage Habitat Type[1]	Hydrology
Drainage 16	Trifolium 12 Drain	Ephemeral	5	----	Ruderal/Disturbed due to agricultural practices	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 17	Unnamed	Ephemeral	5	----	Ruderal/Disturbed due to agricultural practices	Irrigation-related water regime. Indicators of an OHWM were present.
Drainage 18	Unnamed	Ephemeral	5	----	Ruderal/Disturbed due to agricultural practices	Irrigation-related water regime. Indicators of an OHWM were present.
Drainage 19	Trifolium Lateral 11	Ephemeral	5	----	Ruderal/Disturbed due to agricultural practices	Irrigation-related water regime. Indicators of an OHWM were present.
Drainage 20	Trifolium 11 Drain	Ephemeral	5	----	Ruderal/Disturbed due to agricultural practices	Irrigation-related water regime that discharges to the Salton Sea
Drainage 21	Unnamed	Ephemeral	6	----	Ruderal/Disturbed due to agricultural practices	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 22	Unnamed	Ephemeral	10	----	Iodine bush scrub	Water flowing from the direction of agricultural lands to the Salton Sea.

Appendix C – Jurisdictional Data Summary Table

Drainage	Drainage Name	Jurisdictional Feature	OHWM	Bank to Bank	Drainage Habitat Type[1]	Hydrology
Drainage 23	Unnamed	Ephemeral	13	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 24	Unnamed	Ephemeral	20	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.
Drainage 25	Unnamed	Ephemeral	10	----	Tamarisk scrub	Water flowing from the direction of agricultural lands to the Salton Sea.

Notes:
[1]Drainages were contained within the wetland portion of the Project area, and the habitat type reflects the wetland vegetation present adjacent to the drainage. Drainage 14 (New River) was the only drainage that supported riparian habitat.

MAP BOOK SERIES 1 TO 12 – SALTON SEA SCH PROJECT JURISDICTIONAL DELINEATION MAP BOOK SERIES

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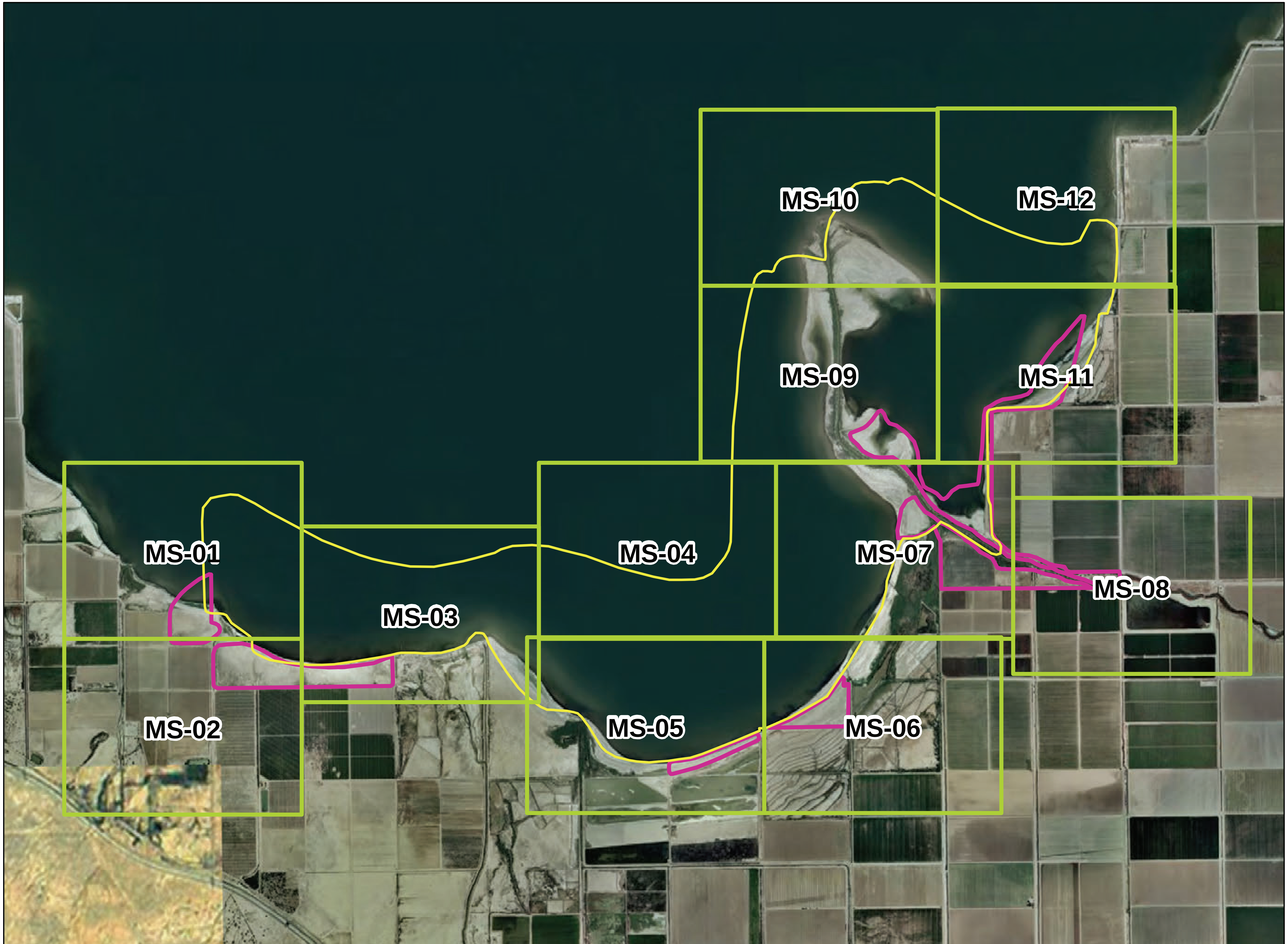
Salton Sea SCH Project Jurisdictional Delineation Map Book Series



Legend

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- Project Boundary
- Potential Staging Areas

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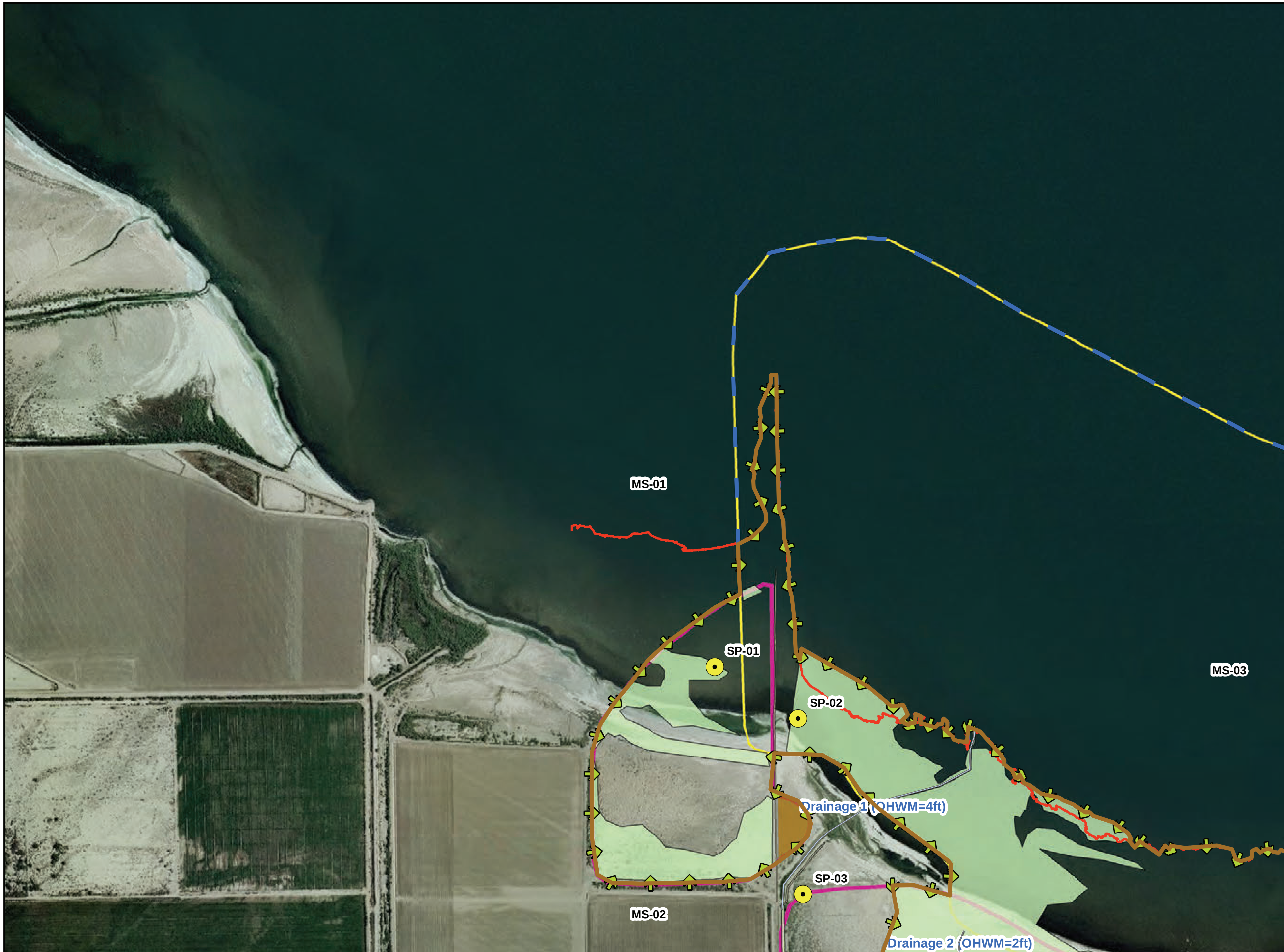

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- Lacustrine - Open Water
- Soil Pits
- USACE [OHWM]
- CDFG [Bank to Bank]
- Project Boundary
- Potential Staging Areas
- -231 foot contour

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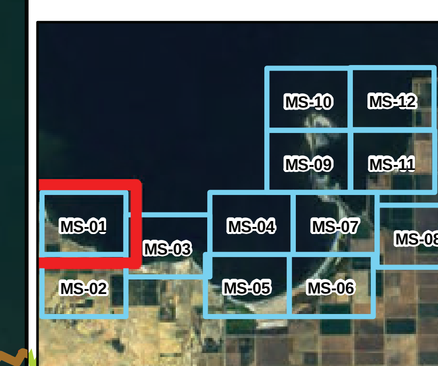

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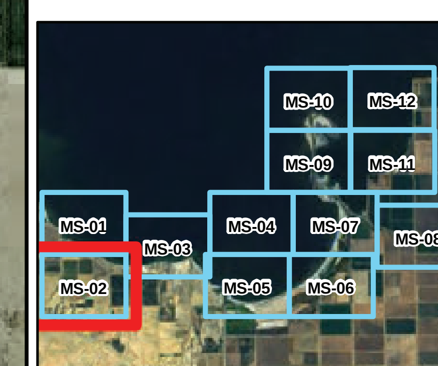

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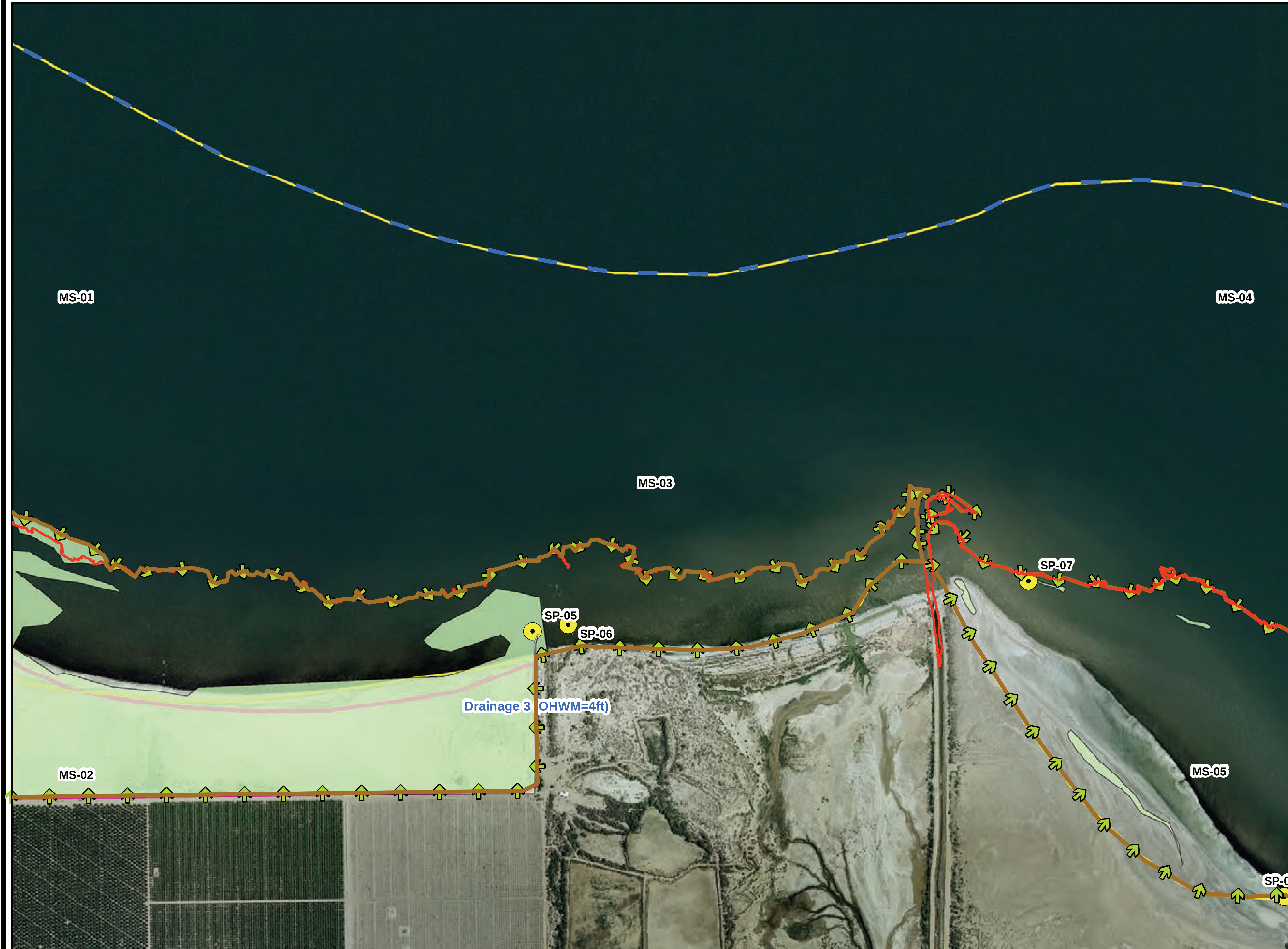

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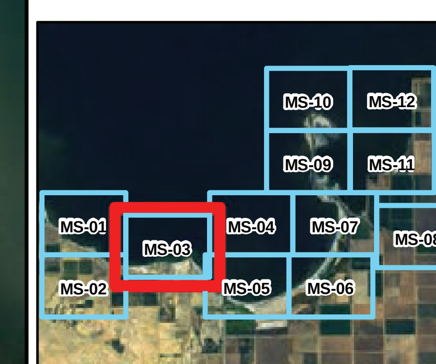

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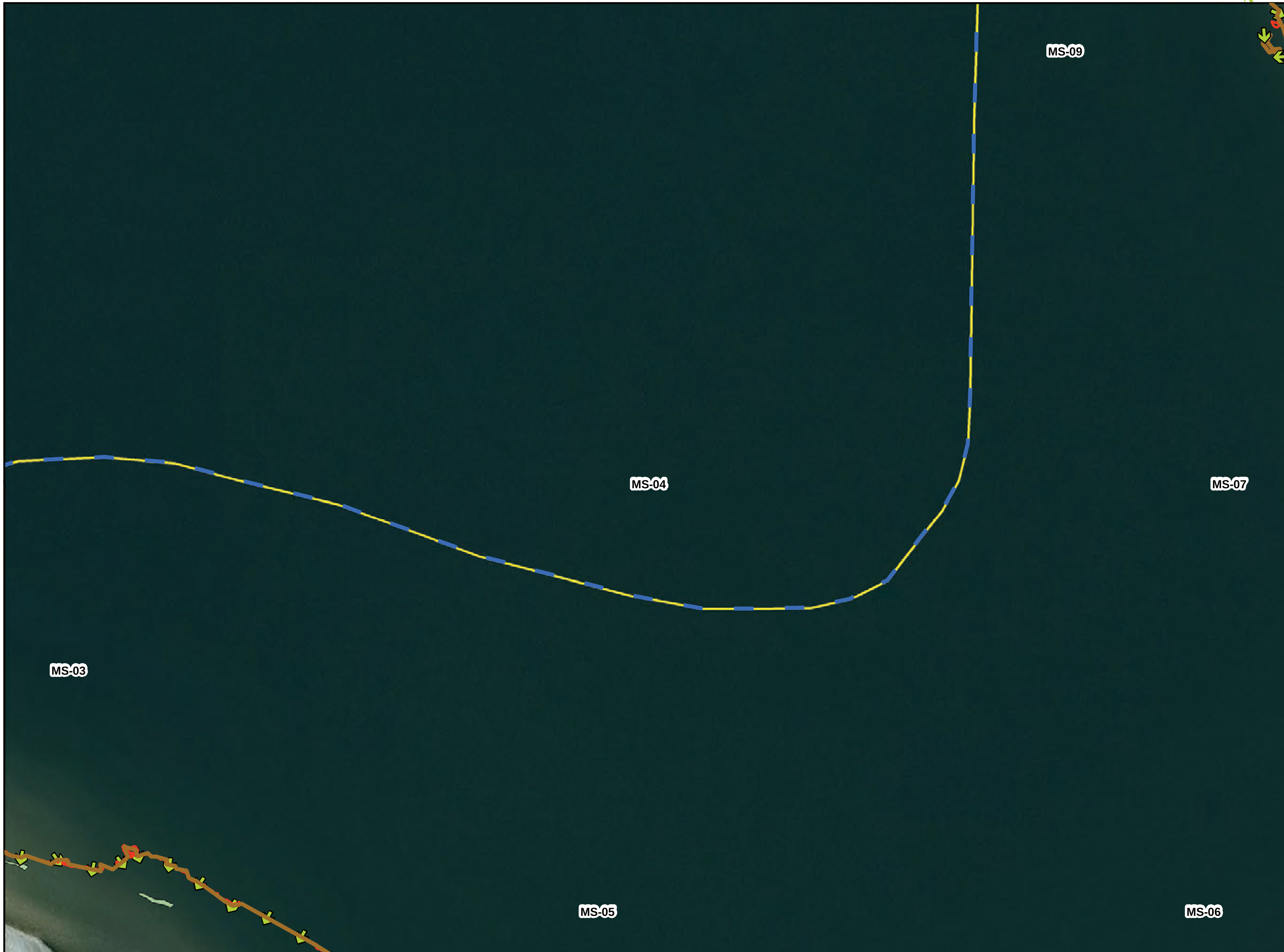

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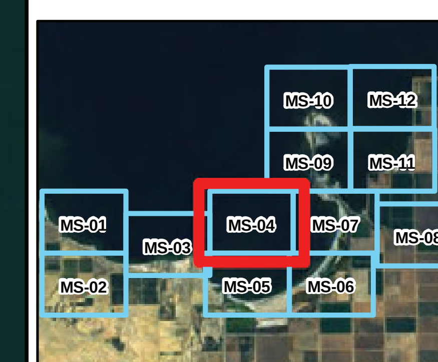

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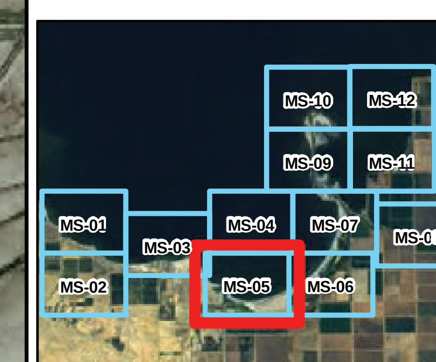

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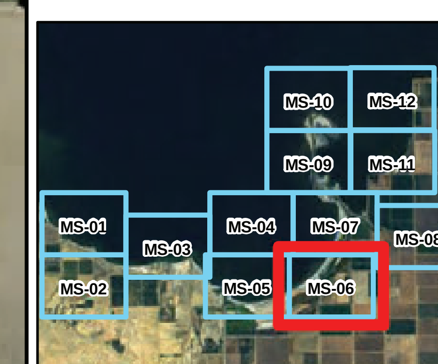
Feet



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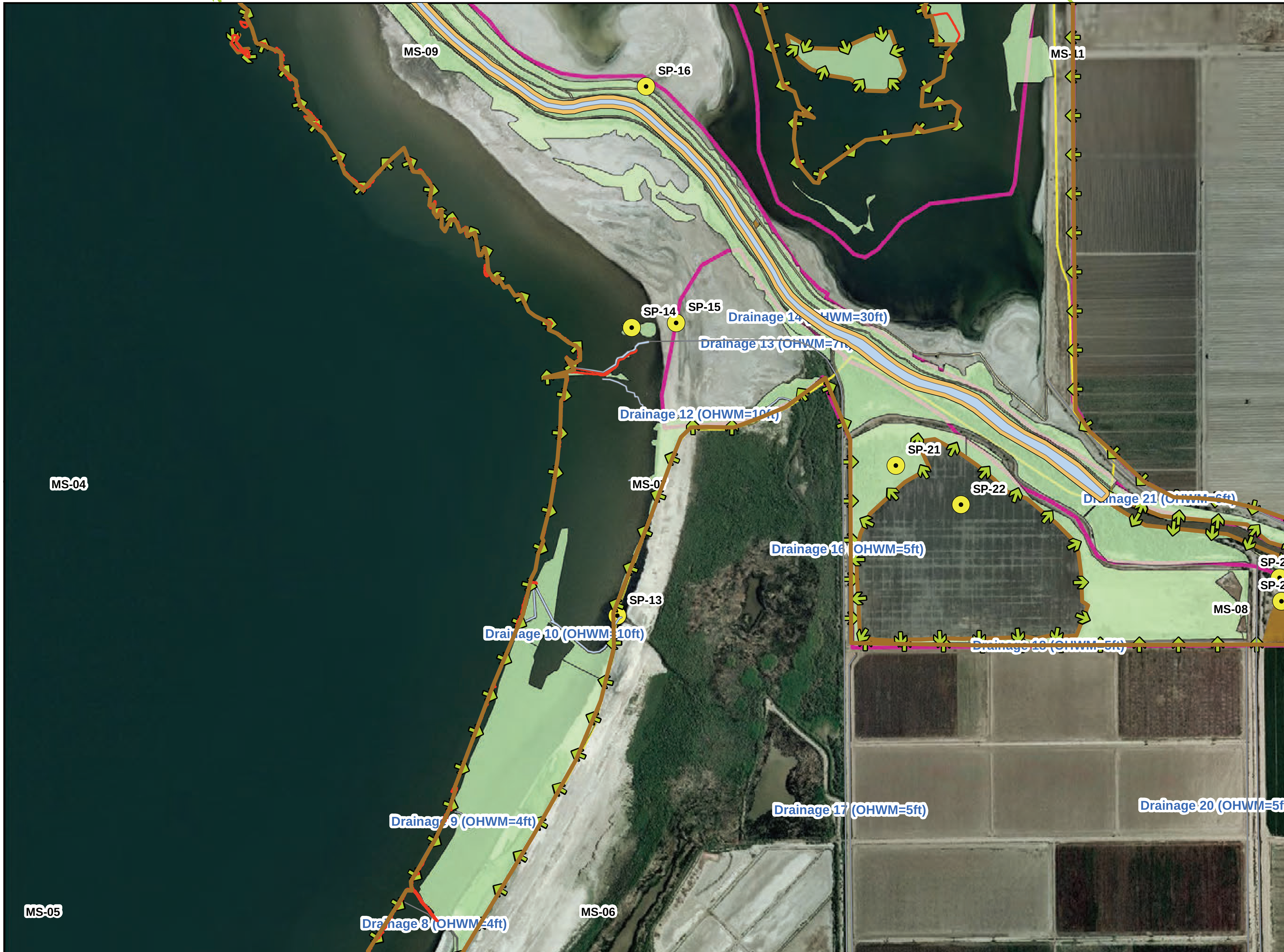

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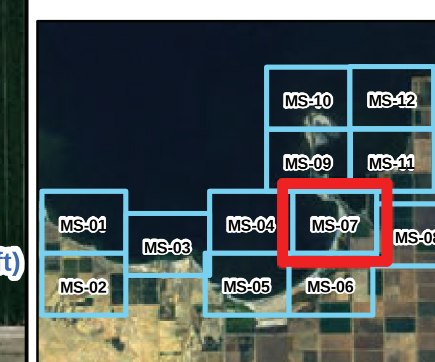

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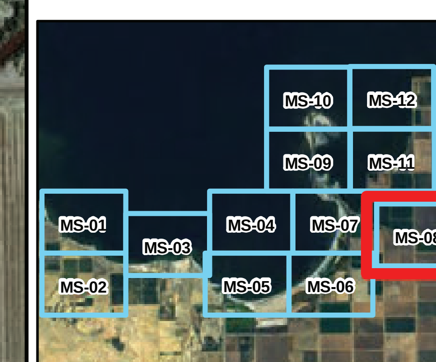

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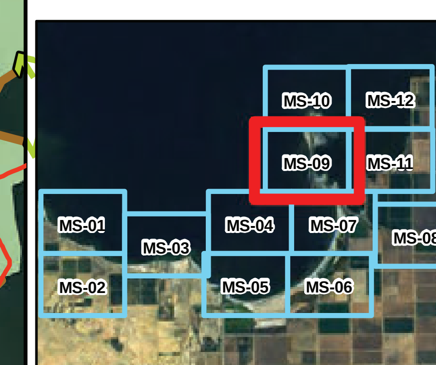

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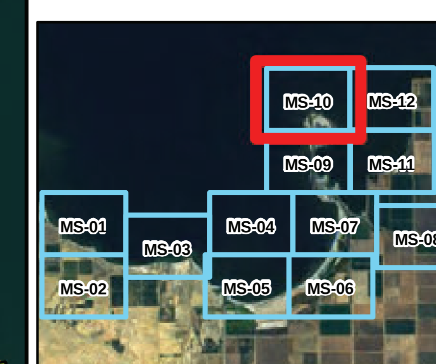

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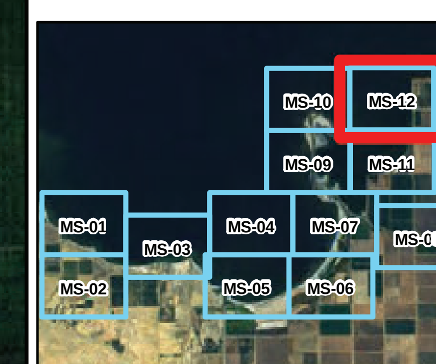
Feet



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ATTACHMENT 3

Draft 404(B)(1) ALTERNATIVES ANALYSIS

DRAFT 404(B)(1) ALTERNATIVES ANALYSIS
for the
Salton Sea Species Conservation Habitat Project

APRIL 2013

Draft 404(b)(1) Alternatives Analysis for Salton Sea Species Conservation Habitat Project

TABLE OF CONTENTS

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LIST OF FIGURES

LIST OF TABLES

LIST OF CHARTS

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
˚C	degrees Celsius
˚F	degrees Fahrenheit
µg/g	micrograms per gram
µg/L	micrograms per liter
AA	assessment area
af	acre-feet
afy	acre-feet per year
BMP	best management practice
cfs	cubic feet per second
cm	centimeters
CNDDB	California Natural Diversity Database
Corps	U.S. Army Corps of Engineers
CRAM	California Rapid Assessment Method
CRBRWQCB	Colorado River Basin Regional Water Quality Control Board
dBA	A-weighted decibel
DDD	dichlorodiphenyldichloroethane
DDT	dichlorodiphenyltrichloroethane
DDE	dichlorodiphenyldichloroethylene
DFW	California Department of Fish and Wildlife
dw	dry weight
DWR	California Department of Water Resources
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
EPA	Environmental Protection Agency
ESCP	Erosion and Sediment Control Plan
FEMA	Federal Emergency Management Agency
GIS	geographic information system
HMMP	Habitat Mitigation and Monitoring Plan
HUC	Hydrologic Unit Code
IID	Imperial Irrigation District
IP	Individual Permit
IWA	Imperial Wildlife Area
LEDPA	Least Environmentally Damaging Practicable Alternative
Leq	equivalent sound level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MM	Mitigation Measure
MOA	Memorandum of Agreement
msl	mean sea level
NEPA	National Environmental Policy Act

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ng/L	nanograms per liter
NWP	nationwide permit
NWR	National Wildlife Refuge
OHWM	ordinary high water mark
PEC	Probable Effects Concentration
ppt	parts per thousand
PVC	polyvinyl chloride
Reclamation	Bureau of Reclamation
SCH Project or Project	Salton Sea Species Conservation Habitat Project
SHP	Saline Habitat Ponds
SR	State Route
SWPPP	Stormwater Pollution and Prevention Plan
SWRCB	State Water Resources Control Board
USDA-NRCS	U.S. Department of Agriculture–National Resource Conservation Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
WARM	warm freshwater habitat
ww	wet weight

Draft 404(b)(1) Alternatives Analysis for Salton Sea Species Conservation Habitat Project

1.0 INTRODUCTION

1.1 Regulatory Setting

Any activity requiring a Standard Individual Permit (IP) under section 404 of the Clean Water Act must undergo an analysis of alternatives in order to identify the Least Environmentally Damaging Practicable Alternative (LEDPA) pursuant to requirement of guidelines established by the United States (U.S.) Environmental Protection Agency (EPA), known as the Section 404(b)(1) Guidelines. The Section 404(b)(1) Guidelines prohibit discharge of dredge or fill material into waters of the U.S. if there is a "practicable alternative to the proposed discharge that would have less impact on the aquatic ecosystem, provided that the alternative does not have other significant environmental consequences" (40 CFR 230.10(a)). An alternative is practicable "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes" (40 CFR 230.10(a), 230.3(q)). "If it is otherwise a practicable alternative, an area not presently *owned* by an Applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered" (40 CFR 230.10(a)(2)).

If the proposed activity would involve a discharge into a special aquatic site, such as a wetland, the Section 404(b)(1) Guidelines distinguish between those projects that are water dependent and those that are not. A water-dependent project is one that requires access to or proximity to or siting within a special aquatic site to achieve its basic purpose, such as a marina. A non-water-dependent project is one that does not require access to or proximity to or siting within a special aquatic site to achieve its basic purpose, such as a housing development.

The Section 404(b)(1) Guidelines establish two presumptions for non-water-dependent projects that propose a discharge into a special aquatic site, such as wetlands. First, it is presumed that there are practicable alternatives to non-water-dependent projects, "unless clearly demonstrated otherwise" (40 CFR 230.10(a)(3)). Second, "where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise" (40 CFR 230.10(a)(3)). The thrust of the guidelines is that applicants should design proposed projects to meet the overall project purpose while avoiding impacts on aquatic environments. This approach is emphasized in a Memorandum of Agreement (MOA) between the EPA and the U.S. Army Corps of Engineers (Corps) concerning the determination of mitigation under the Clean Water Act Section 404(b)(1) Guidelines (EPA 1990), as modified by the Corps and EPA Final Mitigation Rule (33 CFR 325, 332; 40 CFR 230). The MOA articulates the Guidelines' "sequencing" protocol as first, avoiding impacts; second, minimizing impacts; and third, providing practicable compensatory mitigation for unavoidable impacts and no overall net loss of functions and services.

In addition to requiring the identification of the LEDPA, the Section 404(b)(1) Guidelines mandate that no discharge of dredged or fill material shall be permitted if it causes or contributes to violations of any applicable state water quality standard (40 CFR 230.10(b)(1)), violates any applicable toxic effluent standard or prohibition (40 CFR 230.10(b)(2)), jeopardizes the continued existence of any endangered or threatened species or destroys or adversely modifies critical habitat (40 CFR 230.10(b)(3)), or causes or contributes to significant degradation of waters of the U.S. (40 CFR 230.10(c)).

1.2 Basic and Overall Project Purpose

Basic Project Purpose – The basic project purpose comprises the fundamental, essential, or irreducible purpose of the proposed action and is used by the Corps to determine whether an applicant's project is water dependent (i.e., whether it requires access or proximity to or siting within a special aquatic site). The basic purpose for the SCH Project is aquatic habitat restoration. The basic Project purpose is water dependent. Title 40 CFR Section 230.10(a)(3) sets forth rebuttable presumptions that (1) alternatives for non-water dependent activities that do not involve special aquatic sites are available and (2) alternatives that do not involve special aquatic sites have less adverse impact on the aquatic environment. Because the Project is water dependent, these rebuttable presumptions do not apply (40 CFR 230.10[a][3]).

Overall Project Purpose – The overall project purpose serves as the basis for the Corps' section 404(b)(1) alternatives analysis and is determined by further defining the basic project purpose in a manner that more specifically describes the applicant's goals for the project, and which allows a reasonable range of alternatives to be analyzed. The overall Project purpose is to develop a range of aquatic habitats along the exposed shoreline of the Salton Sea that would support fish and wildlife species dependent on the Salton Sea in Imperial County, California.

The proposed Project is water dependent and focused on restoration of aquatic habitat. Therefore, the majority of the Project footprint is within Corps' jurisdictional areas, although associated infrastructure and construction staging areas are located in adjacent upland areas. The scope of the Federal review is normally defined by 33 CFR part 325, Appendix B, which states: "…the district engineer should establish the scope of the NEPA document to address the impacts of the specific activity regarding the Department of the Army permit and those portions of the entire Project over which the district engineer has sufficient control and responsibility to warrant Federal review."

The Corps' regulations require the Corps to determine if their "scope of review" or "scope of analysis" should be expanded to account for indirect and/or cumulative effects of the issuance of a permit (33 CFR part 325, Appendix B). Typical factors considered in determining "sufficient control and responsibility" include:

- Whether or not the activity constitutes merely a link in a corridor-type project;
- Whether aspects of the upland facility in the immediate vicinity of the regulated activity affect the location and configuration of the regulated activity;
- Extent to which the entire project would fall within Corps jurisdiction; and
- Extent of Federal cumulative control and responsibility.

The SCH Project involves the restoration of saline habitat ponds and does not constitute merely a link in a corridor-type project. The Project purpose is to restore aquatic habitat and as such is a water dependent activity, therefore the upland facilities are dictated by the location and configuration of the regulated activity. The Project is 4,065 acres and contains a total of 2,748 acres of wetland and non-wetland waters of the U.S. distributed throughout the Project site. Jurisdictional waters of the U.S. constitute 68 percent of the 4,065-acre site. In addition, the Project site also supports species that are Federally listed as threatened or endangered, which include desert pupfish, California least tern, least Bell's vireo, southwestern willow flycatcher, and Yuma clapper rail. Based on 33 CFR part 325, Appendix B, and the evaluation above, sufficient Federal control and responsibility exists to warrant expanding the scope of analysis to include the entire Project footprint. Given the overall Project purpose, the extent and distribution of the Corps' jurisdictional areas throughout the Project site, and in consideration of the Endangered Species Act issues involved, the Corps has determined there exists sufficient cumulative Federal control to require National Environmental Policy Act (NEPA) review to include analysis of environmental impacts on the upland portions of the Project site in addition to the Corps' jurisdictional areas. In particular, the upland portions of the Project area are necessary for the practical construction and operation of the Project. As such, all access road and pipeline routing within non-jurisdictional areas are within the scope of analysis. Therefore, the appropriate scope of analysis for the Federal review of the proposed Project consists of the entire Project footprint. In these upland areas, the Corps will evaluate impacts on the environment, alternatives, mitigation measures, and the appropriate state or local agencies with authority to implement such measures if they are outside the authority of the Corps.

1.3 Location

The Project site is located at the southern end of the Salton Sea in Imperial County, California (Figures 1 and 2). The Project would involve a blend of brackish river water from the New River and saline water from the Sea to maintain an appropriate salinity range within constructed ponds.

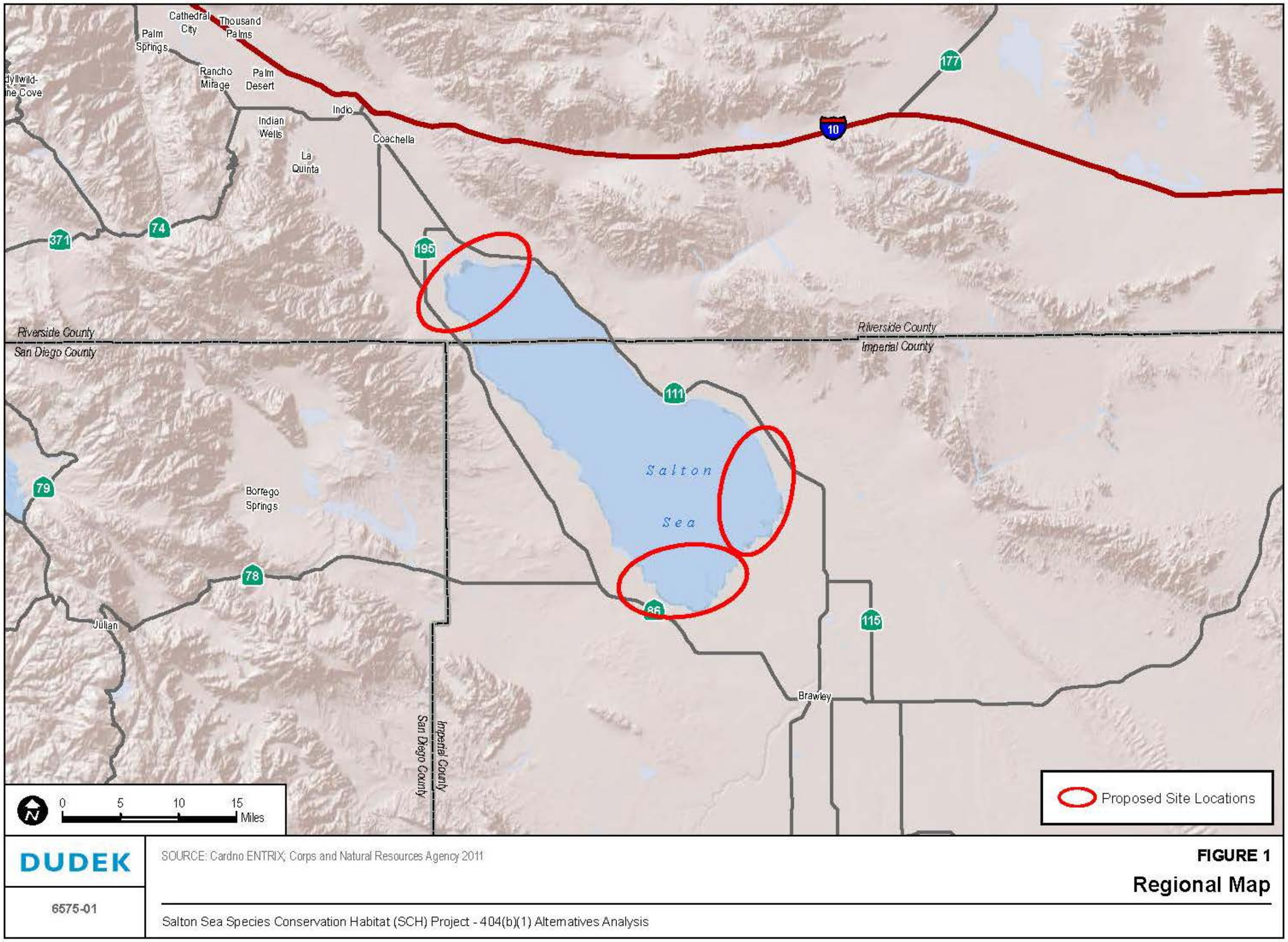


Figure 1 Regional Map

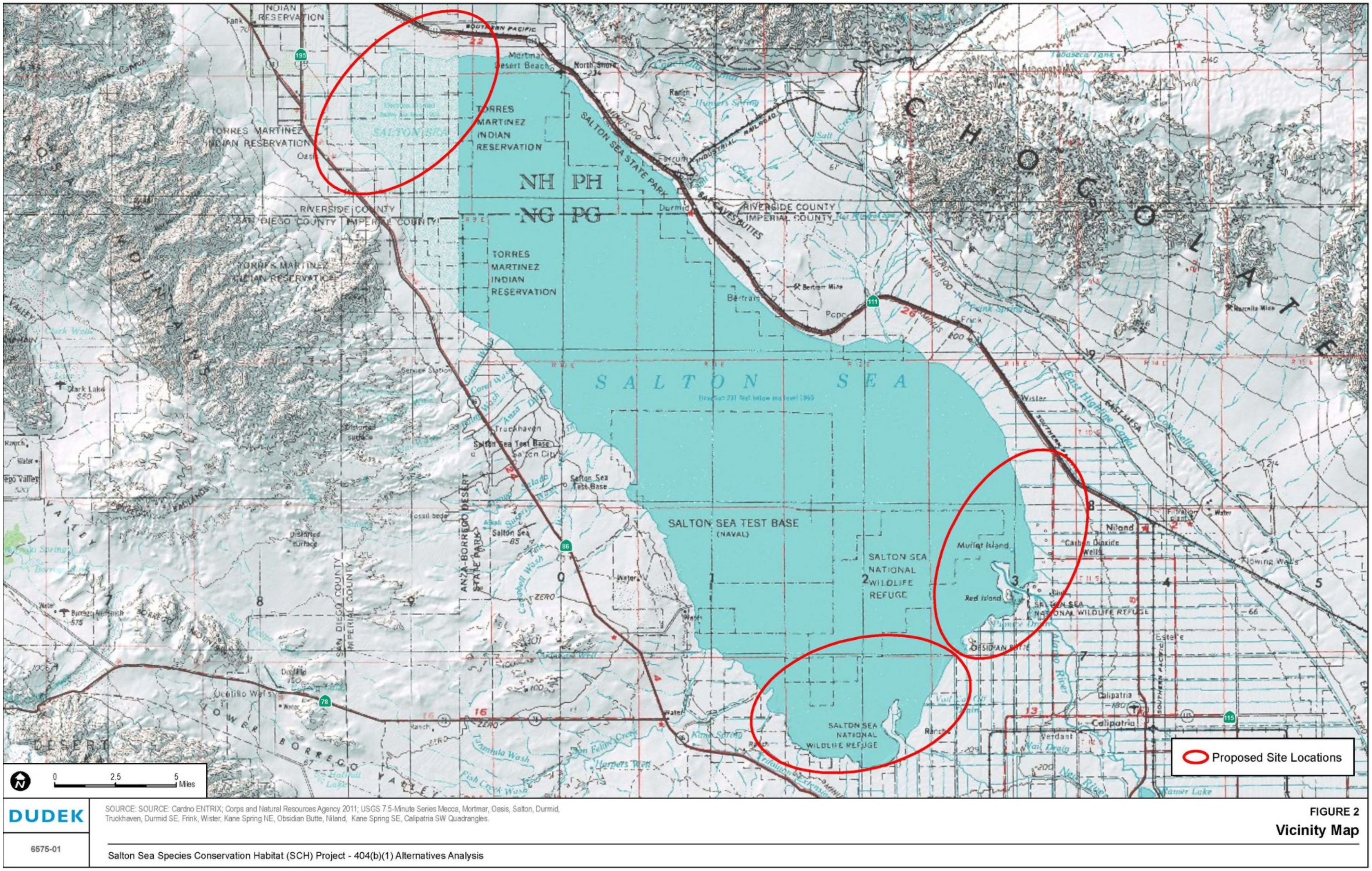


Figure 2 Vicinity Map

1.4 Proposed Project Description

The California Department of Fish and Wildlife (DFW), on behalf of the California Natural Resources Agency, proposes to construct and operate the SCH Project, which would restore shallow water habitat lost due to the Salton Sea's ever-increasing salinity and reduced area as the Sea recedes. The SCH ponds would use available land at elevations less than -228 feet mean sea level (msl) (the former Sea level in June 2005).

The SCH Project would use the large bay to the northeast of the New River (East New), the shoreline to the southwest (West New), and the shoreline continuing to the west (Far West New). Cascading ponds would be attached to each of the pond units (Figure 3). The ponds would be constructed with the necessary infrastructure to allow for the management of water into and through the Project area (Figure 4). The newly created habitat would be contained within low-height berms. The water supply for the SCH Project ponds would be a combination of brackish river water and saline water from the Sea, blended to maintain an appropriate salinity range for target biological benefits.

The SCH Project is designed as a proof-of-concept project in which several Project features, characteristics, and operations could be tested under an adaptive management framework for approximately 10 years after completion of construction (until 2025). By then, managers would have had time to identify those management practices that best meet the Project goals. After the proof-of-concept period, the Project would be operated until the end of the 75-year period covered by the Quantification Settlement Agreement (2078), or until funding was no longer available.

The SCH ponds would be constructed on recently exposed playa following the existing topography (ground surface contours) where possible using a range of design specifications. The ground surface within the SCH ponds would be excavated with a balance between cut and fill to acquire material to build the berms and habitat islands. Specifically, the SCH water depth at the exterior berms would range between 0 and 6 feet (measured from the water surface to the Sea-side toe of the berm); the maximum depth within the SCH ponds would be up to 12 feet in excavated holes, and the maximum water surface elevation would be at -228 feet msl.

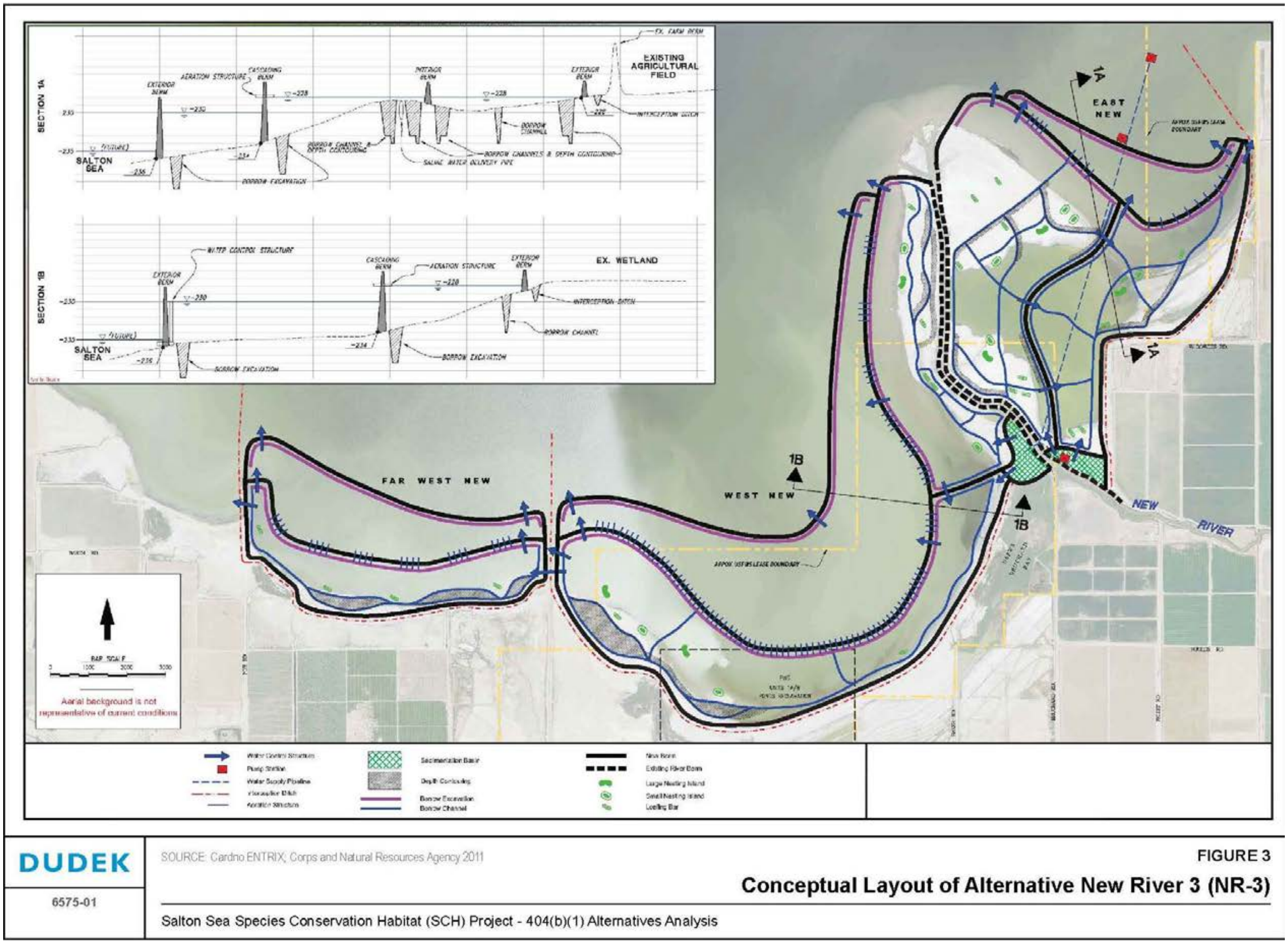


Figure 3 Conceptual Layout of Alternative New River 3 (NR-3)

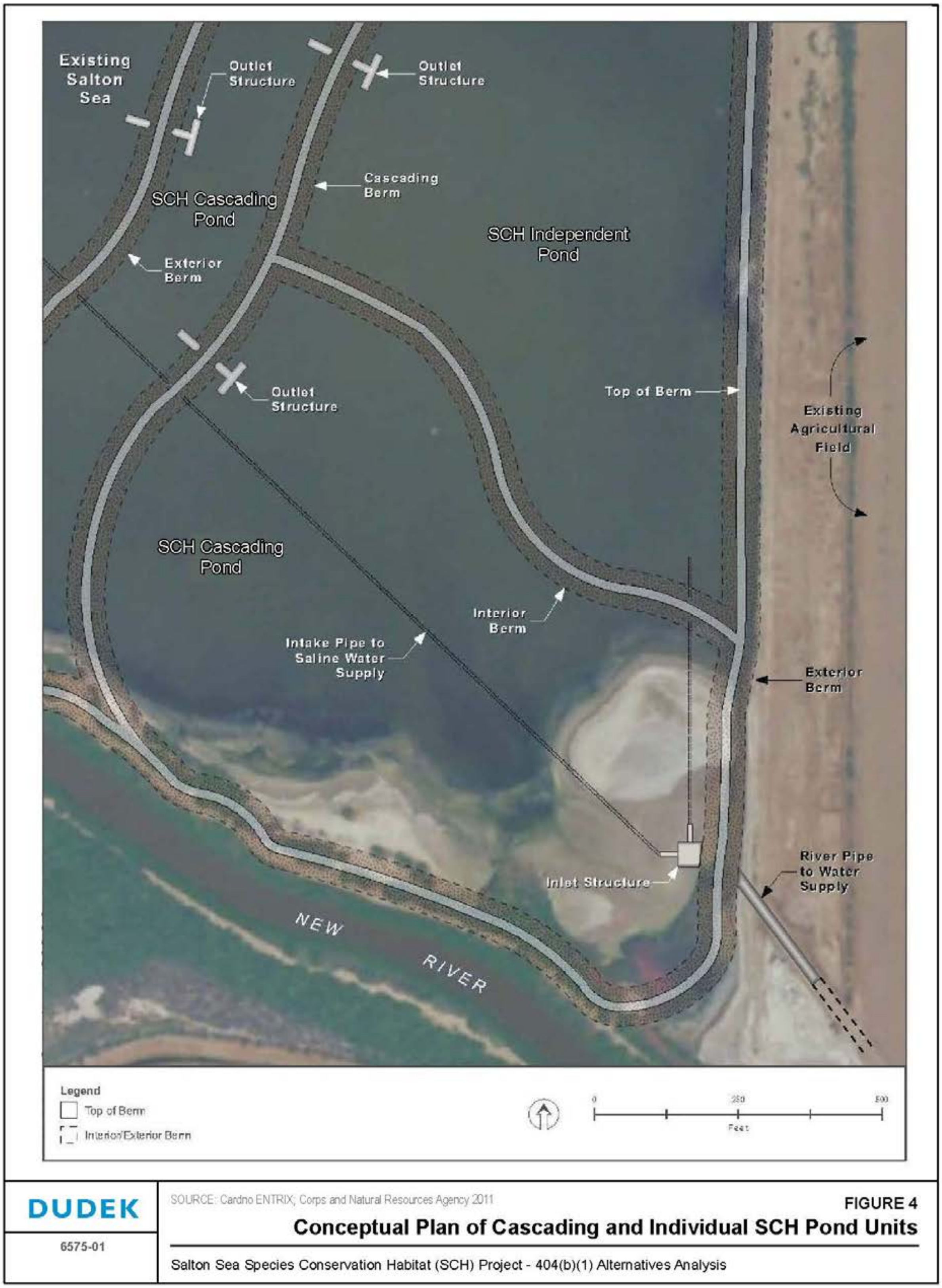


Figure 4 Conceptual Plan of Cascading and Individual SCH Pond Units

Each component of the SCH ponds is described in more detail in Section 1.5. However, the proposed Project would have the following components:

- **River Water Source.** Water would be pumped from the New River at the SCH Project's southern edge using a low-lift pump to a sedimentation basin on each side of the river. A metal bridge structure would be used to support the diversion pipes across the river.

- **Saline Water Source.** A saline pump would be located to the north of East New on a structure in the Salton Sea. Water would be delivered to the pond intakes through a pressurized pipeline.

- **Sedimentation Basin.** Two sedimentation basins would be located within the SCH Project area. They would serve the pond units east and west of the New River. Water would be released from each basin to a distribution system serving the individual ponds. The basins would total 70 acres and would be fenced to prevent unauthorized access.

- **Pond Layout.** The Project would consist of several independent pond units at Far West New, West New, and East New. Within each pond unit, interior berms would form individual ponds. The ponds at Far West New would receive their water supply from a pipeline from West New. Cascading ponds would be connected to each of the pond units. These cascading ponds would drain to the Sea.

- **Water Surface Elevation.** The water surface elevation in the ponds would be a maximum of -228 feet msl. The maximum depth from the water surface in each pond unit to the downstream toe of the confining berm would be 6 feet. The water surface elevation in the cascading ponds would be from 2 to 4 feet lower than the elevation in the independent ponds.

- **Berm Configuration.** Exterior berms would be placed at an elevation of -234 feet msl to separate the ponds from the Sea. The cascading berms would be placed at elevations of -236 or -238 feet depending on the pond location, site conditions, and the Sea elevation at the time of construction.

- **Pond Connectivity.** Interior berms would subdivide the independent pond units, and gated control structures would be present in the interior berms to allow controlled flow between individual ponds. Each individual pond would have an ungated overflow structure that connects directly to the Sea with an overflow pipe that would be sized to handle the overflow from a 100-year rainfall on the pond.

- **Borrow Source.** The borrow source for berm material would be from excavation trenches along the exterior berm, shallow excavations, and borrow swales. The borrow swales would create deeper channels within an individual pond.

- **Agricultural Drainage and Natural Runoff.** Agricultural drains operated by Imperial Irrigation District (IID) terminate at the beach along the southern end of the independent pond units. This drainage would be collected in an interception ditch. Natural runoff from watersheds to the southwest of the SCH Project area is also present in two drains that intersect the Project. The exterior berms would be aligned so as not to interrupt the flowpath of the occasional stormflows from these watersheds to the Sea.

- **Tailwater Return.** A tailwater system could be provided for the SCH Project.

- **Pond Size.** The sizes of the individual ponds would range from 150 to 720 acres.

1.5 Components Used to Develop Alternatives

The following Project components were identified and evaluated as part of the process of developing a range of Project alternatives that would meet the basic and overall Project purpose. Each component is described in detail below along with how each component applies to the six alternatives including the proposed Project.

1.5.1 Pond Units

Ponds would be constructed through a process of excavation (i.e., borrow), berm construction, depth contouring, and installation of water control structures.

1.5.1.1 Pond Unit Type

Each pond unit could be either independent or cascading (Figure 4). An independent pond unit would have one inflow point for brackish and saline water that could be subdivided into multiple smaller ponds. Water would be conveyed between the smaller ponds through a gated pipe, and the ponds would have similar water surface elevations. A cascading pond unit would be attached to an independent pond unit on the outboard (Sea) side and would receive water from an independent unit. In this case, the water surface in each pond would differ by about 2 to 4 feet for Alternatives NR-1 and NR-3. For Alternatives AR-1 and AR-3, the difference would be about 5 feet. Cascading ponds would be used to help aerate the water in the lower pond unit (Figure 4).

1.5.1.2 Berms

Berms would be constructed to impound water to create and subdivide ponds. Up to four berm types would be constructed as part of the Project alternatives:

- **Exterior berm.** Exterior berms would define the outer boundary of an SCH pond unit (either cascading or independent). These berms would separate the Sea from the SCH ponds and the SCH ponds from the interception ditch and adjacent land uses above -228 feet msl.

- **Interior berm.** Interior berms would subdivide the SCH pond unit into individual smaller ponds.
- **Cascading berm.** Cascading berms would separate a cascading pond from an independent pond and would contain facilities to cascade the water from one pond to another (applicable only to Alternatives NR-1, NR-3, AR-1, and AR-3).
- **Improved river berm.** The improved river berm would separate the ponds from the river and be an elevated berm on top of the existing ground along the river.

The berms would be placed to achieve the desired pond size, shape, bottom configuration, and orientation. The exterior berm would be placed with the downstream (Sea-side) toe of the berm at an elevation of -234 feet msl for independent ponds and at a lower elevation for cascading ponds. In both cases, the berms would be located so that under the maximum pond water elevation, the difference between the water surface elevation in the pond and the downstream toe of the berm, would be 6 feet or less. The exterior berm may be protected with riprap or other materials on the outboard (Sea) side. Interior berms would have riprap or other bank protection on the berm slopes above and below the high-water line.

Berms would be constructed by two methods, both involving impacts on potential jurisdictional areas. “In the dry” construction activities would occur in exposed playa areas where the berm would be located at an elevation higher than the Salton Sea’s elevation at the time of construction. In the near-term, however, the exterior berm, especially with a cascading pond unit, would be in direct contact with the Sea. “In the wet” construction may require a barge-mounted dredge to excavate the material for the berm. The berm-side slopes were determined based on Project-specific geotechnical analyses (refer to Appendix C, Geotechnical Investigations, of the Environmental Impact Statement/Environmental Impact Report [EIS/EIR]). A berm would include a single-lane, light-duty vehicle access road on top and turnouts every 0.5 mile. Based on preliminary geotechnical analyses, the foundation after berm placement would consolidate, thus requiring an approximately 10.5-foot-high berm to yield an 8-foot berm.

Construction “in the wet” would result in wave action against the seaward toe of the berms during both construction and the period the level of the Sea was above the toe of the berm. Protective measures would be implemented in order to prevent wave action from eroding the berm fill. Several construction techniques could be used, all of which involve the placement of a barrier on the Sea side of the construction area to intercept the wave action. The techniques would be examined during the final Project design, including sacrificial soil barrier, rubble rock mound, sheet pile barrier, timber breakwater, Geotube®, large sand bags, and floating tire breakwater. Detailed information about each technique is provided in Section 2.4.1.3 of the SCH Project's Draft EIS/EIR (Corps and Natural Resources Agency 2011).

1.5.1.3 Borrow Excavations

On-site material would be used to construct the berms and habitat features (i.e., islands). The amount of excavated material would be balanced with the amount of fill needed for constructing the berms and other features, thus eliminating the need for importing embankment material with the exception of imported riprap and gravel. The borrow areas generally would be adjacent to channels, swale channels, and shallow excavations. Swales and channels would be excavated within the ponds by scrapers and excavators to a depth of 2 feet or more. They ultimately would serve as habitat features that connect shallow and deep areas of a pond. Shallow borrow areas would be from the highest and driest ground and would provide water depths of approximately 2 feet in areas that would otherwise have very shallow water of less than 1 foot. Any of the above-mentioned areas may serve as borrow sites. The source of borrow material within the Project footprint would be determined by the type of material needed for berm construction, taking into account berm construction methods, geotechnical properties of the playa material, and habitat requirements.

1.5.1.4 Depth Contouring

The channels excavated for borrow material to construct berms and islands would create habitat diversity. In addition, features such as swales would be used to achieve greater diversity of depths and underwater habitat connectivity. Borrow channel flowline elevations may not be low enough if the material were too saturated or unsuitable for embankment. There may also be areas within the pond units in which the native material was unsuitable for borrow, yet a channel was still desired to provide a connection to other deeper water habitat areas. In these cases, a hydraulic dredge would provide greater depth to borrow channels or create new channels through areas with soft soils. Soils removed as dredge spoils would be placed either within the Project pond areas or outside of the exterior berm in the Sea, but within the Project footprint.

1.5.2 Water Supply and Water Control Structures

The water supply for the Project would come from the brackish New or Alamo rivers, depending on the alternative, and the Salton Sea. The salinity of the river water is currently about 2 parts per thousand (ppt), and the Sea is currently about 51 ppt. For reference, the ocean is about 35 ppt. Blending the river water and seawater in different amounts would allow for a range of salinities to be used in the ponds. Detailed modeling studies performed for this Project showed that increasing salinity through evapoconcentration (allowing the salinity to increase by evaporating the fresh water and leaving the salts behind) would not produce higher salinity ponds in a reasonable time frame (Appendices D and J of the Draft EIS/EIR). The saline diversion would occur from pumps placed on a structure in or adjacent to the Sea. The river diversion would occur either by a gravity diversion from an upstream location or pumps located near the SCH ponds.

1.5.2.1 Inflow and Outflow Structures

The water supply would enter into the ponds through an inflow structure. This structure would connect to a pumped or gravity flow system for the river and a pumped system for the saline water. A single inflow structure would distribute the water to individual ponds within a unit. The brackish water and saline water inflows could be either separate systems delivering water to a pond or combined to premix water of different salinities.

Outflow structures would be included in all SCH ponds. The outflow structure would consist of a concrete riser with removable flash boards and an outlet pipe. The flash boards could be removed to adjust the water surface elevation of a pond or to reduce the water level elevation in an emergency. The top of the structure would be a weir at least 2 feet below the top of the berms to maintain the maximum water surface at the -228 feet msl elevation (6 feet deep at the outlet). The structure and the outflow pipe would be sized to handle normal pond flow-through and overflow during a 100-year rainfall event. Because the ponds would not have an uncontrolled connection to the river, the outflow structure would not have to handle flood flows entering from the river.

Water control structures would allow for the controlled supply and conveyance of water through the pond units. These structures would be managed to adjust the rate of flow and maintain desired water surface elevations in individual ponds. Structures could be placed to allow water to flow between pond units in which an independent supply is not cost effective, or to provide flexibility in the management of water resources supplied to the ponds.

1.5.2.2 River Diversion Gravity Diversion Structure

For alternatives that consider supplying river water to the Project via gravity diversion (Alternatives NR-1 and AR-1 [Alternatives 1 and 4 in the Draft EIS/EIR]), a water control structure would be constructed at the diversion location along the bank of the New or Alamo rivers. The structure would be a series of pipes to extract water laterally from the river, and discharge it into an adjacent sedimentation basin. From the sedimentation basin, the water would be delivered by gravity to the SCH ponds through large-diameter brackish water pipelines. The diversion would be located, at a minimum, a distance upstream that would have a sufficient water surface elevation at the river to run water through the diversion pipes, sedimentation basin, and brackish water pipeline to the SCH ponds.

1.5.2.3 Brackish Water Pipeline

The gravity brackish water pipeline that conveys water from the sedimentation basin to the SCH ponds would consist of several large-diameter polyvinyl chloride (PVC) pipes buried along the route, which is not yet identified because it is dependent on availability of land from willing owners and the ability to negotiate a lease or easement from such owners. It is estimated that three 5-foot-diameter pipes are necessary to minimize velocity in the pipeline, thereby minimizing head loss.

1.5.2.4 River Diversion Pump Stations

A pump station would be required for alternatives using a river water diversion located at the Project site (Alternatives NR-2, NR-3, AR-2, and AR-3 [Alternatives 2, 3, 5, and 6 in the Draft EIS/EIR]) because the water surface elevation in the river is below the design elevation of -228 feet msl. A single pump station could pump directly into sedimentation basins located on either side of the river for delivery to the SCH ponds. The pump station would have multiple pumps to allow variable diversion rates. In addition, multiple pumps would allow individual maintenance without eliminating the entire diversion. Power to operate the pumping station would be supplied from existing three-phase power lines owned by IID.

1.5.2.5 Saline Water Supply Pump Station

Saline water would be pumped from the Salton Sea, which has a lower water surface than that of the SCH pond units. Alternatives include locating it on a platform in the Sea, which would require three-phase power to be brought to the station. The pump station may be relocated farther out as the Sea recedes and as pumps require replacement or maintenance. Another option would excavate a channel to bring the water to a pump station located closer to the Project site. This option would require less pipeline and a shorter run of utility lines, but would require the channel be maintained and deepened as the Sea recedes. Because the Sea gets progressively more saline as it recedes, at some point salinity balance may be achieved through a tailwater return system or similar process.

1.5.2.6 Tailwater Return Pump

A pump located at the far end of a SCH pond, or series of SCH ponds, could be utilized to return water that otherwise would be discharged to the Sea back to the top of the system. This method is for promoting the movement and flow of water through the SCH ponds while conserving water resources. It also could serve to aerate the water.

1.5.2.7 Boat Ramps

Boat ramps would allow boat access for monitoring and maintaining the ponds, Project features, and habitat conditions. A boat launch would accommodate a vehicle and trailer of approximately 46 feet in length with appropriate room for turn-around before the ramp. The ramp would extend about 30 feet into the water and require a 3-foot depth at the end of the ramp. Precast concrete barriers on the windward side of the ramp would protect the boat during launch and recovery.

1.5.3 Additional Project Components

1.5.3.1 Power Supply

Three-phase, 480-volt electrical power to operate the pumps would be provided by existing aboveground power lines operated by IID. Aboveground electrical power lines would be modified to prevent bird collisions and electrocutions (e.g., bird deterrents).

1.5.3.2 Sedimentation Basin

A sedimentation basin would be needed for all alternatives to remove the suspended sediment from influent river water before it enters the SCH ponds. For alternatives considering a gravity diversion, the basin would be located at the point of diversion. For pumped diversion alternatives, basins would be located at the SCH ponds on one or both sides of the river. The sedimentation basin would detain water for approximately 1 day to allow suspended sediment to settle to the bottom of the basin.

The basin would be divided into two sections, alternately labeled the active basin and the maintenance basin. The maintenance basin would be dried for sediment removal. This basin would then become the active basin and the other side would be dried. Excavated material would be used in the SCH ponds to maintain berms, construct new habitat features, or stockpile for eventual use at the SCH Project.

1.5.3.3 Interception Ditch/Local Drainage

SCH berms would be located to allow natural runoff to flow to the Sea unimpeded. Existing drainage ditches located along the Salton Sea’s perimeter discharge agricultural drainwater to the Sea. An interception ditch would be excavated along the existing shoreline to collect the drainwater and route it around the Project ponds. Ditch design would prevent the Project from causing water to back up in these drains, thus preventing the discharge of drainwater to the Sea, as well as mitigate the potential of the higher water in the ponds creating a localized shallow groundwater table higher than that which currently exists on neighboring properties. The interception ditch also would maintain connectivity among pupfish populations in drains adjacent to the Project, allowing fish movement along the shoreline between drains, which is a requirement of IID's Water Conservation and Transfer Project.

1.5.3.4 Aeration Drop Structures

For cascading ponds, small-diameter pipes with variable placement in the cascading berm would allow flow from the upper pond to the lower pond. The 2- to 5-foot elevation difference (depending on the alternative), would create localized zones of increased dissolved oxygen.

1.5.3.5 Bird Habitat Features

Each pond would include several islands for roosting and nesting to provide habitat for birds that is relatively protected from land-based predators. One to three nesting islands suitable for tern species and three to six smaller roosting islands suitable for cormorants and pelicans are anticipated. The islands would be constructed by excavating and mounding up existing playa sediments to create a low-profile embankment approximately 1 to 4 feet above waterline. The nesting islands (0.3 to 1.0 acre) would have an elliptical and undulating shape with sides that gradually slope to the water (8 to 9 percent slope). The roosting islands would be V-shaped or linear, approximately 15 feet wide and 200 feet long, with steep sides to prevent nesting. Orientation of most or all roosting islands would be along the prevailing wind fetch, but it could be varied for a subset of islands if deemed necessary to test habitat preference and island performance (i.e., erosion susceptibility) for future restoration implementation.

The overall pond unit could also include one or two very large nesting islands from 2 to 10 acres with rocky substrate for double-crested cormorants (*Phalacrocorax auritus*) and gulls. The islands would be constructed by mounding sediments to create a tall profile (up to 10 feet), and armoring with riprap to create rocky terraces. However, the amount of fill required to construct such an island is large and may be cost prohibitive. If this option proves infeasible, these features would be eliminated from the final Project design.

The number and placement of islands would be determined by the pond size, shape, and depth, as well as available budget. To the extent possible, islands would be placed at least 900 feet from shore and in water with a minimum depth of 2.5 feet to discourage access by land-based predators such as coyotes (*Canis latrans*) and raccoons (*Procyon lotor*).

An alternative island habitat technique would construct islands to float on the pond's surface rather than requiring conventional excavation and placement of playa sediment. In addition to islands, snags or other vertical structures (5 to 15 per pond) could be installed in the ponds to provide roosting or nesting sites. They could be dead branches or artificial branching structures mounted on power poles. They would be optional features for a SCH pond, depending on presence of existing snags and roosts, availability of materials, and cost feasibility.

1.5.3.6 Fish Habitat Features

The SCH ponds would provide suitable water quality and physical conditions to support a productive aquatic community including fish. The Project would incorporate habitat features to increase microhabitat diversity and provide cover and attachment sites (e.g., for barnacles). The type and placement of such features would depend on habitat needs of different species, site conditions, and feasibility, and would vary to test performance of different techniques. Examples of habitat features considered include swales or channels, hard substrate on berms, bottom hard substrate, and floating islands. A detailed description of the potential fish habitat features is provided in Section 2.4.1.20 and Appendix D of the SCH Project's Draft EIS/EIR (Corps and Natural Resources Agency 2011).

1.5.3.7 Operational Facilities

A trailer or other temporary structure would be located near the ponds and would provide office space for permanent employees. Bottled water would be brought in for potable uses, and power would be provided to the facility. A self-contained waste system would substitute for septic tanks or sewerage. Boats and other equipment would be stored at the Imperial Wildlife Area's (IWA's) Wister Unit in existing facilities.

1.5.3.8 Fish Rearing

A goal of the SCH Project is to raise fish to support piscivorous (fish-eating) birds. To accomplish this goal, a supply of fish that can tolerate saline conditions must be available for initial stocking of the SCH ponds and for possible restocking if severe fish die-offs occur. The SCH ponds would be stocked initially with fish species currently in the Salton Sea Basin, such as California Mozambique hybrid tilapia (*Oreochromis mossambicus x O. urolepis hornorum*) and other tilapia strains in local waters. If necessary to obtain sufficient numbers for stocking, fish may be collected from local sources, and then bred and raised at one or more of the private, licensed aquaculture facilities in the area (within 15 miles of all alternative sites).

1.5.3.9 Public Access

The SCH Project is not specifically designed to accommodate recreation because provision of recreational opportunities is not a Project goal. Nevertheless, certain recreational activities could be available to the extent they are compatible with the management of the SCH ponds as habitat for piscivorous birds dependent on the Salton Sea and nearby sensitive resources. Such activities include day use, hiking, bird watching, and non-motorized watercraft use. Management plans may require that certain areas be seasonally closed to human activities to avoid disturbance of sensitive birds. When bird nesting is observed by SCH managers, human approach would be limited by posted signs. Hours of public access would be restricted in the early morning during hot weather when nesting birds could be present. Fish would not be intentionally stocked for the purpose of providing angling opportunities. Nevertheless, such opportunities may be provided at the SCH ponds, in particular for tilapia. Fish populations would be monitored as a metric of the SCH Project’s success. If populations become well established and appear to provide fish in excess of what birds are consuming, angling may be allowed. Waterfowl hunting may also be allowed, consistent with protection of other avian resources.

1.5.3.10 Land Acquisition

The SCH ponds would be located on land owned by IID and the Federal government. It would be leased from IID for the Project’s duration and include a cooperative agreement with the U.S. Fish and Wildlife Service (USFWS). Much of the land where the ponds would be located is already leased by IID to the USFWS for the management of the Sonny Bono Salton Sea National Wildlife Refuge (NWR). An agreement between DFW and USFWS would be established prior to construction of the SCH Project to ensure compatibility between NWR uses and the SCH Project. Other Project facilities, such as pump stations, pipelines, or access roads, may be located on IID land, public right-of-way, or private land. On private land, easements would be obtained from willing landowners only. If an easement cannot be negotiated with a landowner, the proposed facilities would be located elsewhere. The easement would be structured to avoid precluding the continued use of the property by the landowner. Land in easement disturbed during construction would be returned to the preexisting condition, except at the sites of permanent facilities, such as pump stations, diversion works, and pipeline access manholes.

2.0 ALTERNATIVES ANALYSIS

2.1 Off-Site and No Project Alternatives

As required by the Section 404(b)(1) Guidelines, the Corps evaluated alternative project sites to determine if there is an alternative site available on which the proposed Project could be constructed that would involve fewer impacts on aquatic resources than the proposed Project and would not have concomitant adverse impacts on other sensitive resources such as listed species. This involved a two-step review. First, alternative sites were subject to a detailed evaluation of the key siting criteria required for similarly sized, aquatic habitat restoration projects. The "key siting criteria" are described below. The second part is a practicability review that is described in Section 2.3.

Key siting criteria used to evaluate alternatives are:

1. **Available land (ownership and accessibility):** Sufficient land must be either owned by the Natural Resources Agency or available for use for the SCH Project either through lease, access agreements, sale, transfer, or other such legal agreement. In that case where land is either leased, transferred, or sold, there must be a landowner(s) willing to enter into such an agreement.

2. **Adequate water supply (quantity, quality, and seasonal availability):** Assuming 6 feet of evaporation annually, the amount of water necessary to supply the SCH ponds each year ranges from 5,400 acre-feet (af) for 900 acres of SCH ponds to 34,200 af for 5,700 acres of SCH ponds (this water is lost to evaporation and does not include water that is circulated in the ponds to maintain salt balance or discharged to the Sea to flush ponds). This volume of water would be necessary throughout the year and would be provided from a water right obtained by the Natural Resources Agency or an agreement with an existing water rights holder. The SCH ponds could be operated as brackish water, saline water, or blended water habitat. Different ponds could be operated under different salinities to test which salinity regime results in the best combination, or balance, of invertebrate and fish productivity, bird use, and seasonal fish survival (refer to Appendices D, Project Operations, and E, Monitoring and Adaptive Management Framework, of the Draft EIS/EIR).

2.2 Screening of Off-Site and No Project Alternatives

The California DFW and Department of Water Resources (DWR), on behalf of the Natural Resources Agency, initially identified three generalized locations for the SCH ponds, based on the potential availability of contiguous acreage and the potential availability of a nearby, suitable water supply. The most suitable areas initially identified were located near the mouths of the New, Alamo, and Whitewater rivers (Figure 2).

In addition to evaluation of the potential locations for SCH ponds, potential alternative sources of water were evaluated. These sources include river water, agricultural drainwater, Salton Sea water, and groundwater. Agricultural drainwater and groundwater were eliminated from consideration based on the factors described below.

Agricultural Drainwater: Drainwater purely from agricultural sources was eliminated as a potential water source for a variety of reasons, but primarily due to the seasonal variation in agricultural discharge. This seasonality means that the minimum necessary volume of water would not reliably be available throughout the year. Furthermore, agricultural drainwater has consistently poorer water quality than that of the rivers (drainwater is primarily tilewater and not as diluted as river water; thus, its pollutants are more concentrated). There are also known hotspots of selenium within agricultural areas. Lastly, the agricultural drains are habitat for the Federally and state-listed desert pupfish (*Cyprinodon macularius*), and use of drainwater would reduce this habitat potentially conflicting with Federal and state laws intended to protect such species.

Groundwater: The Project area is part of the Imperial Valley Groundwater Basin. Previous studies (LLNL 2008) have found that production of groundwater in the central portion of the Imperial Valley is limited because of the low permeability of the aquifer and poor groundwater quality. The low permeability is a consequence of the deposition of former seabed sediments that comprise the Imperial Valley soils. Some of these sediments have low transmissivity and, therefore, do not produce significant amounts of groundwater. The groundwater is characterized as occurring in a shallow system (ground surface to 2,000 feet deep) and a deeper system (extending to bedrock). The shallow system in the Imperial Valley Groundwater Basin consists of low permeability lake deposits from 0 to 80 feet, a low-permeability aquitard from 60 to 450 feet, and alluvium down to about 1,500 feet (LLNL 2008). Well-production data are limited for the Imperial Valley aquifer, but available data suggest the wells in the central portion of the aquifer (closest to the Project area) have the following characteristics:

- Production rates of less than 100 gallons per minute (0.2 cfs);
- Salinity generally ranging between 1,000 and 2,000 to as high as 15,700 parts per million; and
- Hydraulic conductivity of 0.6 foot/day (LLNL 2008).

Although groundwater in the central Imperial Valley aquifer is saline, this source is not a replacement for the Salton Sea as a source of saline water for the Project (the salinity is less than the lowest pond salinity proposed). Based on best available information, it appears that groundwater is not a suitable replacement supply for the river water used in the Project because of inadequate yield of the shallow groundwater. Additionally, insufficient data exist regarding this supply including depth to groundwater, yield, salinity, subsidence, and location of cost-effective production wells, to carry this supply forward in the Project. This supply can be reevaluated at a later time if additional data are available. Therefore, this option was eliminated from further consideration.

2.2.1 Whitewater River Site Alternative

The Whitewater River flows into the Salton Sea at the northwestern end of the Sea. At this location, approximately 900 acres of pond area could potentially be developed through the SCH Project (Figure 2). These lands are not directly adjacent to the river, but are slightly offset to the northeast (563 acres) and southwest (378 acres) of the river. The sites have an elevation between -228 and -234 feet. The land is owned by IID, U.S. Department of Interior, the Torres Martinez Desert Cahuilla Indian Tribe (Torres Martinez Tribe), and various private entities.

Siting Criteria Review: The Whitewater River Site Alternative was eliminated as an off-site alternative for the proposed Project because water rights and an adequate water supply are not available at the Whitewater River. The Whitewater River is designated by the State Water Resources Control Board (SWRCB) as a fully appropriated stream from the Salton Sea to the headwaters; thus, no water would be available for the SCH Project. Due to existing and projected demands on the Whitewater River by the Coachella Valley Water District and the Torres Martinez Tribe, there is not adequate water available to support a large restoration project (see Appendix B of the Draft EIS/EIR). This site does not meet the water rights and adequate water supply siting criteria. With regard to the available land criterion, IID's ownership is in a checkerboard pattern, mixed with lands owned by the Torres Martinez Tribe. Tribal land would be required to convey water to ponds at the Whitewater River site. Considering the Tribe has not been willing to participate in the SCH Project, acquiring Torres Martinez tribal lands for the proposed project is not likely.

2.2.2 Alamo River Alternatives

The Alamo River flows into the Salton Sea at the southeastern end of the Sea. At this location, approximately 2,400 acres of pond area could potentially be developed through the SCH Project (Figure 2). These lands are directly adjacent to the river to the north (2,306 acres) and southwest (1,111 acres) of the river. The sites have an elevation between -228 and -232 feet. IID, DFW, and various private entities own the land.

Siting Criteria Review: The Alamo River Alternatives meet the Corps siting criteria (adequate water and land are available from IID) and were analyzed for practicability, the results of which are described below.

Because the Alamo River was comparable to the New River in regard to the key general siting criteria, multiple detailed alternatives were analyzed at the Alamo River (Alternatives AR-1, AR-2, and AR-3; Section 2.3.1).

2.2.3 No Project/No Federal Action Alternative

Under the No Project/No Federal Action Alternative, the Corps would not issue a permit for the SCH Project, and no components of the SCH Project would be constructed. The No Project/No Federal Action Alternative is intended to reflect existing conditions plus changes that are reasonably expected to occur in the foreseeable future if the Project is not implemented. An SCH Project alternative could not be constructed without a Federal action because any SCH Project alternative would require diversion of flows from a riverine source, and such a diversion would require discharge within the jurisdictional limits of the riverine system (e.g., New River). Furthermore, although there are non-jurisdictional areas of exposed playa within the Salton Sea, jurisdictional wetlands still occur in and around these non-jurisdictional exposed playas, and it would be infeasible to design a project completely within the non-jurisdictional areas only. Thus, the No Federal Action Alternative is the same as the No Project Alternative.

Under the No Project/No Federal Action Alternative, the Salton Sea would continue to recede as water levels decline over the years. Reduced inflows in future years would result in the Salton Sea's ecosystem collapse due to increasing salinity (expected to exceed 60 ppt by 2018, which is too saline to support fish) and other water quality stresses, such as temperature extremes, eutrophication (process by which a water body acquires a high concentration of nutrients [e.g., nitrates and phosphates]), and related anoxia (decrease in oxygen) and algal productivity. The most serious and immediate threat to the Salton Sea ecosystem is the loss of fishery resources that support piscivorous birds.

The No Project/No Federal Action Alternative would not achieve the overall Project purpose of restoring aquatic habitat along the exposed shoreline of the Salton Sea. The No Project/No Federal Action Alternative would not be subject to the cost, logistic, or technology criteria because there would be no cost threshold or modification of logistics to evaluate. Therefore, the No Project/No Federal Action Alternative is not carried forward for comparison purposes.

2.3 Practicability of Alternatives

The following criteria were used to screen the practicability of off-site and on-site alternatives: overall Project purpose, cost criteria, logistics criteria, and environmental impacts.

Overall Project Purpose: To be practicable, an alternative must meet the overall Project propose, which is to develop a range of aquatic habitats along the exposed shoreline of the Salton

Sea that would support fish and wildlife species dependent on the Salton Sea in Imperial County, California.

Cost Criteria: The construction costs for each alternative were compared to the proposed Project. The estimated costs for each alternative were developed based on a measure of the size of overall grading/construction and the individual unit costs for various facilities that make up the alternative conceptual design. The Corps has determined that the practicability of alternatives with regard to cost criteria is based on the cost to construct each alternative compared to the construction costs for the proposed Project (estimated to be $80.9 million). To meet the cost criteria an alternative must not substantially increase the cost of construction.

Logistics Criteria: These criteria include issues related to the complexity of the Project design based on individual site characteristics, special equipment needs, and land acquisition issues. As such, these criteria focus on the key components required to achieve the basic and overall Project purpose. The following logistical criteria were developed to evaluate practicability:

1. **Disruption of agricultural drainage systems:** An alternative may be considered impracticable if construction and operation result in the likely disruption of agricultural drainage systems, including subterranean tile drains due to the highly sensitive nature of the drainage systems potentially affected and the number of agricultural enterprises potentially affected.

2. **Long-term soil stability:** The practicable construction of the Project depends on the ability to reliably use borrow excavations from constructed ponds to construct berms and for those berms to remain stable. Factors that negatively affect soil stability, such as high geologic activity (e.g., mud pots) may result in future repairs and re-design with associated costs that could not be absorbed by the Project.

Technology Criteria: The Corps determined that technology would have no bearing on the practicability analysis because all alternatives analyzed propose the use of the water conveyance and pond construction technology to create aquatic habitat (e.g., gravity or pumped water conveyance and ponds constructed of excavations and berms). An alternative technology for creating aquatic habitat that does not involve the conveyance of water to areas that can hold and support water has not been identified. A number of potential Project components were evaluated in the Draft EIS/EIR, Appendix B, Table B-2 (Corps and Natural Resources Agency 2011).

Environmental Criteria: Environmental impacts due to the implementation of the alternatives were not used to eliminate an alternative in this section. An alternative that may have larger short-term environmental impacts may also result in larger long-term environmental benefits; therefore, alternatives that meet the practicability criteria listed above are carried forward throughout the document. The environmental impacts and expected benefits for each practicable alternative are fully analyzed in Section 4.0 of this document.

2.3.1 Practicability of Off-Site Alternatives

Three off-site alternatives are evaluated (Figure 5), each involving constructing ponds along the north side of the Alamo River. Each of these alternatives is evaluated for practicability based on the criteria outlined above. All practicable off-site and on-site alternatives will then be compared to determine which is the least environmentally damaging.

2.3.1.1 Alamo River, Gravity Diversion + Cascading Pond (Alternative AR-1)

Alternative AR-1, identified as Alternative 4 in the EIS/EIR, would construct 2,290 acres of ponds on the northern side of the Alamo River (Figure 6). River water would be pumped into the sedimentation basin via an upstream gravity diversion. This alternative would include both independent and cascading pond units. Alternative AR-1 would consist of the following facilities:

- A gravity structure on the Alamo River;
- Saline water pump at Red Hill with associated pipeline;
- Sedimentation basin (at upstream location) adjacent to the river;
- Independent and cascading pond units at Morton Bay defined by exterior and interior berms with control structures to regulate water flows;
- Borrow material from pond excavations, including borrow swales to create deeper channels;
- An interception ditch to direct flows from agricultural drains; and
- A tailwater return system.

Overall Project Purpose: This alternative would meet the overall Project purpose.

Cost Criteria: This alternative would require construction costs of $39.9 million, which is 49 percent less than the cost of the proposed Project; therefore, this alternative meets the cost criteria.

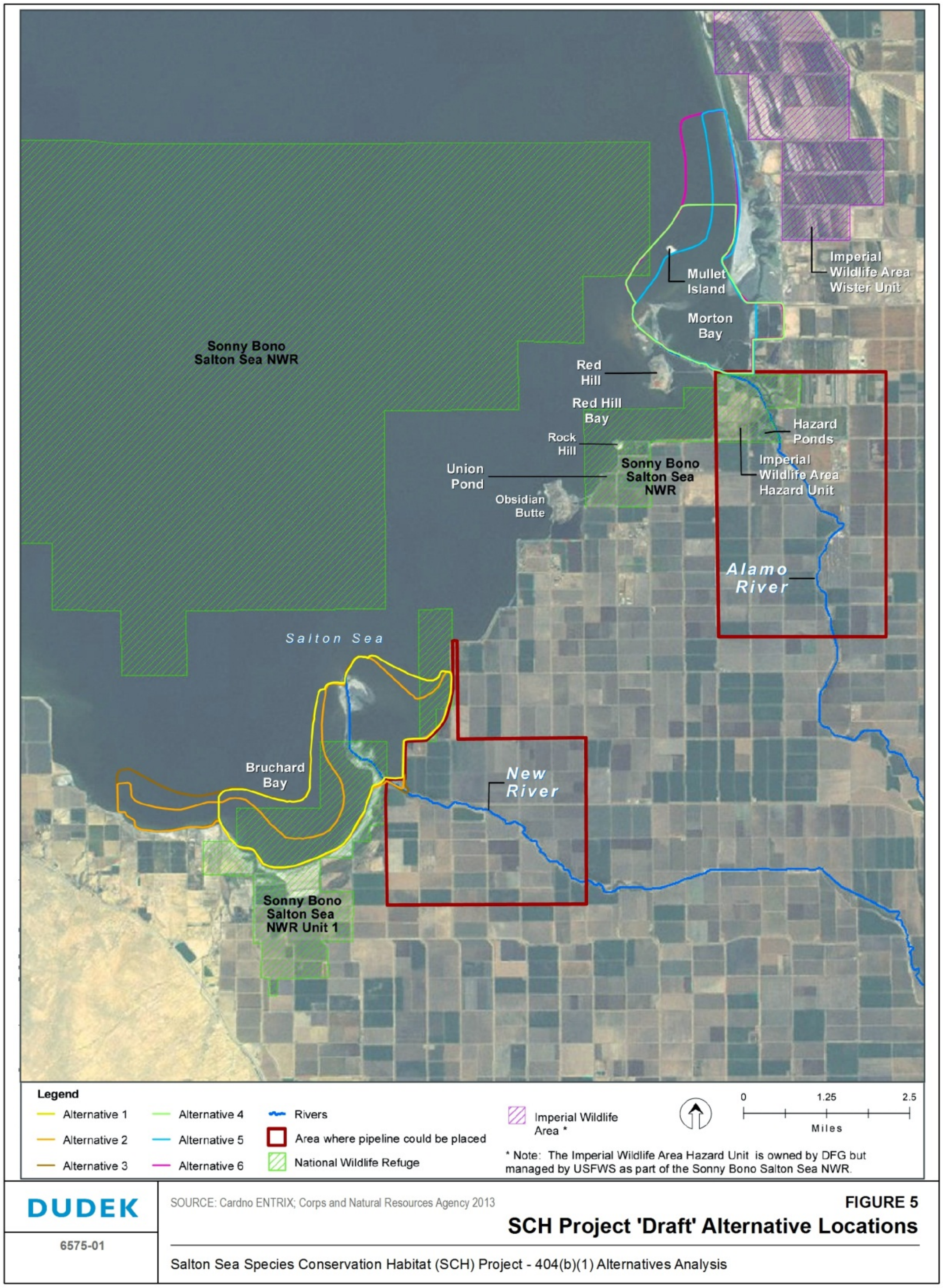
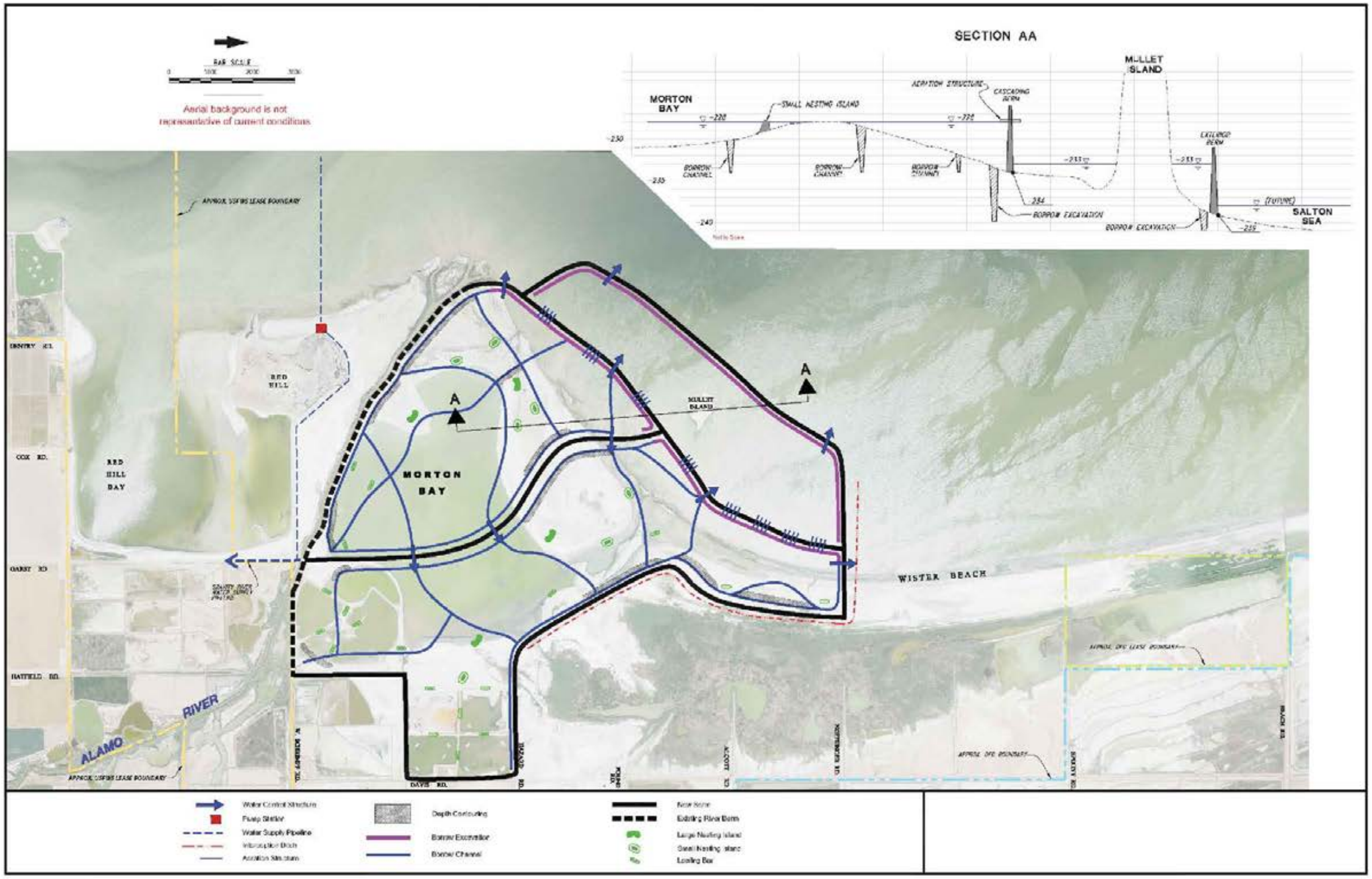


Figure 5 SCH Project Alternative Locations



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SOURCE: Cardno ENTRIX; Corps and Natural Resources Agency 2011

FIGURE 6

Conceptual Layout of Alternative Alamo River 1 (AR-1)

Salton Sea Species Conservation Habitat (SCH) Project - 404(b)(1) Alternatives Analysis

Figure 6 Conceptual Layout of Alternative Alamo River 1 (AR-1)

Logistics Criteria:

1. **Disruption of agricultural drainage systems –** The gravity water supply structure proposed under this alternative would bisect existing farmland that relies on a subterranean tile drain system with the potential to permanently alter drainage patterns. Such alterations could result in a loss of farmland productivity and/or a requirement to ensure adequate drainage across the fields adjacent to the gravity water supply structure through maintenance of various drainage facilities. This alternative is not considered practicable because it would either require substantial land acquisition of agricultural fields adjacent to the Project and potential liability for loss of farmland productivity and/or the ongoing maintenance of drainage facilities to offset potential drainage alterations.

2. **Long-term soil stability –** This site is subject to high geologic activity as evidenced by the presence of mud pots east of the Alamo River in Morton Bay. These conditions may result in the release of carbon dioxide gas that could erode and undermine the berms, causing them to fail. Berms would need to be reconstructed in a different location, thus potentially requiring redesign and reconstruction costs. Based on the criteria for this evaluation, this alternative would not be practicable due to poor long-term soil stability.

Based on the evaluation of logistics criteria, although AR-1 is constructible, it is not considered practicable due to substantially increased potential disruption of agricultural drainage systems and poor long-term soil stability compared with the proposed Project.

2.3.1.2 Alamo River, Pumped Diversion (Alternative AR-2)

Alternative AR-2, identified as Alternative 5 in the EIS/EIR, would construct 2,080 acres of ponds on the northeastern side of the Alamo River (i.e., Morton Bay) (Figure 7). A river diversion would be installed at the SCH pond site and consist of a low-lift pumped diversion. This alternative would include independent pond units only. Alternative AR-2 would consist of the following facilities:

- A low-lift pump station on the Alamo River;
- Saline water pump in the Sea with associated pipeline;
- Sedimentation basin adjacent to the river;
- Independent pond units at Morton Bay and Wister Beach with an interior berm to form individual ponds within the Morton Bay independent pond unit;
- Borrow material from pond excavations including borrow swales to create deeper channels;
- An interception ditch to direct flows from agricultural drains; and
- A tailwater return system.

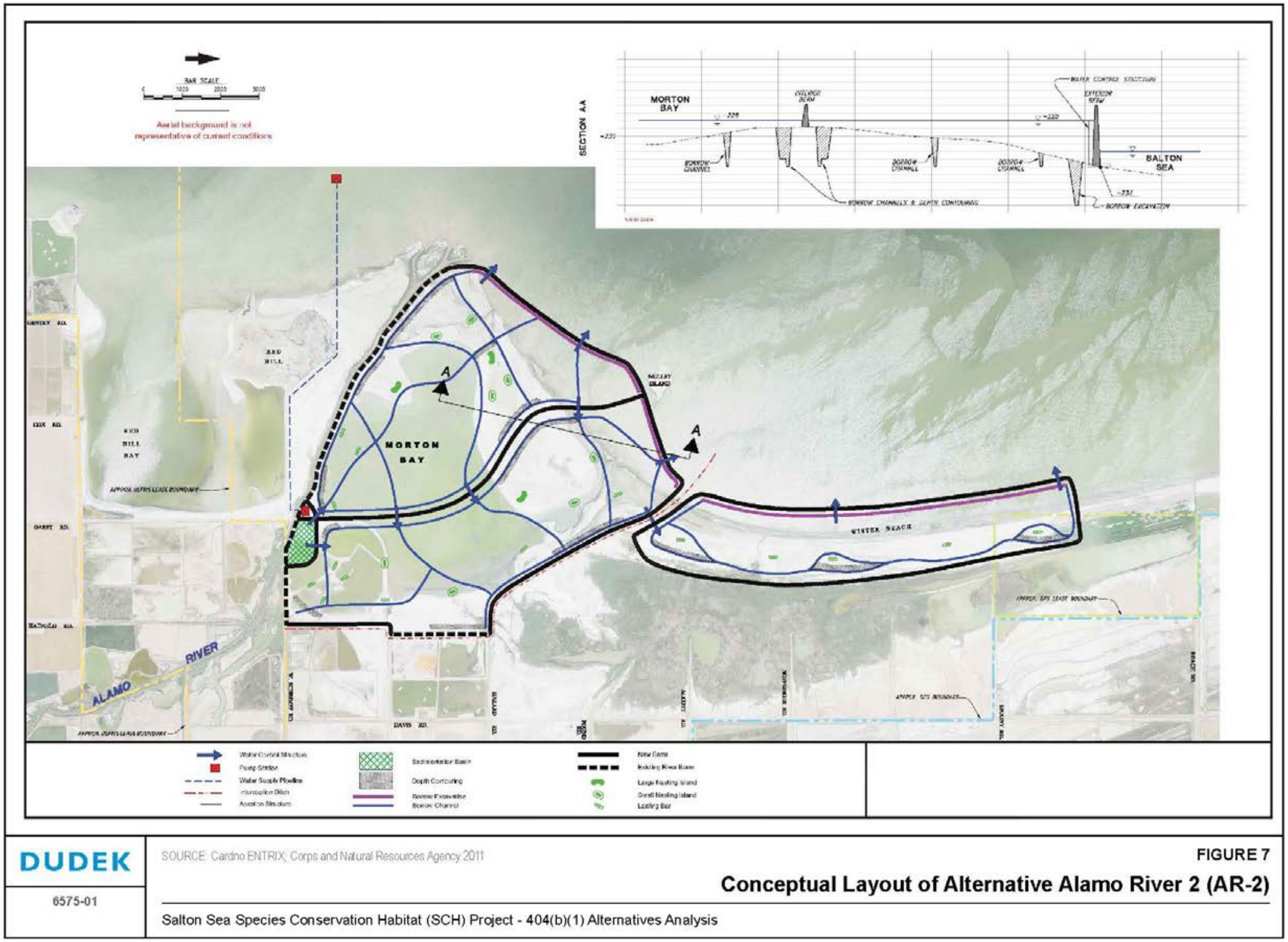


Figure 7 Conceptual Layout of Alternative Alamo River 2 (AR-2)

Overall Project Purpose: This alternative would meet the overall Project purpose.

Cost Criteria: This alternative would require construction costs of $30.9 million, which is 38 percent less than the cost of the proposed Project; therefore, this alternative meets the cost criteria.

Logistics and Constructability Criteria:

1. **Disruption of agricultural drainage systems –** The low-lift pump station water supply structure proposed under this alternative would not require bisecting existing farmland and would therefore have limited potential to permanently alter drainage patterns within agricultural areas. This alternative is therefore considered practicable under this criterion.
2. **Long-term soil stability –** This site is subject to high geologic activity as evidenced by the presence of mud pots east of the Alamo River in Morton Bay. These conditions may result in the release of carbon dioxide gas that could erode and undermine the berms, causing them to fail. Berms would need to be reconstructed in a different location, thus potentially requiring redesign and reconstruction costs. Based on the criteria for this evaluation, this alternative would not be practicable due to poor long-term soil stability.

Based on the evaluation of logistics criteria, although Alternative AR-2 is constructible and would not pose a substantial risk to agricultural drainage systems, it is not considered practicable based on insufficient long-term soil stability.

2.3.1.3 Alamo River Pumped Diversion + Cascading Ponds (Alternative AR-3)

Alternative AR-3, identified as Alternative 6 in the EIS/EIR, would construct 2,940 acres of ponds on the northern side of the Alamo River (Figure 8). A pumped river diversion at the SCH ponds would be included in the Project design, as well as both independent and cascading pond units. Alternative AR-3 would consist of the following facilities:

- A low-lift pump station on the Alamo River;
- Saline water pump at Morton Bay with associated pipeline;
- Sedimentation basin adjacent to the river;
- Independent pond units at Morton Bay and Wister Beach with a cascading pond in each and an interior berm to form individual ponds within the Morton Bay independent pond unit;
- Borrow material from pond excavations including borrow swales to create deeper channels;
- An interception ditch to direct flows from agricultural drains; and
- A tailwater return system.

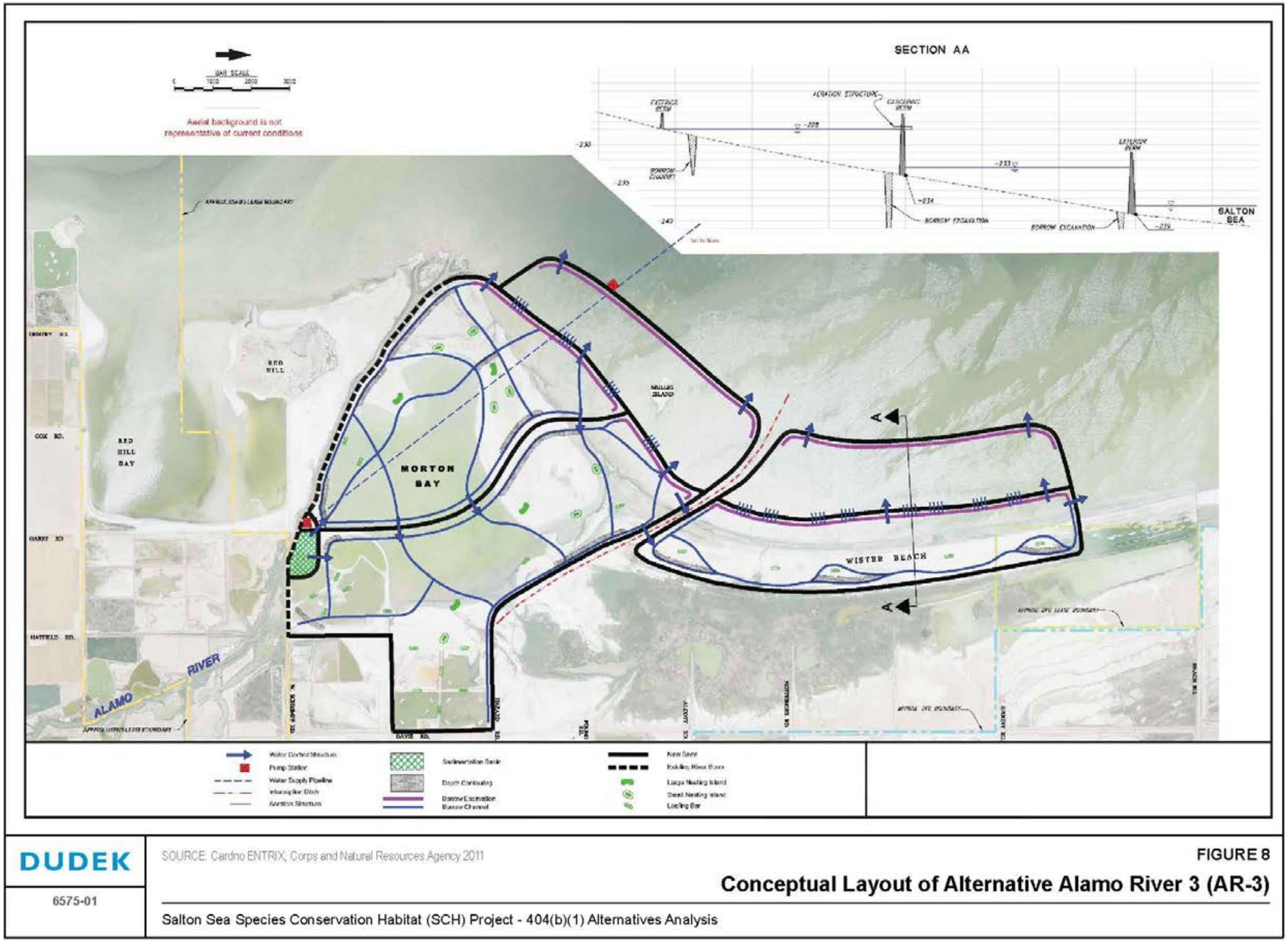


Figure 8 Conceptual Layout of Alternative Alamo River 3 (AR-3)

Overall Project Purpose: This alternative would meet the overall Project purpose.

Cost Criteria: This alternative would require construction costs of $43.5 million, which is 54 percent less than the cost of the proposed Project; therefore, this alternative meets the cost criteria.

Logistics Criteria:

1. **Disruption of agricultural drainage systems –** The low-lift pump station water supply structure proposed under this alternative would not require bisecting existing farmland and would therefore have limited potential to permanently alter drainage patterns within agricultural areas. This alternative is therefore considered practicable under this criterion.

2. **Long-term soil stability –** This site is subject to high geologic activity as evidenced by the presence of mud pots east of the Alamo River in Morton Bay. These conditions may result in the release of carbon dioxide gas that could erode and undermine the berms, causing them to fail. Berms would need to be reconstructed in a different location, thus potentially requiring redesign and reconstruction costs. Based on the criteria for this evaluation, this alternative would not be practicable due to poor long-term soil stability.

Based on the evaluation of logistics and constructability criteria, although Alternative AR-3 is constructible and would not pose a substantial risk to agricultural drainage systems, it is not considered practicable based on poor long-term soil stability.

2.3.2 Practicability of On-Site Alternatives

The following on-site alternatives consider various pond and pump configurations located at the New River outlet to the Salton Sea (Figure 5).

2.3.2.1 New River, Gravity Diversion + Cascading Ponds (Alternative NR-1)

Alternative NR-1, identified as Alternative 1 in the EIS/EIR, would construct a total of 3,130 acres of ponds on both sides of the New River (East New and West New) and would include an upstream gravity diversion of river water and independent and cascading pond units (Figure 9). Alternative NR-1 would consist of the following facilities:

- A lateral structure on the New River to allow gravity flow of brackish water via pipelines to the SCH ponds;
- Saline water pump on a platform in the Salton Sea and associated pressurized pipeline;
- Sedimentation basin (at upstream location) adjacent to the river;

- Independent and cascading pond units;
- Borrow material from pond excavations including borrow swales to create deeper channels;
- An interception ditch to direct flows from agricultural drains; and
- A tailwater return system.

Overall Project Purpose: This alternative would meet the overall Project purpose.

Cost Criteria: This alternative would require construction costs of $73.1 million, which is 90 percent less than the cost of the proposed Project; therefore, this alternative meets the cost criteria.

Logistics Criteria:

1. **Disruption of agricultural drainage systems –** The gravity water supply structure proposed under this alternative would bisect existing farmland that relies on a subterranean tile drain system and has the potential to permanently alter drainage patterns. Such alterations could result in a loss of farmland productivity and/or a requirement to ensure adequate drainage across the fields adjacent to the gravity water supply structure through maintenance of various drainage facilities. This alternative is not considered practicable because it would either require substantial land acquisition of agricultural fields adjacent to the Project and potential liability for loss of farmland productivity and/or the ongoing maintenance of drainage facilities to offset potential drainage alterations.

2. **Long-term soil stability –** The New River SCH sites do not have mud pot geologic features, as found east of the Alamo River in Morton Bay. Therefore, the potential for gas releases to erode and undermine the berms is minimal and the alternative is considered practicable based on a long-term soil stability criteria.

Based on the evaluation of logistics criteria, although Alternative NR-1 is constructible and would not have substantial soil stability issues, it is not considered practicable due to potential disruption of agricultural drainage systems.

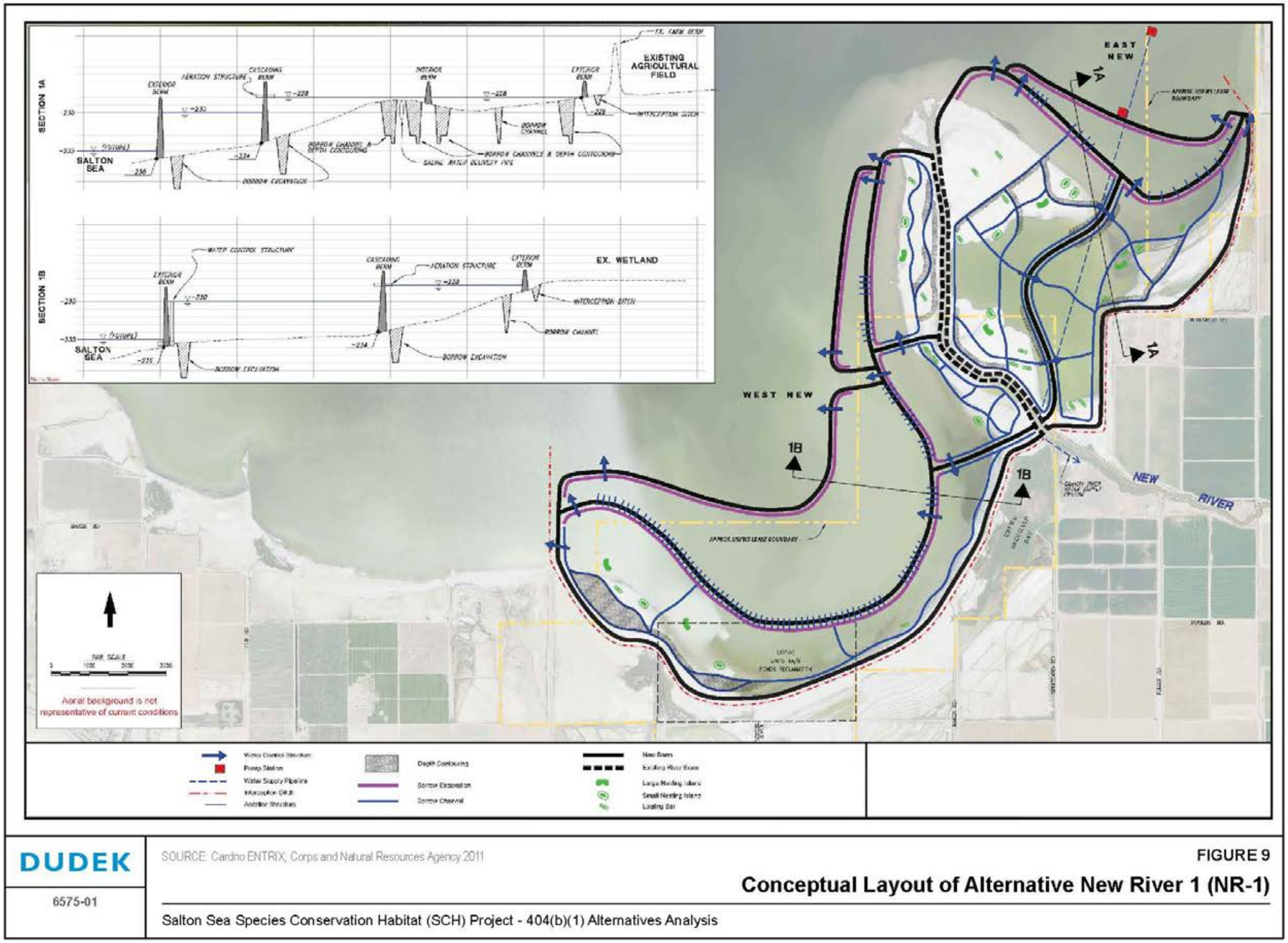


Figure 9 Conceptual Layout of Alternative New River 1 (NR-1)

2.3.2.2 New River, Pumped Diversion (Alternative NR-2)

Alternative NR-2, identified as Alternative 2 in the EIS/EIR, would construct a total of 2,670 acres of ponds on both sides of the New River (East New, West New, and Far West New) and would include pumped river diversion at the SCH ponds and independent ponds (Figure 10). Alternative NR-2 would consist of the following facilities:

- A low-lift pump station on the New River and metal bridge structure to support diversion pipes;
- Saline water pump on a structure in the Salton Sea with associated pressurized pipeline;
- Two sedimentation basins adjacent to the river;
- Several independent pond units;
- Borrow material from pond excavations, including borrow swales to create deeper channels;
- An interception ditch to direct flows from agricultural drains; and
- A tailwater return system.

Overall Project Purpose: This alternative would meet the overall Project purpose.

Cost Criteria: This alternative would require construction costs of $53.7 million, which is 66 percent less than the cost of the proposed Project; therefore, this alternative meets the cost criteria.

Logistics Criteria:

1. **Disruption of agricultural drainage systems –** The low-lift pump station water supply structure proposed under this alternative would not require bisecting existing farmland and would therefore have limited potential to permanently alter drainage patterns within agricultural areas. This alternative is therefore considered practicable under this criterion.

   Long-term soil stability – The New River SCH sites do not have mud pot geologic features, as found east of the Alamo River in Morton Bay. Therefore, the potential for gas releases to erode and undermine the berms is minimal, and the alternative is considered practicable based on a long-term soil stability criterion.

Based on the evaluation of logistics and constructability criteria, Alternative NR-2 is constructible and would not present substantially worsened logistical conditions compared with the proposed Project (i.e., no substantial increase in risk of agricultural drainage system disruption or lack of soil stability). Therefore, this alternative is carried forward to Section 4.0 of this document.

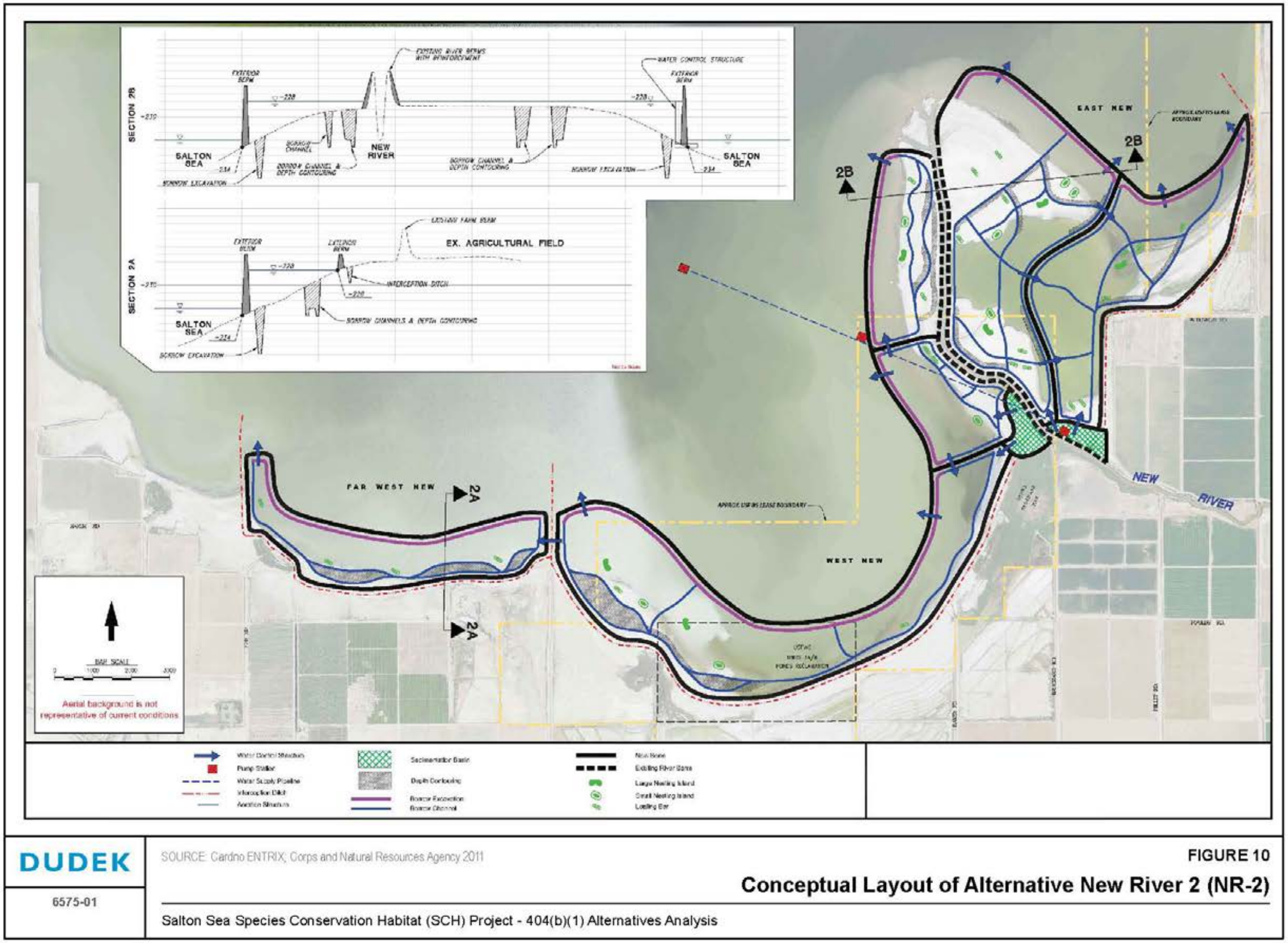


Figure 10 Conceptual Layout of Alternative New River 2 (NR-2)

2.3.2.3 New River Pumped Diversion + Cascading Ponds (Alternative NR-3; Applicant's Proposed Project)

Alternative NR-3, identified as Alternative 3 in the EIS/EIR, would construct up to 3,770 acres of ponds on both sides of the New River (East New, West New, and Far West New) and would include pumped diversion of river water and independent ponds extended to include Far West New and cascading pond units (Figure 3). Alternative NR-3 is the applicant's proposed Project and would consist of the following facilities:

- A low-lift pump station on the New River;
- Saline water pump on a structure in the Salton Sea with associated pressurized pipeline;
- Two sedimentation basins adjacent to the river;
- Several independent pond units with interior berms to form individual ponds and cascading ponds that would drain to the Sea;
- Borrow material from pond excavations including borrow swales to create deeper channels;
- An interception ditch to direct flows from agricultural drains; and
- A tailwater return system.

Overall Project Purpose: This alternative would meet the overall Project purpose.

Cost Criteria: This alternative would require construction costs of $80.9 million. This alternative is the applicant's proposed Project; therefore, it meets the cost criteria.

Logistics and Constructability Criteria:

1. **Disruption of agricultural drainage systems –** The low-lift pump station water supply structure proposed under this alternative would not require bisecting existing farmland and would therefore have limited potential to permanently alter drainage patterns within agricultural areas. This alternative is therefore considered practicable under this criterion.

2. **Soil stability –** The New River SCH sites do not have mud pot geologic features, as found east of the Alamo River in Morton Bay. Therefore, the potential for gas releases to erode and undermine the berms is minimal, and this alternative conforms with this criterion.

Based on the evaluation of logistics and constructability criteria, Alternative NR-3 is constructible and would not present substantial logistical issues with regard to agricultural drainage system disruption or soil stability. Therefore, this alternative is carried forward to Section 4.0 of this document.

2.3.3 Summary of Practicability

Project alternatives were screened for practicability based on achieving the overall Project purpose, cost, and logistics criteria. The logistics criteria consisted of evaluation of the potential for disruption of agricultural drainage systems and long-term soil stability. All Project alternatives would achieve the overall Project purpose and all would meet the cost criteria.

Those Project alternatives that would require gravity diversion of water from the New or Alamo rivers (Alternatives AR-1 and NR-1) are not considered practicable based on the logistics criteria related to potential disruption of agricultural drainage systems.

Of Alternatives AR-2, AR-3, NR-2, and NR-3, those located at the Alamo River are not considered practicable based on the logistics criteria, related to potential long-term soil stability issues due to mud pots located east of the Alamo River in Morton Bay. Table 1 presents a summary of the evaluation of the alternatives to the criteria established.

Alternatives NR-2 and NR-3 are both evaluated in Section 4.0 of this document.

Table 1
Comparison of the Alternatives to the Established Criteria

Alternative	Overall Project Purpose	Cost	Logistics
AR-1	Yes	Yes	No
AR-2	Yes	Yes	No
AR-3	Yes	Yes	No
NR-1	Yes	Yes	No
NR-2	Yes	Yes	Yes
NR-3 (Proposed Project)	Yes	Yes	Yes

3.0 EXISTING CONDITIONS

3.1 General Description

The site of the proposed Salton Sea SCH Project (Alternative NR-3) is located at the southern end of the Salton Sea, near the mouth of the New River, in Imperial County, California (Figures 1 and 2). The Project site is partially located within the Sonny Bono Salton Sea NWR. The SCH Project comprises approximately 4,065 acres, which includes 3,770 acres of pond construction area and 295 acres within six potential staging areas.

The latitude and longitude of the approximate center of the site is 33° 6' 13.8" N and 115° 42' 2.8" W. The Universal Transverse Mercator (UTM) coordinates for the approximate center are UTM Easting (meters) 621230 and UTM Northing (meters) 3663549. The study area lies within the Westmorland West and Obsidian Butte 7.5-minute quadrangles. The SCH Project site is located within Township 12 South, Range 12 East, and Sections 13 and 14, and 23 through 29 as mapped by the U.S. Geologic Survey (USGS).

3.1.1 Jurisdictional Determination

Table 2 shows the jurisdictional waters within the study area.

Table 2
Comparison of the Alternatives to the Established Criteria

Jurisdictional Waters Types	Acres
Lacustrine Non-Wetland Waters	2173
Riverine Non-Wetland Waters	15
Lacustrine Vegetated Wetlands	349
Lacustrine Unvegetated Wetlands	196

3.1.1.1 Non-Wetland Waters

Non-wetland waters include both lacustrine waters, areas below the Ordinary High Water Mark (OHWM) of the Salton Sea, riverine waters, areas below the OHWM of the New River, or one of several agricultural drains within the Project area (Figure 11).

Lacustrine Waters

The physical characteristics normally used to determine OHWM seen at the Salton Sea can be considered unreliable because they are likely relic hydrology indicators left as the Sea continues to recede. Therefore, the OHWM for the Salton Sea and the limits of the lacustrine waters are defined by the recorded high water surface elevation for the most recent period representing "normal circumstances" for purposes of this delineation by excluding records during potential drought periods, per Corps guidance (Corps 1982). Detailed information regarding the determination of the OHWM can be found in the jurisdictional delineation report (Dudek and Chambers 2012). The total lacustrine non-wetland Waters of the U.S. present in the Project area is 2,173 acres (Figure 11).

Figure 11 Jurisdictional Resources

Riverine Waters

The Salton Sea is a traditional navigable water (Corps and Natural Resources Agency 2011), and drainages that were observed within the Project area were evaluated for their connectivity to the Sea. Twenty-five drainages (New River and 24 agricultural drains) were observed within the Project area that channel water in the general direction of and discharge into the Salton Sea. Each drainage exhibited signs of an OHWM, and the OHWM widths ranged from 2 feet up to 30 feet. The drainages contained unvegetated channels within the OHWM, and many had associated wetland vegetation. The drainages receive hydrology primarily from agricultural runoff and receive additional hydrology from direct precipitation and local stormwater runoff. The total riverine non-wetland waters of the U.S. present in the Project area is 15 acres (24,300 linear feet) (Figure 11).

3.1.1.2 Wetlands

Positive indicators for all three wetland parameters (hydrophytic vegetation, hydric soils, and wetland hydrology) were present as patches throughout the Project area. Vegetation was not present throughout the entirety of the wetlands; however, the vegetation that did exist within the wetlands was established with dense areal coverage.

Vegetated Wetlands

Vegetated wetlands are based on observation of current indicators of hydrophytic vegetation, hydric soils, and hydrology (i.e., three criteria per the Corps manual and supplement [Corps 1987, 2008]) during field investigations conducted by Chambers and Dudek. These jurisdictional areas were mapped around several agricultural drain outlets along the Salton Sea shoreline, as well as lands adjacent to the New River. These wetlands are mostly located above the OHWM of the Salton Sea; however, some areas extend below the OHWM. The vegetated wetlands comprise approximately 349 acres of the Project area.

Unvegetated Wetlands

Unvegetated wetlands include a few specific areas that have recent indicators of hydric soils and hydrology (similar to those listed above for vegetated wetlands), but may not support vegetation due to historical or current disturbance, including high salinity. A bay-like area is present north of the New River where a gate control structure has been placed by the USFWS in the north bank of the New River, allowing a drainage to form and water to be conveyed into an area that would otherwise likely be an exposed playa. The lack of hydrophytic vegetation in this area is likely due to high salinity. The extent of unvegetated wetlands in this area was determined through interpretation of a 2012 aerial photograph (Bing Maps 2012). Additional areas along the Salton Sea include exposed playas surrounded by wetland vegetation and proximate to agricultural drains. In the potential staging areas, unvegetated wetlands include a wide drainage ditch and portions of agricultural fields that support hydric soils and are proximate to the New River, thus providing a potential source of hydrology. Unvegetated wetlands occupy 196 acres of the Project area.

3.1.2 Condition of Jurisdictional Resources

3.1.2.1 CRAM

The State of California and Federal agencies that comprise the California Wetlands Monitoring Workgroup[1] are promoting the use of rapid assessment methods as a core tool to evaluate aquatic resource conditions. Dudek evaluated the baseline condition of the SCH Project area in August and November 2011 utilizing the California Rapid Assessment Method (CRAM; Collins et al. 2008), which is the most widely used wetland rapid assessment method in the state (www.cramwetlands.org).

To evaluate the ecological condition of the aquatic resources that would be affected by the proposed Project, Dudek conducted assessments within agricultural drainages leading to the Sea, the New River, and along the southern shoreline of the Salton Sea. A functional assessment was completed using the most recent version of CRAM, version 5.0.2 (Collins et al. 2008). Twelve assessment areas (AAs) were evaluated, including eight riverine and four lacustrine (Figure 12) (Dudek 2012). The eight riverine AAs include four AAs located along the New River and four agricultural drainages. Three wetland classification sub-types as defined in CRAM were identified within the Project area: riverine (confined), riverine (non-confined), and lacustrine.

In general, the CRAM analysis revealed that both the riverine and lacustrine AAs trended toward higher CRAM scores in the buffer and landscape context, medium scores in the hydrology categories, and low to medium scores in the physical structure and biotic structure.

Buffer and Landscape Context: Relative to the other attributes measured by CRAM, the Buffer and Landscape Context scored the highest in both riverine and lacustrine AAs. The riverine AAs scored between 55.9 and 93.4; when agricultural drainages were excluded; scores were between 73.3 and 93.4 for this attribute. The lacustrine AAs scored between 72.9 and 93.4 for buffer and landscape connectivity. In all AAs, buffers were present and there were few or no buffer interruptions (e.g., paved roads, developments) within the 250-meter and 500-meter study areas. The high abundance of non-native vegetation lowered some of the AA scores.

[1] The California Wetlands Monitoring Workgroup is a subcommittee of the California Water Quality Monitoring Council (Senate Bill 1070).

Figure 12 Assessment Areas Overview Map

Hydrology: The agricultural drainages and the New River have distinct hydrologic characteristics, which is the primary reason that the CRAM scores for this attribute have a greater differential than that of the other three attributes. The agricultural drainages function to convey irrigation runoff from the adjacent agricultural fields into the Sea and are primarily unnatural drainage courses. These drainages have fluctuating perennial flow that varies seasonally based on the agricultural activities occurring in the surrounding area. The New River is a natural stream course that has been altered substantially to benefit the surrounding agricultural uses. The New River is bermed along both margins within the Project area to prevent floodwaters from reaching the adjacent lands. The New River is also perennial and fluctuates seasonally, although it carries a substantially larger volume of water compared to the agricultural drainages.

The riverine AAs scored between 50.0 and 83.4 in the Hydrology attribute, with a combined average of 66.7 (average of 56.3 for the New River and 77.1 for the agricultural drainages). The Hydrologic Connectivity metric score was high within the AAs associated with the agricultural drainages, indicating that water that flows through these drainages is able to flow laterally within the floodplain without encountering hillsides, terraces, or other obstructions. The hydrologic connectivity for the New River AAs scored lower because the river is bermed on either side and is therefore confined to the main channel. Both the New River and the agricultural drainages were indicative of channels approaching equilibrium with few indicators of degradation and/or aggradation, although the relatively stable conditions are largely manufactured through periodic management activities (e.g., dredging, berming, and vegetation clearing).

The Hydrology attribute for the lacustrine AAs scored low to moderate. Three of the lacustrine AAs scored 66.7 in the Hydrology attribute while one, LAC-04, scored 75.0. The low scores for this attribute were largely due to low scores for the Water Source metric, which measures the freshwater sources that affect the dry season condition. In the case of the Salton Sea, these water sources are predominantly artificial, resulting in a low metric score. The Hydroperiod (i.e., frequency and duration of inundation) and Hydrologic Connectivity (ability of water to flow into or out of wetlands) metrics had moderate scores. Features that affected the Hydroperiod and Hydrologic Connectivity scores were unnatural filling or inundation and limited lateral movement of floodwaters due to constructed berms and elevated access roads. When compared to the other three attribute scores, the average Hydrology attribute scored the second highest after Buffer and Landscape Context.

Physical Structure: The Physical Structure attribute received the lowest scores of any of the CRAM attributes for both riverine and lacustrine AAs. The riverine AAs scored low in the Physical Structure attribute–between 25.0 and 37.5. Within all of the riverine AAs, the physical structure consisted of a mostly uniform slope with little to moderate micro topography, resulting in relatively low scores for topographic complexity. The lacustrine AAs are on the shore of the

Sea, which is often mostly barren and relatively flat. Consequently, the physical structure characteristics within the lacustrine AAs were minimal (25.0 to 37.5).

Biotic Structure: The vegetation communities associated with the riverine AAs had little biotic structural diversity, either in type and distribution of vegetation communities or in overlap of tall, medium, and short plant layers. Scores for biotic structure ranged between 27.8 and 55.6. The majority of the AAs also were either dominated or co-dominated by non-native vegetation. These features are representative of a highly disturbed ecosystem, which was reflected in the low Biotic Structure attribute scores for both the New River and the agricultural drainages.

The lacustrine AAs are on the shore of the Sea, which is mostly barren, and there are large swaths of the shore that could not be evaluated with CRAM because they did not support at least 5 percent vegetative cover. Scores for biotic structure ranged between 44.5 and 61.2. Within the areas that did have at least 5 percent vegetative cover, the biotic structural diversity was minimal. There was little overlap of plant layers, few vegetation communities/complexes, few dominant species, and the dominant species was often invasive.

The scoring for riverine and lacustrine AAs is summarized in Figures 1 and 2, respectively.

Chart 1
SCH Riverine Final Attribute

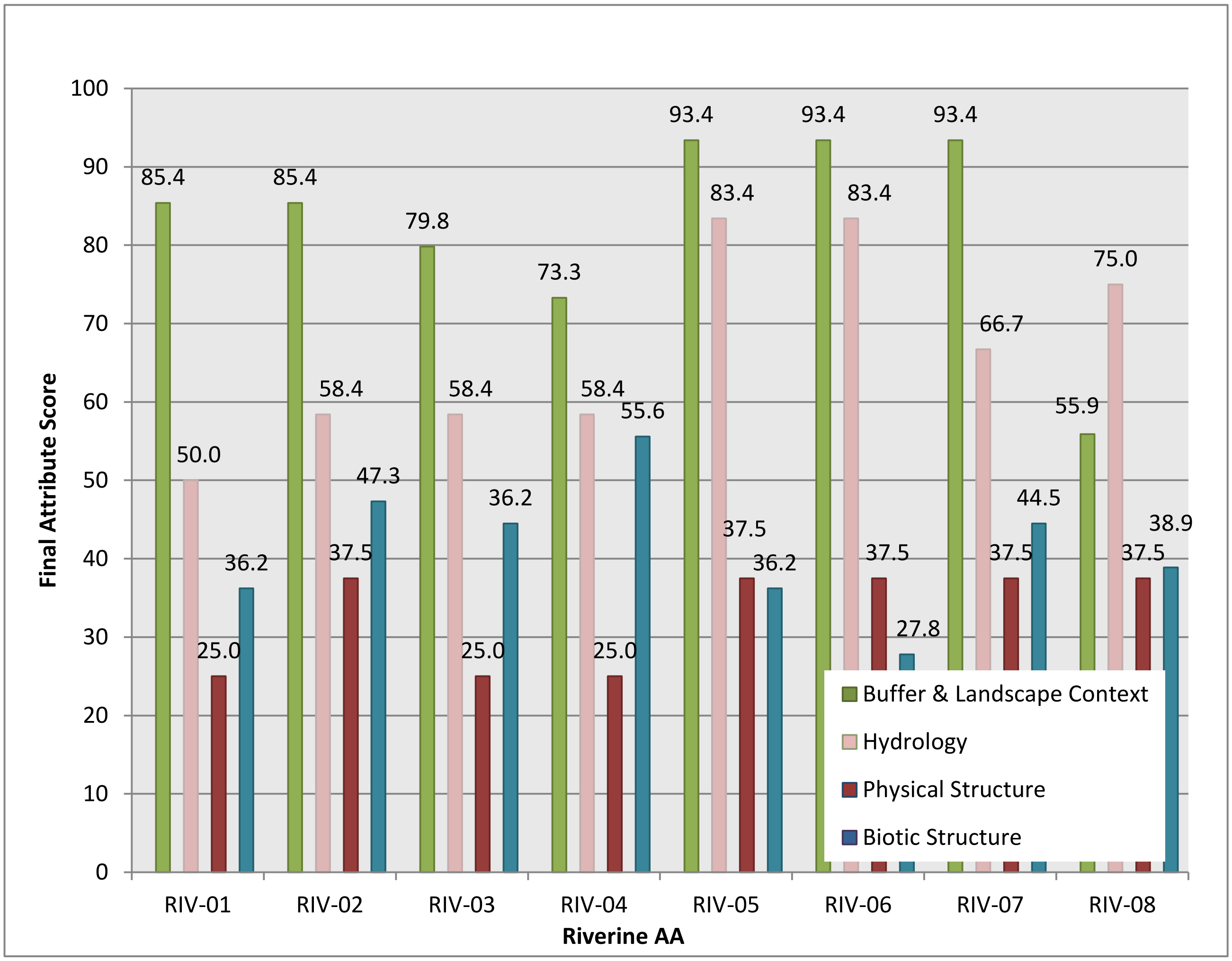
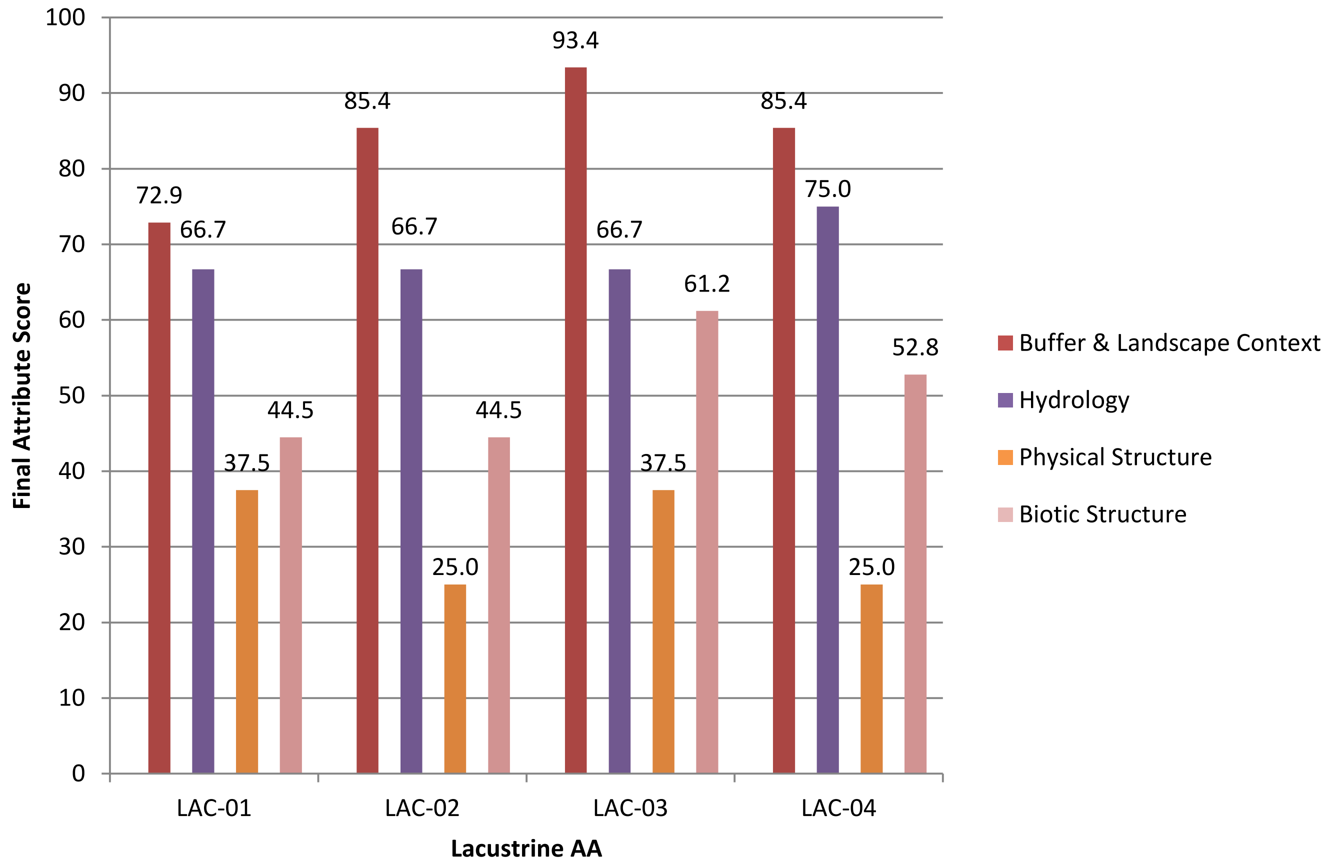


Chart 2
Lacustrine Final Attribute Scores



Upon completion of the proposed SCH Project, the baseline data collected during this assessment would be used as comparative data to evaluate the SCH Project relative to Project goals. While it is anticipated that the future conditions of portions of the proposed Project would be evaluated using CRAM, the functions and services of the baseline condition may not be directly compared to the post-Project conditions because of the substantial reconfiguration of the land to develop the ponds. However, these results can be used to compare post-Project results to current conditions in order to determine changes of the functions and services of the wetlands and waters due to the implementation of the proposed Project.

3.2 Physical and Chemical Characteristics

3.2.1 Physical Substrate Determinations

3.2.1.1 Soil Survey

The U.S. Department of Agriculture Natural Resource Conservation Service (USDA-NRCS) Web Soil Survey indicates 10 soil types within the Project site; the Sea is mapped as water (USDA-NRCS 2012). The soil types include:

- Fluvaquents, saline – These soils are formed on basin floors from alluvium that has been derived from mixed sources (USDA-NRCS 2012). The poorly drained soils are found around the edge of the Salton Sea and are subject to periodic flooding. The stratified lacustrine deposits can range from fine sand to silty clay (Knecht 1980).
- Holtville silty clay, wet – These soils are formed on basin floors from alluvium that has been derived from mixed sources. Holtville soils are well drained with low surface runoff and slow permeability in the upper clay layer (Knecht 1980). The hazard for erosion is slight for this soil type (County of Imperial 2006).
- Imperial silty clay, wet – These soils are slowly permeable, and the water table is located at approximately 10 to 36 inches below the surface. The surface runoff for this soil type is slow, and the erosion hazard is slight (Knecht 1980).
- Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes – These soils consist of 40 percent Imperial and Glenbar soils mixed with 20 percent of other minor components. The Glenbar series consists of very deep, well-drained soils that formed in stratified stream alluvium (USDA 2009a). The water capacity for these soils is high to moderate, and both soils are moderately well drained (USDA-NRCS 2012).
- Indio loam, wet – These soils are a composite of alluvium or eolian deposits derived from mixed sources (USDA-NRCS 2012). The Indio series consists of well-drained to moderately well-drained soils. The soils are moderately permeable, and the water table is 3 to 5 feet, or deeper, below the surface (Knecht 1980).
- Indio-Vint complex – Indio soils are described above. The Vint series soils are also a composite of alluvium or eolian deposits derived from mixed sources (USDA-NRCS 2012). These soils are somewhat excessively drained with very slow runoff and moderately rapid permeability (USDA 2009b). The Indio-Vint complex consists of 35 percent Indio soils, 30 percent Vint soils, and 35 percent minor components (USDA-NRCS 2012).

- Meloland very fine sandy loam, wet – This soil series is also a composite of alluvium or eolian deposits derived from mixed sources (USDA-NRCS 2012). These soils are well drained with low to medium surface runoff and slow permeability (USDA 2005).
- Meloland and Holtville loams, wet – This soil series contains 40 percent Holtville soils and 40 percent Meloland soils with 20 percent minor components. These soils are described above.
- Rositas fine sand, wet, 0 to 2 percent slopes – Similar to the soils described above, Rositas soils are a composite of alluvium or eolian deposits derived from mixed sources (USDA-NRCS 2012). These soils are somewhat excessively drained with negligible to low runoff and rapid permeability (USDA 2006).
- Vint loamy very fine sand, wet – These soils are described under the Indio-Vint complex.

3.2.1.2 In-Sea Soils

In-Sea soils are derived from lacustrine (lake) evaporites (deposits) and are summarized below (Natural Resources Agency 2007):

- Sea Floor Deposits – The first layer, Salton Sea Floor Deposits, is composed of recently deposited, very soft to loose, highly plastic clays to silty fine sands. The thickness of this layer ranges from 0 to 21 feet, with the greatest thickness occurring in the southern and mid-Sea areas.
- Soft Lacustrine Deposits – The Soft Lacustrine Deposits were found to underlie the seafloor deposits over much of the Salton Sea’s area. These materials consist of highly plastic, soft to very soft clays ranging in thickness from 0 to 26 feet. The thickest deposits were found in the Whitewater River delta and the mid-Sea’s easterly area.
- Upper Alluvial Deposits – The Upper Alluvial Deposits are interspaced between the Soft and Stiff Lacustrine Deposits and are predominant near the Salton Sea’s perimeter. These deposits are described as composed of loose to dense silty fine sands with interbedded silt and sand lenses ranging in thickness from 0 to 26 feet. The thickest deposits were found in the Salton Sea’s northeastern, southwestern, and west-central margins.
- Upper Stiff Lacustrine Deposits – The Upper Stiff Lacustrine Deposits underlying both the Soft Lacustrine and Upper Alluvial Deposits are composed of predominantly stiff to very stiff, highly plastic clays ranging in thickness from 4 to 31 feet. The thickest deposits were found in the mid-Sea’s eastern and southeastern areas; the latter is near the Alamo River delta.
- Lower Alluvial Deposits – The Lower Alluvial Deposits are similar to the Upper Alluvial Deposits except that their density is greater, ranging in consistency from medium dense

to dense. These deposits were predominant in the southern Salton Sea, ranging from 0 to 22 feet in thickness.

- Lower Stiff Lacustrine Deposits – The Lower Stiff Lacustrine Deposits likely underlie the entire Salton Sea and have a thickness much greater than 100 feet. This layer is primarily hard plastic clay.

3.2.2 Water Circulation, Fluctuation, and Salinity Determinations

3.2.2.1 Salton Sea

The Salton Sea is located in the Salton Trough, a northern extension of the Colorado River Delta. The Sea's bottom elevation is about 278 feet below msl, and the water surface elevation between October 2010 and September 2011 (the most recent water year for which USGS has published data [2011 water year]) was between -231.0 and -232.0 feet msl (USGS 2011). The Sea's total volume is approximately 7.2 million af, with a current maximum depth of 46 feet. With about 350 square miles of surface area, the Salton Sea is the largest water body in California. It measures about 35 miles along a northwest/southeast axis by about 15 miles at its widest point. The total shoreline measures about 120 miles (Natural Resources Agency 2007).

The Salton Sea is a terminal water body that receives water from the New, Alamo, and Whitewater rivers, along with numerous small streams, precipitation, and groundwater. The only outflow from the Sea is through evaporation and seepage. Formed in 1905 through 1907 from Colorado River flood flows, the current Salton Sea is supported primarily by agricultural return flows. These return flows have decreased in recent time because of several factors, including reduction in water orders from farmers during the last 10 years, reduced flows from Mexico, and lower precipitation, all of which have also contributed to the decline in flows in the New and Alamo rivers. Recent Salton Sea elevations show the elevation peak around May 1995 and a decreasing trend to the end of the 2011 water year (i.e., from October 2010 to September 2011). Inflow to the Sea from the Imperial Valley is projected to continue to decline, mainly due to decreased volume of agricultural runoff, from the current annual average of 1,029,620 acre-feet per year (afy) to 723,940 afy (with adjustment for the Quantification Settlement Agreement) by 2020 (Natural Resources Agency 2007). The combined inflow from Imperial Valley and Mexico to the Salton Sea represents about 86.3 percent of the total inflow to the Sea. Coachella Valley accounts for 8.5 percent of the total inflow to the Sea. The total salt loading to the Sea from these sources is 92.6 and 5.8 percent, respectively (Natural Resources Agency 2007). Figure 3.11-3 of Section 3.11, Hydrology and Water Quality, in the Draft EIS/EIR (Corps and Natural Resources Agency 2011) shows the relative magnitude of annual flow to the Sea from the three major tributaries .

Wastewater discharges enter the Salton Sea from numerous municipal wastewater systems in Imperial and Coachella valleys. Wastewater effluent is discharged to the New River, Alamo

River, or Coachella Valley Stormwater Channel and eventually flows to the Sea. In the future, wastewater effluent is expected to decline as more water is recycled and overall municipal wastewater flows decrease because of water conservation measures.

3.2.2.2 New River

The New River originates in the Mexicali Valley of northern Mexico and terminates where it flows into the Salton Sea. It receives runoff from several sources, primarily agricultural drainage conveyed to the river by subsurface drains, as well as wastewater treatment plant flows. The New River watershed is predominantly at or below sea level. Rainfall in Imperial Valley is less than 2 inches annually, but the New River receives up to 10 inches each year in the southwestern portion of the watershed located in northern Mexico (Hely and Peck 1964).

The New River flow is measured at a gage near Westmorland (USGS gage #10255550) and at the international boundary with Mexico (USGS gage #10254970). The annual flow (based on water year) for water years 1944 through 2010 at the Westmorland gage has ranged from 360,459 to 536,100 af, with an average of 443,272 af. Both IID and USGS measured the New River flow independently before March 2005. Since that time, both agencies have cooperatively collected streamflow data for the river. Daily flow data at the USGS stream flow gage near Westmorland indicate that the flows from 1944 to date show a median flow for each month that ranged from 521 cubic feet per second (cfs) (December) to 732 cfs (April). The 90 percentile flow (90 percent of all flows are greater) is 423 cfs (December) while the minimum 10 percentile flow (only 10 percent of flow is greater) is 848 cfs (April) (Table 3). The range in any month between the 10 and 90 percentile ranges from 200 to 240 cfs. The Westmorland gage provides data rated “Good” for 74 percent of its history.

3.2.2.3 Agricultural Drains/Natural Watercourses

IID is the agricultural water purveyor in Imperial Valley, providing water from the Colorado River through the All American Canal. IID receives and delivers about 90 percent of the 3.2 million af of irrigation water delivered from the Colorado River (LLNL 2008). IID also provides a network of drainage channels that receive water from on-farm subsurface drainage systems. Detailed information regarding the drainage network is shown on Figure 3.11-6 in Section 3.11 of the Draft EIS/EIR (Corps and Natural Resources Agency 2011). This drainage water is then conveyed to the New River, Alamo River, or directly to the Salton Sea. Agricultural drainage from Imperial Valley directly to the Sea comprises about 10 percent of total Imperial Valley contribution to the Sea’s inflow, which is estimated at 93,848 afy (Natural Resources Agency 2007).

Within Alternative NR-3, 24 agricultural drainages are classified as ephemeral waterways, have demonstrated signs of an OHWM, and have contained, unvegetated bottoms. Many of the drainages discharge directly into the Salton Sea. Seven drainages are used for agricultural purposes and are concrete-lined; however, those drainages demonstrated a definable OHWM and are hydrologically connected to drainages that discharge directly into the Salton Sea. The 24 drainages directed both seasonal stormwater runoff and agricultural runoff directly to the Sea (Chambers Group, Inc. 2012).

Table 3
Statistical Representation of Mean Daily Stream Flow

New River (cfs)			
Month	*90%*	*Median*	*10%*
October	517	620	756
November	445	540	687
December	423	521	661
January	436	535	669
February	481	582	708
March	559	678	811
April	607	732	848
May	554	659	786
June	487	589	688
July	483	586	698
August	481	590	714
September	494	594	729

Source: USGS 2010

3.2.2.4 Flooding

The Project area was defined by the Federal Emergency Management Agency (FEMA) in 1984 as a special flood hazard area. The New and Alamo rivers, along with the land between both rivers within 4.5 miles of the Salton Sea, are listed as Zone A.

The Zone A delineation refers to flood boundaries that are set using approximate methods (an estimation of the flood boundary) rather than a detailed hydraulic model. Therefore, the depth of flooding is not presented on the flood maps but is assumed to be less than 1 foot (typically how Zone A is represented). The area where the proposed SCH ponds would be located is shown on the flood map as within the Sea's inundation area. That is, it is not in the flood hazard area because it is part of the Sea.

3.2.2.5 Salinity

The Colorado River Basin Regional Water Quality Control Board's (CRBRWQCB's) (2006) water quality objective for total dissolved solids (salinity) at the Salton Sea is to stabilize salinity at 35,000 milligrams per liter (mg/L) or 35 ppt. Average salinity in the Sea in 2010 was 51,829 mg/L (approximately 52 ppt) (C. Holdren, Reclamation, unpublished data). Between about 2004 and 2007, average salinity in the Sea increased by approximately 13.1 percent. Lower salinity conditions frequently occur near the tributaries and near the Sea's shoreline due to dilution by inflows. Higher salinity generally occurs in the Sea's center. Imported Colorado River water is the primary source of salts in the Sea's watershed. It is used to irrigate fields, and the salts in the water are carried off by tailwater or tilewater into surface drains. Imperial Valley contributes a greater salt load to the Sea than does the Coachella Valley (Natural Resources Agency 2007).

The New River has an average salinity of 2,636 mg/L (C. Holdren, Reclamation, unpublished data). Between about 2004 and 2007, average salinity in the New River increased by approximately 23.6 percent. Although salinity is increasing in the New River, salinities are still below the CRBRWQCB's (2006) water quality objective of 4,000 mg/L for total dissolved solids (salinity) (Corps and Natural Resources Agency 2011).

3.2.3 Suspended Particulate/Turbidity Determinations

Sediment loading to the Salton Sea comes from the New, Alamo, and Whitewater rivers, numerous natural watercourses that flow into the Sea, and also the individual drains and canals that directly enter the Sea. Total suspended solids, a measure of the sediment load, have been measured in the New River. These data indicate that the total suspended solids for the New River average 217 mg/L (Corps and Natural Resources Agency 2011). Assuming an average annual New River flow of 845 cfs, then the annual sediment loading to the Sea is 132,000 tons/year for the New River (Corps and Natural Resources Agency 2011).

3.2.4 Contaminant Determinations

The CRBRWQCB Water Quality Control Plan (2006) provides general surface water quality objectives for the Colorado River Basin Region. These water quality objectives are compared below, by constituent of concern, to seasonal water quality data collected by the U.S. Bureau of Reclamation (Reclamation) in the Salton Sea and its tributaries in 2004 through 2010 (C. Holdren, Reclamation, unpublished data) (Table 4).

Table 4
Comparison of Water Quality Objectives with Current Conditions
(2004-2010 Mean Annual)

Current Conditions			
Constituent	*Objective*	*Salton Sea*	*New River*
Suspended solids (mg/L)	—	39	217
Total dissolved solids (salinity) (mg/L or ppt)	35 ppt (Sea) 4 ppt (Rivers)	51,829 mg/L 52 ppt in 2010	2,636 mg/L 2.6 ppt
Nitrate and nitrites (NO_3/NO_2) (µg/L)	—	209	4,142
Ammonia (NH_3) (µg/L)	—	1,157	1,750
Total phosphorus (µg/L)	35 (Sea)	103	976
Orthophosphate (µg/L)	—	42	536
Selenium (µg/L)	5 (Sea)	1.34	3.18
Dissolved oxygen (mg/L)	5 (New River)	—	3.2–11.5

Source: C. Holdren, Reclamation, unpublished data
Note: Objectives from CRBRWQCB 2006

3.2.4.1 Selenium

Selenium is present in the water, sediment, and biota of the Salton Sea. Most of the selenium entering the Salton Sea originally comes from the upper Colorado River in water used to irrigate agricultural fields in the Imperial and Coachella valleys. Selenium becomes concentrated by agricultural usage and is discharged from subsurface tile drains into surface drains that flow into the Sea either directly or via tributaries (Saiki et al. 2010). Selenium concentrations in agricultural drains vary widely (0.79 to 79.1 micrograms/liter [µg/L]), averaging 4.18 µg/L in selected IID drains monitored in 2005 through 2009 (Saiki et al. 2010). Total selenium concentration was 3.2 µg/L in the New River in 2004 through 2010 (C. Holdren, Reclamation, unpublished data) (Table 4). Future scenarios modeled in the *Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report* suggested that selenium in the New River will not exceed 10 µg/L by 2075 (Natural Resources Agency 2007).

Selenium enters the Salton Sea as highly soluble salt (primarily as selenate and selenite) and accumulates in the anoxic sediments on the Salton Sea floor (Natural Resources Agency 2007). Waterborne concentrations are rapidly reduced to less than 2 µg/L as selenium assimilates into biota and settles as part of the organically rich sediments. The anoxic nature of the Sea sediments is important in trapping the selenium in insoluble, non-bioavailable forms of selenite, elemental selenium, and selenide. The CRBRWQCB's (2006) water quality objective for selenium is 5 µg/L (4-day average).

Selenium concentrations in sediment were measured in 2010 at proposed Project sites adjacent to the mouths of the New and Alamo rivers. Mean selenium concentrations were 1.1 milligrams per kilogram (mg/kg) (range 0.54 to 2.3 mg/kg). The majority of sediment samples (63 percent) were less than 1 mg/kg of selenium and are considered "low risk." The remaining 37 percent of the samples were between 1 and 4 mg/kg (only two samples exceeded 2.5 mg/kg) and were considered in the "level of concern" category. No sample exceeded the "toxicity threshold" value of 4 mg/kg (Amrhein and Smith 2011). The sediment threshold categories "low risk," "level of concern," and "toxicity threshold" are derived from the National Irrigation Water Quality Program's (NIWQP's) *Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment: Selenium* (1998). According to these guidelines, "low risk" or "no effect" concentrations of selenium, less than 1 mg/kg, produce no discernible adverse effects on fish or wildlife and are typical of background concentrations in uncontaminated environments. "Level of concern" concentrations, between 1 and 4 mg/kg of selenium, rarely produce discernible adverse effects but are elevated above typical background concentrations. Selenium concentrations of 4 mg/kg or greater, "toxicity threshold," appear to produce adverse effects on some fish and wildlife species (NIWQP 1998).

Oxidized selenium is present in the exposed playa sediments, and rewetting the sediments could result in a "flush" of selenium released into the pond water (Natural Resources Agency 2007; Amrhein et al. 2011). An experiment measured water-soluble selenium released from wetted sediment samples taken from the SCH Project area and incubated up to 235 days with low-salinity water (2 ppt and 13.7 ppt) (Amrhein et al. 2011; see also Appendix I of the Draft EIS/EIR [Corps and Natural Resources Agency 2011]). Sediment selenium concentrations were positively related to organic carbon, but the oxidation rates and amount released into water did not appear to be affected by carbon content, salinity, location, or depth of sample core. Rather, the release of selenium appeared controlled by the amount of oxidizable iron present in sediments. If iron was present, the oxidized selenium adsorbed onto the iron and remained in the sediment, and less selenium dissolved into pond water.

3.2.4.2 Temperature

The CRBRWQCB's (2006) water quality objective for temperature is that the receiving water's temperature should not be altered by waste discharges unless demonstrated that the temperature alteration does not adversely affect the receiving water's designated beneficial use. Water temperature was monitored at three sampling sites toward deep areas of the Sea in 1999 (Holdren and Montaño 2002, cited in Natural Resources Agency 2007) and 2004 through 2010 (C. Holdren, Reclamation, unpublished data). The Sea's water surface temperatures ranged from a low of 12.8 degrees Celsius (˚C) (55.1 degrees Fahrenheit [˚F]) in February

2009 to a high of 36.5˚C (97.7˚F) in August 1999 (C. Holdren, Reclamation, unpublished data; Holdren and Montaño 2002). The Salton Sea is a polymictic lake (a lake having no stable thermal stratification), which can stratify and mix many times during the year.

In the New River, water surface temperature was measured quarterly from 2004 through 2010. Temperatures were lowest in February 2009 (11.7˚C [53.1˚F]) and highest in July 2006 (31.1˚C [88.0˚F]) (C. Holdren, Reclamation, unpublished data).

3.2.4.3 Dissolved Oxygen

Dissolved oxygen is of particular concern at the Salton Sea because it is essential to support survival of fish and other aquatic organisms. Surface water (technically referred to as the epilimnion or epilimnetic water) is often supersaturated with respect to dissolved oxygen for several months during daylight hours, while water at the Sea's bottom near the seabed (also referred to as the hypolimnion or hypolimnetic water) is virtually devoid of dissolved oxygen (Holdren and Montaño 2002, cited in Natural Resources Agency 2007; Anderson and Amrhein 2003, cited in Natural Resources Agency 2007). Dissolved oxygen supersaturation is often caused by photosynthetic production of oxygen during the daytime. Dissolved oxygen concentrations are a function of the geometry of the water body, wind fields, algal production, and biological and chemical oxygen demand in the water body (Natural Resources Agency 2007).

Thermal stratification leads to accumulation of chemically reduced compounds in the hypolimnion. The anaerobic microbial decomposition of organic matter in an anoxic hypolimnion produces hydrogen sulfide and ammonia, constituents that are toxic to most aquatic life. When wind action mixes hypolimnetic and surface waters and breaks down stratification, these toxic components are distributed throughout the water column and deplete dissolved oxygen. These mixing events have been linked with massive fish kills (Schladow 2004, cited in Natural Resources Agency 2007), which are observed during all seasons, including some that result from low water temperatures.

A dissolved oxygen concentration of about 4 to 5 mg/L is generally considered necessary for most aquatic species. Tilapia can tolerate infrequent very low dissolved oxygen concentrations, generally less than 2 mg/L (FAO 1986, cited in Natural Resources Agency 2007) and briefly 1 mg/L (personal communication, K. Fitzsimmons 2010). The CRBRWQCB's (2006) water quality objective for dissolved oxygen of all designated "warm freshwater habitat (WARM)" surface waters within the Colorado River Basin states that dissolved oxygen should not be reduced below the minimum level of 5 mg/L. In addition, the CRBRWQCB's (2010a) total maximum daily load for dissolved oxygen in the New River is 5 mg/L.

Vertical profiles of dissolved oxygen were measured in the Salton Sea 1999 (Holdren and Montaño 2002, cited in Natural Resources Agency 2007) and 2004 through 2010 (C. Holdren, Reclamation, unpublished data). Dissolved oxygen ranged from 20.6 mg/L and greater than 370 percent saturation in the surface water to 0 in the bottom water. A period of severe dissolved oxygen depletion during August and September 1999 (0.21 mg/L as surface dissolved oxygen on September 8, 1999) coincided with extensive fish kills (Holdren and Montaño 2002, cited in Natural Resources Agency 2007).

In the New River, dissolved oxygen ranged from 11.5 mg/L in November 2008 to a low of 3.2 mg/L in July 2006 (C. Holdren, Reclamation, unpublished data).

3.2.4.4 Nutrients

The Salton Sea is a eutrophic to hypereutrophic water body characterized by high nutrient concentrations, high algal biomass as demonstrated by high chlorophyll a concentrations, high fish productivity, low clarity, frequent very low dissolved oxygen concentrations, massive fish kills, and noxious odors (Setmire 2000, cited in Natural Resources Agency 2007). The eutrophic conditions appear to be controlled (i.e., limited) by phosphorus. In addition, nutrients can stimulate the overproduction of algae, which can lead to low dissolved oxygen and the production of hydrogen sulfide (Natural Resources Agency 2007).

Phosphorus

Phosphorus is an essential nutrient for plant and algal growth. Setmire et al. (2001, cited in Natural Resources Agency 2007) identified phosphorus as the limiting nutrient at the Salton Sea, and others (Holdren and Montaño 2002, cited in Natural Resources Agency 2007; Schladow 2004, cited in Natural Resources Agency 2007) have supported this conclusion. Phosphorus is present in water bodies in many forms, including soluble and particulate organic phosphates from algae and other organisms, inorganic particulate phosphorus, polyphosphates, and soluble orthophosphates. Soluble orthophosphate is assimilated by phytoplankton and therefore is an important indicator of productivity and quality. Total phosphorus is another indicator of the maximum level of productivity of a water body (Natural Resources Agency 2007). Eutrophic lakes are typically associated with total phosphorus concentrations of 16 to 386 µg/L, which is very productive for warm water fisheries.

In the Salton Sea, levels of soluble orthophosphates during 2004 to 2010 were lowest during the spring and summer months and highest during the winter months, correlating with typical seasonal algal growth patterns. Total phosphorus concentrations were lowest in the spring and summer months and highest in the fall and winter months, with peak concentrations as high as 756 µg/L (C. Holdren, Reclamation, unpublished data). The Sea's concentration of phosphorus was nearly the same in 1968/69 as in 1999 despite a 100 percent increase in external phosphorus loading (Setmire et al. 2001, cited in Natural Resources Agency 2007), which indicates an effective phosphorus removal mechanism in the Salton Sea. The annual average total phosphorus concentration for 2004 to 2010 was 103 µg/L (C. Holdren, Reclamation, unpublished data), which exceeds the draft total maximum daily load target of 35 µg/L (CRBRWQCB 2006).

In the New River from 2004 to 2010, average levels of soluble orthophosphates were 536 µg/L (Table 4) (C. Holdren, Reclamation, unpublished data). Similar to the Salton Sea, during the summer months levels of soluble orthophosphates and total phosphorus were lowest. Total phosphorus concentrations were highest during the fall months at the New River. Average annual concentrations of total phosphorus were 976 µg/L (C. Holdren, Reclamation, unpublished data).

Nitrogen

Nitrogen is present in water bodies in several forms. Ammonia is the form most readily used by phytoplankton and is typically found in water with low oxygen concentrations. Bacteria can break ammonia down to form nitrite, which, in turn, is converted to nitrate. Nitrate is commonly found in surface water. Nitrogen in the inflows to the Salton Sea is primarily in nitrate-nitrite form. Nitrate-nitrite levels in the rivers were approximately 20 to 30 times greater than in the Sea (Table 4) (C. Holdren, Reclamation, unpublished data).

Most of the nitrogen in the Salton Sea consists of ammonia and organic nitrogen. High levels of ammonia indicate frequent reducing conditions in the Sea and contribute to anoxia and fish kills. The annual mean concentration of ammonia for 2004 through 2010 was 1,157 µg/L in the Sea and 1,750 µg/L in New River (Table 4) (C. Holdren, Reclamation, unpublished data).

3.2.4.5 Pesticides and other Contaminants

The New River is highly polluted from agricultural runoff, sewage from Mexico, and discharges from manufacturing plants in Mexico, and it is listed as impaired under section 303(d) of the Clean Water Act for a wide range of pollutants (EPA 2012). Causes of impairment for the New River include, but are not limited to, the following: trimethylbenzene, chlordane, chloroform, chlorpyifos, copper, dichlorodiphenyltrichloroethane (DDT), diazinon, dieldrin, mercury, meta-para xylenes, nutrients, organic enrichment, pesticides, and selenium. Pollutants in the New River flow into the Salton Sea and contribute to impairment of the Sea for nutrients, salinity, and selenium.

A large percentage of the water the Salton Sea receives is from agricultural runoff, which contains numerous pesticides and heavy metals at levels that can be toxic to aquatic organisms (de Vlaming et al. 2004 and Phillips et al. 2007, cited in Wang et al. 2011). Concentrations of pesticides in sediments and water correlate with their seasonal usage in the adjacent agricultural areas (LeBlanc and Kuivila 2008, cited in Wang et al. 2011). Concentrations were highest near the shoreline and mouth of inflowing rivers, but levels dropped below detection off shore.

In 2010, levels of chlorinated insecticides and pyrethroids were measured in water of the New River and in the bed sediments at potential SCH pond sites (Wang et al. 2011; see also Appendix J, Summary of Special Studies, in the EIS/EIR [Corps and Natural Resources Agency 2011]). In the water (four samples), most organochlorine pesticides were <1.5 nanograms per liter (ng/L) or were not detected. Chlorpyrifos was the most frequently detected, but only one sample at the New River (80 ng/L) exceeded the DFW Hazardous Assessment Criteria (14 ng/L 4-day average) (Siepmann and Finlayson 2000, cited in CRBRWQCB 2008). Of pyrethroids, permethrin (3.3 to 7.5 ng/L) was the most commonly detected, and fenpropathrin (New River, 11.6 ng/L) was detected once at elevated levels.

Sediment concentrations of pesticides were also measured in 2010 at exposed playa and submerged sites (Wang et al. 2011). Samples were taken at three depths (0 to 5 centimeters [cm], 5 to 15 cm, and 15 to 30 cm deep) in order to discriminate potential differences in deposition of legacy (i.e., organochlorines) and current-use pesticides. Total sediment pesticide concentrations detected ranged from 0.2 to 120 nanograms per gram [ng/g]. Sediment pesticide concentrations, particularly organochlorines, were greatest at the mouth of the New River. DDT and its metabolites were detected in all samples, and dichlorodiphenyldichloroethylene (DDE) was the predominant pesticide residue. In general, the concentrations of organochlorine pesticides were higher in the 5 to 30 cm depth interval than in the 0 to 5 cm depth interval (more recent deposition). This correlation equates with the banning of most organochlorine pesticides, including DDT, in the U.S. in the 1970s. Mean DDE concentrations at the New River were 1.14 to 6.52 ng/g at the surface (0 to 5 cm deep) and 0.89 to 9.10 ng/g subsurface (5 to 15 cm and 15 to 30 cm deep) (Table 5). Organochlorine pesticide concentrations showed a pattern of decreasing concentration with distance from the river mouth. The highest DDE concentrations were documented in East New (Wang et al. 2011). Lower concentrations of DDE were documented at the Mid New River site (Wang et al. 2011). The lowest DDE concentrations were documented at the Far West New River site (Wang et al. 2011).

Table 5
DDE Concentrations in Sediment at SCH Project Area (ng/g)

Location	Surface Mean (# samples)	Surface Maximum	Subsurface Mean (# samples)	Subsurface Maximum
New River – East	6.52 (11)	23.71	9.10 (21)	41.16
New River – Middle	2.78 (15)	7.99	5.44 (29)	33.51
New River – Far West	1.14 (6)	2.90	0.89 (13)	2.41

Source: Calculated from raw data in Wang et al. 2011. Surface (0 to 5 cm deep) and Subsurface (5 to 15 cm and 15 to 30 cm deep). Nondetect values were defined as 0.01 ng/g for purpose of calculating means. Samples were pooled for air-exposed and submerged sites within each

Table 5
DDE Concentrations in Sediment at SCH Project Area (ng/g)

location.

The frequency of surface sediment samples exceeding a sediment guideline of 31.3 ng/g total DDE (Probable Effects Concentration [PEC]; MacDonald et al. 2000, cited in CRBRWQCB 2008) was none at New River sites. The frequency of subsurface samples exceeding the PEC was 10 percent at New River East (41.16 ng/g maximum), 3 percent at New River Middle (33.51 ng/g maximum), and none at New River West. Mean DDE sediment concentrations (0 to 5 cm deep) were measured at nearby sites by USGS from 2006 to 2008 (Miles et al. 2009). For comparison, 0 to 5 cm depth were 4 to 48 ng/g at the Reclamation/USGS Saline Habitat Ponds (SHP),[2] 41 to 56 ng/g in the Alamo River, 15 to 41 ng/g in the Salton Sea near Alamo River, 60 to 98 ng/g at the Freshwater Marsh near Morton Bay, and 2 to 6 ng/g at the D-Pond on the Sonny Bono Salton Sea NWR (Miles et al. 2009). With the exception of the D-Pond, these concentrations are similar or higher than the levels measured at the Salton Sea SCH site.

Chlordane (organochlorine, <1.2 ng/g New River) and bifenthrin (pyrethroid, <0.5 ng/g New River) were also detected, but at lower levels than DDE. Other pesticides were infrequently detected (Wang et al. 2011).

3.3 Biological Characteristics

3.3.1 Vegetation Communities

The *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (Natural Resources Agency 2007) provides general information about vegetation around the Salton Sea. Additional data sources for the Project area included geographic information system (GIS) files from the Redlands Institute at the University of Redlands (1999), vegetation mapping completed for IID (2007), 6-inch resolution aerial photographs (Southern California Association of Governments and California Department of Transportation 2008), and site visits conducted on April 29 and November 16 through November 18, 2011. The biological resources section of the EIS/EIR (Section 3.4) describes the vegetation within all of the alternatives considered. The vegetation communities located within the SCH Project area include agriculture, common reed marsh, disturbed/developed, drainage ditch, mudflat, open water, tamarisk scrub, and tamarisk woodland. Additional observations of existing vegetation communities were recorded by Chambers Group (2012) during the wetlands delineation of the SCH Project area, including identification of iodine bush scrub and cismontane alkali marsh. The jurisdictional delineation was

[2] The SHP complex is a 100-acre project divided into four 25-acre ponds less than 2 feet deep. USGS and Reclamation developed the SHP complex at the Salton Sea's southern end in 2006; it was decommissioned in 2010.

finalized by the Corps and Dudek in November of 2012 and included a determination of the OHWM of the Salton Sea within the Project area.

3.3.1.1 Open Water and Exposed Playa/Seabed

The majority of the Project area consists of the Sea itself and associated unvegetated playa/seabed that occur adjacent to the shoreline where the Sea has recently receded. Areas below -231 feet msl generally support open water but may also include shallow areas that are intermittently exposed and inundated over an approximately 4-6 month period due to annual fluctuations in the Sea water surface elevation. For example, during the 2011 water year, the water surface elevation was -231.9 feet msl between October and December 2010 and then rose to -231.0 feet msl by August 2011 before declining again to -232.0 feet msl by September 2011. Wind action also shifts the geographic extent of inundation on a daily basis. This regime allows for playa areas to support invertebrates communities similar to mudflats; however, the lack of regular tidal influence, coupled with the receding condition of the Sea, means the periodically inundated area will not likely be sustained in a particular area for more than a few years, and, thus, these areas do not meet the Corps' definition of mudflat.

3.3.1.2 Common Reed Marsh

Common reed marshes are dominated by common reed (*Phragmites australis*). Herbs are less than 13 feet in height with a continuous canopy. This community is found in semi-permanently flooded and slightly brackish marshes, ditches, impoundments. Soils have high organic content and are poorly aerated (Sawyer and Keeler-Wolf 2009). Common reed marshes occurred much less frequently throughout the Project area. The community was well established in association with the New River in the Project area. Other areas of common reed marshes were observed at a lesser extent than the tamarisk scrub or iodine bush scrub throughout the Project area above the -231-foot below sea level elevation, primarily associated with the agricultural drainage portions of the Project area. Vegetation within the agricultural drainages is routinely maintained, and therefore the presence and abundance of this vegetation type is likely to fluctuate over time.

3.3.1.3 Agriculture/Disturbed

According to the Draft EIS/EIR, the primary agricultural crops present at the time of the November 2010 site visit included spinach, various types of grass hay, and alfalfa (Corps and Natural Resources Agency 2011). Many of the staging areas may be located in agricultural areas. In addition, there are approximately 5 acres of roads within the Project area.

3.3.1.4 Irrigation Ditches/Agricultural Drains

Irrigation ditches include both drains taking water away from the fields and water supply canals bringing water to the fields. Ditches may include both earthen and concrete-lined channels. The jurisdictional delineation identified 24 drainage channels, 7 of which were concrete-lined (Dudek and Chambers Group 2012). Vegetation associated with the ditches often changes over time based on use of an individual ditch, level of salinity, and frequency and timing of vegetation clearing by the landowner.

3.3.1.5 Tamarisk Scrub and Tamarisk Woodland

Tamarisk scrub is characterized as a weedy monoculture of any of several tamarisk species (*Tamarix* spp.), usually replacing native vegetation following major disturbance. This vegetation community can be found on sandy or gravelly braided washes or intermittent streams, often in areas where high evaporation increases the stream's salinity. Tamarisk is a prolific seeder and strong, long-rooted plant that absorbs water from the water table or the soil above it. These characteristics make this species an aggressive competitor in disturbed riparian corridors (Holland 1986). Tamarisk scrub was the predominant vegetation community observed throughout much of the wetland portion of the Project area. This vegetation community was observed within the exposed playa and upper extent of the shoreline of the Salton Sea, above the -231-foot below sea level elevation. Tamarisk scrub was also closely associated with the drainages within the Project area, and the riparian vegetation of the New River.

3.3.1.6 Iodine Bush Scrub

Iodine bush scrub is dominated by iodine bush (*Allenrolfea occidentalis*). Shrubs in this community are typically less than 7 feet in height with an open to continuous canopy. The herbaceous layer is variable and may include salt grass (*Distichlis spicata*) and alkali sacaton (*Sporobolus airoides*). This community can be found on dry seabed margins, hummocks, playas perched above current drainages, and seeps (Sawyer et al. 2009, cited in Chambers Group, Inc. 2012). Iodine bush scrub was also a common vegetation community throughout the Project area, but to a lesser extent than that of tamarisk scrub. Similar to what was reported in the Draft EIS/EIR, iodine bush scrub was observed in relatively open stands on the shores and exposed playa of the Salton Sea, and primarily above the -231-foot below sea level elevation (Corps and Natural Resources Agency 2011). This community was observed along some of the agricultural drainages, within former agricultural fields, and at the outlet/mouth of the New River.

3.3.1.7 New River

The New River is a perennial waterway with an approximately 30-foot-wide OHWM that was unvegetated and appears to have a mud bottom. The banks of the river contain associated riparian and wetland vegetation, and the bottom of the channel is dominated by southern cattail (*Typha domingensis*) and common reed. The river is separated from the Sea by a berm that was constructed for access purposes. The berm is approximately 5 to 7 feet in height, and an access road runs along the top of the berm. The river flows north through the Project area and discharges into the Salton Sea. Prior to discharging into the Sea, the New River crosses through mixed-use agricultural lands, and runoff from the agricultural lands contributes hydrology to the system. Direct precipitation and local stormwater runoff also contribute hydrology to the New River system. The New River is approximately 11,480 linear feet in length and encompasses approximately 11.0 acres within the Project area.

3.3.2 Threatened and Endangered Animals

Documented presence and suitable habitat for the following Federally listed species are within or near the Project footprint: desert pupfish, Yuma clapper rail, California least tern, least Bell's vireo, and southwestern willow flycatcher. Based on the above determinations, the Corps has initiated formal consultation under section 7 of the Endangered Species Act with the USFWS. Species presence was determined based on its recorded occurrence within the Salton Sea region (based on the California Natural Diversity Database). No focused surveys were completed for the proposed Project, but preconstruction surveys would be completed for nesting birds, Yuma clapper rail, and desert pupfish.

The Project area was determined to be absent of any Federally listed plant species (see Appendix H of the Draft EIS/EIR [Corps and Natural Resources Agency 2011]).

3.3.3 Fish, Crustaceans, Mollusks, and other Aquatic Organisms in the Food Web

Aquatic biota in the Salton Sea include invertebrates and fish. The initial aquatic biota (both invertebrates and fish) present in the Salton Sea were those that came in with the water from the Colorado River. Species from the rivers, creeks, and drains also entered the Sea. Subsequently, a variety of invertebrate and fish species were stocked in the Sea as salinity increased. Invertebrates also entered the Sea in the water with the stocked fish. Aquatic organisms that currently or in the recent past comprised the food web supporting fish in the Sea include phytoplankton, zooplankton, and benthic and water column macroinvertebrates. Macroinvertebrate species include diptera (flies), corixids (water boatmen), benthic polychaetes such as pileworms (*Neanthes succinea*) and a spionid worm (*Streblospio benedicti*), amphipods (*Gammarus mucronatus* and *Corophium louisianum*), ostracods (seed shrimp), and a barnacle (*Balanus amphitrite*) (Detwiler et al. 2002; Miles et al. 2009); zooplankton is dominated by copepods (Miles et al. 2009).

Between 1929 and 1956, more than 30 species of non-native fish were introduced into the Sea on more than 20 occasions, some of which were introduced repeatedly (Walker 1961). Between 1948 and 1956, the California Department of Fish and Game (now known as the Department of Fish and Wildlife, or DFW) introduced fish with the intention of creating a marine sport fishery (Walker 1961). Although a number of fish species were present in the Salton Sea while salinity was in the range of marine waters, those fish were introduced for recreational fishing and not as forage for birds. Tilapia that inhabit the Sea are hybrids between the Mozambique tilapia (*Oreochromis mossambicus*) and Wami River tilapia (*O. urolepis hornorum*) (Costa-Pierce 2001). These fish, called California Mozambique hybrids ("Mozambique hybrid tilapia"), are currently the most abundant fish in the Sea and have been used extensively as forage by birds due to their range in size classes and location within the water column that make them available for bird foraging.

The shoreline pools and shallow waters provide habitat for desert pupfish and sailfin molly (*Poecilia latipinna*), as well as other fish and invertebrates. These areas also provide important spawning and nursery habitat for tilapia. The smaller fish in shallow waters feed on invertebrates as well as algal material. Rocky shoreline habitats also provide valuable refugia for invertebrates during periods when hypoxic or anoxic conditions persist in the Salton Sea (Detwiler et al. 2002).

The open water supports fish and invertebrate production. Until recently, these areas also provided habitat for pelagic spawning fish such as orangemouth corvina (*Cynoscion xanthulus*). Orangemouth corvina, along with Gulf croaker (*Bairdiella icistia*) and sargo (*Anisotremus davidsonii*), have not been detected in the Sea since 2003 (DFG 2008) and are probably no longer present due to the Sea's increased salinity. The distribution of fish in the open water is concentrated along the nearshore areas. The Salton Sea's tilapia (Mozambique hybrid tilapia) population has risen considerably since 2003, contributing to elevated fish numbers in the Sea (DFG 2008). For example, the DFW (formerly DFG) recorded an increase in fish caught from 9.26 fish/net-hour in the summer of 2006 to 28.03 fish/net-hour in the summer of 2007 (DFG 2007).

The river mouths, particularly in the Sea's southern part, provide an area of reduced salinity and higher dissolved oxygen. Mozambique hybrid tilapia is the only fish species that has been recently collected near the river mouths, although common carp (*Cyprinus carpio*), threadfin shad (*Dorosoma petenense*), striped mullet (*Mugil cephalus*), striped bass (*Morone saxatilis*), and mosquitofish (*Gambusia affinis*) occasionally enter the Sea from the rivers (personal communication, S. Keeney 2011). In the past, orangemouth corvina has been reported to congregate (possibly for spawning) where freshwater flows into the Salton Sea, possibly due to higher dissolved oxygen or better water quality (Costa-Pierce 2001). No amphibians occur within the Salton Sea itself due to the high salinity.

Invertebrates in the Alamo River and agricultural drains include plankton, snails, midge larvae (chironomids), Asiatic clams (*Corbicula fluminea*), and crayfish (CRBRWQCB 2002a). Fish species present in the New River include blue tilapia (*Oreochromis aureus*), common carp, and channel catfish (*Ictalurus punctatus*) (personal communication, J. Crayon 2010; U.S. Department of Health and Human Services 2000). Other species reported in the Alamo and/or New rivers include orangemouth corvina, Mozambique tilapia, threadfin shad, channel catfish, flathead catfish (*Pylodictis olivaris*), red shiner (*Cyprinella lutrensis*), largemouth bass (*Micropterus salmoides*), and mosquitofish (CRBRWQCB 2002a; Costa-Pierce and Riedel 2000).

Fish in the agricultural drains include sailfin molly, red shiner, mosquitofish, longjaw mudsucker (*Gillichthys mirabilis*), common carp, desert pupfish, shortfin molly (*Poecilia mexicana*), porthole livebearer (*Poeciliopsis gracilis*), Mozambique tilapia hybrids, redbelly tilapia (*Tilapia zillii*), and possibly blue tilapia (Crayon and Keeney 2005; personal communication, J. Crayon 2010, S. Keeney 2011; CRBRWQCB 2005). Spiny softshell turtles (*Apalone spinifera*), bullfrogs (*Lithobates catesbeianus*), and Rio Grande leopard frogs (*Lithobates berlandieri*) are also present in the rivers and agricultural drains; the checkered garter snake (*Thamnophis marcianus*) occurs in agricultural drains/canals and marshes (personal communication, J. Crayon 2011).

3.3.4 Contaminant Effects in the Food Web

Selenium occurs in the Salton Sea's water and sediment and has the potential to bioaccumulate and adversely affect fish and wildlife (Natural Resources Agency 2007), as discussed in Appendix I, Selenium Management Strategies, of the Draft EIS/EIR (Corps and Natural Resources Agency 2011). Aquatic and benthic invertebrates are a major route of food-chain transfer in the Salton Sea food chain (Natural Resources Agency 2007). The suggested toxicity threshold for invertebrates as prey (to avoid bioaccumulation in birds) is 3 to 4 µg/g dw (Hamilton 2004). However, selenium concentrations observed at the Salton Sea vary widely among locations and taxa and frequently exceed this threshold. Mean invertebrate selenium concentrations ranged from 2.37 to 6.64 µg/g dw at Salton Sea, 2.16 to 8.50 µg/g dw at the SHP complex. The SHP complex was an experimental created habitat adjacent to the Alamo River, managed by the USGS, that used a blend of Salton Sea and Alamo River waters. The ponds were decommissioned at the end of the experiment in 2010. At the SHP complex, mean concentrations exceeded 4 µg/g dw in 67 to 80 percent of corixid samples and 0 to 30 percent of chironomid samples (Miles et al. 2009). In the IID agricultural drains, selenium concentrations in chironomids ranged considerably higher (mean 6.5 µg/g dw, maximum 50.6 µg/g dw) (Saiki et al. 2010).

Fish currently exposed to selenium include tilapia, sailfin molly, western mosquitofish, and desert pupfish. Lemly (2002) recommended a threshold of 4 µg/g dw to avoid toxic effects in sensitive fish species. Selenium levels in fish currently exceed this threshold. Mean whole-body fish selenium concentrations were 10.4 µg/g dw in the open Salton Sea, 9.67 µg/g dw in the New River Estuary, 11.5 µg/g dw in the Alamo River Estuary (Natural Resources Agency 2007, Appendix F), 6.81 to 6.89 µg/g dw in IID agricultural drains (Saiki et al. 2010), and 2.8 to 4.7 µg/g dw in New River wetlands upstream (Johnson et al. 2009). USGS studies noted that sailfin mollies and mosquitofish did not appear to be adversely affected at concentrations of 3.1 to 30.4

µg/g dw, and pupfish in laboratory experiments did not exhibit negative health effects from such levels of selenium exposure (Saiki et al. 2010).

Selenium's most substantial effects occur in bird embryos, such as increased risk of reduced hatching success and teratogenesis (embryo deformities) at higher concentrations. As such, selenium in the egg is the most sensitive measure for evaluating hazards for birds (Skorupa and Ohlendorf 1991, cited in Ohlendorf and Heinz 2011). The responses to selenium vary among bird species, ranging from "sensitive" (e.g., mallard [*Anas platyrhynchos*]) to "average" (e.g., black-necked stilt [*Himantopus mexicanus*]) and "tolerant" (e.g., avocet) (Skorupa 1998, cited in Ohlendorf and Heinz 2011). Cormorants and terns are likely to be fairly tolerant of selenium in keeping with greater tolerance of other saltwater-adapted species, such as avocets and snowy plover (*Charadrius alexandrinus*), compared to freshwater-adapted species, such as mallards (personal communication, H. Ohlendorf 2010). Risk of impaired reproduction can start to occur at egg concentrations of 6 to 12 µg/g dw. The risk of teratogenesis starts to occur above 12 µg/g dw for sensitive species and above 20 µg/g dw for moderately sensitive species (Ohlendorf and Heinz 2011).

Other contaminants of concern are pesticides, and organochlorine pesticides are the predominant type in sediments near the Alamo and New rivers (see Section 3.11.3.2, Surface Water Quality, and Appendix J, Summary of Special Studies, of the Draft EIS/EIR [Corps and Natural Resources Agency 2011]; Wang et al. 2011). The concentration of most pesticides was well below detectable levels, but DDT and its metabolites represented more than 80 percent of the total concentration of organochlorine pesticides detected in Salton Sea sediments, with DDE as the most abundant derivative. Because the use of DDT has been banned in the U.S. for decades, these are assumed to be legacy contaminants.

Of the current-use pesticides evaluated, bifenthrin was the most commonly detected pyrethroid and was found at concentrations up to 26 ng/g (Wang et al. 2011). Some of the air-exposed sediments contained bifenthrin at levels exceeding the 10-day median lethal concentration for *Hyalella azteca* (an aquatic isopod) of 4.5 ng/g dw. However, based on the relative sensitivity of *H. azteca* to pyrethroid exposure, the potential toxicity of these sediments to the invertebrate taxa that occur in the Salton Sea is likely overestimated (Ding et al. 2010).

Current DDE concentrations in surface sediments (0 to 5 cm deep) represent undisturbed existing conditions and the No Project Alternative. Mean DDE concentrations in these sediments were 1.14 to 6.52 ng/g near the New River (Table 6). Organochlorine pesticide concentrations showed a pattern of decreasing concentration with distance from the river mouth. Sediment DDE levels observed at the proposed SCH sites fall within the range of values observed in the region: 4 to 48 ng/g at the SHP complex and 2 to 98 ng/g for reference habitats in the southern Salton Sea area (Miles et al. 2009).

Table 6
Estimated Sediment DDE Concentrations (ng/g) for Existing Conditions/No Project and Proposed SCH Project (Alternative NR-3)

	Existing Conditions and No Project[1]		SCH Project[2]		Difference between Existing/No Project and Project	
Pond units	*Mean*	*Maximum*	*Mean*	*Maximum*	*Mean*	*Maximum*
New East	6.5	23.7	7.1	27.9	0.6	4.2
New Middle	2.8	8.0	3.5	14.7	0.7	6.7
New Far West	1.1	2.9	1.1	2.7	-0.6	- 0.2

1. DDE concentrations (mean and maximum values) in undisturbed surface sediments (0 to 5 cm deep) measured at each location (Amrhein and Smith 2011; Wang et al. 2011).
2. Expected (calculated) DDE concentrations for each SCH alternative, based on field measurements of surface sediments (0 to 5 cm) and subsurface sediments (5 to 15 and 15 to 30 cm deep) (Wang et al. 2011), and weighted according to proportion of pond area that would remain undisturbed but inundated (surface 0 to 5 cm concentrations) and area disturbed by construction (borrow ditches for berms, excavated swales and channels, borrow for habitat islands) (subsurface 5 to 30 cm concentrations). "Mean" is the area weighted average calculated using mean values for surface and subsurface sediments. Because DDE concentrations below 30 cm are unknown and construction could disturb deeper sediments, hypothetical "maximum" concentrations were also calculated using maximum observed values of surface and subsurface sediments, as a hypothetical upper bound of potential risk.

The scientific and regulatory literature was reviewed and evaluated to determine appropriate ecotoxicological screening criteria for DDE in sediment and biota. The first-tier screening criterion (31.3 ng/g DDE) is a PEC for general ecotoxicity based on sediment guidelines established by the CRBRWQCB (2010b, based on MacDonald et al. 2000) to prevent direct toxicity to the macroinvertebrate population, which serves as a food base for fish and insectivorous birds. The second-tier screening criteria address potential risk of DDE bioaccumulation in birds and their eggs. These sediment bioaccumulation screening level values are 0.55 ng/g for protection of adult fish-eating birds (herons) and 0.17 ng/g for protection against eggshell thinning in raptors (osprey) (Poulsen and Peterson 2006). A comparison of the screening level value criteria to the values in Table 6 shows that existing sediment concentrations of DDE are already at levels that pose a risk for bioaccumulation that could cause adult toxicity or eggshell thinning as a result of the long-term legacy of agricultural runoff.

Finally, DDE concentrations in black-necked stilt eggs at the Salton Sea have been measured (Miles et al. 2009). Reference sites were established at the Alamo River, Salton Sea, Freshwater Marsh, and the D-Pond or Hazard complexes (Sonny Bono NWR, USFWS). The Alamo River and Salton Sea (represented by Morton Bay) sites represented habitats that provided source waters to the shallow water SHP. The SHP was a 50-hectare experimental complex constructed by the USFWS in 2006. The SHP consisted of four interconnected ponds constructed at the southeastern shoreline of the Salton Sea that were flooded with blended waters from the Alamo River and Salton Sea. The Freshwater Marsh, located north of the SHP, represented an expansive vegetated open wetland sustained by flow-through agricultural drainwater. The NWR complexes (D-Pond and Hazard) are impounded wetlands sustained by water directly from the Colorado

River that represented an assumed lowest contaminant risk. The D-Pond initially was used as a reference site, but it was drained prior to the end of the study and was then substituted with the Hazard site (Miles et al. 2009).

These researchers cited 4.0 µg/g wet weight (ww) (Henny and Herron 1989, cited in Miles et al. 2009) as a threshold for observed eggshell thinning in aquatic birds, and 1.7 µg/g ww (Henny et al. 2008, cited in Miles et al. 2009) as a level at which eggshell thinning in stilt eggs was not observed at the SHP. The proportion of stilt eggs that exceeded the 1.7 µg/g p,p'-DDE value was 44 percent at the SHP, 29 percent at Freshwater Marsh/Morton Bay, and 21 percent at D-Pond/Hazard. By contrast, only 18 percent of the SHP eggs, 3 percent of the Freshwater Marsh/Morton Bay eggs, and 7 percent of the D-Pond/Hazard eggs exceeded 4.0 µg/g. Although stilt eggs are not necessarily reflective of the entire avian community, these observations give some indication that, in spite of elevated DDE levels in Salton Sea sediments, DDE concentrations in bird eggs do not pose a high potential for eggshell thinning.

Total DDT (includes dichlorodiphenyldichloroethane [DDD] and DDE) concentrations in fish tissue were measured around the Salton Sea by the SWRCB Toxic Substances Monitoring Program (1978 to 1995) for use in developing sedimentation/siltation total maximum daily load guidance for the New River (CRBRWQCB 2002b) and IID drains that empty directly into the Salton Sea (CRBRWQCB 2005). Mean total DDT fish tissue concentrations were 1,090 µg/kg in the New River (34 samples, representing 176 individual fish) (CRBRWQCB 2002b) and 97 µg/kg ww for Salton Sea fish (21 samples, representing 102 individual fish) (CRBRWQCB 2005). Poulsen and Peterson (2006) developed acceptable fish tissue levels of DDT, DDD, and DDE for protection of adult bird populations (150 µg/kg ww) and for protection against eggshell thinning in raptor populations (41 µg/kg ww). Therefore, fish tissue concentrations measured in the Salton Sea and the New River are already at levels that have the potential for avian toxicity and eggshell thinning.

3.3.5 Other Wildlife

The following are the principal references reviewed to obtain information regarding wildlife, including special-status wildlife, within the Project area and a buffer of 0.5 mile:

- The DFW California Natural Diversity Database (CNDDB) *Special Animals List*, reviewed in 2010;
- *Birds of the Salton Sea* (Patten et al. 2003) for descriptions of status and habitats on or adjacent to Project site;
- *Birds of North America Online* for range and habitat descriptions from various authors;
- Natural History Museum of Los Angeles County;
- Sonny Bono NWR (USFWS 2010a, b) occurrence data; and

- Studies on patterns of abundance, distribution, annual phenology, and habitat associations (Shuford et al. 2000).

In addition, observations of wildlife during focused surveys for Federally listed bird species (Dudek 2010) were recorded.

3.3.5.1 Common Bird Species

The Salton Sea ecosystem has become one of the most important habitats for birds in North America and supports some of the highest levels of avian biodiversity in the southwestern U.S. Recent studies have documented the great importance of the Salton Sea ecosystem in providing habitat for migrating and resident waterbirds, particularly those migrating within the Pacific Flyway. More than 400 resident, migratory, and special-status bird species have been recorded in the Salton Sea Basin; about 270 of those species, including 33 bird species that are threatened, endangered, or of special concern, use the Basin on a regular basis. In addition to the diversity of birds, studies have indicated that the large number of individual birds using the Salton Sea is even more ecologically relevant than the number of species due to its importance as a migratory stopover and wintering area for hundreds of thousands of birds (Natural Resources Agency 2007).

The Basin provides important habitat for 48 species of gulls (more than 40,000 individuals), terns, and shorebirds. It is one of only five areas in the interior of western North America used by tens of thousands of birds in spring (Shuford et al. 2000). Some common aquatic bird species for which the Salton Sea provides important habitat include American avocet (*Recurvirostra americana*), American coot (*Fulica americana*), American wigeon (*Anas americana*), American white pelican (*Pelecanus erythrorhynchos*) (30 percent of North American breeding population), black-necked stilt, California brown pelican (*Pelecanus occidentalis*), eared grebe (*Podiceps nigricollis*) (90 percent of North American population in some years), and ruddy duck (*Oxyura jamaicensis*) (50 percent of Pacific Flyway population) (USFWS 2010a; Shuford et al. 2000; Jehl 1994). Bird populations vary throughout the year as birds migrate to the Sea for breeding and as they stop over during migration to points north and south. The American avocet, American coot, American white pelican, and ruddy duck are all found at the Salton Sea throughout the year. In some years, the California brown pelican is present throughout the year. The American wigeon and eared grebe are absent for a few months in the summer (USFWS 2010a).

Point count surveys conducted within and near the Project area in 2009 (USFWS 2010a) show that the American avocet population is more abundant during August and September with numbers of individuals reaching into the thousands, while the American coot's population is greatest in March with numbers of individuals also reaching the thousands. The American wigeon is present in greater numbers in January and February with counts of over 5,000 individuals and is absent from the Salton Sea during the summer months (June through

September). American white pelican populations peak twice during the year, first from January through March and then again from July through September, with populations in the low thousands and then remaining in the hundreds during other months. California brown pelicans follow a similar pattern with a population increase in January and then again from June through September. The eared grebe population is greatest in January with a peak of over 5,000 individuals, which then declines in the summer and fall months. The ruddy duck population is highest in the winter to early spring (November through April) with the greatest numbers occurring in February (over 13,000 individuals), which then also declines in the summer months.

Numerous other bird species occur within the Project region as residents, visitors, and migrants. A total of 107 species of waterbirds were recorded for the Salton Sea in 1999 (Shuford et al. 2002) and include western and Clark's grebes (*Aechmophorus occidentalis* and *A. clarkii*, respectively); wading birds such as herons, egrets, and night-herons; and a number of waterfowl species such as snow (*Chen caerulescens*) or Ross's (*Chen rossii*) geese, northern shoveler (*Anas clypeata*), northern pintail (*Anas acuta*), and green-winged teal (*Anas crecca*). A number of raptor species have been recorded at the Salton Sea, most of which are discussed below. Shorebird species and numbers tend to peak during migration with large numbers of black-bellied plover (*Pluvialis squatarola*), black-necked stilt (also occurs in large numbers as a breeding species), willet (*Tringa semipalmata*), marbled godwit (*Limosa fedoa*), western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), dowitchers (*Limnodromus* spp.), and Wilson's phalarope (*Phalaropus tricolor*).

The Caspian tern (*Hydroprogne caspia*) is a common breeding bird that occurs within the Salton Sea region from mid-April through October. It is most abundant at the Sea from late summer through fall. Most Caspian terns depart from the region by the end of October, but some remain through the winter (Patten et al. 2003). Caspian terns forage primarily or exclusively for fish but may occasionally take crayfish and insects (Cuthbert and Wires 1999). Approximately 25 percent of the North American population of the Caspian tern breeds at the Salton Sea (Cuthbert and Wires 1999; personal communication, K. Molina 2010a). In 2009, the population size within the Project area was in the hundreds for the winter months and in the thousands for the breeding season (USFWS 2010a). In the past, Caspian terns nested on Mullet Island (Molina 2004). In 2010, nesting numbers of Caspian terns were up to 2,500 breeding pairs, on the D pond islands (personal communication, K. Molina 2010b).

In 2009, the California gull (*Larus californicus*) was found at the Salton Sea, primarily in December (USFWS 2010a). A few occurrence records are present for January, May, and June, although the numbers are much lower than the counts from December. This species was observed during summer 2010 surveys (Dudek 2010), and Molina (2004) states that the California gull colonized the Sea in 1996 and has nested annually since then in small numbers. It also winters at the Sea (Winkler 1996) and can be found throughout the year (USFWS 2008).

The double-crested cormorant (*Phalacrocorax auritus*) is a year-round resident of the Salton Sea with the highest counts occurring in November, December, and February; however, populations remain steadily in the thousands throughout the year. They nest regularly at the Sea. The largest nesting colony was on Mullet Island off the southeastern shore (Massey and Zembel 2002), but they also nest along the Alamo River (Molina and Sturm 2004) as discussed below for rookeries.

The laughing gull (*Leucophaeus atricilla*) was only observed at the Salton Sea in August during 2009 bird counts (USFWS 2010a), but was observed during summer 2010 surveys (Dudek 2010), and it is a fairly common summer and fall visitor. The Sea is the only area where the laughing gull occurs regularly in the western U.S. It has been observed nesting at Sonny Bono NWR after several decades of no breeding activity (Shuford et al. 2000; Molina 2004; Patten et al. 2003).

The long-billed curlew (*Numenius americanus*) is present throughout the year at the Salton Sea, but thousands occur in the Imperial Valley in the winter (20 percent of world population) (Audubon California 2011). Those staying year-round are likely first-year birds, and they concentrate around Red Hill, Obsidian Butte, and Bruchard Bay (Patten et al. 2003). In 2009 (USFWS 2010a), the long-billed curlew population was greatest in July and November. This species was observed during summer 2010 surveys (Dudek 2010). Curlews may occur along the mudflats and shoreline but occur in highest numbers in agricultural lands.

Least terns (*Sternula antillarum*) at the Salton Sea may be either from coastal California or more likely from Mexico. It has not been recorded breeding at the Sea (Patten et al. 2003), but may breed due to observations of pairs. This species was not observed in the 2009 aquatic surveys (USFWS 2010a) or by Dudek in 2010. The least tern probably occurs at the Sea on an annual basis and has been observed at Sonny Bono NWR’s Unit 1, Red Hill, IWA Wister Unit, and at other locations farther away from the Project area. It occurs most often on mudflats and at the deltas of the New and Alamo rivers where it forages in fresh water in rivers or ponds (Patten et al. 2003).

The Salton Sea is an important migratory stopover for thousands of black terns (*Chlidonias niger*), but the species does not breed at the Sea (Patten et al. 2003; Shuford et al. 2000). In 2009, it was most abundant in May and then occurred in smaller numbers from June through December (no records for November) (USFWS 2010a). It was also observed during summer 2010 surveys (Dudek 2010) and could utilize open water and marshes around the Project area.

The northern harrier (*Circus cyaneus*) is a common winter visitor and is a nonbreeding summer visitor (Patten et al. 2003); it was also observed on several occasions during the summer 2010 surveys (Dudek 2010). Suitable foraging habitat within the Project area includes agricultural fields, marshes, and open scrub habitats.

The white-faced ibis (*Plegadis chihi*) occurs in large numbers at the Salton Sea as a winter visitor (up to 50 percent of California population) (National Audubon Society 2011) and migrant (30 percent of world population) (Audubon California 2011). It also is a nonbreeding summer visitor with numbers often exceeding 15,000 year-round (Patten et al. 2003; Shuford et al. 2000). It has attempted to nest periodically, and a relatively small colony is located at Finney Lake outside of the Project area. In 2010, the species was observed flying overhead in flocks of several hundreds of individuals (Dudek 2010). It nests in marsh habitat and forages in muddy ground and marshes; in shallow ponds, lakes, and rivers; and in flooded fields and estuaries. CNDDB has records from 1980 near the New River mouth.

The American white pelican (*Pelecanus erythrorhynchos*) formerly bred at the Salton Sea up to the 1950s but occurs now primarily as a migrant and winter resident. The Sea is an important wintering site for approximately 30 percent of the North American breeding population of American white pelicans and at times supports a substantial proportion of the species' world population (Patten et al. 2003; Shuford et al. 2000). As recently as 1999, nearly 23,000 individuals were observed in aerial surveys at the Sea (Shuford et al. 2000). Wintering birds congregate at the river mouths, loaf on sandbars and mudflats, and forage in shallow water. In 2009, the American white pelicans were most abundant in August with almost 3,000 individuals recorded near and within the Project area; numbers declined in the fall but the species remained a consistent visitor throughout the year (USFWS 2010a). This species was observed during Summer 2010 surveys near the mouths of the New and Alamo rivers and along the shoreline foraging within the Sea in rafts of several hundred (Dudek 2010); suitable loafing habitat includes sandbars and mudflats within the Project area.

3.3.5.2 Riparian Bird Species

A total of 115 species of birds was recorded within or adjacent to the riparian habitat along the New and Alamo rivers during the focused riparian surveys in 2010 (Dudek 2010). Bird species associated with riparian habitat that were commonly observed included song sparrow (*Melospiza melodia*), Abert's towhee (*Melozone aberti*), verdin (*Auriparus flaviceps*), house finch (*Carpodacus mexicanus*), black phoebe (*Sayornis nigricans*), common yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), and marsh wren (*Cistothorus palustris*) (Dudek 2010).

3.3.5.3 Rookeries

A number of bird species occur at the Salton Sea as colonial nesting species specifically using rookeries, including double-crested cormorant; great blue heron (*Ardea herodias*); and great (*Ardea alba*), snowy (*Egretta thula*), and cattle (*Bubulcus ibis*) egrets. During the 2010 focused surveys, rookeries of the double-crested cormorant and great blue heron were observed at the mouth of the Alamo and New rivers. The double-crested cormorant also breeds on Mullet Island in one of the largest North American colonies (Shuford et al. 2002). Great blue herons also have been recorded within rookeries along the shoreline around IWA's Wister Unit and the New River delta (Shuford et al. 2000; Patten et al. 2003). The great blue heron does not form dense nesting colonies, but the species uses snags of partly submerged dead trees at the Salton Sea. Great egret nesting tends to be more colonial with sites concentrated along the shoreline at IWA's Wister Unit and Morton Bay around the delta of the New River (Molina and Sturm 2004; Patten et al. 2003). Similar to the great blue heron, the great egret nests in partially submerged snags. The snowy egret is similar to the great egret in nesting behavior and locations (Molina and Sturm 2004; Patten et al. 2003). At the Salton Sea, the cattle egret establishes massive rookeries (Molina and Sturm 2004; Patten et al. 2003), and during the 2010 surveys, hundreds to thousands of individuals were observed flying up and down the New and Alamo rivers (Dudek 2010). The rookeries for the cattle egret were only located along the Alamo River (Shuford et al. 2002; Dudek 2010).

3.3.5.4 Other Terrestrial Wildlife Species

A number of common terrestrial wildlife species occur in the Project area. Common terrestrial reptiles include side-blotched lizard (*Uta stansburiana*), desert spiny lizard (*Sceloporus magister*), western diamond-backed rattlesnake (*Crotalus atrox*), and gopher snake (*Pituophis catenifer*). They are found in upland habitats within the Project area, especially in habitat associated with agricultural development that provides subsidies of water and forage species. Common mammals of riparian, upland, and agricultural habitats of the Project area include coyote (*Canis latrans*), raccoon (*Procyon lotor*), muskrat (*Ondatra zibethicus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), desert cottontail (*Sylvilagus audubonii*), round-tailed ground squirrel (*Spermophilus tereticaudus*), and western pocket gopher (*Thomomys bottae*).

3.3.6 Special Aquatic Sites

Special aquatic sites within the Project area include the Sonny Bono Salton Sea NWR and wetlands. Portions of the Project area are within the Sonny Bono Salton Sea NWR, which is managed by the USFWS. Section 3.4.5 provides more detail about the Sonny Bono NWR.

The Project area was determined to support 1,132 acres of non-vegetated wetland and 493 acres of vegetated wetlands for a total wetland area of 1,625 acres. In addition, the majority of the land below the -231-foot elevation is considered lacustrine non-wetland waters and comprises 2,373 acres of the Project area. Portions of this area may be exposed depending on water level fluctuations within the Sea. Exposed areas bear some resemblance to mudflats; however, no tidally influenced mudflats are present.

3.4 Human Use Characteristics

3.4.1 Municipal and Private Water Supplies

Designated beneficial uses for surface waters in the SCH Project area include industrial service supply. The New River and Salton Sea are potential use sites for industrial service supply within the SCH Project area. Industrial service supply refers to uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.

3.4.2 Recreational and Commercial Fisheries

The predominant recreational activities at the Salton Sea include bird-watching, wildlife observation, camping, hiking, picnicking, and hunting. Historically, the Salton Sea provided a variety of recreational opportunities, including swimming, water skiing, sport fishing, and boating. In recent years, however, recreational use at the Salton Sea has decreased noticeably, most likely due to a perception of deteriorating water quality and odors, the decline of the sport fishery, and the declining surface water elevation. Starting in 2000, all sport fish populations underwent a dramatic reduction. Marine sport fish species have been undetectable in DFW gill net sampling since mid-May 2003. In addition, none has been detected in fish kills or presented by anglers since mid-May 2003. In response to the loss of the marine sport fish, angling and recreational boating have virtually ceased at the Salton Sea (Natural Resources Agency 2007). Of eight boat-launching facilities that were active in the 1980s, today only two are active (Varner Harbor at the Salton Sea State Recreation Area Headquarters and the Obsidian Butte boat launch). On most days, no boats or other watercraft are present on the Salton Sea. The few boats that are observed on the Salton Sea are primarily research vessels (personal communication, J. Crayon 2011).

There are no commercial fisheries within the SCH Project area and limited recreational fishing.

3.4.3 Water-Related Recreation

Water-related recreation can be either noncontact or contact. Noncontact recreation refers to the uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities. Noncontact recreation is a designated beneficial use of surface waters at the New River and the Salton Sea within the SCH Project area.

Water contact recreation refers to uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs. This is a designated beneficial use of surface waters at the New River; however, although some fishing occurs in the downstream reaches, the presently contaminated water in the river makes it unfit for any recreational use. An advisory has been issued by Imperial County Health Department warning against the consumption of any fish caught from the river and the river has been posted with advisories against any body contact with the water. Water-contact recreation is also a designated beneficial use for the surface waters at the Salton Sea within the SCH Project area.

Figure 5 shows the relationship of the proposed SCH pond site to the nearby NWR. The Sonny Bono Salton Sea NWR was established in 1930 as a refuge and breeding habitat for wildlife and is operated by the USFWS. See Section 3.4.5 for more information regarding the NWR.

Hunting also occurs on lands owned by IID. Although it is not IID's policy to allow hunting on their lands, it does occur during the waterfowl hunting season, particularly at IID's Managed Marsh Complex. If waterfowl hunting does occur on IID-owned lands, the hunters must follow the State of California hunting regulations (e.g., cannot shoot guns containing lead shot over surface water bodies) and hunt during state-mandated hunting seasons applicable to Southern California (personal communication, B. Wilcox 2011).

3.4.4 Aesthetics

3.4.4.1 Project Vicinity

Elements that influence the visual environment include topographic features such as landforms; the Salton Sea itself; vegetation patterns; human-made alterations to the landscape such as roads, public works projects, agricultural land uses, and structures; and wildlife. Section 3.1 of the EIS/EIR provides a comprehensive analysis of the alternatives in relation to the surrounding viewshed (Corps and Natural Resources Agency 2011).

The New River flows into the Salton Sea where the proposed SCH site is located, forming a river delta that is a significant visual element within the region. Riparian vegetation and exposed shore (playa) dominate the delta area. Vegetation is generally dense and distributed linearly along the river, obscuring water views of the river.

Intensive irrigated row crops and wildlife management areas are the primary land uses in the study area. Agricultural lands consist of expansive areas of uniform rows and plots, separated by berms and cement-lined canals. The vivid green crops contrast significantly with the earthen tones of the berms and other surrounding land features of the arid desert. The berms and canals create a uniform grid pattern over a majority of the land area.

Due to their large numbers and variety, birds are an important aesthetic/visual element at the Salton Sea. Many of the birds congregate at or near the Sonny Bono NWR, which contains areas of salt and freshwater marsh, open water, exposed playa, pasture, and managed agricultural fields. Public access to the shoreline is provided at observation towers, viewing blinds, observation trails, and an interpretive center. Two separate units comprise the Sonny Bono NWR, including Unit 1, which encompasses the New River mouth and the shoreline to the south and west of the outlet. Rock Hill and Red Hill are both considered scenic “mountain peaks” because they are the only topographic features for miles around the Project vicinity. Previous studies in the area have considered the incorporation of one or both of these features in the design of restored habitat to significantly enhance the scenic quality of the area (Salton Sea Authority Outdoor Recreation Advisory Committee 2004).

Geothermal plants are visible northeast of the Project area and are dominant visual features due to their height and bulk. Steam plumes from the plants may be visible depending on atmospheric conditions, especially during cooler weather.

3.4.4.2 Visibility

Despite the Project area’s generally flat topography, visual access to the southern portion of the Salton Sea is limited due to the Salton Sea’s distance from major highways (State Route [SR] 86 and SR-111) and other urban centers. Within the study area, visual access is further limited by areas of dense riparian vegetation associated with the rivers and canals, as well as by the berms separating agricultural fields. In addition to limited visual access, physical access to the shoreline of the Salton Sea is generally restricted throughout most of the study area because of private land ownership and trespassing restrictions in protected areas.

3.4.4.3 Viewer Sensitivity

Viewer sensitivity is a measure of public concern for scenic quality and is analyzed by considering the type of users, amount of use, public interest, and adjacent land uses. Users within the study area include recreational users, such as hunters, anglers, and birdwatchers; farmworkers and residents at nearby farms; employees at the geothermal plants; and commuters/travelers on SR-86 between the intersection of SR-78 and Vendel Road. Workers and commuters in the area would view the Salton Sea in the vicinity of the New River as a backdrop to their daily activities or as a brief view as they pass through the area. Worker and commuter views of the SCH ponds would generally be obstructed by industrial and farming uses, including geothermal plants; farm equipment; agricultural fields; and the expansive grid network of canals that covers most of the area. These users would likely be insensitive to changes in visual character because the Project area would not be the focus of their activities and because views of farming and industrial uses would dominate the foreground of their views.

Recreational users, such as hunters, photographers, and birdwatchers, participate in these activities at the Sonny Bono NWR, IWA, and other sites in the study area. Because the value of such recreational activities is enhanced by the scenic quality of the surrounding areas, these users would have a greater interest in the preservation or enhancement of the visual character of the proposed Project sites. Additionally, because many of these users partake in recreational activities within or directly adjacent to the Project site, views are more focused on the natural environment and less obstructed by man-made modifications that would lessen their sensitivity to change.

3.4.5 Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

Figure 5 shows the relationship of the proposed SCH pond sites to the nearby NWR and IWA. The Sonny Bono Salton Sea NWR was established in 1930 as a refuge and breeding habitat for wildlife and is operated by the USFWS. Most of the refuge is inundated by the Salton Sea. Along the shoreline, the refuge includes upland forage and freshwater marsh areas. This portion of land adjacent to the Salton Sea is an important part of the Pacific Flyway and is considered one of the premier bird-watching locations in the nation. The refuge, which receives approximately 20,000 visitors a year (personal communication, C. Schoneman 2011), also includes nature trails and provides opportunities for photography, picnicking, and waterfowl hunting. Public access to the shoreline is provided at observation towers, viewing blinds, observation trails, and an interpretive center; the only other areas open to the public are portions of Union Tract and Hazard Unit (northwest of the SCH Project), which are available for hunting from November to January.

4.0 IMPACT ANALYSIS

4.1 Impacts on Waters of the U.S.

4.1.1 Construction Impacts

Figures 13a through 13c show the jurisdictional resources in the SCH Project boundary with the limit of disturbance for Alternatives NR-2 and NR-3. In addition, these figures show the jurisdiction of two other resources agencies, the CRBRWQCB and DFW, which generally overlap with Corps-jurisdictional waters of the U.S.

For purposes of analyzing impacts on jurisdictional waters, the footprints of the various proposed Project components are categorized as either resulting in permanent or temporary impacts. Permanent impacts are broken down into two categories–permanent impacts that would result in a loss of waters of the U.S. and permanent impacts that would not result in a permanent loss of waters of the U.S., but that would change the elevation and contours of the aquatic resource and may result in a habitat type conversion. Temporary impacts include areas that may be impacted during construction, but the elevation and contours would be restored to preconstruction conditions once construction is completed.

Some component of the Project such as pipelines and power lines may be constructed outside the SCH Project boundary as shown on Figures 13a-13c. These components would be constructed completely within uplands and mainly within existing roads.

Permanent Impacts – No Loss of Waters of the U.S. (Habitat Conversion)

Alternative NR-3

The ponds themselves and the pond shoreline would be considered jurisdictional waters, but construction would permanently alter existing conditions (e.g., change bottom elevation and contours), and therefore these areas are also considered permanently impacted. The pond shoreline, located between the berms and the water surface of the ponds, would vary in width from 6 to 25 feet wide. Construction of the SCH ponds and pond shoreline (totaling 3,285 acres) would result in permanent impacts, but also would convert jurisdictional waters from one type to another. Up to 2,402.1 acres of jurisdictional resources (2,012 acres of non-wetland waters and 390 acres of wetland waters) would be converted to saline wetland ponds under Alternative NR-3.

Alternative NR-2

Construction of the SCH ponds and pond shoreline under Alternative NR-2 (totaling 2,178 acres) would result in permanent impacts, but also would convert jurisdictional waters from one type to another. Up to 1,294.9 acres of jurisdictional resources (905 acres of non-wetland waters and 390 acres of wetland waters) would be converted to saline wetland ponds under Alternative NR-2.

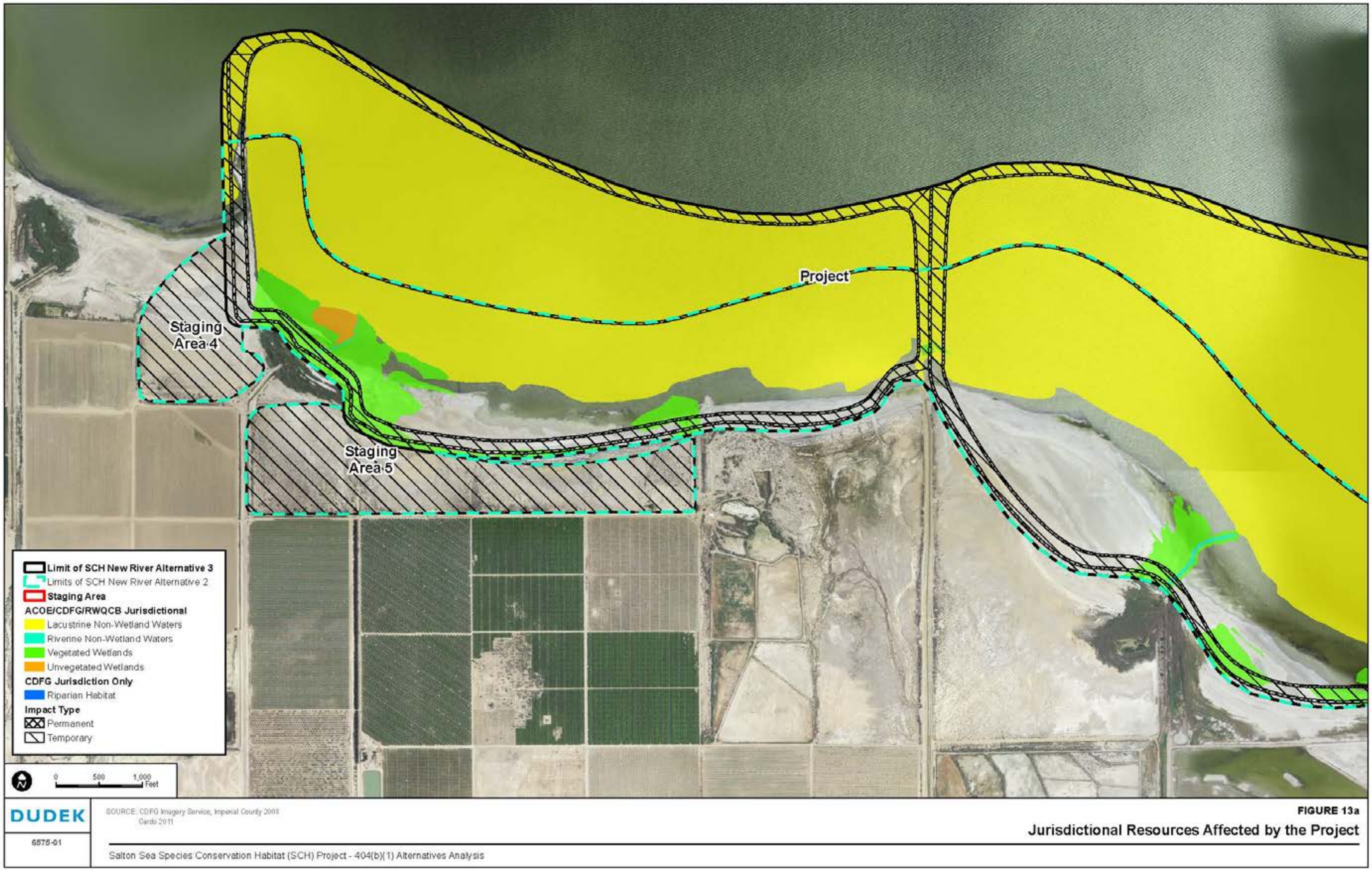


Figure 13a Jurisdictional Resources Affected by the Project

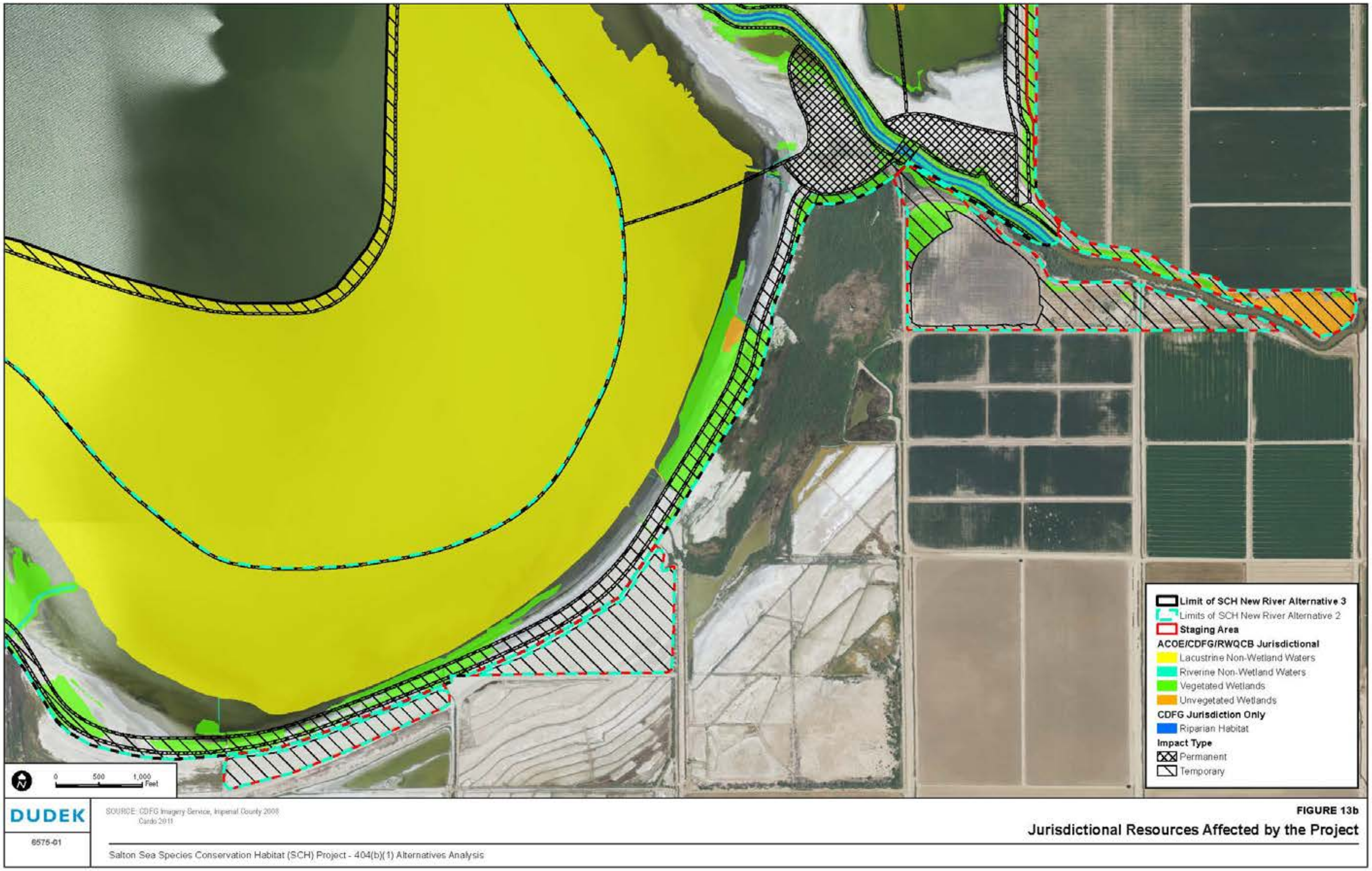


Figure 13b Jurisdictional Resources Affected by the Project

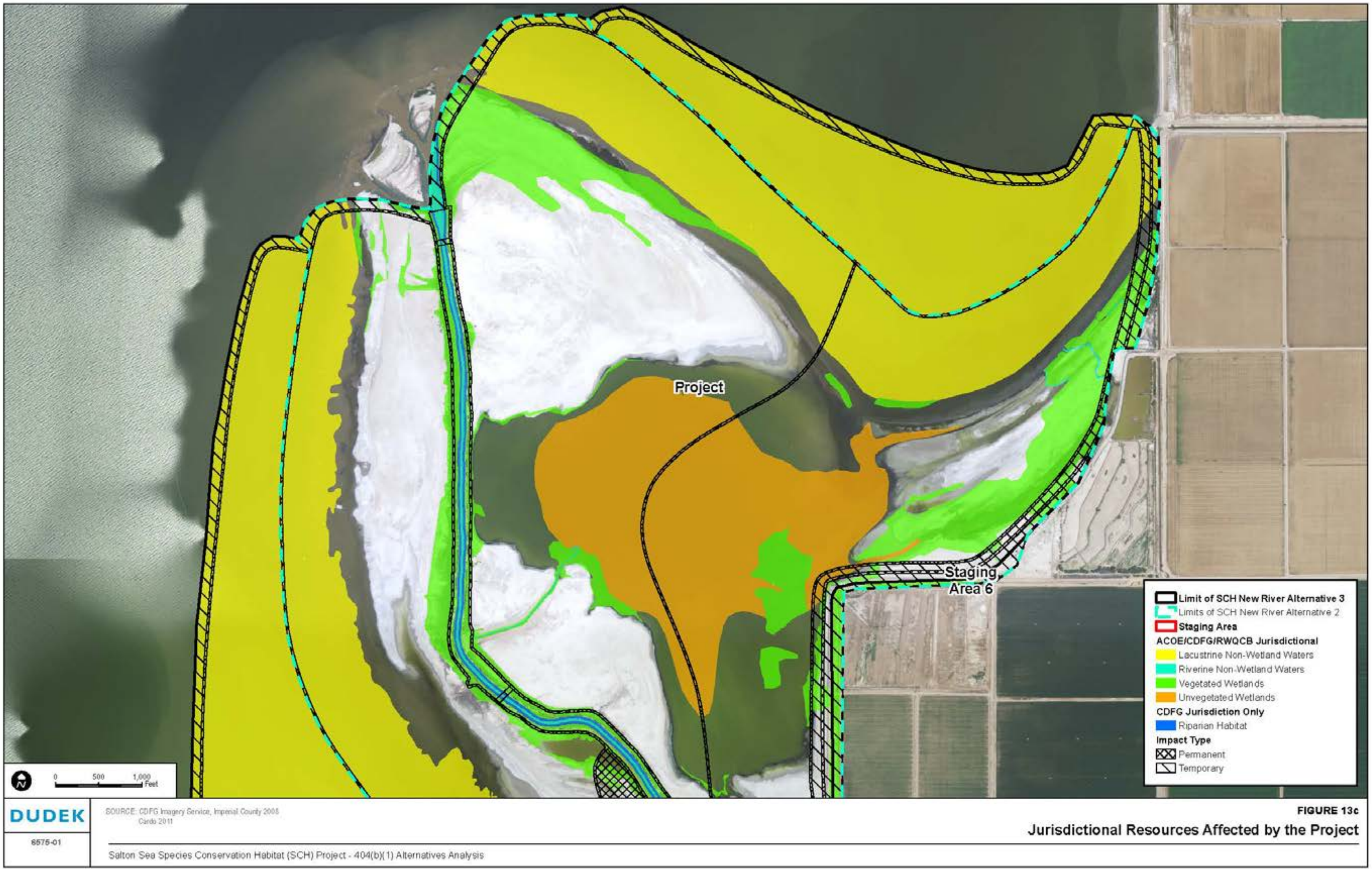


Figure 13c Jurisdictional Resources Affected by the Project

Permanent Impacts – Loss of Waters of the U.S.

Alternative NR-3

SCH Project components that are categorized as permanent impacts resulting in a loss of waters of the U.S. include berms, sedimentation basins, water diversion at the New River, and creation of an interception ditch. Construction of these Project components under Alternative NR-3 would result in the permanent loss of approximately 90.1 acres of jurisdictional resources (Table 7, Figure 13a through 13c).

Creation of the ponds requires construction of both perimeter and cascading interior berms within and adjacent to the Sea, which is responsible for the majority of the permanent impacts. The base of the berms would be 110 linear feet wide but would become partially submerged upon filling the ponds. The top of the berms would be approximately 26 feet wide, which includes an approximately 20-foot-wide driving surface and a short section of bank (3 feet either side) to support the road surface above the water in the ponds. Construction of the berms under Alternative NR-3 would result in permanent impacts on up to 71.9 acres of jurisdictional resources (Table 7).

In order to remove sediment from the water before pumping it into the ponds, two sedimentation basins would be created on either side of the New River. Each basin would be divided into two parts: the active basin and the maintenance basin. Since the water within the basins would fluctuate according to operational requirements, and accumulated sediments would be excavated to maintain the berms, these basins are categorized as a permanent impact and would result in a loss of 3.9 acres of jurisdictional resources (Table 6). The New River pump station would be placed within the analyzed impact footprint of one of the sedimentation basins and therefore does not constitute an additional permanent impact.

Permanent impacts on the New River would occur at the river diversion. The diversion would be located near the sedimentation basins. Creation of this diversion would permanently impact and result in a loss of approximately 0.9 acres of jurisdictional resources (Table 7).

A 30-foot-wide earthen interception ditch would be created along the southern perimeter of the ponds, in part, to capture agricultural runoff before it enters the ponds. Expected establishment of vegetation within the ditch would require routine dredging to ensure that water is able to flow from the agricultural areas to the Sea. This maintenance dredging is expected to occur every 1 to 2 years, and therefore this Project component was categorized as a permanent impact. Initial construction of the interception ditch would impact up to 13.5 acres of jurisdictional resources (Table 7).

Table7
Maximum Permanent from Loss of Section 404 Jurisdictional Waters of the U.S. within the SCH Study Area – Alternative NR-3

Jurisdictional Resource	Permanent Impacts (acres)				
	Berms	*Interception Ditch*	*New River Diversion*	*Sedimentation Basin*	*Total*
Lacustrine Non-Wetlands Waters	48.4	3.1	0.0	0.0	51.5
Riverine Non-Wetlands Waters	0.2	0.1	0.2	0.1	0.6
Lacustrine Vegetated Wetlands	20.3	10.2	0.7	3.7	34.9
Lacustrine Unvegetated Wetlands	3.0	0.1	0.0	0.0	3.1
Total	71.9	13.5	0.9	3.9	90.1

Alternative NR-2

Alternative NR-2 would include similar facilities as Alternative NR-3, including berms, an interception ditch, New River diversion, and sedimentation basin. These facilities would occupy the same locations as Alternative NR-3 and result in the same amount of impacts with the exception of the berms. Under Alternative NR-2, cascading ponds would not be constructed; therefore, permanent loss of jurisdictional waters due to the construction of berms would be smaller than under Alternative NR-3. A total of 68.8 acres of permanent loss of jurisdictional waters would occur under Alternative NR-2 (Table 8), including 51.9 acres of berms.

Table 8
Maximum Permanent from Loss of Section 404 Jurisdictional Waters of the U.S. within the SCH Study Area – Alternative NR-2

Jurisdictional Resource	Permanent Impacts (acres)				
	Berms	*Interception Ditch*	*New River Diversion*	*Sedimentation Basin*	*Total*
Lacustrine Non-Wetlands Waters	28.4	1.8	0.0	0.0	30.2
Riverine Non-Wetlands Waters	0.2	0.1	0.2	0.1	0.6
Lacustrine Vegetated Wetlands	20.3	10.2	0.7	3.7	34.9
Lacustrine Unvegetated Wetlands	3.0	0.1	0.0	0.0	3.1
Total	51.9	12.2	0.9	3.8	68.8

Temporary Impacts

Alternative NR-3

Temporary impacts under Alternative NR-3 include staging areas, two temporary river crossings, and interstitial areas (areas between the footprint of the berms and the Project boundary [i.e., construction work areas]). These three Project components would temporarily impact up to 209.7 acres of jurisdictional resources within the Project area (Table 9).

The final location of the staging areas has not been determined; however, this analysis assumes that all six staging areas, in their entirety, would be temporarily impacted. This conservative approach is being used because of the unknown nature of the staging activities in terms of the amount of land needed and the locations that might be used. The staging areas would be constructed in a manner that reduces the amount of impacts on vegetation and jurisdictional resources to the furthest extent possible. Of the 255.5 acre of staging areas identified; 28.3 acres support jurisdictional resources. (Table 9).

Two temporary river crossings, at the middle and the north end of the New River, would be used to transport dirt across the river during construction. The exact placement of the temporary crossings has not been identified, but one is planned at the north end of the New River, and the second is planned approximately halfway between the northern and southern borders of the Project area. The crossings are expected to impact a total of up to 0.3 acre of jurisdictional resources along the river and would be removed after the ponds have been constructed (Table 9).

Interstitial areas are those areas between the berms and Project boundary, the berms and the interception ditch, and the Project boundary and interception ditch. Although no specific disturbance is scheduled to occur in the interstitial areas, these areas would likely be temporarily disturbed as construction of the ponds and associated facilities occurs. Approximately 181.1 acres of jurisdictional resources occur within the interstitial areas (Table 9).

Table 9
Maximum Temporary Impacts on Section 404 Jurisdictional Waters of the U.S. within the SCH Study Area – Alternative NR-3

Jurisdictional Resource	Temporary Impacts (acres)			
	Staging Areas	*New River Crossing*	*Interstitial Areas*	*Total*
Lacustrine Non-Wetlands Waters	0.0	0.0	111.6	111.6
Riverine Non-Wetlands Waters	0.2	0.1	2.4	2.7
Lacustrine Vegetated Wetlands	18.6	0.2	65.9	84.7
Lacustrine Unvegetated Wetlands	9.5	0.0	1.1	10.7
Total	28.3	0.3	181.1	209.7

Alternative NR-2

Alternative NR-2 would include similar temporary work areas as Alternative NR-3, including the same staging areas and New River crossing location. The amount of interstitial work area would, however, be reduced due to the reduced pond area constructed under Alternative NR-2. Under Alternative NR-2, a total of 115.7 acres of temporary loss of jurisdictional waters would occur (Table 10).

Table 10
Maximum Temporary Impacts on Section 404 Jurisdictional Waters of the U.S. within the SCH Study Area – Alternative NR-2

Jurisdictional Resource	Temporary Impacts (acres)			
	Staging Areas	*New River Crossing*	*Interstitial Areas*	*Total*
Lacustrine Non-Wetlands Waters	0.0	0.0	17.5	17.5
Riverine Non-Wetlands Waters	0.2	0.1	2.4	2.7
Lacustrine Vegetated Wetlands	18.6	0.2	65.9	84.7
Lacustrine Unvegetated Wetlands	9.5	0.0	1.1	10.7
Total	28.3	0.3	87.0	115.7

Summary of Impacts on Jurisdictional Resources

Both Alternatives NR-2 and NR-3 would result in impacts on jurisdictional resources. The alternatives would result in the permanent conversion of jurisdictional waters (2,402.1 acres under Alternative NR-3 and 1,294.9 acres under Alternative NR-2). Both alternatives would also result in permanent loss of jurisdictional waters (90.1 acres under Alternative NR-3 and 68.8 acres under Alternative NR-2). Finally, both alternatives would result in a temporary loss of jurisdictional waters (209.7 acres under Alternative NR-3 and 115.7 acres under Alternative NR-2). However, these impacts are small in comparison with the pond area to be created under each alternative (3,285 acres under Alternative NR-3 and 2,178 acres under Alternative NR-2) and the enhanced conditions to jurisdictional resources expected to occur through implementation of the alternatives. Given the small amount of permanent loss relative to the amount of habitat to be created and preserved and the receding condition of the Sea under the No Project Alternative, these impacts are considered less than significant.

4.1.2 Operational Impacts

In addition, operation and maintenance of the ponds and associated facilities would cause temporary disturbances to waters of the U.S. at intervals during the Project's life under Alternative NR-2 or NR-3. The steep earthen sides of the sedimentation basins would grow a narrow band of emergent wetland vegetation and tamarisk that would likely be removed at least annually during basin maintenance. Berms would be maintained by using the dredged sediment materials from the sedimentation basins and from the ponds.

4.1.3 Indirect Effects

The proposed Project, under both Alternatives NR-2 and NR-3, has been designed in a manner that minimizes indirect effects on waters of the U.S. Water control structures and sedimentation basins would ensure that sedimentation, erosion, scour, and other potential adverse effects on the Sea and adjacent wetlands would be minimized. Furthermore, the interception ditch would be designed and operated in a manner that balances local surface and subsurface water movement so that the amount of water in adjacent marshes is not affected.

4.1.4 Direct and Indirect Impacts on Jurisdictional Conditions

The Project area was evaluated to quantitatively determine the conditions within jurisdictional areas using CRAM as described in Section 3.1.2.1. CRAM was used to evaluate agricultural drainages, the New River, and some vegetated areas along the southern shoreline of the Salton Sea. These areas would be subject to direct impacts due to Project construction and the resulting conversion of these areas to either ponds or pond-associated infrastructure such as berms, sedimentation basins, and interception ditches under either Alternative NR-2 or NR-3. For the majority of the Project area under both alternatives, the Project represents a conversion of existing waters of the U.S. and unvegetated exposed playa to aquatic habitat (waters of the U.S.) with no vegetation. CRAM is not currently designed to assess unvegetated, aquatic habitats such as would be created by the Salton Sea SCH Project. Therefore, the typical Corps practice of predicting CRAM scores for post-Project conditions within the unvegetated aquatic areas cannot be applied to the majority of the Salton Sea SCH Project. Instead, a qualitative evaluation has been compiled based on predicted functional conditions of the unvegetated aquatic areas within the Project area. Following the qualitative assessment of unvegetated aquatic areas, a quantitative analysis conducted for the vegetated portions of the Project is summarized.

Although these analyses were completed for Alternative NR-3, a similar forecast would be predicted for Alternative NR-2 because of the largely similar features of both alternatives. The larger extent of ponds under Alternative NR-3 would result in slightly higher scoring in some categories (e.g., biotic function), due to the greater extent of saline wetland pond created under Alternative NR-3; however, it would also result in slightly lower scoring in other categories (e.g., hydrology), due to the increase in hydrologic modifications (e.g., construction berms) under Alternative NR-3 compared with Alternative NR-2.

4.1.4.1 Post-Project Unvegetated Aquatic Area Assessment

The buffer and landscape context condition is expected to remain relatively unchanged under either alternative. Project features, such as berms, sedimentation basins, and associated access roads, may have a negative effect on the buffer condition but would not constitute a break in buffers because these features could be used by wildlife.

The hydrology of the Project area would be highly altered by the Project under either alternative. The purpose of the Project is to develop hydrologic conditions that can support aquatic habitat, particularly for fish as a food source for avian species because these conditions are currently under threat. As with current conditions, hydrology would be largely dependent on artificial conditions and would have limited lateral movement of floodwaters due to constructed berms and water control structures. These predicted future conditions represent low ecological functions (as measured by CRAM and other assessment tools derived from natural systems), but are similar to existing conditions.

The physical structure of the Project area would be altered through Project construction activities (dredging and filling) required to create ponds and berms as well as bird habitat islands under either alternative. The Project is designed to provide stable, relatively uniform slopes along the edges; however, below the pond surface would be deeper escape channels for fish and within the ponds would be bird habitat islands. Thus, the typical functional measures for topographic complexity are expected to be greater than existing conditions.

Biotic structure, under CRAM, is focused on vegetative cover. The Salton Sea SCH Project, under either Alternative NR-2 or NR-3, is not intended to provide vegetated habitat areas, although some habitat areas would be developed to offset for permanent and temporary impacts on vegetated areas. The majority of the Project is instead intended to be developed as aquatic habitat with relatively minimal vegetative cover. Thus, biotic structure is expected to be low.

Additional biotic functions beyond those associated with vegetated features are expected to increase with implementation of either alternative. In addition to the aquatic habitat provided by the ponds themselves, new shallow shoreline would be created inside the berms on the fringes of the ponds that would provide foraging opportunities for shorebirds since an invertebrate population would be supported by the lower salinity conditions. Breeding functions for nesting birds, such as snowy plover, gull-billed tern (*Gelochelidon nilotica*), and Caspian tern would be supported along the shoreline of the SCH ponds, and predator-free nesting areas on islands within the ponds would be provided. Loafing opportunities for species such as white pelican would continue to be available along the shoreline within the berms as well as outside of the berms and on the berms themselves. Under the pond water surface, deeper meandering channels would be created to allow escape cover and safe passage for fish throughout the Project area.

4.1.4.2 Post- Project Vegetated Area Assessment

A post-Project analysis of functional condition was prepared to evaluate the anticipated ecological functions that could be expected within the vegetated areas of the SCH Project (Dudek 2012). With the exception of the locations of the four assessment areas on the New River, which remain unchanged, all assessment area locations had to be relocated and reconfigured due to Project construction, which would significantly alter the landscape. The future assessment areas were placed in areas thought to be appropriate based on the anticipated Project design and include both riverine and lacustrine areas (Figure 14) (Tables 11 and 12).

Table 11
Comparison of Average CRAM Attribute Scores between the Existing Conditions AAs and the Forecasted Post-Project Riverine AAs for Alternative NR-3

CRAM Attributes	Existing Condition AAs	Forecasted Post-Project AAs
Buffer and Landscape Context	82.5	84.3
Hydrology	66.7	71.4
Physical Structure	32.8	33.3
Biotic Structure	40.3	39.6
Overall Score	56.0	57.2

Table 12
Comparison of Average CRAM Attribute Scores between the Existing Conditions AAs and the Forecasted Post-Project Lacustrine AAs for Alternative NR-3

CRAM Attributes	Existing Conditions AAs	Forecasted Post-Project AAs
Buffer and Landscape Context	84.3	82.3
Hydrology	68.8	66.7
Physical Structure	31.3	25.0
Biotic Structure	50.8	44.5
Overall Score	60.0	55.0

Based on this analysis, the post-Project functional condition of the vegetated areas is expected to remain approximately the same relative to the pre-Project condition. For riverine wetland types, including the New River and the created interception ditch, functional conditions are expected to remain the same (from an average of 56.0 pre-Project to 57.2 post-Project, under Alternative NR-3), with only very slight increases in buffer and landscape context, hydrology, and physical structure attribute scores. For lacustrine wetland types, including the pond shorelines, functional conditions are expected to also remain the same (from an average of 60.0 pre-Project to 55.0 post-Project under Alternative NR-3) with only very slight decreases attribute scores. Both slight increases and declines forecasted are negligible and within the error precision tolerance for CRAM (e.g., 10 percent for overall index scores and 5 percent for individual attribute scores).

Figure 14 Assessment Areas Post-Project Forecast Overview Map

Buffer and landscape context conditions are expected to remain mostly the same because buffers would be present with little to no buffer interruptions (e.g., paved roads, developments). Within all of the assessment areas, buffer and landscape connectivity is expected to be suitable for wildlife movement. Similar to the pre-Project condition, each of the assessment areas is expected to contain a large assemblage of non-native vegetation, primarily salt cedar, which results in a low to moderate Buffer Condition score.

The agricultural drainages and interception ditches, when compared to the New River, are distinct from each other in their hydrologic characteristics. The functions and services of the wetland habitats associated with the New River would remain essentially unchanged. However, the interception ditch would be a new feature that functionally replaces the agricultural drainages that currently cross the exposed playa/seabed. The interception ditch would convey agricultural runoff around the ponds and into the Sea. It is anticipated that the hydrologic characteristics of the interception ditch would be similar to the agricultural drainages, with fluctuating, perennial flow that varies depending on the agricultural uses of the season.

The physical structure of the assessment areas is based on physical features (e.g., structural patch types) and the topographic complexity (e.g., variety of elevational gradients) within the waterways and Sea shore. Within all of the assessment areas, the physical structure is predicted to consist of mostly uniform slopes with little micro topography resulting in low scores for topographic complexity. Likewise, the drainages are predicted to exhibit minimal structural patch richness. Overall, the Physical Structure attribute receives the lowest scores of any of the CRAM attributes, as is the case with the existing conditions, which is indicative of the extensive management of the New River, as well as unnatural conditions of the agricultural drainages and interception ditches.

Similar to the baseline conditions, the vegetation communities are predicted to have little biotic structural diversity, both in types and distribution of vegetation communities and in overlap of tall, medium, and short plant layers. Also, the majority of the assessment areas are expected to either be dominated or co-dominated by non-native vegetation. These features are representative of a highly disturbed ecosystem, which is reflected in the low Biotic Structure attribute scores predicted for both the New River and the agricultural drainages.

Summary

As discussed above, the condition of the jurisdictional resources would be similar to existing conditions under either alternative, but would be higher than the predicted future conditions. Due to the receding condition of the Sea, jurisdictional resources would decline, as would their functions and services they provide. Although Alternatives NR-3 and NR-2 would result in similar short-term jurisdictional conditions, Alternative NR-3 would result in higher jurisdictional conditions long-term due to the additional jurisdictional resources that would be preserved.

4.1.5 Physical Substrate Impacts

Portions of the ground surface within the SCH ponds would be excavated (with a balance between cut and fill) to acquire material to build the berms and habitat islands resulting in disturbance of the physical substrate. Best management practices (BMPs) to be implemented include an Erosion and Sediment Control Plan (ESCP) and a Stormwater Pollution and Prevention Plan (SWPPP). Typical measures include preservation of existing vegetation to the extent feasible, installation of silt fences, use of wind erosion control (e.g., geotextile or plastic covers on stockpiled soil), and stabilization of site ingress/egress locations to minimize erosion. Additionally, the Project would comply with the Imperial County Air Pollution Control District's Regulation VIII rules for dust control (general requirements, construction and earthmoving activities, bulk materials, open areas, and conservation management practices), which are required for all projects.

Water would be used to perform hydrostatic tests of the saltwater and brackish water pipelines before they were put into service. The test water from the pipelines would be released into either one of the sedimentation basins or one of the SCH ponds. The water would be released in a controlled manner to minimize the potential for erosion, and any erosion that did occur would be contained within the basin or the pond, reducing potential impacts on physical substrate.

Exposed playa that was recently submerged would be used to construct the berms. It is highly saline and not considered topsoil. Topsoil along the existing New River berm would be removed during construction of the pipeline leading from the river to the ponds; however, this pipeline segment is very short (approximately 100 feet). Thus, any loss of topsoil would be minimal.

In general, the soils on the seabed are weak (in terms of expected stability in the context of constructed berms, etc.) and may be subject to erosion, piping, settlement, and spreading during the life of the Project. These factors would be considered during the geotechnical design and accommodated by allowing for settlement in the design and placement of soil, adding features such as a cutoff wall to avoid seepage, and using flatter side slopes on the berms to reduce seepage and add stability. The preliminary geotechnical investigation (Appendix C of the Draft EIS/EIR [Corps and Natural Resources Agency 2011]) showed that the Sea sediments at the pond sites are predominantly fine-grained soils with low strength. These types of soils would readily erode when exposed to even light wave action and are dispersive in fresh water and brackish water. Compressibility, seepage, and expansion potential are also issues that would need to be addressed through appropriate design. If seepage developed through or underneath a berm, the dispersive nature of the soils could lead to the loss of the embankment. Additional geotechnical analysis would be performed prior to construction, however, and the berms would be constructed following appropriate site-specific soil construction techniques, including the use of specialized equipment and flat to moderate slopes. The Project would not cause instability in the surrounding area, and should berm failure occurring during the life of the Project, this would be addressed by repairing the failed section, relocating a section of berm, or changing the berm cross section. Therefore, due to the ESCP and SWPPP that would be developed and approved prior to construction and the BMPs that would be implemented both during and immediately after construction and maintenance activities, the direct and indirect impacts to substrate would be less than significant.

Although there is less grading under Alternative NR-2, the nature of the impact would be similar under either alternative.

4.1.6 Water Circulation, Fluctuation, and Salinity Impacts

The Project is designed to manipulate water circulation, fluctuation, and salinity levels within the proposed SCH ponds. Based on a proof-of-concept model, each pond or set of ponds would be operated under different conditions to test the success of the habitat with different pond characteristics. The final operations would be decided at the end of the proof-of-concept period, expected to occur in 2025. Appendix D of the Draft EIS/EIR provides examples of the range of operations for the SCH Project (Corps and Natural Resources Agency 2011).

The main parameters subject to change include salinity, residence time,[3] and depth. They can be controlled by changing the amount and salinity of water delivered to the SCH ponds, the outflow to the Salton Sea, and the total storage in the ponds. The potential range of these parameters includes:

- Salinity: Typical range of 20 to 40 ppt, occasionally up to 50 ppt;
- Residence time: 2 to 32 weeks; and
- Depth: 4 to 6 feet at the exterior berm.

The biotic community (e.g., algae, invertebrates, fish, and birds) would respond in varying ways to these operations and other environmental conditions. These operations, ecological responses to the operations, and other key indicators or events at the ponds (e.g., water temperature, bird die-offs), would be monitored, and any necessary adjustments to operations would be made through a monitoring and adaptive management program (Appendix E of the Draft EIS/EIR).

Water Surface Elevation: The SCH ponds would lose about 72 inches of stored water to evaporation each year, similar to the adjacent Salton Sea. The total volume of water lost to evaporation would be equivalent to the evaporation rate multiplied by the surface area of the

[3]Residence time is the amount of time water entering the SCH ponds from the New River and Salton Sea would reside in the ponds before being released to the Sea.

SCH ponds. For a maximum surface area of 3,770 acres, about 22,460 af of water would be lost from the ponds per year. In the absence of the Project, this volume of water would otherwise flow to the Sea, where it would be subjected to a similar evaporation rate (slightly smaller because of the lake effect and the hypersaline conditions). As the Sea recedes, the surface area exposed to evaporation will decline, while the surface area of the ponds would remain constant. Thus, evaporation from the SCH ponds would remain constant while evaporation from the Sea will decrease over time.

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a maximum of approximately 269,460 af of water could be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less due to the SCH diversion and other reductions in inflow. By 2025, the volume of water stored in the Sea would be reduced by up to 156,700 af under Alternative NR-3 compared to the No Action Alternative, and the Sea's surface elevation would be about 0.9 feet or less lower.

By 2077, the Sea's depth (water surface elevation minus the bottom elevation of the Sea) would be reduced by up to 5.1 percent, and its water surface elevation would be about 1.0 foot or less lower as a result of the SCH diversions under Alternative NR-3.

The SCH ponds would cover playa that would otherwise be exposed under the No Action Alternative, and by 2077, the net effect would be to inundate an additional 1,150 acres of playa under Alternative NR-3 compared to the No Action Alternative, even though the Project captures water that would otherwise flow to the Sea, resulting in a smaller remnant Sea.

The Project would also result in a change to the Salton Sea's water surface elevation when compared to existing conditions. Most of the change, however, would be a consequence of the changes in inflow to the Sea, and not related to the Project. Table 13 shows the changes from existing conditions that occur under the No Action Alternative and the small increment associated with the Project. For example, by 2077 the water surface elevation of the Sea is expected to decline by 27.2 feet relative to existing conditions. While this is a substantial change in elevation, 1.0 foot of the change would result from Alternative NR-3 (0.7 foot from Alternative NR-2). That is, the Sea will get smaller, shallower, and saltier regardless of whether or not the SCH Project is implemented. Increasing salinity (expected to exceed 60 ppt by 2018, which is too saline to support fish) and other water quality stresses, such as temperature extremes, eutrophication (process by which a water body acquires a high concentration of nutrients [e.g., nitrates and phosphates]), and related anoxia (decrease in oxygen) and algal productivity, threaten the Salton Sea ecosystem with the most immediate threat being the loss of fishery resources that support piscivorous birds. The Project would offset a portion of this lost habitat by providing new habitat that is usable by birds, fish, and other organisms. It would not, in itself, result in changes that would have an adverse effect on or preclude the beneficial uses of the Salton Sea identified in the Basin Plan (CRBRWQCB 2006).

Table 13
Salton Sea Surface Elevation and Area – No Action[1] and SCH Project Alternatives

	Elevation			Storage			Area		
	2014 (ft)	*2025 (ft)*	*2077 (ft)*	*2014 (af)*	*2025 (af)*	*2077 (af)*	*2014 (acres)*	*2025 (acres)*	*2077 (acres)*
Existing[2]	-231.0	—	—	6,744,357	—	—	227,299	—	—
No Action	-234.7	-248.4	-258.2	5,867,592	3,183,010	1,648,221	219,785	169,467	141,723
NR-3[3]	-234.8	-249.3	-259.2	5,845,137	3,026,286	1,504,769	219,493	166,413	139,097
Difference	-0.1	-0.9	-1.0	-22,455	-156,725	-143,451	-292	-3,054	-2,626
NR-2	-234.8	-249.0	-258.9	5,851,729	3,072,288	1,545,332	219,577	167,308	139,847
Difference	-0.1	-0.6	-0.7	-15,863	-110,723	-102,889	-208	-2,159	-1,875

Notes:
1. No Action modeled in Programmatic EIR, Appendix H-2, Attachment 2, Table H2-2-3 (Natural Resources Agency 2007).
2. Existing Conditions are represented by 2010 conditions.
3. Maximum change if all ponds are constructed.

Therefore, when comparing what is expected to occur in the near future with the proposed Project impacts, Project construction would have less than significant direct impacts on the Salton Sea water surface elevation. These impacts would be similar under both Alternatives NR-2 and NR-3. Alternative NR-2, due to a smaller pond area, would have slightly less hydrologic effect on the Sea.

Hydrologic effects on the New River, due to the diversion of water for the SCH ponds, is estimated based on simulations of possible Project operations to determine reductions in the average annual flow and the peak monthly flow immediately downstream of the diversion. The reduction would be present only in the portion of the river between the diversion and the Sea. The water would be returned to the Sea, less the evaporation loss that occurred while the water was in the SCH ponds. For the average annual condition under Alternative NR-3, the diversion would range from 7 to 51 percent of the New River flow, depending on the pond salinity and residence time. For the peak evaporation month (June), the reduction downstream of the diversion would range from 10 to 56 percent for the New River. The reductions in flow would be offset by the flow returned to the Sea from the ponds. Therefore, the hydrologic effects on the New River under Alternative NR-3 are expected to be less than significant. The effects would be slightly reduced under Alternative NR-2.

Flooding: The SCH ponds would be located on areas that are recently exposed (dry) playa or are currently submerged. Rainfall on the dry playa would infiltrate and/or drain to the Sea. Rainfall on the SCH ponds temporarily would be retained in the ponds and would not cause an increase in flooding. The drainage pattern of some IID drains would be altered by the SCH Project because some of them would be intersected by the interception ditch. The interception ditch would be designed to convey the historic flow in the drains and maintain a channel elevation that is lower than the elevation of the drains to avoid backing water into the drains. The IID drains would remain in a free-flowing condition, and connectivity between the drains and the Sea would be maintained. The interception ditch would also collect shallow groundwater that seeps from the SCH ponds. Therefore, the Project would alter the drainage pattern of the IID drains, but not substantially or in a manner that could result in substantial erosion, siltation, or flooding.

Water from the New River would supply the SCH ponds, but the course of the river would not be changed. The structures that would be used to divert water would be set into the river bank and stabilized with riprap, thus preventing erosion. Less water would be carried in the river after the water was diverted, thus lessening the potential for siltation, erosion, and flooding.

The proposed SCH site would be located adjacent to Flood Zone A defined by FEMA. The pumped diversion is designed to be recessed into the bank of the river in order to maintain the channel cross section and avoid collecting debris on the diversion works. In addition, the diversion would remove water from the river, thereby decreasing the flow and lowering the water surface elevation in the river at the diversion and downstream, which would reduce the risk of flooding.

Other structures constructed under this Project include berms, which are not habitable structures as defined by FEMA. Moreover, if the berms failed, the impounded water would be released directly to the Salton Sea or onto exposed playa where it would then flow to the Sea, and their failure would not expose people to risk of injury or death. The bottom of the sedimentation basin would be from 15 to 20 feet below the ground surface and, therefore, would not pose a flood hazard.

This Project would include a trailer or similar facility that would serve as office space for the permanent employees. It would be constructed on adjacent ground above the -228-foot elevation. This facility would be in Zone A delineated by FEMA and would be constructed in conformance with the Imperial County floodplain regulations for elevation, flood proofing, and tie-downs (for a trailer). These design features would reduce the flood potential and, therefore, by design avoid a flooding-related impact.

The proposed Project has been designed to reduce the potential of flooding both upstream of the Project site and downstream. The construction of the interception ditch is to allow the connectivity of the drains and the Sea in order to prevent flooding issues in the surrounding areas. In addition, any structures created would abide by County floodplain regulations to reduce the potential of impacts from flooding. Therefore, the construction of the proposed Project would have less than significant impacts on flooding. Because Alternative NR-2 includes facilities in the same locations as Alternative NR-3, it would have similar potential flooding impacts.

Salinity. The salinity of the Salton Sea already exceeds the Basin Plan objective (it currently is approximately 51 ppt, whereas the objective is 35 ppt). Because the diverted water under the proposed Project would pass through the SCH ponds, losing water only to evaporation, both water and salt would be returned to the Sea. The SCH ponds would temporarily store a volume of salt, a portion of which would be continuously released back to the Sea and a portion of which would be temporarily in storage. The amount in storage is related to the SCH salinity and the volume of the ponds, and the rate that is returned to the Sea depends on the residence time (2 to 32 weeks). The salt only would be stored temporarily; thus, the SCH ponds would not be a salt sink.

Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced due to the decreased rate of inflow from the New River as a result of the SCH diversion. The following salinity levels are estimated for the onset of operations (2014), the end of the proof-of-concept period (2025), and the end of the Project's lifetime (2077). Under the No Action Alternative, salinity is expected to reach 59.0 ppt in 2014, 114.0 ppt in 2025, and 272.0 ppt in 2077. These levels can be compared with the levels predicted under full build-out of the proposed Project: 59.2 ppt in 2014, 119.9 ppt in 2025, and 297.9 in 2027 for Alternative NR-3. For Alternative NR-2, these levels would be slightly reduced in later years of the Project: 59.2 ppt in 2014, 118.1 ppt in 2025, and 290.1 in 2027.

Under either alternative, the Project would also result in a change to the Salton Sea's salinity when compared to existing conditions, but the salinity of the Sea would continue to increase regardless of whether the SCH Project were implemented. The Project would not, in itself, result in changes that would have an adverse effect on or preclude the beneficial uses of the Salton Sea identified in the Basin Plan. The construction of the proposed Project would have direct impacts to the Salton Sea by increasing the salinity about 9.5 percent by 2077 under Alternative NR-3 and 6.7 percent under Alternative NR-2; however, when compared to the future predicted conditions, the proposed Project only would create a slight increase, and the impact would be less than significant.

4.1.7 Suspended Particulate/Turbidity Impacts

The proposed Project may result in adverse effects related to suspended particulates and turbidity from diversion of New River flows and/or modification of the Salton Sea playa. Each of these potential circumstances is evaluated below.

Under the proposed Project, a portion of the New River's flow would be diverted through the sedimentation basins to allow sediment to settle out prior to conveyance and delivery of water to the SCH habitat ponds. Routine operations would include the removal and disposal of the sediments collected in the sedimentation basins. The resulting discharge from the SCH ponds to the Salton Sea would have a reduced sediment load, and thus, the Project would contribute to meeting the sedimentation/siltation total maximum daily load standard and would reduce turbidity (CRBRWQCB 2002b).

The SCH ponds, under either alternative, would have both interior and exterior berms. A berm failure could occur as a result of a seismic event, seiche, flood event, or other similar factor. The volume of sediment released would be about the size of the eroded portion of the berm. If an interior berm failed, sediment would enter the SCH ponds and would not affect other water bodies. If an exterior berm failed, nearby canals or drains would not be affected because the SCH ponds would be downgradient, and any water and sediment released from the ponds would flow away from them, toward the Salton Sea. However, water flowing over the exposed playa could pick up sediment from the berm failure and transport it to the Sea. If this were to occur, impacts on the Salton Sea would be short term, lasting only for several days. If a large-scale berm failure occurred, water would be released through the breach and either would enter the Sea directly (in the near term) or would be released onto the exposed playa (in the future). If a smaller breach occurred, the ponds would be drained both through the breach and through the release of water through the control valve. This release would also occur over several days. Sediment released into the Sea would settle and would not have a substantial effect on water quality. Impacts on the New River would occur only if a berm failed in the immediate vicinity of the river. This type of failure is unlikely because the elevation of the existing ground is above -228 feet, but should this occur, the sediment would temporarily degrade water quality of a short segment of the river, and the sediment would flow to the Sea. If failure were to occur, the berms would be repaired promptly and BMPs would be employed immediately to prevent additional sediment from eroding away from the site.

Both Alternatives NR-2 and NR-3 may have direct adverse short-term impacts on suspended particulates and turbidity for several days following berm failures. Both would, however, have a long-term benefit to the Salton Sea by trapping most of the sediment loads from the New River in the sedimentation basin and ponds and reducing the amount of sediment and turbidity within the Salton Sea at the outlet of the SCH ponds. Thus, impacts of suspended particulates and turbidity are considered to be less than significant.

4.1.8 Contaminant Impacts

Selenium. Existing (2004 to 2009) mean selenium concentrations in the New River are 3.2 μg/L (C. Holdren, Reclamation, unpublished data). These concentrations have varied little over recent years and are expected to be similar over the next few years. Under future conditions, selenium concentrations will increase by 2075 but will not exceed 10 μg/L (Natural Resources Agency 2007).

Under both Alternatives NR-2 and NR-3, a portion of the New River's selenium-laden flow would be diverted through the ponds before discharging to the Sea. The SCH ponds would be operated using blended inflow water with a selenium concentration between the New River (mean < 3.5 μg/L) and Salton Sea (< 2 μg/L). For 20 ppt salinity (this would be the worst-case scenario for selenium under existing conditions and near-term conditions), the inflow selenium concentration would be 2.6 μg/L (Sickman et al. 2011). Shortly after the ponds were constructed and first filled with water, selenium concentrations in the ponded water would be expected to increase due to solubilization of oxidized selenium from the rewetted playa sediments (Amrhein et al. 2011, summarized in Corps and Natural Resources Agency 2011, Appendix I). Selenium concentrations in overlying water (approximately 1 meter deep) could increase by approximately 0.9 μg/L (Amrhein et al. 2011). The total load of selenium solubilized and released to the Salton Sea would depend on the amount of playa sediments exposed and oxidized (this increases each year as the Sea recedes), available iron oxides in sediments (these bind selenium and reduce the amount solubilized in water) (Amrhein et al. 2011), and the size of the ponds that would be constructed and inundated. However, this "flush" would be temporary and would likely decline over the first 1 to 2 years. This is supported by findings from the Reclamation/USGS SHP, where the water selenium concentration and frequency of elevated egg selenium concentrations declined after the first year (Miles et al. 2009). Sickman et al. (2011) suggested that saline wetlands at the Salton Sea appear to develop selenium removal pathways (i.e., volatilization or sequestration) within the first 1 to 2 years after construction. Reducing water retention time and increasing flow-through of the ponds for several weeks or months following initial filling could be used to flush soluble selenium from the ponds (Amrhein et al. 2011).

If a minimal amount of selenium were removed within the ponds, the selenium concentration of the discharge would be 2.6 μg/L under existing conditions, and potentially elevated by approximately 0.9 μg/L during the initial wetting period. These levels would still be below the water quality objective of 5 μg/L. In the future, however, the discharge may exceed this standard, depending on the water blending ratios needed to achieve suitable salinities (Sea salinity is increasing, so the ponds would use less Sea water in the future) and the future selenium concentrations in the river (up to 10 μg/L possible). Nevertheless, this concentration would be lower than the concentration of New River water directly flowing to the Salton Sea.

In conclusion, there would likely be an increase in total selenium load reaching the Sea compared to the existing conditions and No Action Alternative. This increase, however, would be temporary (lasting 1-2 years), and the relative magnitude of selenium load compared to the amount present in river-source water would be less than significant. The selenium discharged to the Sea would be diluted and assimilated, given the Sea's much greater volume and its assimilative capacity in its anoxic sediments; therefore, the proposed Project would not affect the Sea's selenium loading or waterborne concentrations.

Dissolved Oxygen. Operation of the SCH ponds would use nutrient-rich New River water blended with Salton Sea water. Water quality modeling (B. Barry and M. Anderson, University of California Riverside, unpublished data) indicates that the ponds would sustain high primary productivity, with phytoplankton blooms in March through May and in October. This high primary productivity would result in periods of anoxia both daily (near dawn due to respiration of all organisms present) and seasonally (especially in spring and fall). SCH pond water discharged to the Salton Sea during these anoxic periods would have lower levels of dissolved oxygen, potentially lower than the CRBRWQCB (2006) water quality objective of 5 mg/L, but this would be offset by aeration that would occur as it cascades from the outfall structure. Furthermore, this lowering of dissolved oxygen would have only a localized effect that would be quickly dissipated in the larger Sea, assisted by wave action. The proposed Project is expected to have a direct short-term, localized impact on dissolved oxygen entering the Sea, but this impact would be less than significant. The impact is expected to be similar regardless of which alternative is implemented.

Nutrients. Operation of the SCH ponds would include the blending of New River water and Salton Sea water. Total phosphorus concentration in the SCH pond water would be greater than in the Salton Sea (> 122 µg/L), but less than in the New River (< 1,031 µg/L). The concentration of total phosphorus in SCH pond water discharged into the Salton Sea would exceed the draft numeric target of 35 µg/L (0.035 mg/L), but this exceedance already occurs for river water discharging directly to the Sea. Therefore, Alternatives NR-2 and NR-3 would not contribute additional concentrations of total phosphorous into the Sea. Release of phosphorus would temporarily stimulate local algae production and reduce water quality conditions. Any potential effect would be localized and temporary because the pond discharge would be rapidly dissipated in the considerably larger volume of the Sea; therefore, proposed Project impacts on nutrients would be less than significant. The impact is expected to be similar regardless of which alternative was implemented.

Pesticides and other Contaminants: Project construction would last approximately 2 years, during which time sediment and associated pesticides inputs to the Salton Sea and New River might be increased. Construction activities would temporarily increase suspended sediment in waters of the Sea. Re-suspended bottom sediments would allow release of previously deposited water-soluble contaminants. With regard to pesticides, disturbance of bottom sediments in those areas where berm construction and excavation of swales would occur would redistribute buried DDT residues and pyrethroid pesticides into the water column, particularly at East New River. Pyrethroid pesticides (Fojut and Young 2011), as well as DDT and residues, are highly hydrophobic, however, and would likely remain bound to disturbed sediments that would remain in the ponds and berms. In addition, potential inadvertent releases of hazardous materials into nearby waters during construction would temporarily degrade water quality at the Salton Sea. Generally, these potential impacts would be short term and limited to the duration of construction.

Both Alternatives NR-2 and NR-3 would include an ESCP and SWPPP for construction and maintenance activities. These plans would address the potential for erosion and incorporate appropriate protections into the design. Although DDT residues could remain in the surface sediments beyond the 2-year construction period, concentrations would likely be similar to elevated concentrations already present in several other nearby habitats. Resuspension and redistribution of almost exclusively sediment-bound pyrethroids would be unlikely to increase pyrethroid toxicity over existing levels, based on ongoing input of pyrethroids from agricultural drainage and pesticide concentrations currently measured in waters entering the Salton Sea. Therefore, direct and indirect impacts from pesticides and other contaminants would be short-term, lasting only during the construction period (2 years), and would be less than significant. The impact is expected to be similar regardless of which alternative is implemented.

4.2 Biological Impacts

4.2.1 Vegetation Communities

Project construction activities would result in removal of vegetation communities, particularly stands of tamarisk adjacent to the New River, depending on the amount of excavation for material to construct the ponds and berms. For areas to be inundated by the ponds or where structures would be placed (e.g., access roadways along the river berms, river water intake), the loss would be permanent. Vegetation communities would also be temporarily disturbed or removed for construction of the water delivery pipelines, construction work areas, and designated staging areas. However, Project features outside the ponds would be sited to minimize or avoid impacts on vegetated wetland communities to the maximum extent feasible.

As discussed in Section 4.1.5, the SCH ponds are expected to provide high-functioning aquatic habitat that is not directly comparable to existing functions of vegetated wetlands. Overall, existing functional scores are relatively low and not expected to be substantially negatively affected by implementation of the proposed Project. Based on these factors, the conversion of vegetation communities to aquatic habitat within the SCH ponds is not considered a substantial adverse impact.

Conversion of existing vegetation communities to SCH pond infrastructure, such as berms, sedimentation basins, etc., does represent a potentially substantial adverse loss of wetland functions that would require mitigation measures to reduce the impacts.

Tables 14 and 15 list the estimated maximum permanent and temporary impacts on vegetation communities that would occur based on existing conceptual layout of facilities and existing vegetation conditions under Alternatives NR-3 and NR-2. The impacts under both alternatives are the same because the additional ponds proposed under Alternative NR-3 would be located in areas that are unvegetated (i.e., open water). Quantification of direct permanent and temporary impacts would be refined at the time of construction and documented in the Final Habitat Mitigation and Monitoring Plan (HMMP) to be prepared for the proposed Project.

Table 14
Maximum Permanent Impacts on Mature Vegetated Resources*

Impact Type	Habitat Type	Jurisdictional Vegetation Impacts (Acres)[1]	Non-Jurisdictional Vegetation Impacts (Acres)
Pond	Cattail Marsh	16.8	--
	Tamarisk Scrub	30.5	7.3
	Tamarisk Woodland	6.3	0.1
	Subtotal	53.6	7.4
Berms	Cattail Marsh	0.9	--
	Common Reed Marsh	0.1	--
	Tamarisk Scrub	4.5	1.0
	Tamarisk Woodland	7.2	0.2
	Subtotal	12.7	1.2
Sedimentation Basins	Tamarisk Scrub	1.0	0.1
	Tamarisk Woodland	1.7	0.5
	Subtotal	2.7	0.6
Interception Ditch	Cattail Marsh	1.0	--
	Tamarisk Scrub	2.3	--
	Iodine Bush Scrub	0.9	--
	Subtotal	4.2	--
New River Crossings	Common Reed	0.2	--
	Tamarisk Scrub	0.2	0.1
	Tamarisk Woodland	0.4	--
	Subtotal	0.9	0.1
	Grand Total	74.1	9.4

*Note that the impact acreages listed in this table are the maximum possible under the proposed Project design and assume that the entire Project would be built. Impact acreages would likely be less than this because the entire Project area would likely not be utilized for the Project.
[1] Numbers may not total due to rounding.

Table 15
Temporary Impacts on Vegetated Resources*

Impact Type	Habitat Type	Jurisdictional Vegetation Impacts (Acres)	Non-Jurisdictional Vegetation Impacts (Acres)
Staging Areas	Common Reed Marsh	0.5	--
	Iodine Bush Scrub		65.0
	Quailbush Scrub	0.5	11.4
	Tamarisk Scrub	8.4	7.0
	Tamarisk Woodland	1.6	0.8
	Subtotal	11.0	84.2
New River Crossings	Common Reed	0.1	--
	Tamarisk Scrub	0.1	--
	Tamarisk Woodland	0.2	--
	Subtotal	0.4	0.0
Interstitial Areas (between perimeter berms and outer edge of Project)	Cattail Marsh	5.7	--
	Common Reed Marsh	0.1	--
	Iodine Bush Scrub	4.1	--
	Tamarisk Scrub	12.9	0.8
	Tamarisk Woodland	3.1	0.5
	Subtotal	25.9	1.3
	Grand Total	37.3	85.6

*Note that the impact acreages listed in this table are the maximum possible under the proposed Project design and assume that the entire Project would be built. Impact acreages would likely be less than this because the entire Project area would likely not be used for the Project.

Mitigation Measures

The EIS/EIR for the Project includes Mitigation Measure (MM) BIO-5, which would offset permanent impacts resulting from the footprint of SCH pond infrastructure facilities, as well as temporary impacts from construction activities, including staging. MM BIO-5 requires preparation of a Habitat Protection, Mitigation, and Restoration Program. The program would detail measures to avoid impacts/disturbance of habitat, specifically during the bird breeding season; quantify the maximum area of each plant community that may be temporarily or permanently removed during construction; and provide methods for restoration of those plant communities including on- or off-site restoration locations, use of native seed sources, details for planting, irrigation, maintenance, and monitoring, with ultimate success determined through defined performance criteria.

As discussed above, the applicant and the EIS/EIR propose numerous measures to be implemented along with either alternative chosen that would mitigate the direct and indirect impacts to biological resources.

4.2.2 Threatened and Endangered Animals

The Project, under either alternative, has the potential to adversely affect the following Federally listed species: desert pupfish, California least tern, least Bell's vireo, southwestern willow flycatcher, and Yuma clapper rail. Potential impacts on each species are discussed below.

4.2.2.1 Desert Pupfish

It has been determined that the Project, under either alternative, would likely adversely affect desert pupfish. Desert pupfish are present in agricultural drains and in shallow water along the Sea's shoreline, and construction activities for the ponds and diversion of the drain outflows around the Project area would result in habitat loss, alteration of adjacent habitat through turbidity, and mortality of some individuals. As a consequence, it is foreseeable that construction and maintenance of these features has the potential to result in permanent and temporary direct impacts on the desert pupfish. However, the SCH Project would provide up to approximately 1,693 acres of suitable desert pupfish habitat within the 3,770 acres of SCH ponds under Alternative NR-3 or approximately 1,089 acres of suitable desert pupfish habitat within the 2,670 acres of SCH ponds under Alternative NR-2. Thus, while some impact to pupfish and their habitat would occur, there would be an increase in suitable habitat for pupfish.

Loss or Harm to Individuals

If construction activities occurred during the desert pupfish breeding season (approximately April through October), reproductive success for those mature pupfish in the Project footprint would be greatly reduced. Since the species generally does not live more than 2 years, loss of reproduction for 1 year could have substantial effects on the population size at a specific location. However, if a location remains connected or is reconnected to desert pupfish habitat, immigration and a subsequent population rebound can be expected. Construction of the pump stations and pipeline for bringing saline water from the Salton Sea to mix with the river water for salinity control in the ponds would be from a barge and the adjacent berm and would temporarily affect a small area of the Sea, primarily through underwater sound and turbidity. Few, if any, desert pupfish would be affected by this construction activity. As the Sea recedes, the outer pump station would need to be moved, or another one built, and the pipeline extension placed on or within the exposed playa/seabed. By that time, salinity in the Sea would exceed the tolerance of desert pupfish, and construction would not affect them. Desert pupfish have been shown experimentally to survive in 90 ppt salinity, but they succumb in situ when salinity approaches 70 ppt.

Operation of the pump stations to bring saline water to the ponds has the potential to entrain desert pupfish until the Sea becomes too saline for their survival. The intake would be screened until that time, and maintenance activities to clean or to replace the screen could affect pupfish in the intake's immediate vicinity. Maintenance of the pump stations could result in release of lubricants or other chemicals potentially toxic to pupfish. Due to the proposed location of the pump stations (adjacent to the outer berm and offshore from the ponds), few desert pupfish are likely to be affected by maintenance activities.

When the Sea's salinity or water quality exceeds their tolerance, any desert pupfish entering the overflow would be killed. Water from existing agricultural drains that discharge to the Sea where the ponds would be built would be diverted around the ponds by new interception ditches to the east and west. Habitat used by pupfish in those drains would remain, but the individual drain connections to the Sea would be combined into as many as three connections, thereby resulting in a greater distance for desert pupfish to traverse in the Sea between the new (combined) drain outlets. Construction of the new drain interception ditches would disturb existing pupfish habitat at the mouth of the drains and could disrupt spawning, depending on time of year, or result in injury or mortality of individuals. The new drain interception ditches, once completed, would provide habitat for desert pupfish, but maintenance of these channels would cause periodic disturbance within that habitat and could result in disturbance to spawning or mortality of some individuals.

Maintenance activities for the ponds also could affect desert pupfish that are present in the ponds. Turbidity effects, disturbance of feeding and spawning areas, and direct mortality could occur. The inclusion of other fish species in the ponds would likely result in competition and possibly predation. Dropping the water level of one or more ponds for maintenance could strand desert pupfish resulting in mortality from desiccation or predation by birds. Under an emergency situation, draining one or more of the ponds for maintenance could occur and would strand desert pupfish resulting in the same types of mortality.

Loss of Suitable Habitat

The Project would result in a permanent isolation of existing shallow shoreline habitat (up to approximately 8.1 miles) where the ponds are constructed compared to current conditions. The acreage of open water that would be altered is as much as 2,221 acres, and an additional maximum of 13 acres of drainage ditches and irrigation canals would be altered. Pupfish, however, would still be able to move around (outside) the ponds via the Sea until salinity exceeds their tolerance in about 2020. The ponds would overflow directly into the Sea, and pupfish could enter that overflow. When the Sea's salinity or water quality exceeds their tolerance, any desert pupfish entering the overflow would be killed.

Habitat Gain

Although the SCH ponds are not specifically designed to provide pupfish habitat, the shallow water within them would be suitable habitat, and some pupfish are likely to be trapped in the ponds during construction if the downslope (offshore) berms are installed "in the wet" rather than on the exposed playa. The DFW would also inoculate the ponds with pupfish. These pupfish would likely persist due to the proposed water quality for the ponds but would be isolated (physically and genetically) from those in the Salton Sea and its connected waters. Isolation of populations in the drains and tributaries would also occur in approximately 2020; therefore, the proposed Project would have the same effect as what would naturally occur in future conditions (No Action Alternative). The DFW would manage the genetic health of the population in the SCH ponds by infusion of fish from outside populations as necessary.

The EIS/EIR for the Project includes mitigation that requires the preparation and implementation of a desert pupfish protection and relocation plan. The plan is intended to address pupfish protection and relocation during construction as well as during future maintenance activities within the Project. Included in the plan are protocols for preconstruction or premaintenance surveys, pupfish capture and release, optimal timing to minimize impacts on pupfish spawning, and maintenance of screens to control movement when salinity of the Salton Sea exceeds thresholds that allow pupfish to live.

Adaptive management procedures that include assessment of mitigation measure effectiveness, development of revised measures to improve effectiveness, and similar assessment of revised measures to verify effectiveness. In summary, SCH Project activities have the potential to directly and indirectly impact desert pupfish and alter their habitat even with the implementation of the mitigation measures. However, a gain of suitable habitat would also occur, fully offsetting the habitat loss. In consideration of the aforementioned analysis, mitigation measures identified above and any additional requirements specified in the Biological Opinion from the USFWS for the Project would minimize and/or mitigate for impacts to desert pupfish populations and their habitat.

Impacts under Alternative NR-2 would be less than under Alternative NR-3; however, less suitable habitat would be constructed due to the smaller acreage of SCH ponds developed under Alternative NR-2.

4.2.2.2 California Least Tern

It has been determined that the Project would have no effect on California least tern. Least terns have not been recorded breeding at the Sea (Patten et al. 2003). This species was not observed in the 2009 aquatic surveys (USFWS 2010b) or by Dudek in 2010.

4.2.2.3 *Least Bell's Vireo*

It has been determined that the Project, under either alternative, may affect, but is not likely to adversely affect least Bell's vireo. Within the SCH Project area, suitable least Bell's vireo habitat exists in tamarisk riparian habitat, which occurs primarily along the New River. The tamarisk habitat occurs in association with the two main rivers that empty into the Salton Sea: New River and Alamo River. The habitat occurs along the edges of the rivers often as a very narrow band of vegetation. In some areas, the tamarisk scrub widens out and forms more of a patch of habitat versus a linear strip of vegetation. Based on past surveys, it is unlikely that the species occurs in this region; however, some habitat suitable for both breeding and migratory stopover is present.

Loss of or Harm to Individuals

During migration, construction activities could disturb least Bell's vireos but are unlikely to result in significant impacts on these birds. If least Bell's vireos breed onsite in the future, maintenance activities could result in nesting failure and possible mortality of a few individuals, primarily nestlings during the breeding season. The low lift pump diversion at the SCH ponds would be located adjacent to the New River. This potential impact is anticipated to be minimal and could be avoided by timing maintenance activities at those locations for outside the breeding season. If least Bell's vireo were to nest within the Project area in the future within stands of tamarisk that remain within the Project, maintenance activity disturbance could cause failure of nesting and possible mortality of some individuals. Mitigation measures incorporated into the environmental analysis of the Project include measures to conduct surveys if activities are planned during the breeding season and to avoid maintenance activities that would disturb breeding behavior/success (e.g., delaying maintenance activities or implementing noise attenuation).

Loss of Suitable Habitat

Suitable habitat for the least Bell's vireo occurs within 99.1 acres of tamarisk riparian habitat along the New River within the SCH pond area. Construction activities for the river diversion as well as the berm improvement and road construction along both sides of the river between the ponds could result in riparian habitat loss if they occur during migration. While loss of habitat is anticipated to be minimal, noise and human activity immediately adjacent to the riparian corridor could adversely affect breeding for any individuals present in that area if construction activities occur during the riparian bird breeding season (April through September) and would thus result in making the habitat unsuitable for them. Mitigation measures as identified above including preconstruction surveys, biological buffers, and noise attenuation measures to reduce impacts.

In summary, construction activities, maintenance taking place in vireo habitat, and permanent and temporary losses of riparian habitat associated with the SCH Project would have direct and indirect impacts on least Bell's vireo and their suitable habitat. Mitigation measures identified above and any additional requirements specified in the Biological Opinion from the USFWS for the Project would minimize and/or mitigate for impacts to least Bell's vireo and their habitat.

Impacts under Alternative NR-2 are largely similar to Alternative NR-3 because most of the tamarisk habitat is near the shoreline and along the New River where to the alternatives have nearly identical development features.

4.2.2.4 Southwestern Willow Flycatcher

It has been determined that the Project, under either alternative, may affect, but is not likely to adversely affect southwestern willow flycatcher. Development activities have the potential to temporarily displace southwestern willow flycatchers from some habitat areas and to reduce their ability to successfully form pairs, establish territories, build nests, forage, and defend their territories and young. Within the SCH Project area, suitable southwestern willow flycatcher habitat exists in tamarisk riparian habitat, which occurs primarily along the New River. The habitat occurs along the edges of the river often as a very narrow band of vegetation. In some areas, the tamarisk scrub widens out and forms more of a patch of habitat versus a linear strip of vegetation. Willow flycatchers were observed along the New River within the survey area as well as in a patch of habitat located south of the New River, also known as Bruchard Bay. While the identification of the birds detected in 2010 was not confirmed, there is some potential for the observed individuals to be the southwestern willow flycatcher (Patten et al. 2003). Migratory stopover areas, for either the migrant willow flycatcher subspecies (most likely the little willow flycatcher [*E. t. brewsteri*]) or the southwestern willow flycatcher subspecies, may provide critically important resources affecting local and regional flycatcher productivity and survival (Sogge et al. 1997). Thus, this species should be considered to potentially breed on site or to use the site for migratory stopover purposes.

Loss of or Harm to Individuals

Because the southwestern willow flycatcher is highly mobile and has not been observed nesting within the SCH Project area, there is little potential for Project-related construction to result in harm to, or mortality of, willow flycatchers. However, should this species nest within the SCH Project area in the future, implementation of the proposed Project could result in mortality of southwestern willow flycatchers due to destruction of nests and loss of young if construction activities occurred during the nesting season.

It is foreseeable that short-term, construction-related impacts could potentially affect the southwestern willow flycatcher in areas adjacent to construction zones. These secondary impacts include construction-related noise and ground vibration, fugitive dust, nighttime illumination, and contact with polluted runoff, and could potentially harm individual birds, young, and/or eggs. In particular, construction-related noise, vibration, and nighttime illumination could adversely affect nesting and breeding behavior, resulting in a decrease in nesting success. Mitigation measures incorporated into the environmental analysis of the Project include measures to conduct surveys if activities are planned during the breeding season and to avoid maintenance activities that would disturb breeding behavior/success (e.g., delaying maintenance activities or implementing noise attenuation).

Maintenance activities could result in a minor amount of riparian habitat loss or disturbance at the diversion location and where the river and Sea water pipelines enter the ponds. During migration, these activities could disturb southwestern willow flycatcher but are unlikely to result in significant impacts on these birds. If southwestern willow flycatchers breed on site in the future, maintenance activities could result in nesting failure and possible mortality of a few individuals, primarily nestlings during the breeding season. The low lift pump diversion at the SCH ponds would be located adjacent to the New River and operations of the pump may disrupt breeding of this species. Maintenance of and driving along the river berms during the nesting season could have similar impacts. This potential impact is anticipated to be minimal and could be avoided by timing maintenance activities at those locations for outside the breeding season. In addition, noise measures as discussed above would also be implemented for maintenance and operation activities that have been identified within the proximity of nesting southwestern willow flycatcher.

Loss of Suitable Habitat

Suitable habitat for the southwestern willow flycatcher occurs within 99.1 acres of tamarisk riparian habitat along the New River within the SCH pond area. Construction activities for the river diversion, as well as the berm improvement and road construction along both sides of the river between the ponds, could result in riparian habitat loss. If southwestern willow flycatcher were to nest within the SCH Project area in the future within stands of tamarisk that remain within the Project, riparian habitat loss from maintenance activities or due to disturbance could cause failure of nesting and possible mortality of some individuals. While loss of habitat is anticipated to be minimal, noise and human activity immediately adjacent to the riparian corridor could adversely affect breeding for any individuals present in that area if construction activities occur during the riparian bird breeding season (April through September) and would thus result in making the habitat unsuitable for them.

In summary, the southwestern willow flycatcher is highly mobile, has not been documented to nest in the SCH Project area, and is only expected to use on-site riparian habitat during migration periods, although there is potential for breeding on site. Thus, there is little potential for Project-related construction or operations, or for potential long-term secondary impacts, to result in direct impacts to willow flycatchers; however, implementation of the proposed Project could result in mortality of southwestern willow flycatchers due to destruction of nests and loss of young if such construction/grading activities occurred during the nesting season and nesting occurred on site. If southwestern willow flycatchers were to nest in the Project area in the future, maintenance activities could affect reproductive success of pairs nesting near such activities. Mitigation measures identified above and any additional requirements specified in the Biological

Opinion from the USFWS for the Project would minimize and/or mitigate for impacts to southwestern willow flycatchers and their habitat.

Impacts under Alternative NR-2 are largely similar to Alternative NR-3 because most of the tamarisk habitat is near the shoreline and along the New River where the alternatives have nearly identical development features.

4.2.2.5 Yuma Clapper Rail

It has been determined that the Project, under either alternative, may affect, but is not likely to adversely affect Yuma clapper rail. Development activities have the potential to temporarily displace Yuma clapper rails from occupied habitat and to reduce their ability to successfully form pairs, establish territories, build nests, forage, and defend their territories and young. Suitable Yuma clapper rail habitat exists in several freshwater marsh areas that occur near the Project area. Human activity and noise may potentially interfere with establishing territories and nesting.

Loss of or Harm to Individuals

Yuma clapper rails are present within freshwater marsh habitat along the drains or within freshwater marsh habitat immediately adjacent to the Project footprint. There would be no direct impacts on occupied freshwater marsh habitat because all suitable habitat is located outside of the Project footprint. Construction noise and activity near areas occupied by Yuma clapper rail, such as within Bruchard Bay or other marshes in Unit 1, could result in nesting failure if such activities occur during the breeding season (March through August). Due to the low population size of this species, any loss of individuals or their annual reproduction could adversely affect the population size. Mitigation measures incorporated into the environmental analysis of the Project include measures to conduct surveys if activities are planned during the breeding season and to avoid maintenance activities that would disturb breeding behavior/success (e.g., delaying maintenance activities or implementing noise attenuation). Furthermore, the design of interception ditches would be such that the amount of water in existing adjacent marshes (including those occupied by Yuma clapper rail) would not be affected.

Loss of Suitable Habitat

Operation of the interception ditches, particularly in NWR Unit 1 (southwest of the New River), could reduce the amount of water in adjacent marshes such as Bruchard Bay through interception of subsurface flow. Loss or alteration of marsh habitat could affect Yuma clapper rail breeding because it would reduce potential breeding habitat. Maintenance or construction within the drain interception ditches would have the potential to affect breeding habitat of this species if marsh vegetation develops in the channels, is colonized by the species, and is cleared during the nesting season. In summary, Yuma clapper rails are known to occur within suitable habitat adjacent to the Project area. Thus, there is a potential for Project-related construction or operations to result in indirect impacts on the Yuma clapper rail. Mitigation measures identified above and any additional requirements specified in the Biological Opinion from the USFWS for the Project would minimize and/or mitigate for impacts on Yuma clapper rails and their habitat.

Impacts under Alternative NR-2 are largely similar to Alternative NR-3 because both alternatives include ponds adjacent to Yuma clapper rail occupied habitat areas.

4.2.3 Fish, Crustaceans, Mollusks, and other Aquatic Organisms in the Food Web

Some aquatic organisms would be entrained with the water diverted from the New River and end up in the sedimentation basins and ultimately in the SCH ponds. Since they are freshwater species, many would survive in the sedimentation basin, but none is expected to survive in the ponds, which would typically be managed at salinities above 20 ppt. River flow downstream of the diversion would be reduced by less than 50 percent, which would also reduce the amount (volume) of aquatic habitat and its structure (e.g., depth). However, these potentially adverse conditions would only affect individuals of or habitat for non-native aquatic species that reside in the New River.

Although the Project generally would benefit aquatic species, some water quality instabilities are likely to occur, at least in some of the ponds, which could affect aquatic organisms. The nutrient load in the New River would sustain high primary productivity (primarily phytoplankton) to support invertebrates and fish. As a result, dissolved oxygen in the ponds could become very low at times, such as near dawn, due to respiration of all organisms present. Water temperatures are also expected to fluctuate in these shallow ponds on a daily and seasonal basis with thermal stratification occurring at times. The lower thermal and dissolved oxygen tolerances for fish may be exceeded under certain environmental conditions, but not necessarily at the same time, resulting in fish kills that reduce the population size in the ponds where this phenomenon occurs. The lower dissolved oxygen tolerance for some benthic invertebrate species that provide food for fish may also be exceeded at times in some locations, primarily in the deeper portions of some ponds. The duration of such events is expected to be short with rapid recovery of the fish and invertebrate populations. Impacts on aquatic species would be less than significant, but loss of adequate fish for forage could affect piscivorous birds that rely on the ponds for forage. The level of effect would depend on how extensive the fish die-off was (i.e., what proportion of fish present were killed in a pond and how many ponds were affected). The Project is designed to test various pond designs with monitoring to determine what works best to meet the Project goals and objectives and would be outlined in the adaptive management plan that would be developed for the Project.

The Project would result in a temporary disturbance or loss of shallow shoreline habitat (up to approximately 8.1 miles under either Alternative NR-2 or NR-3) where the ponds would be constructed compared to current conditions. Individuals of shoreline and shallow water foraging species would still be able to move around (outside) the ponds and forage along the Sea's other shoreline areas. Although the SCH ponds are not specifically designed for species that forage on invertebrates, the shallow water within them would provide the same amount or more suitable foraging habitat. The part of the existing shoreline not altered by the shoreline low berm, associated road, and slope protection would again be available for nesting and foraging upon completion of construction, and shorelines along the pond berms could provide additional habitat, although it may be rocky rather than sedimentary due to slope protection.

Therefore, the Project's overall effects on aquatic organisms are considered less than significant under either Alternative NR-2 or NR-3.

4.2.4 Contaminants in the Food Web

Contaminants in the water and sediment, such as selenium and pesticides, could impact biota using the SCH ponds. Breeding species that could be exposed to selenium by feeding at the SCH ponds include gull-billed tern, California brown pelican, double-crested cormorant, Caspian tern, black skimmer (*Rynchops niger*), black-necked stilt, American avocet, and western snowy plover (*Charadrius alexandrinus nivosus*). Ecorisk modeling was used to estimate potential selenium concentrations in water and biota for different Project alternatives and operations (model scenarios of river water blended with Salton Sea water to achieve 20 or 35 ppt salinity in ponds) (Sickman et al. 2011; see Appendix I of the Draft EIS/EIR). For the proposed Project, estimated fish tissue selenium concentrations would be 4.3 to 5.5 µg/g dw in ponds operated at salinities of 20 to 35 ppt, which exceeds a protective standard of 4.0 µg/g dw (Lemly 2002) but is similar to or less than existing levels at the Salton Sea and rivers (Natural Resources Agency 2007; Johnson et al. 2009; Saiki et al. 2010). Bird egg selenium concentrations would be 6.0 to 8.3 µg/g dw in ponds operated at salinities of 20 to 35 ppt, and less than 6 µg/g dw for ponds operated at 40 ppt or greater. This egg selenium concentration exceeds the conservative toxicity threshold (> 6.0 µg/g dw), which would increase the probability of reduced hatching success in some species, but would not reach levels associated with teratogenesis (>12 µg/g dw) (Ohlendorf and Heinz 2011).

The actual magnitude of selenium impacts for the SCH Project would be lower than estimated by Sickman et al. (2011). First, the ecorisk model assumed all diet comes from the SCH ponds. The actual concentrations would likely be lower than modeled because the birds' foraging range would include other habitats beyond the SCH ponds. For example, the actual concentration could be less for gull-billed terns because they forage extensively in agricultural fields and drains as well as over the Salton Sea. Second, when the model was run using parameters estimated from the SHP complex, the modeled egg selenium concentrations were greater than the actual measured egg concentrations (Miles et al. 2009), indicating that this ecorisk model is a very conservative estimator of risk. Third, selenium concentrations decreased over time at other constructed habitats in the region, both in sediment of freshwater treatment wetlands (Johnson et al. 2009) and eggs from saline ponds (Miles et al. 2009), which suggests that selenium removal pathways could develop within the first 1 to 2 years after construction (Sickman et al. 2011). Impacts of the Project on common bird reproductive success would be less than significant for bird species that forage on invertebrates due to the availability of other freshwater marsh foraging habitat in the area. For species of piscivorous birds that nest at the Sea, such as the Caspian tern, a reduction in breeding success would be unlikely, at least until fish are no longer present in the Sea, because foraging would not be limited to the SCH ponds and pond management to minimize the selenium risk would occur. To minimize selenium bioaccumulation through detritus, the SCH ponds and sedimentation basins would be designed and operated to discourage the growth of emergent vegetation, such as cattails and bulrushes, which contribute high amounts of organic matter.

Concerning pesticides, the predominant pesticide residue measured in Salton Sea sediments was DDE. The area-weighted DDE concentration (SCH Project column) of inundated pond sediment (undisturbed playa surface, borrow ditches, habitat swales, and submerged edges of berms and islands) was compared to existing conditions (i.e., DDE concentration of undisturbed surface sediment) to determine whether exposure to DDE would change due to pond construction and inundation.

For the proposed Project, the estimated DDE concentration of pond sediments would be very similar to existing conditions, with an increase of 0.7 ng/g for estimates based on mean existing DDE concentrations and an increase of 4.3 to 6.7 ng/g for estimates using only the highest observed DDE concentration (Table 6). The Project did not exceed the PEC concentration of 31.3 ng/g for any estimation. Therefore, direct and indirect impacts of contaminants caused by the proposed Project would be less than significant. These effects would be similar under either Alternative NR-2 or NR-3.

4.2.5 Diseases

Bird and fish die-offs have occurred since the Sea's creation in 1905, but their frequency and intensity have increased in the past 2 decades (Friend 2002; Moreau et al. 2007). Avian botulism, avian cholera, and Newcastle disease were determined to be the major causes of most monitored bird die-offs in the 1990s (Natural Resources Agency 2007; Moreau et al. 2007). Botulism spores occur in the sediment and are ingested by fish such as tilapia. Fish die-offs occur periodically at the Salton Sea, and fish-eating birds, especially pelicans, can die from botulism toxins ingested from dying fish. In general, outbreaks of avian cholera, a bacterial disease, occur among dense concentrations of waterfowl, usually during the winter. Most recently, outbreaks of botulism have occurred in 2006 and 2008. In the past 2 years, one episode of avian cholera began in December 2010 and ended before February 2011 (personal communication, K. Riesz 2011).

The proposed SCH ponds would have a low potential to expose birds to disease. If extensive fish die-offs occurred in the ponds due to conditions such as anoxia or temperature extremes, the dead fish could poison fish-eating birds. The conditions that result in fish die-offs in the Salton Sea are usually due to large turnover events where deep anoxic waters come to the surface. In contrast, the SCH ponds would be much shallower and experience more mixing, which is expected to result in lower biological oxygen demand and less severe conditions of anoxia. Also, pond operations could be adjusted to reduce conditions that would be stressful to fish (e.g., periodically increase flow-through rates or reduce salinities). Therefore, the relative risk of fish die-offs in the SCH ponds would be lower compared to the Salton Sea under current conditions. The risk of avian cholera in the SCH ponds would likely be similar to or lower than the risk in existing wildlife ponds at Sonny Bono NWR or IWA's Wister Unit, where densities of waterfowl are higher than expected at the SCH ponds. To reduce the risk of disease transmission and spread, the SCH ponds are designed to allow boat access for monitoring and removal of bird carcasses, if necessary. Therefore, direct and indirect impacts to disease caused by the proposed Project (under either Alternative NR-2 or NR-3) would be less than significant.

4.2.6 Beneficial Impacts

The SCH Project would benefit fish and aquatic invertebrates by restoring habitat that is more stable than the Sea's and with salinity near that of seawater. The SCH ponds would be specifically designed for piscivorous birds such as the American white pelican, Caspian tern, and double-crested cormorant, and habitat within the Project ponds would include the shallow water they require for foraging, a food source, and constructed islands that provide predator protection for resting and nesting. The amount of fish available for these birds would increase as the fish populations in the ponds develop and stabilize, and fish density should be higher than prior to Project construction. Providing forage fish as conditions in the Sea exceed the tolerance of fish currently present and the addition of islands protected from predators are beneficial impacts of the Project.

The Project would not result in a loss of shoreline greater than what would occur under the No Action Alternative, but it may result in changes to the invertebrate food base for species that rely on invertebrate food. If that occurs, the Project would be a beneficial impact for the species compared to the No Action Alternative by providing foraging opportunities that may not exist under future conditions. The Project would replace that impacted shoreline with equal or greater shoreline and provide a food source that may not exist under the No Action Alternative. For piscivorous birds, the Project would provide a food source as the source in the Salton Sea declines to a very low level with essentially no tilapia except in small areas at the drain and river outflows. The amount of fish provided, however, would be considerably less than that currently in the Sea and would support a smaller number of piscivorous birds. Consequently, after the Sea's salinity exceeds the tolerance of the fish species used by the birds, the Project would be the primary source of forage fish at the Sea, and the piscivorous bird populations would likely decline to match the more limited availability of food sources.

Overall, the Project could have beneficial impacts for piscivorous bird foraging and bird nesting on islands when compared to the existing environmental setting and the No Action Alternative. The benefits of the Project are greater under Alternative NR-3 due to the large area of ponds (3,770 acres) that would be constructed, compared with Alternative NR-2 (2,670 acres).

4.2.7 Other Wildlife

4.2.7.1 Construction Impacts

Bird Species

Construction activities could affect special-status and common bird species that are present within the Project footprint through direct habitat disturbance, noise, and human presence. Individuals immediately adjacent to Project activities also could be affected by noise. Noise has been documented to adversely affect avian reproduction, and thus, construction noise and activity, if adjacent to areas occupied by nesting birds, could result in nesting failure if such activities occur during the breeding season. These effects are expected to be similar under either Alternative NR-2 or NR-3.

Burrowing Owl. Because the burrowing owl (*Athene cunicularia*) is or could be present along the drains and berms, construction of the interception ditches and the gravity diversion pipeline and sedimentation basin could result in burrow loss and mortality of some individuals. If construction activities occurred during the burrowing owl breeding season (February through August), burrowing owl adults, eggs, or young could be trapped or killed by grading or excavation activities. Construction noise and activity, if adjacent to areas occupied by nesting burrowing owls, could result in nesting failure. If construction activities occurred during the burrowing owl wintering season and burrowing owls occupied a burrow within the construction area, the adults may be trapped, injured, or killed. Once construction was completed, burrowing owls could reestablish use of the area disturbed. No permanent loss of habitat would occur.

Maintenance of Project roads, pond berms, and sedimentation basins could temporarily affect burrowing owl nesting or wintering as described for construction (DFG 2012). Mitigation incorporated into the EIS/EIR to minimize adverse effects on burrowing owl includes provisions for avoidance of impacts to nesting or wintering burrowing owls within the Project impact area through preconstruction (or premaintenance) surveys, establishment of buffers around the active burrow, and passive relocation methods.

California Black Rail. The California black rail (*Laterallus jamaicensis coturniculus*) occupies habitat areas similar to those used by the Yuma clapper rail, and the potential for adverse effects would be the same as described in Section 4.2.2. In addition, similar mitigation measures as described in Section 4.2.2 for the Yuma clapper rail would be implemented to reduce impacts to California black rail.

Other Nesting Marsh Bird Species. Redhead (*Aythya americana*), least bittern (*Ixobrychus exilis*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*) are or could be present in freshwater marsh habitat as breeding birds within the Project area if freshwater marsh habitat is present within the drains that would be affected. Construction noise and activity could result in habitat disturbance or loss as well as nesting failure during the breeding season (April through August).

Operation of the interception ditches could affect adjacent marsh nesting habitat as described for the Yuma clapper rail. Maintenance of the drain interception ditches would have the potential to affect breeding of these species if marsh vegetation develops in the channels, is colonized by these species, and is cleared during the nesting season.

Western Snowy Plover. Because western snowy plovers are or could be present nesting and wintering along the shoreline and foraging in shallow water along the Sea's shoreline, construction activities for the ponds and drain interception ditches around the Project area could result in habitat loss and mortality of some individuals. Pond construction (primarily berm on the landward side of the ponds) would cause a small loss of foraging habitat for the western snowy plover, but other foraging habitat would remain outside the Project footprint. If construction activities were to occur during their breeding season (March through August), reproductive success for those snowy plovers in the Project footprint could be greatly reduced through the destruction of nests and nest abandonment by adults due to noise and human activity. Due to the relatively small population in the region, loss of reproduction for a portion of the breeding population at the Salton Sea for up to 2 years could have substantial effects on the population size.

The Project would result in a permanent disturbance or loss of shallow shoreline habitat (up to approximately 8.1 miles) where the ponds are constructed compared to current conditions. The loss could also include flooding of currently exposed shorelines along the bay on the eastern side of the New River. Western snowy plovers would still be able to move around (outside) the ponds and nest and forage along the Sea's other shoreline areas. Although the SCH ponds would not be specifically built for western snowy plovers, the shallow water and shoreline within them could provide suitable foraging habitat upon completion of construction. Suitable nesting habitat and foraging opportunities may also be present where not covered by shoreline protection (e.g., riprap). However, the low berm (approximately 2 feet high) with its associated road along the landward side of the ponds could eliminate or alter shoreline habitat used by western snowy plovers for resting and nesting.

Maintenance activities along the shoreline of the ponds may result in impacts on western snowy plover nesting, if maintenance takes place during the breeding season and if the species nests within the Project area.

Riparian Bird Species. Because white-tailed kite (*Elanus leucurus*), little willow flycatcher, yellow-breasted chat (*Icteria virens*), gila woodpecker (*Melanerpes uropygialis*), and crissal thrasher (*Toxostoma crissale*) are or could be present in riparian habitat along the New River within the SCH pond area, construction activities for the river diversion as well as the berm improvement and road construction along both sides of the river between the ponds could result in riparian habitat loss or disturbance that could cause failure of nesting and possible mortality of some individuals. While loss of habitat is anticipated to be minimal, noise and human activity immediately adjacent to the riparian corridor could adversely affect breeding for any individuals present in that area if construction activities occur during the riparian bird breeding season (April through September).

Maintenance activities could result in a minor amount of riparian habitat loss or disturbance at the diversion location and where the river and Sea water pipelines enter the ponds. During the breeding season, maintenance activities could result in nesting failure and possible mortality of a few individuals, primarily nestlings. Maintenance of and driving along the river berms during the nesting season could have similar impacts. This impact is anticipated to be minimal and could be avoided by timing maintenance activities at those locations for outside the breeding season.

Gull-Billed Tern and Black Skimmer. The gull-billed tern and black skimmer both occur at the Salton Sea for breeding and foraging, and both prefer to nest on islands for protection from predators because they are ground-nesting species. No island nesting sites are currently present within the Project area; however, both species have occasionally nested along the Sea’s shoreline, although with limited success. Although it is unlikely that construction would result in direct impacts on the gull-billed tern and black skimmer, nesting failure due to construction activities or noise adjacent to nesting areas could occur if construction activities, including drain interception ditch construction, took place during the species’ breeding season (April through September). Since relatively few individuals are present in the region, loss of reproduction for even a portion of the local breeding population for 1 year could have substantial effects on the population size. Construction of the river diversion and sedimentation basins would not affect any breeding habitat.

Project construction would result in a temporary disturbance or alteration of shallow shoreline habitat (up to approximately 6.3 miles) where the ponds would be constructed compared to current conditions. Although gull-billed terns and black skimmers might forage along the shoreline, few would be expected in this area because nesting is limited due to lack of predator protection along the shoreline. Construction noise and activity, if adjacent to areas occupied by gull-billed tern or black skimmer, would have a low potential to result in nesting failure if such activities occur during the breeding season (April through September).

Maintenance activities within the ponds would have the potential to affect nesting birds through noise and human presence, if such activities occurred during the breeding season and near nesting sites.

Loggerhead Shrike. Because loggerhead shrikes (*Lanius ludovicianus*) are or could be present in shrub and scrub habitat along the Salton Sea shoreline, Project construction activities for the drain interception ditches and the landward pond berm could result in temporary disturbance of suitable habitat. If these construction activities would result in habitat disturbance or loss during the breeding season (April through September), breeding efforts of any pairs present may fail. Construction noise and activity, if adjacent to areas occupied by nesting loggerhead shrikes, could result in nesting failure. Compared to the No Action Alternative and current existing conditions, the Project could result in impacts on nesting loggerhead shrike if nesting habitat is present within or immediately adjacent to the construction area. Maintenance of the drain interception ditches could affect breeding loggerhead shrikes immediately adjacent to the channels if maintenance occurred during the breeding season.

Common Bird Species. The Salton Sea and surrounding region provide nesting, wintering, and migration stopover habitat for hundreds of bird species and thousands of individuals. The Project area provides habitat for a subset of the species and individuals that occur within the greater Salton Sea area. A number of common bird species could be affected by the Project.

Because common species are or could be present nesting and/or foraging for breeding, within or immediately adjacent to the Project footprint, construction activities for the ponds, drain interception ditches around the Project area, and diversion facilities, if they were to occur during the bird breeding season (March through September), could result in destruction of nests and nest abandonment by adults due to direct disturbance or noise and human activity.

Construction activities also could result in the direct removal of snags used by colonial nesting birds, which include double-crested cormorant, great blue heron, cattle egret, great egret, and snowy egret. However, most snags could be avoided and left in place for use by birds until they deteriorated and collapsed due to natural processes. A few trees located adjacent to the New River that may be used by colonial nesters also could be removed, depending on placement of the diversion structure and conveyance pipeline crossing of the New River to reach the western ponds as well as improvement of the river berms. However, the Project structures would be placed to minimize or avoid impacts on the maximum extent feasible.

Mitigation Measures

The EIS/EIR includes mitigation measures to offset significant impacts on birds including MM BIO-2: Prepare and implement a preconstruction/maintenance survey plan for bird species, MM BIO-3: Conduct noise calculations/measurements and implement noise attenuation measures, if needed, and MM BIO-4: Design interception ditches to avoid alteration of water levels in adjacent marshes. The implementation of these measures would reduce impacts to nesting birds within and adjacent to the Project site to a level which is less than significant.

4.2.7.2 Operational and Maintenance Impacts

Birds

During operations, noise from the pump that brings saline water to the ponds is unlikely to affect breeding because it would be located at the edge of the outer berm and offshore (approximately 3,000 feet or more from the existing shoreline), or on the exposed playa/seabed when the Sea recedes that far.

Burrowing Owl. Pump stations and pipelines bringing saline water from the Salton Sea to mix with the water for salinity control in the ponds are unlikely to affect burrowing owls unless they had nesting or wintering burrows within the small area where the pipeline would cross the river bank. As the Salton Sea recedes, the outer pump station may require relocation or reconstruction and a pipeline extension placed on or within the exposed playa/seabed. These activities would not affect burrowing owls because none is expected to be present in the recently exposed playa/seabed due to lack of suitable habitat.

California Black Rail. Operation and maintenance of the pump stations to bring saline water to the ponds would not affect breeding of the California black rail because no suitable habitat for these species is present at or near those locations. Maintenance of the ponds would not affect these species because salinity of the habitat pond water and design of the sedimentation basins (steep slopes, water depth greater than emergent vegetation can grow in) would prevent development of marsh habitat used by this species. Noise from maintenance activities within the ponds would not be high enough to affect rails in nearby habitats due to attenuation with distance. The sedimentation basins are designed to minimize growth of emergent vegetation with maintenance at least annually so that no habitat suitable for California black rail would develop.

Other Nesting Marsh Bird Species. Operation and maintenance of the pump stations to bring saline water to the ponds would not disrupt breeding of the redhead, least bittern, or yellow-headed blackbird because no suitable habitat for these species is present at or near those locations. As described for the rail species, the Project ponds and sedimentation basins would not provide suitable habitat for marsh bird nesting.

Western Snowy Plover. Operation of the pump stations to bring saline water to the ponds would not disrupt breeding of the western snowy plover because no suitable nesting habitat for the species is present at the location of the pump stations.

Loggerhead Shrike. Operation and maintenance activities for the ponds and pump stations are not expected to affect loggerhead shrike breeding because these activities would not occur in or adjacent to nesting habitat.

Riparian Bird Species. Operation of the pump stations to bring saline water to the ponds would not disrupt breeding of the riparian bird species because no suitable nesting habitat for these species is present at the pump stations' locations.

Common Bird Species. Maintenance activities have the potential to disturb bird nesting on the islands and along the berms if such activities occurred during the breeding season. Such disturbances could cause nest abandonment or nest destruction if physical activities occurred on the islands or along the berms. During operations, both pump stations would provide an isolated structure that could be used by some species of birds for resting, roosting, or even nesting. These structures may include deterrents to bird use. If such deterrents are not used or are not effective, maintenance of the pump stations would intermittently disturb any birds using the structures. Disturbance during the nesting season could result in nest failure for the pairs using the structures.

Operation of the pump stations to bring saline water to the ponds would not disrupt breeding of common birds that nest within the Project area because the pump stations would be located adjacent to the seaward side of the outer berm and in the Sea away from any nesting habitat, including the islands within the ponds. Maintenance activities have the potential to disturb bird foraging throughout the Project. Effects on foraging, however, would be less than significant because maintenance would occur in only a portion of the ponds at a time leaving other foraging areas available nearby within the Project area.

The sedimentation basins adjacent to the river diversion would likely attract birds, such as ducks and gulls, that rest on the water surface. Due to the basin's steep sides and annual maintenance, foraging and nesting habitat for these species would not develop. The basin, therefore, would not increase the population size of these birds. Ducks and geese are present at the Salton Sea primarily during the winter when the duck clubs operate, and the amount of surface water provided by the basin (approximately 40 acres) would be small compared to that of the duck clubs. Piscivorous birds may use the basin to forage if populations of fish develop from individuals entrained with the diverted water.

In summary, operations and maintenance impacts to birds are considered less than significant under either Alternative NR-2 or NR-3.

4.2.7.3 Beneficial Impacts

The SCH ponds would provide additional habitat for desert pupfish after the Salton Sea exceeds their water quality tolerances. Isolated populations would remain where the drains and tributaries (rivers and several streams) enter the Sea, but the ponds would provide approximately 2,178 acres of habitat with suitable water quality under Alternative NR-2 and 3,285 acres under Alternative NR-3. In addition, the interception ditch would maintain connectivity among pupfish populations in drains adjacent to the Project (allow fish movement along the shoreline between drains).

The SCH ponds are specifically designed to attract gull-billed tern and black skimmer, among several other special-status bird species, and the habitat provided would include the shallow water they require for foraging, a food source, and constructed islands that would provide predator protection for nesting upon completion of construction, which would increase the amount of habitat for these species. The addition of islands protected from predators and a food source for piscivorous birds is a beneficial impact of the Project.

Increasing salinity in the Sea may result in changes to the invertebrate food base for species during the Project. If, under the No Action Alternative conditions, the increased salinity changes the prey base and the food source is unsuitable for the western snowy plover, the Project would have a beneficial impact on this species by providing foraging opportunities that may not exist under the No Action Alternative.

4.2.8 Special Aquatic Sites

Special aquatic sites identified within the Project area include wetlands and the Sonny Bono NWR. Impacts on wetlands are addressed in Section 4.2.1. Impacts on the Sonny Bono NWR are addressed in Section 4.3.5.

Table 16 provides a summary of impacts on wetlands and the amount of new pond wetlands to be created as a result of each alternative. Under both alternatives, approximately 883 acres of disturbed upland areas would be converted to wetland waters of the U.S. The remaining acreage of wetlands created is the conversion of existing non-wetland waters to wetlands. Due to the size of Alternative NR-3, more non-wetland waters would be converted to wetlands.

Table 16
Wetlands Impacts and Pond Creation

Impact/Creation Type	Alternative NR-2 (acres)	Alternative NR-3 (acres)
Current Jurisdictional Wetlands within Project Area	544.7	544.7
Permanent Loss of Wetlands	38.0	38.0
Permanent Conversion of Wetlands to Ponds	389.8	389.8
Additional Wetlands Created Through Constructed Ponds[a]	1,788.4	2,895.7

[a] This includes both the conversion of non-wetland waters to wetlands and converting disturbed uplands to wetland waters.

4.3 Impacts on Human Use Characteristics

4.3.1 Municipal and Private Water Supplies

The local groundwater conditions reflect a shallow perched water table that receives inflows from the IID drains and applied water that is not captured in on-farm drains. The Project would store water on otherwise dry playa and, therefore, would provide seepage (additional water) to the shallow groundwater system. The interception ditch would intercept a portion of this seepage, and the remainder would flow toward the Salton Sea. This Project would not interfere with or cause a deficit in groundwater resources and, therefore, would not cause an adverse impact on groundwater. If future studies suggest that shallow groundwater is a potential water supply for the Project, additional environmental review would be needed before that supply can be used. The proposed Project, under either Alternative NR-2 or NR-3, would not have impacts on municipal and private water supplies.

4.3.2 Recreational and Commercial Fisheries

As discussed in Section 3.4.2, the Project area does not support recreational or commercial fisheries. Fish would not be intentionally stocked for the purpose of providing angling opportunities. Nevertheless, such opportunities may be provided at the SCH ponds, in particular for tilapia. Fish populations would be monitored as a metric of the SCH Project's success. If populations became well established and appeared to provide fish in excess of what birds were consuming, angling could be allowed. The proposed Project, under either Alternative NR-2 or NR-3, may have beneficial effects on recreational fisheries.

4.3.3 Water-Related Recreation

The SCH Project is not specifically designed to accommodate recreation because the provision of recreational opportunities is not a Project goal. Nevertheless, some recreational activities would be available to the extent that they are compatible with management of the SCH ponds as habitat for piscivorous birds dependent on the Salton Sea.

Public access could be allowed to facilitate day use, hiking, bird-watching, and nonmotorized watercraft use. However, management plans may require that certain areas be seasonally closed to human activities to avoid disturbance of sensitive birds. When bird nesting was observed by SCH managers, human approach would be limited by posted signs. Hours of public access could be restricted to early morning during hot weather when nesting birds are present.

Waterfowl hunting would be allowed consistent with the protection of other avian resources.

The water diversion would be located in the bank of the New River adjacent to the ponds while the sedimentation basins would be located within the pond footprint and would not affect recreational opportunities.

Overall, Project impacts on recreational resources would be beneficial under either Alternative NR-2 or NR-3.

4.3.4 Aesthetics

Construction of the SCH ponds and associated components would involve extensive excavation and the formation of berms and islands. Trucks and light vehicles would traverse nearby roads each day in order to transport workers and haul construction materials, but these would not cause a substantial visual change since trucks and heavy equipment are typically used in agricultural settings.

Views by visitors to the Sonny Bono NWR during Project construction would be dominated by heavy machinery engaged in ground-disturbing construction activities and dust emissions. Individuals viewing the Project from this area would likely be sensitive to changes in the visual environment; however, access is limited in this area and construction would only occur temporarily.

Construction would likely disrupt normal wildlife patterns in the immediate vicinity, but this change would be temporary, and wildlife-viewing opportunities would be available at the nearby Sonny Bono NWR and IWA.

Once operational, views of the Project site would likely be of the berms and dikes that contain the SCH ponds due to the angle of view from which travelers along SR-86 and nearby agricultural areas view the site. Because of the distance (over 2 miles from the nearest pond site), the Project site would likely be undistinguishable from the surrounding area. There would be little contrast between the Project and the adjacent agricultural areas and remaining open water of the Salton Sea. No impacts on the visual environment would occur when the Project was viewed from this distance.

The SCH ponds would be constructed in areas that are currently or were recently submerged. Upon completion of construction, the area viewed from points within the Sonny Bono NWR would consist primarily of SCH ponds surrounded by berms. The ponds and nesting islands are considered a more aesthetically pleasing setting than the exposed playa that would be present when construction begins. The SCH ponds are intended to provide habitat for birds, which would also contribute to the area's scenic qualities. The scenic quality and character of the site would be improved compared to the No Action Alternative.

Views from the Sonny Bono NWR may include a trailer that would be present at the site for use by permanent employees. The trailer would be compatible with existing agricultural uses that predominate. The sedimentation basins that would be located adjacent to the New River within the pond footprint would also be compatible with agricultural uses. The diversion structure would require the removal of a small amount of vegetation on the New River bank, but the disturbed area would be minor and would not be visible from sensitive viewpoints at the Sonny Bono NWR. The seawater pump stations would be located on platforms at the outer berm and in the Sea and may have to be relocated as the Sea recedes. A pipeline would be required to bring seawater to the ponds. Such small-scale facilities would be visually compatible with surrounding agricultural uses.

It is possible that some activities, such as dredging, may occur 24 hours a day and require night lighting. This impact would be temporary, and the site is located in a remote rural area, well-removed from populations who could be affected by the increased night lighting. Therefore, the proposed Project, under either Alternative NR-2 or NR-3, would have minimal impacts to aesthetics.

4.3.5 Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

As discussed in Section 3.4.5, the Project area includes lands within the Sonny Bono NWR. IID owns the land where the SCH ponds would be located and the Natural Resources Agency would lease the land from IID for the Project's duration. IID already leases much of the land where the ponds would be located to the USFWS for management of the Sonny Bono Salton Sea NWR. The USFWS is also planning to develop a restoration project at Bruchard Bay. This area is adjacent to, but outside of, the area proposed for the SCH Project. The Unit 1 A/B Ponds Reclamation Project is planned for a separate portion of the NWR at the southern tip of the Salton Sea. This area is within the current footprint of the proposed SCH Project at the New River. The SCH agencies would coordinate with the USFWS to maximize the constructability of both projects; however, the USFWS considers the SCH Project a priority in this area and if reclamation of part or all of the old Unit 1 A/B Ponds is not possible as a result of the SCH Project, the USFWS prefers to seek reclamation alternatives elsewhere (personal communication, C. Schoneman 2011).

An agreement between DFW and USFWS would be established prior to construction of the SCH Project, under either Alternative NR-2 or NR-3, in order to ensure compatibility between NWR uses and the SCH Project. Therefore, preserves are expected to be minimally impacted by the proposed Project.

4.4 Determination of Cumulative Effects on Waters of the U.S.

Cumulative effects associated with the Project are described in detail in Section 4.0 of the Draft EIS/EIR. The Draft EIS/EIR had determined there would be no cumulative impacts on Agricultural Resources and Land Use and Recreation, and a less than significant impact for Aesthetics, Energy Consumption, Geology and Soils, Greenhouse Gas Emissions, Hydrology and Water Quality, and Noise. The Draft EIS/EIR found that with implementation of mitigation measures for the proposed Project, as well as general required measures for other projects, cumulative impacts would be reduced to less than significant for Biological Resources, Cultural Resources, Hazards and Hazardous Materials, and Paleontological Resources. The Draft EIS/EIR also found that cumulative impacts were significant and unavoidable after implementing mitigation measures for Environmental Justice and Air Quality.

The geographic scope for the environmental resources cumulative impact analysis consists of the Salton Sea Hydrologic Unit Code (HUC) 8 watershed within Imperial County. This geographic area was chosen because the entire Salton Sea HUC 8 watershed would be too large of an area to provide a meaningful cumulative analysis. Therefore, only the portion of the watershed within the boundaries of Imperial County that could influence the southern portion of the Salton Sea (where the proposed Project is located) was analyzed. As discussed above, a small amount of permanent loss of jurisdictional resources would be caused by either alternative, which would immediately be offset by the additional jurisdictional resources created. In addition, both Alternative NR-2 and NR-3 would preserve more jurisdictional resources compared to the No Action Alternative, although Alternative NR-3 would preserve more jurisdictional resources than Alternative NR-2 due to its larger size. A 404 permit would be required for the SCH Project, under either alternative, containing permit conditions that would ensure that impacts of this Project on waters of the U.S. were minimized, as well, and any cumulative impacts from the issuance of such permits also would be minimized. Construction, operation, and maintenance of the other past, present, or reasonable foreseeable projects could result in significant cumulative impacts on biological resources associated with the loss of habitat and individuals of special-status species, disturbance or loss of riparian or other sensitive habitats, and adverse effects on Federal waters of the U.S., including wetlands. Although the SCH Project alternatives would have overall beneficial impacts on biological resources, construction, maintenance, and operations would result in significant impacts, and their contribution would be cumulatively considerable. Feasible mitigation measures would reduce potential impacts of other projects, and implementation of MM BIO-1, a desert pupfish relocation plan; MM BIO-2, preconstruction and maintenance surveys; MM BIO-3, noise measurements and as-needed noise attenuation features; and MM BIO-4, a habitat mitigation and restoration plan, would reduce the SCH Project's contribution to cumulative impacts on biological resources to less than significant.

4.5 Determination of Least Environmentally Damaging Practicable Alternative (LEDPA)

As presented in Section 4, Alternatives NR-2 and NR-3 have similar impacts. The footprints of the two alternatives are identical, expect Alternative NR-3 includes additional cascading ponds towards the center of the Salton Sea. These additional ponds would result in additional impacts on jurisdictional resources (mainly open water) in this location, but effects on listed species, water quality, hydrology, other wildlife species, and human use would not increase as a result of construction of these additional ponds. These additional ponds provide a benefit of establishing 1,107 acres of additional habitat area compared to Alternative NR-2. Alternative NR-3 would result in approximately 20 more acres of permanent loss than Alternative NR-2 due to the additional berms; however, this would be immediately offset by the creation of 883 acres of wetland waters of the U.S. Although both alternatives would create the same amount of additional wetland waters (883 acres), this increased acreage would only be short-term due to the recession of the Sea. Therefore, only the total acreage of ponds created by the Project would continue to support jurisdictional resources and provide functions and services attributed to aquatic resources, while surrounding areas are eventually expected to convert to non-jurisdictional uplands. Alternative NR-3 would preserve more area as jurisdictional resources (3,285 acres) than would Alternative NR-2 (2,178 acres). Therefore, although the immediate short-term impacts would be slightly higher under Alternative NR-3, the long-term environmental benefits would also be higher for Alternative NR-3.

The Corps finds that the long-term potential benefits of creating the additional constructed pond area outweighs the increased short-term impacts of Alternative NR-3, especially given the long-term fate of these areas if no project was constructed. Alternative NR-3 is therefore determined to be the LEDPA.

5.0 MITIGATION PROPOSED BY THE APPLICANT

The proposed Project purpose is to restore aquatic habitat along the Salton Sea; therefore, the majority of impacts on waters of the U.S., while permanent (because the proposed Project would alter the elevation and contours), would not result in a loss of waters of the U.S. The pond sites would be converted from one aquatic resource habitat type to another. In addition, the small amount (90.1 acres) of permanent impacts that would result in a loss of waters of the U.S. under Alternative NR-3 (the LEDPA) would be from the creation of berms, diversion structures, and sedimentation basins, which are essential components of the proposed Project and are required to create the restored areas. The LEDPA (Alternative NR-3), when completed, would restore a total of 883.4 acres of waters of the U.S. that currently are non-jurisdictional upland playa, resulting in an overall net gain of 793.3 acres (restored waters of the U.S. minus loss of waters due to Project implementation). Therefore, in accordance with the EIS/EIR for the SCH Project, no Project-specific compensatory mitigation for impacts on jurisdictional wetlands and waters of the U.S. is required. Due to the beneficial nature of the Project for water quality, wildlife habitat, and special-status wildlife species, the Project is considered to be self-mitigating. However, the Corps would review and approve the adaptive habitat management plan that would be developed with this Project and require monitoring reports to be available for Corps review upon request to ensure that habitat restoration is successful and functioning as intended.

Temporary impacts also would occur during construction from the use of temporary components such as staging areas and crossings, and the Corps requires full restoration of all temporarily impacted areas. If such areas are not fully restored, then impacts are considered permanent and may require additional mitigation. The applicant has prepared a Draft HMMP, which quantifies and describes the mitigation measures and Corps requirements. The HMMP is focused primarily on providing guidance for replacement of wildlife habitat that would be impacted by non-pond features of the SCH Project, in accordance with MM BIO-5 from the EIS/EIR.

The Corps' restoration requirements would be applied to both temporary and permanent impacts. Temporary impacts would be restored at a minimum of 1:1 ratio at impact sites for both native and non-native plant communities, in accordance with the Corps' definition of temporary impacts. The focus of the restoration effort would be to restore habitat for wildlife in accordance with MM BIO-5. The HMMP provides an implementation plan to ensure the successful restoration of wetlands, including restoration of all areas of temporary impact. The HMMP identifies roles and responsibilities of various entities involved in the restoration, describes restoration goals and objectives, and identifies suitable restoration sites. It also includes a restoration work plan with recommended methodologies for site preparation, seeding/planting, irrigation, etc.; a maintenance plan; specific monitoring and reporting requirements, including site performance standards; and a description of long-term management of the restoration sites.

The Project also includes provision for an Operations Plan and an Adaptive Management and Monitoring Plan. The Draft EIS/EIR includes initial framework drafts of these documents in

Appendix D (Project Operations) and Appendix E (Monitoring and Adaptive Management Framework). These documents would govern operations of the Project and the collection of monitoring data to assess the effectiveness towards the various goals and objectives of the program.

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ATTACHMENT 4

Mitigation Monitoring and Reporting Program

ATTACHMENT 4

MITIGATION MONITORING AND REPORTING PROGRAM

1.1 INTRODUCTION

Both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) require the implementation of a monitoring program to ensure that mitigation measures included in an Environmental Impact Statement (EIS) or Environmental Impact Report (EIR) are being implemented as described in their respective documents. Under NEPA, the regulations require that "a monitoring and enforcement program shall be adopted…where applicable for mitigation" (40 CFR section 1505.2(c). In addition, the regulations state that agencies may "provide for monitoring to assure that their decisions are carried out and should do so in important cases" (40 CFR section 1505.3). Monitoring plans and programs should be described or incorporated by reference in the agency decision documents. Under CEQA, a public agency is required to adopt a program for monitoring or reporting on the changes to a project that it has required and the measures it has imposed to mitigate or avoid significant environmental impacts (CEQA Guidelines section 15097; refer also to CEQA Guidelines section 15091(d) and section 21081.6 of the California Public Resources Code).

This Mitigation Monitoring and Reporting Program (MMRP), which is included as part of the Final EIS/EIR for the Salton Sea Species Conservation Habitat Project (SCH Project), includes a list of mitigation measures that would be implemented if the preferred alternative were approved and implemented and describes the process whereby the mitigation measures would be monitored.

1.2 OVERVIEW OF THE CORPS' PREFERRED ALTERNATIVE / CALIFORNIA NATURAL RESOURCES AGENCY'S PROPOSED PROJECT

The preferred alternative/least environmentally damaging practicable alternative/proposed project (Alternative 3 in the Draft EIS/EIR) would create approximately 3,770 acres of shallow ponds, contained within low berms, on either side of the New River at elevations less than -228 feet mean sea level. The ponds would be supplied with a combination of brackish and saline water. This water would be pumped from the New River and Salton Sea, respectively, and blended to maintain an appropriate salinity range. The SCH Project is designed as a "proof-of-concept" project in which several Project features, characteristics, and operations could be tested under an adaptive management framework. The proof-of-concept period would last for approximately 10 years after completion of construction. By that time, managers would have had time to identify those management practices that best meet the Project goals. After the proof-of-concept period, the Project would be operated until the end of the 75-year period covered by the Quantification Settlement Agreement (2078) or until funding were no longer available. The SCH ponds would be constructed and operated by the California Department of Fish and Wildlife (DFW), on behalf of the California Natural Resources Agency, who would be responsible for ensuring that mitigation measures are implemented prior to, during, and after construction of the Project. If another alternative is selected by the decision makers, or if Alternative 3 is modified as part of the approval process, this MMRP will be updated to ensure that all applicable mitigation measures are implemented.

1.3 MITIGATION MONITORING AND REPORTING PROGRAM

The categories identified in the MMRP are described below:

- **Mitigation Measure.** This column provides the text of the mitigation measures identified in the Draft EIS/EIR.

- **Timing/Schedule.** This column lists the time frame in which the mitigation would take place.
- **Implementation/Monitoring Method.** This column identifies the methods that would be used to ensure that the mitigation measure is implemented correctly.
- **Responsible Entity.** This column identifies the entity or entities responsible for complying with the requirements of the mitigation measure.
- **Check-Off**. This column is for verifying compliance and is to be dated and initialed by the responsible entity**.**

SCH Project Mitigation Monitoring and Reporting Program

Mitigation Measure	Timing/Schedule	Implementation/ Monitoring Method	Responsible Entity	Check-Off
Air Quality				
Mitigation Measure AQ-1: **Implement fugitive PM_{10} control measures.** The following measures will be incorporated into the construction contract specifications in order to reduce PM_{10} emissions from fugitive dust: ▪ Water exposed soil so that visible dust emissions would be limited to 20 percent opacity for dust emissions at all times (as indicated by soil and air conditions). ▪ Replace ground cover in disturbed areas as quickly as possible. ▪ Limit vehicle speed for all construction vehicles to 15 miles per hour on any unpaved surface at the construction site. ▪ Develop a trip reduction plan to achieve a 1.5 average vehicle ridership for construction employees.	Prior to and during construction.	DFW shall confirm measures are incorporated into the contract specifications; DFW or designated monitor shall confirm compliance by monitoring during construction.	DFW Project Manager and/or designated monitor.	Initials: Date:
Mitigation Measure AQ-2: **Implement diesel control measures.** The following measures will be incorporated into the construction contract specifications in order to reduce PM_{10} and NO_x emissions from diesel engines: ▪ A schedule of low-emissions tune-ups will be developed and such tune-ups will be performed on all equipment, particularly for haul and delivery trucks. ▪ Ultra-low-sulfur ($\leq$ 15 ppmw S) fuels will be used in all stationary and mobile equipment. ▪ Curtail construction during periods of high ambient pollutant concentrations as directed by the ICAPCD. ▪ Reschedule activities to reduce short-term impacts to the extent feasible.	Prior to and during construction.	DFW shall confirm measures are incorporated into the contract specifications; DFW or designated monitor shall confirm compliance by monitoring during construction.	DFW Project Manager and/or designated monitor.	Initials: Date:
Biological Resources				
Mitigation Measure BIO-1: **Prepare and implement a desert pupfish protection and relocation plan.** This plan is applies primarily to construction and maintenance of the drain interception ditches but will also apply to pond construction and maintenance activities as noted and will provide:	Prior to and during construction and maintenance.	DFW shall confirm preparation of the plan. DFW or designated monitor shall confirm compliance by monitoring during construction and maintenance.	DFW Project Manager and/or designated monitor.	Initials: Date:

1. Protocols for preconstruction or premaintenance surveys to assess species presence and spawning within or immediately adjacent to work areas (e.g., in the drains/drain channels, along the shoreline if construction is in the "wet," and around the pond margins for maintenance); 2. Capture (e.g., trapping in the drains for construction and maintenance; or trapping, dip netting, and seining in the ponds if drained or if the water level is dropped) and transport methods to minimize handling and stress as well as exposure to heat, low DO, and crowding; 3. Identification of locations for release of captured desert pupfish; 4. Timing windows when construction or maintenance in shallow shoreline areas and in the drain mouths/channels may be conducted with minimal effects on desert pupfish spawning; 5. Protocols for maintenance activities in the drain interception ditches, such as a rotating schedule to ensure only a portion of the channel is maintained at one time, clearing only part of the vegetation at one time, and timing of maintenance to avoid peak spawning; 6. Maintenance protocol for the 1/8-inch mesh screen on the saline water intake until salinity reaches 68 ppt; and 7. Adaptive management procedures that include assessment of mitigation measure effectiveness, development of revised measures to improve effectiveness, and similar assessment of revised measures to verify effectiveness. All desert pupfish mitigation measures will be in conformance with the Biological Opinion from USFWS for the Project.				
Mitigation Measure BIO-2: Prepare and implement a preconstruction/maintenance survey plan for bird species. The plan will include preparation of suitable habitat maps that are updated periodically to focus survey locations as well as survey methods consistent with current science and regulations. Adaptive management measures will also be included in the plan.	Prior to and during construction and maintenance.	DFW shall confirm preparation of the plan. DFW or designated monitor shall confirm implementation of plan prior to construction and maintenance.	DFW Project Manager and/or designated monitor.	Initials: Date:
Mitigation Measure BIO-3: Conduct noise calculations/measurements and implement noise attenuation measures, if needed. Based on equipment specifications, calculate or measure the distance from equipment where noise would be greater than or equal to 60 A-weighted decibels (dBA) equivalent sound level (L_{eq}). This would also include multiple noise sources, if applicable. Then, use that distance to determine	Prior to and during construction and maintenance.	DFW shall confirm noise measurements and work schedule. DFW or designated monitor shall confirm compliance by monitoring during construction and maintenance.	DFW Project Manager and/or designated monitor.	Initials: Date:

where noise could exceed 60 dBA L_{eq} within known or potential nesting habitat adjacent to the Project footprint. If any such overlaps occur, schedule work to avoid the breeding season in those areas. If construction must occur during the breeding season at those sites, monitor nesting activity to determine if any effects are occurring. If effects are observed, implement noise attenuation measures such as noise walls and hay bales. Monitor the noise and bird behavior to verify that attenuation measures are successful. Develop and implement additional protection measures if monitoring shows that impacts are still occurring. If noise would be less than 60 dBA L_{eq}, no additional measures are required. (Note: The threshold of 60 dBA L_{eq} used here to protect bird nesting is a conservative estimate of the level above which adverse effects could occur. The actual threshold varies by species and type of noise.)				
Mitigation Measure BIO-4: Design interception ditches to avoid alteration of water levels in adjacent marshes. Design of the interception ditches will balance local surface and subsurface water movement so that the amount of water in adjacent marshes is not affected. Implementation of MM BIO-4 would avoid impacts on adjacent marsh habitat for nesting birds.	During Project design.	DFW shall confirm design; specifications shall be included in final construction plans.	DFW Project Manager.	Initials: Date:
Mitigation Measure BIO-5: Prepare and implement a Habitat Protection, Mitigation, and Restoration Program. Plan preparation will be complete prior to commencement of construction. The restoration program will address the following considerations: 1. Avoidance of sensitive and riparian habitats to the greatest extent feasible, including avoidance of disturbances in or near these habitats during the bird breeding season. 2. Quantifying maximum area of naturally occurring plant communities that could be temporarily and permanently removed for construction of Project facilities, by plant community. 3. Restoration at a minimum rate of 1:1 for nonnative plant communities (i.e., tamarisk woodland or scrub) and 3:1 for native plant communities temporarily removed during Project construction, or as required in Project permits. Habitats restored at 1:1 will be preferentially restored where they were removed, unless it is infeasible or a more desirable off-site location is identified. Species to be used in restoration may include either those that were removed or native species that occur or occurred naturally in the Project area and are suitable	Prior to construction.	DFW shall confirm preparation of the plan. DFW or designated monitor to confirm implementation of plan and that performance criteria are met.	DFW Project Manager and/or designated monitor.	Initials: Date:

to the site. If native species are used to replace nonnative species, mitigation ratios can be reduced. For restoration of tamarisk temporarily removed, natural colonization of the disturbed area is likely to occur and no planting may be needed. The area would still be monitored to document restoration. Permanently removed riparian habitat within the pond area would be replaced by aquatic habitat of equal surface area with a similar or greater ecological value. 4. Identification of locations for on- and off-site restoration, including funding for land purchases and/or easements and agreements with property owners to complete the restoration. 5. Use of only local native seed (or propagule) sources for native species used in restoration. 6. Details on propagation, planting/seeding, irrigation, maintenance (including weed control for species that could interfere with restoration), site access, remedial measures, monitoring, reporting, and photo-documentation. These details will be specific to each site if more than one planting area or type is addressed in the plan. 7. Performance criteria to be met for each habitat type being restored. 8. Monitoring, with a funding source, until performance criteria are met, which may be for a minimum of 5 years.				
Mitigation Measure BIO-6: Clean equipment prior to site delivery. Specifications for ensuring that all equipment, personal gear, and materials brought to the site are clean and free of invasive plants (including seeds) and animals will be included in all construction and maintenance contracts. Equipment, gear, and other materials will be inspected to verify that it is clean.	Prior to and during construction, operation, and maintenance.	Specification shall be included in all construction and maintenance contracts. DFW or designated monitor shall confirm compliance by monitoring during construction, operations, and maintenance.	DFW Project Manager and/or designated monitor.	Initials: Date:
Cultural Resources				
Mitigation Measure CR-1: Prepare and implement a survey plan and an inadvertent discovery plan. A plan for the survey of Project areas not previously surveyed would be prepared to facilitate identification of cultural resources prior to initiation of ground-disturbing activities. A plan for the inadvertent discovery of cultural resources and human remains also would be prepared and would provide protocols for addressing the discovery of cultural resources and human remains including, but not limited to, monitoring; immediately halting all construction in the vicinity of a discovery; investigation of the discovery by an archaeologist that meets the	Prior to and during construction.	DFW shall confirm preparation of the plan. DFW or designated monitor shall confirm compliance by monitoring during ground-disturbing activities.	DFW Project Manager and/or designated monitor.	Initials: Date:

Secretary of the Interior's Standards and Guidelines for Professional Qualifications in order to evaluate the eligibility of the resources pursuant to CRHR and NRHP criteria; and implementation of California Health and Safety Code section 7050.5, CCR section 15064.5(d) and (e), and, if applicable, 36 CFR part 800.13. Resources considered significant would be avoided or subject to a data recovery program. The data recovery program would be designed in consultation with appropriate state (i.e., Office of Historic Preservation) and Federal agencies and include excavation of an archaeological site to recover any buried artifacts or other data.				
Hazards and Hazardous Materials				
Mitigation Measure HAZ-1: Worker training will be provided to workers who may be exposed to air-borne diseases during excavation activities. Training will include recognizing symptoms and use of personal protective equipment.	Prior to and during construction.	DFW shall confirm the preparation of the plan. DFW or designated monitor shall confirm prior to and during construction.	DFW Project Manager and/or designated monitor.	Initials: Date:
Paleontological Resources				
Mitigation Measure PALEO-1: Prepare and implement a survey plan and a paleontological monitoring plan. A plan for the survey of Project areas will be prepared to facilitate identification of paleontological resources prior to initiation of ground-disturbing activities. Additionally, prior to construction, a certified paleontologist retained by the lead agencies will supervise monitoring of construction excavations and produce a Paleontological Resource Management Recovery Plan. Paleontological monitoring will include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor will have authority to temporarily divert grading away from exposed fossils to recover the fossil specimens. Monitoring will take place on a full-time basis when construction occurs at depths greater than 5 feet, part-time (4 hours a day) when excavations exceed 2 feet, and on a spot-check basis on excavations less than 2 feet. The paleontologist will document interim results of the construction monitoring program with monthly progress reports. Additionally, at each fossil locality, field data forms will record that locality, stratigraphic columns will be measured, and appropriate scientific samples will be submitted for analysis.	Prior to and during construction.	DFW shall confirm preparation of the plan. DFW or designated monitor shall confirm compliance by monitoring during ground-disturbing activities.	DFW Project Manager and/or designated monitor.	Initials: Date:
Mitigation Measure PALEO -2: Conduct worker training. Construction supervisors and crew will receive training by a certified paleontologist in the procedures for identifying and protecting paleontological resources, as well as procedures to be	Prior to construction.	DFW or designated monitor shall confirm compliance by verifying worker training.		Initials: Date:

implemented in the event fossil remains are encountered during ground-disturbing activities.				
Mitigation Measure PALEO -3: Prepare and implement a paleontological resource data recovery plan. If fossils are encountered during construction, construction activities will be temporarily diverted from the discovery, and the monitor will notify all concerned parties and collect matrix for testing and processing as directed by the Project paleontologist. To expedite removal of fossil-bearing matrix, the monitor will be empowered to request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Construction will resume at the discovery location once all the necessary matrix is stockpiled, as determined by the paleontological monitor. Testing of stockpiles will consist of screen washing small samples to determine if important fossils are present. If such fossils are present, the additional matrix from the stockpiles will be water screened to ensure recovery of a scientifically significant sample. Samples collected will be limited to a maximum of 6,000 pounds per locality. The Project paleontologist will direct identification, laboratory processing, cataloguing, analysis, and documentation of the fossil collections. When appropriate, splits of rock or sediment samples will be submitted to commercial laboratories for microfossil, pollen, or radiometric dating analysis. Prior to construction, the lead agencies will enter into a formal agreement with a recognized museum repository and will curate the fossil collections, appropriate field and laboratory documentation, and the final Paleontological Resource Recovery Report in a timely manner following construction. A final technical report will be prepared to summarize construction monitoring and present the results of the fossil recovery program. The report will be prepared in accordance with SVP guidelines and lead agency requirements. The final report will be submitted to the lead agency and the curation repository.	Prior to and during construction.	DFW shall confirm preparation of the plan. DFW or designated monitor shall confirm compliance by monitoring during ground-disturbing activities.	DFW Project Manager and/or designated monitor.	Initials: Date:

ATTACHMENT 5

Draft EIS/EIR Appendices D and G-2

APPENDIX D

Project Operations

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Project Operations

D.1 Introduction

The Species Conservation Habitat (SCH) ponds are intended to be operated in a manner that would both provide a partial in-kind replacement for some of the near-term habitat losses at the Salton Sea (the Sea) and answer key questions regarding the development of shallow-water habitat as part of a long-term restoration program at the Sea. Operations of the Salton Sea SCH Project (Project) components would have to balance habitat requirements necessary to achieve desired objectives against competing constraints such as environmental limitations (physical, water quality, and climatological conditions); compatibility with existing and future adjacent land uses (agricultural fields, geothermal development, and other habitat projects at the Sonny Bono Salton Sea National Wildlife Refuge); and habitat values (at the refuge); and consistency with the applicable requirements of the Imperial Irrigation District (IID) Habitat Conservation Plan/Natural Communities Conservation Plan. Decisions necessary to strike this balance and meet the objectives would be made within an adaptive management framework.

This appendix provides a conceptual overview of the range of operations that could be used to provide suitable habitat (for species dependent on the Salton Sea) and to test different operational scenarios as part of the "proof-of-concept" aspect of the SCH Project. Key indicators of physical, chemical, and biological attributes of that habitat would be monitored to determine the effects of different operational scenarios, and any adjustments would be implemented as needed in accordance with the SCH Monitoring and Adaptive Management Framework, as described in Appendix E.

D.2 Key Project Components

The general facilities necessary for each alternative include river water diversion, sedimentation basin, saline water diversion, SCH ponds, in-pond habitat features, and an agricultural drain interception ditch.

D.2.1 River Water Diversion

River water would be diverted for the use of producing shallow-water aquatic habitat in one of two manners. For Alternatives 1 and 4, river water would be diverted via a lateral weir placed on the edge of the river channel. The diversion weir would be located upstream of the SCH ponds to provide sufficient hydraulic head to convey the water to the SCH ponds with gravity. For Alternatives 2, 3, 5, and 6, river water would be diverted via electrically driven pumps located adjacent to the SCH ponds.

D.2.2 Sedimentation Basin

Waters in the New and Alamo rivers contain suspended sediment that would need to be removed prior to conveyance and delivery to the SCH habitat ponds. The concentration of the suspended sediment in the rivers is recently reported at about 219 milligrams per liter (mg/L) for the New River and 280 mg/L for the Alamo River. The water diverted to the SCH ponds from the rivers would have to go through a sedimentation basin to remove the sediment load before the water is released to the SCH ponds. For alternatives using a gravity diversion, the sedimentation basin would be located upstream of the SCH ponds near the point of diversion. For alternatives using the pumped diversion, the sedimentation basin would be located within the SCH pond footprint.

The sedimentation basin would be operated to hold the water just long enough for the sediment to settle out. The settling time is a function of the size of the particles suspended in the water column.

Sedimentation basins elsewhere in the Imperial Valley store water for about 5 days. Routine operations would include the removal and disposal of the sediments collected in the sedimentation basin. The frequency of these actions and amount of material to be removed would be determined once an alternative were selected for design and could be modified during the life of the SCH Project as a result of sediment control measures being independently implemented as part of the Clean Water Act Section 303(d) requirements (Total Maximum Daily Loads).

D.2.3 Saline Water Diversion

Saline water would be diverted by electrically driven pumps placed on a structure in or adjacent to the Salton Sea to produce the desired salinity in the SCH ponds. The water must be pumped (lifted) because the Sea's elevation Sea is less than the desired pond elevation of -228 feet mean sea level (msl). Currently, the water would have to be lifted about 4 feet in elevation from the Sea to the SCH ponds. As the Sea's elevation declines over time, the height that the saline water would have to be lifted would increase, along with the distance that the water had to be conveyed to reach the ponds.

D.2.4 SCH Pond Berms

The SCH pond complex would be formed by constructing low height (up to approximately 8-foot-high) berms to contain water and separate the SCH ponds from the remainder of the Salton Sea and its recently exposed playa. Internal berms would segment the SCH ponds into experimental units.

The SCH ponds would be constructed primarily on recently exposed playa following the existing topography (ground-surface contours) where possible. The ground surface within the SCH ponds would be excavated (with a balance between cut and fill) to acquire material to build the berms and habitat islands. The borrow areas for the berms would generally form adjacent channels, swale channels, and shallow excavations. The maximum water surface elevation would be -228 feet msl. Pond depth would range from near zero toward the shoreline (-228 msl) to 6 feet at the exterior berm. Maximum depth in excavated areas would be up to 10 feet. Outflow structures would be constructed in the outer berms, and maximum outflow from the SCH pond complex to the Salton Sea would total approximately 130 cubic feet per second.

Berms would be maintained to repair damage due to structural failures, differential settling, surface erosion, access, and water management functions. Berms may require future strengthening by others to accommodate other compatible land uses (e.g., geothermal development).

D.2.5 In-Pond Habitat Features

Several constructed bird and fish habitat structures would be included in the SCH ponds, such as swales, holes, and habitat islands. Swales are 2-foot or deeper channels within the pond units that would be constructed with scrapers and excavators. They ultimately would serve as habitat features to increase aquatic habitat heterogeneity, connect shallow and deep areas of a pond unit, and provide deeper refugia near shallow areas. Each SCH pond would include several islands for bird habitat: one to three nesting islands (suitable for tern species) and three to six smaller roosting islands (suitable for cormorants and pelicans). The overall SCH pond complex could also include one or more large (2- to 10-acre) islands that have rocky and sandy substrate (suitable for cormorant nesting).

D.2.6 Agricultural Drain Interception Ditch

Water from adjacent agricultural drains that currently flows (or is pumped) directly into the Salton Sea would be rerouted around the SCH ponds. The interception ditch would allow for the continuation connection of these drains to the Salton Sea and not disturb the flow of agricultural drainwater from the adjacent fields. IID would maintain operational control of these drains and continue to provide all maintenance activities necessary on these drains.

D.3 Operational Variables and Range

D.3.1 Habitat Requirements and Operational Constraints

SCH ponds are intended to:

- Provide habitat suitable for production of fish dependent on the Salton Sea. Likely fish candidates are one or more varieties of tilapia, which are an important forage species for fish-eating birds. Other fishes that could become established in the SCH ponds include desert pupfish (*Cyprinodon macularius*), sailfin mollies (*Poecilia latipinna*), mosquitofish (*Gambusia affinis*), and threadfin shad (*Dorosoma petenense*).
- Provide habitat suitable to support fish-eating birds and other birds dependent on the Salton Sea. Foraging habitat would be a key attribute, but other features to meet habitat needs for nesting and resting would also be included.

SCH pond operations would attempt to meet Project goals and objectives given certain constraints of physical conditions, water quality, and climate. The general characteristics of the aquatic habitat that would likely be present for fish include:

- Highly eutrophic, shallow-water ponds that would be highly turbid in spring through fall.
- Low temperatures below 50 degrees Fahrenheit (˚F) (10 degrees Celcius [˚C]) during short periods of the winter and high temperatures in the low–to mid 90s ˚F (low 30s ˚C) in the late spring through early fall.
- Dissolved oxygen (DO) concentrations ranging from zero mg/L at the mudline to super-saturated during daylight hours in spring to fall.

SCH Project operations would be constrained by the physical characteristics of the ponds (e.g., depth, area, and bottom profile), but certain water quality conditions could be modified, within some range of conditions, as needed, by adjusting the limited operational controls to create more desirable habitat conditions in the ponds. The primary operational variables that could be controlled are:

- Salinity of the water within the ponds;
- Volume of water in the ponds;
- Residence time of the water in the ponds;
- Pond depth;
- Fish species stocked in the ponds; and
- Physical cover elements.

Depending on the specific alternative and pond design selected, the habitat would be composed of a few to several individual ponds. This design would allow the operators to try different combinations of storage, salinity, and residence times to investigate how these factors could be adjusted to provide the best conditions for fish and birds. Different operational scenarios would be tested during the proof-of-concept phase, the first 10 years of Project operation (to approximately 2025). After the proof-of-concept phase, pond variables would be managed to produce the best habitat for fish and wildlife dependent on the Salton Sea.

The following discussion is based on the construction and operation of approximately 2,400 acres of habitat, but the acreage could be less or more depending on the alternative selected and the funding available for Project construction.

D.3.2 Salinity of Stored Water

The SCH ponds would typically be operated within the range of 20 to 40 parts per thousand (ppt) salinity. Water from the Alamo River or New River (salinity approximately 2 ppt) would be blended with water from the Salton Sea (current[1] salinity approximately 53 ppt) to produce the desired pond salinity. Blending the river water and seawater in different amounts would allow for a range of salinities to be used in the ponds.[2]

Different ponds could be operated under different salinities to test which salinity regime results in the best combination, or balance, of invertebrate and fish productivity, bird use, seasonal fish survival, and exposure to selenium (Figure D-1). For example, cold tolerance by tilapia is better at lower salinities (20 ppt) than at higher salinities (60 ppt) (Lorenzi and Schlenk, in preparation), but selenium loading to the pond is increased (more river water equals lower salinity but higher inputs of water-borne selenium) (Appendix I, Selenium Management Strategies). Salinity in the ponds could also be increased as needed to control mosquito populations (Appendix F, Mosquito Control Plan), control emergent vegetation growth (Table D-1), and limit the development of aquatic habitat that would support freshwater fish known to be predators of desert pupfish.

During the proof-of-concept phase, salinities would be typically managed between 20 to 40 ppt. This range is generally sufficient to control many of the negative factors listed above and within the range to be tolerated by the fish species expected to be used in the SCH ponds. Pond salinity may be allowed to exceed this general range (from undiluted river water [2 ppt] up to 50 ppt) in the course of balancing evaporation and water pumping, or if deemed appropriate to test specific fish management or habitat value hypotheses. For example, it may be desirable to operate each pond at a different salinity (e.g., undiluted river water, 20 ppt, and 40 ppt) and monitor biological outcomes and long-term operational feasibility. SCH ponds would not be operated with hypersaline conditions (greater than 50 ppt) because they would result in decreased viability of the desired aquatic habitat.

[1] The salinity in the Salton Sea is expected to increase in the future, with salinity exceeding 100,000 ppt by 2030 (DWR and DFG 2007).
[2] Evapoconcentration, increasing the salinity through the evaporation process, was simulated in the water quality modeling for this Project and found to be ineffective in achieving the desired salinity range in a short period of time.

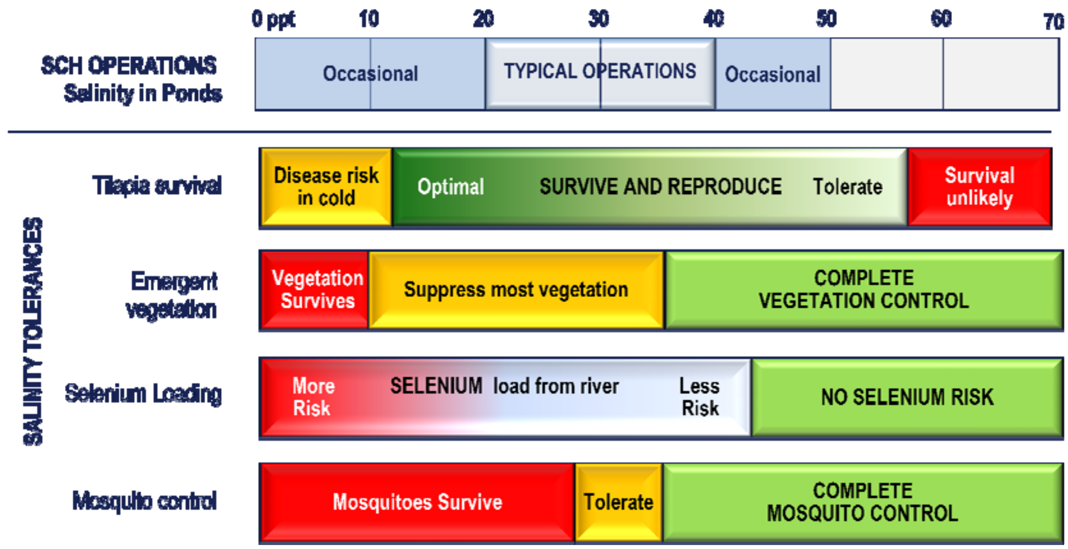

Figure D-1 Operational Range of Salinities and Biological Constraints

Table D-1 Salinity Tolerances of Local Plant Species

Species	Habitat	Typical Salinity Preference	Widest Salinity Tolerated	Comments and Sources
California Bulrush (*Schoenoplectus californicus*)	Widespread in fresh and intermediate marsh zone	0-3.5 ppt	Approximately 10 ppt or greater will control populations	Stutzenbaker 1999 Prolonged exposure to extreme conditions (15-20 ppt) exceeds the typical salinity tolerance and populations decline (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2002)
American Bulrush (*Scirpus americanus*) Olney's three-square bulrush (*Schoenoplectus americanus*)	Fresh to intermediate marshes	0-3.5 ppt	50% reduction at 4 ppt and no germination above 13 ppt	Stutzenbaker 1999; Uchytil 1992 Management and maintenance depends primarily on maintenance of water levels and secondarily on salinity levels (Uchytil 1992)
Saltmarsh Bulrush (*Scirpus maritimus* or *Scirpus robustus*)	Intermediate to brackish marshes, often on soils subject to tidal influence	3.5-10 ppt	Has been found in hypersaline lakes (~60 ppt) Germination reduced 50% at salinity = 9 ppt. No germination at salinity = 21 ppt.	Stutzenbaker 1999; International Lake Environment Committee 1998; Snyder 1991
Broad Leaf Cattail (*Typha latifolia*)	Freshwater aquatic normally, but also found in intermediate marshes	0-0.5 ppt	Found in intermediate marshes with salinity up to 3.5 ppt In marshes of southeastern Louisiana, occurred at salt levels up to 1.13%	Stutzenbaker 1999
Narrow Leaf Cattail (*Typha angustifolia*)	Freshwater aquatic normally, but also found in intermediate marshes; coastal	0-0.5 ppt	15-30 ppt	Stutzenbaker1999; Reed et al.1995
Southern Cattail (*Typha domingensis*)	Wetlands ranging from fresh to brackish	0-10 ppt	75% mortality occurred at 15 ppt	Stutzenbaker 1999; Glenn et al. 1995

D.3.3 Volume of Water in Storage

Storage is the amount of water contained in the SCH ponds at a given time. The volume that could be stored would depend upon the size of the ponds, which varies by alternative. The storage would also be controlled by changing the inflow and outflow to the SCH ponds. A pond could be operated at a constant storage or varying storage, depending on the proof-of-concept testing. Reasons for varying storage (and hence the maximum depth and inundated area) include responding to water quality conditions, desire to create different habitat conditions in the pond (e.g., shallow-water habitat), vector control, or pond maintenance.

Water quality modeling performed for the SCH Project has shown that DO or temperature conditions respond to several operational parameters, including the depth of the water in a pond and pond shape (the relationship between water depth and surface area). Therefore, changing storage in the pond can alter these conditions by changing the amount of shallow- and deepwater habitat.

The storage could be operated at any amount from empty (e.g., for emergency maintenance) to full with a maximum depth of approximately 6 feet at the terminal berm. Should the average depth of the pond be 3 feet, the storage at full depth would be approximately 7,200 acre-feet for a constructed pond complex of 2,400 acres. Operators would determine the appropriate depth and manage the total storage in the pond to meet that depth.

D.3.4 Residence Time

Residence time is a measure of the time it would take the average unit of water volume to pass through the SCH ponds (or loss to evaporation). The residence time defines the amount of water diverted from the river and the Sea and in turn controls the diversion facilities, Project energy use, and cost. Residence time may be an important parameter for the control of habitat conditions in the SCH operations.

SCH pond residence time would be altered as a result of other operations of the SCH ponds or could be an experimental variable for operational testing. Residence time may vary in response to climatic conditions (including temperature, wind frequency, direction and speed, and solar illumination) or may be modified to test various hypotheses regarding the habitat value during differing climatic conditions and to control anticipated negative conditions. These negative conditions would include the increased probability of depleted DO concentration (anoxia) in portions of the water column or pond areas.

During the Project's proof-of-concept phase, pond residence time would be managed to test the hypotheses developed through the use of the adaptive management process (see Appendix E). Based on preliminary water quality modeling results (see Appendix J, Summary of Special Studies Supporting the EIS/EIR Impact Analysis), it is anticipated that residence times could vary from a couple of weeks (2 weeks) to several months (32 weeks). This range is generally sufficient to support the proof-of-concept testing while allowing for the control of potential negative factors and the production of the desired habitat.

D.3.5 Pond Depth

The maximum and average depth of water in the SCH ponds would be varied to test various hypotheses regarding habitat value during differing climatic conditions and to control anticipated negative conditions listed above for residence time. Depth also could be controlled to manage predation on the fish in the ponds. Different ponds could be operated at different depths, and pond depth could be changed to test different scenarios. A range of depths would be created through excavation of material used for berms. The depth (and pond area) could also be changed by varying the amount of water stored in a pond during the year.

During the Project's proof-of-concept phase, pond depth would be managed to test the hypotheses developed through the use of the adaptive management process (see Appendix F). Based on preliminary water quality modeling results (see Appendix J), it is anticipated that the maximum pond depth at the edge of the berms would be 6 feet. Pond depth may be managed outside this general range to test specific fish management or habitat value hypotheses. Ponds may need to be drained or the elevation lowered for emergency maintenance or to control aquatic conditions, but this drainage would not be a routine occurrence.

D.3.6 Fish Stocking in Ponds

Fish Species Selection

The SCH ponds would be designed to support fish to serve as prey for piscivorous birds. Promising candidate species must be able to forage, grow, and reproduce in fluctuating salinities using the soft, fine-grained sediment that would naturally form the pond substrate. Fish that have evolved to deal with environmental fluctuations would be better able to thrive in SCH ponds than those whose physiology is less plastic when dealing with environmental extremes.

A number of species present in riverine or estuarine habitats of Southern California and Baja California, Mexico, could be suitable candidates for a productive SCH fish community (DFG 2011). The main attributes considered were foraging suitability for a wide range of piscivorous birds (e.g., no “bottom-hugging” flatfish that would be inaccessible to most birds), resistance to perturbation (e.g., tolerates wide fluctuations in temperature, DO, salinity), high productivity, and sustainability. These attributes were weighed against potential risk to desert pupfish, potential risk for spread to new habitats not currently occupied, and difficulty or expense in obtaining or producing sufficient numbers for stocking. For the Project’s initial establishment, however, only those species currently inhabiting the Salton Sea and its connected waters would be considered for use. Desert pupfish, a federally protected species, are present around the Salton Sea and would be included in the SCH ponds. Selecting only fish species that currently reside at the Sea would avoid any new impacts beyond what the Salton Sea desert pupfish population is currently exposed.

Therefore, the fish assemblage proposed for initial deliberate introduction into the SCH ponds would include one or more forms of tilapia and possibly threadfin shad, as well as desert pupfish, sailfin molly, and mosquitofish. Stocking more than one fish species in the ponds would provide some redundancy and improve sustainability of the fish community. If these initial species do not meet the Project objectives, other candidate species evaluated by DFG (DFG 2011) would be considered.

Tilapia

Tilapia satisfy the entire suite of attributes sought in a candidate species, more than any other single species being considered for the SCH Project (DFG 2011). This family of fishes has wide tolerances for water quality conditions, flexible diet including algae and invertebrates, high fecundity, and distribution throughout the water column. Furthermore, they could also support sport fishing. This species is highly tolerant of a wide range of salinities, including high salinities, as demonstrated by their current dominance in the hypersaline Salton Sea. Juvenile Mozambique hybrids can be slowly acclimated up to 95 grams per liter and survive at least for 5 days if the temperature is kept constant at 73 to 77 °F (23 to 25 °C) (Sardella et al. 2004a). Tilapia are less capable of dealing with high salinity under extreme temperatures (Sardella et al. 2004b). The preferred temperature range for optimum tilapia growth is 82° to 86°F (28 to 30°C). Growth diminishes significantly at temperatures below 68°F (20°C) and death would occur below 50°F (10°C) (Rakocy and McGinty 1998). At temperatures below 54°F (12°C), tilapia are more vulnerable to infections by bacteria, fungi, and parasites. The temperature regime in the SCH ponds would be expected to be more extreme than that of the current lake (DWR and DFG 2007). Models of water temperatures for the SCH ponds predict temperatures below the lethal threshhold for Mozambique hybrid tilapia (Appendix J).

Tilapia are remarkably tolerant of low DO concentrations, considerably below tolerance limits for most fish. Tilapia can thrive at DO concentrations of 2 mg/L, can survive extended periods of 1 mg/L, and can tolerate routine dawn DO concentrations of less than 0.3 mg/L (Popma and Masser 1999). In low DO conditions, fish frequently are found near the surface taking in water in the thin surficial layer that remains somewhat oxygenated (personal communication, K. Fitzsimmons 2010). Such behavioral coping responses could increase the vulnerability of fish to bird predation near the surface.

Their main drawback, other than potential competition with desert pupfish, is whether they could handle the lowest water temperatures predicted for SCH ponds. Stocking different tilapia species or strains (individually or in combination) among the SCH ponds could test which species is most sustainable and resilient, and could enhance stability of the fishery resource in the ponds in the face of seasonal and annual fluctuations in water quality parameters. The three tilapia species under consideration for stocking in the SCH ponds include the following:

California Mozambique Hybrid Tilapia – California Mozambique hybrid tilapia ("Mozambique tilapia") are a hybrid of *Oreochromis mossambicus* and *O. urolepis hornorum*. This species is currently the dominant species in the Salton Sea and is widely used in aquaculture including at fish farms in the Salton Sea watershed. Advantages of this species are its demonstrated ability to survive, thrive, and achieve high productivity in hypersaline conditions, as well as its presumed importance as a suitable forage fish for all piscivorous birds at the Salton Sea. The risk from using Mozambique tilapia as the sole forage species is the potential for population crashes, as seen with the massive fish die-offs at the beginning of the decade. The proposed SCH operations would be designed to keep water quality conditions within known tolerances and, therefore, population fluctuations may be dampened.

Blue Tilapia – Blue tilapia (*Oreochromis aureus*) have a lower tolerance for salinity, but handle colder temperatures than the other two tilapia (Popma and Masser 1999). Tilapia resembling blue tilapia are currently only present in the New and Alamo rivers. The genetic makeup of this tilapia assemblage is uncertain, but likely includes *O. aureus* and possibly Mozambique tilapia genetic material given the checkered history of tilapia introductions and movements in southern California (personal communication, K. Fitzsimmons 2010).

Redbelly Tilapia – Redbelly tilapia (*Tilapia zillii*) were once the dominant tilapia species in the Salton Sea, when salinity was lower. Although they were replaced by the Mozambique tilapia, they are still thriving in some of the agricultural drains. The difference in their tolerance to salinity and temperature, as well as a different breeding strategy, may provide plasticity in response to perturbation for a fish community that contains both species.

The relative tolerances of these species to combinations of salinities (20 ppt, 45 ppt, and 60 ppt) and temperatures (cold 11-16°C [52-61 °F]), warm 23-28°C [73-82 °F], and hot 33-38°C [91-100°F]) were tested experimentally (Lorenzi and Schlenk, in preparation). The tested fish included Mozambique tilapia (two strains: wild fish from Salton Sea and an aquaculture strain from a local fish farm), fish from a blue tilapia assemblage in the New River, and redbelly tilapia from the New River. The best survival at cold temperatures was observed with the wild Mozambique tilapia, while the aquacultural strain of Mozambique tilapia was the best performer overall for all salinities at warm temperatures. The blue tilapia strain surprisingly did not have better survival than Mozambique tilapia in cold conditions. Redbelly tilapia results were equivocal, due to other sources of mortality in captivity. While most strains and species had moderately good survival in 45 ppt and 60 ppt conditions at warm temperatures, all species showed poor survival in hot high-salinity (60 ppt) conditions.

Desert Pupfish

Desert pupfish are listed as an endangered species under both Federal and California Endangered Species Acts. They currently inhabit the agricultural drains and creeks that feed into the Salton Sea, shallow areas of the Sea itself, and numerous created refuge habitats. A study of IID agricultural drains found an abundance of desert pupfish positively correlated with western mosquitofish, salfin molly, and Mozambique hybrid tilapia (Martin and Saiki 2005). Desert pupfish are observed most frequently in shallow water less than about 1 foot (30 centimeters) deep with velocities less than about 1 foot/second (Black 1980). They are capable of moving freely between the relatively fresh water in the agricultural drains and the highly saline environment in the Salton Sea (DWR and DFG 2007).

Desert pupfish are very tolerant of extreme water quality conditions, and have been held in the laboratory in water with salinity greater than 98 ppt (Barlow 1958, as cited in Moyle 2002). The ability of desert pupfish to tolerate high salinity, high pH, and low DO contributes to their ability to persist at the Salton Sea. Moyle (2002) summarized the life history of desert pupfish as follows, with additional information as noted. This species can tolerate salinities ranging from freshwater to considerably greater than seawater (up to 68 ppt in the wild), DO from saturation to as low as 0.1 to 0.4 mg/L (parts per million), and temperatures from 39.9°F (4.4°C) in winter (Schoenherr 1990) to 108.3°F (42.4°C) in summer (Carveth et al. 2006). Individuals can survive daily temperature fluctuations of up to 78.8°F (26°C) and salinity changes of 10 to 15 ppt. Larvae have a higher salinity tolerance (up to 90 ppt) than do adults (68 ppt) and can withstand sudden salinity changes of up to 35 ppt.

Under current conditions at the Salton Sea, individual desert pupfish inhabiting creeks and drains that flow into the Sea are presumed to move along the Sea's margins and among drains. This movement, which provides the opportunity for genetic exchange among desert pupfish, reduces the potential deleterious effects of isolation of individual populations. It also provides the opportunity to recolonize these same areas in the event a local population is extirpated (DWR and DFG 2007). Therefore, the SCH Project design would include features to maintain connectivity among populations.

Desert pupfish would likely thrive at the SCH ponds, as seen at the Bureau of Reclamation/U.S. Geological Survey Saline Habitat Ponds (Miles et al. 2009). The ponds that had pupfish were mostly less than 1 meter deep and had salinities ranging from 12 to 70 ppt (Miles et al. 2009). Pupfish were the most abundant fish in the Saline Habitat Ponds; over one million were captured when the ponds were drained in late 2010 (personal communication, J. Crayon 2010).

Sailfin Molly and Mosquitofish

Sailfin mollies and mosquitofish are sympatric with desert pupfish in the Salton Sink. Due to their presence in the Colorado River, they also occupy much of the agricultural water supply and drainage systems around the Salton Sea. Like desert pupfish, they demonstrate plasticity in their diet, and tolerance of high water temperature, high salinity, and low oxygen levels. They inhabit the shallow edges of water bodies, usually less than 2 feet deep. As livebearers, they require no special substrate or structure for reproduction.

Desert pupfish, sailfin mollies, and mosquitofish overlap considerably in their trophic roles where they co-exist in the Salton Sink. They would provide diversity and a degree of redundancy in the SCH fish community, which could buffer the effects of perturbation in a dynamic system. Birds that forage for small fish would prey on all three species; however, surface gleaners and skimmers would find sailfin mollies and mosquitofish more accessible, since these fishes are usually active higher in the water column than are desert pupfish.

Threadfin Shad

Threadfin shad form schools near the surface in open water. They can live in seawater but do not reproduce at that salinity. Spawning takes place in open water near floating or partially submerged objects to which the fertilized eggs stick. Threadfin shad feed heavily on larger zooplankton and can greatly reduce the abundance of these organisms (Moyle 2002).

Filling and Stocking of SCH Ponds

The SCH ponds would be stocked with fish species currently in the Salton Sea Basin and captured from local drainages. The initial SCH aquatic community would be comprised of four primary types of fish: tilapia, sailfin molly, mosquitofish, and desert pupfish. Unintentional invasion of other fish from the river waters, such as common carp (*Cyprinus carpio*), various Centrarchid species, red shiners (*Cyprinella lutrensis*), and threadfin shad, may also occur. All but the shad would be unable to survive in waters above 20 ppt salinity.

Following construction, the SCH ponds would be filled with water for the first time and allowed to "season" for a period of several weeks while undergoing various stages of chemical and biological succession. Water chemistry would fluctuate as compounds leach from the newly wetted soils and microbial communities are initiated. Once phyto- and zooplankton are established and salinity exceeds 20 ppt, fish could be introduced, starting with sailfin mollies and mosquitofish.

The first fishes introduced would likely be small species. Sailfin mollies are ubiquitous in the Salton Sea and the agricultural drains surrounding it. They could be easily trapped/and or seined for stocking into SCH ponds. The most productive collection of sailfin mollies would take place in the spring, when the young-of-the-year would still have an approximately 1:1 sex ratio and have not yet been exhausted by the energetic costs of reproduction. Mosquitofish are numerous in the agricultural drains at the Salton Sea's southern end. They also could be easily trapped and/or seined for stocking, or alternately could be obtained from aquaculture or vector control agencies. Pupfish would be trapped and/or seined from several natural localities and created refuges to insure a good representation of available genetic diversity.

Several species and strains of tilapia are present in the waters of the Salton Sea drainage, and each requires a different approach for securing sufficiently large numbers of founders. Mozambique hybrid tilapia are currently abundant in the Salton Sea and large numbers could easily be captured for stocking into SCH ponds. However, their long-term availability is tenuous with the increasing salinity in the Sea. The same fish is available from local aquacultural facilities, but may not perform as well as wild caught fish, given the selection pressure on the wild population that would likely result in greater tolerance of the Sea's salinity and temperature range (Lorenzi and Schlenk, in preparation). Redbelly tilapia are abundant in drains at the Sea's northern end, particularly those filled by tilewater. These populations should persist, due to the consistency of water quality in those drains, and fish would be available for seining/trapping for SCH ponds in the future. Finally, tilapia resembling blue tilapia are present in the rivers, agricultural drains, and Brawley Wetlands.

The release of tilapia into SCH ponds should only take place after phytoplankton and zooplankton are established. If stocks were from freshwater habitats or held in freshwater while captive, they would be first acclimated to the salinity in the ponds. This acclimation could be done under captive maintenance, or by sequestering in a small part of the ponds and allowing the salinity to gradually rise to pond levels before releasing fish into the larger habitat.

Fish Rearing

Due to ever-increasing salinity and degraded water quality in the Salton Sea, the Mozambique hybrid tilapia population in the Sea may have declined seriously by the time of construction of the SCH ponds. If so, extremely intense predation pressure on the fish initially stocked in the ponds may occur. A supply of fish would be needed for initial stocking of the SCH ponds and possible restocking if severe fish die-offs occur. It would be important to stock fish in sufficient numbers to start a sustainable population in the face of predation. Securing an adequate number of fish for stocking may require producing a generation in captivity from captured wild fish. Tilapia could be collected now from local sources while wild stocks remain and held for captive propagation at one or more of the private licensed aquaculture facilities in the area (within 15 miles of all alternative sites). Several trips (fewer than ten) by small (½ to 1 ton) trucks would be required if cultured fish are to be delivered from an aquaculture facility to SCH ponds.

Physical Cover

Heterogeneity in physical habitat structure could be manipulated in the SCH ponds to enhance cover and refugia for fish from predators and possible thermal fluctuations. Refugia from predators would be necessary to allow a sustainable population of fish to persist in the face of expected heavy predation by piscivorous birds, especially when fishery resources in the Salton Sea decline and disappear. Refugia or cover could be provided by deeper waters or physical structural complexity. Types of cover elements considered include:

Swales and Channels – Having water deeper than 3 feet in proximity to shallower areas would allow fish to disperse into areas where they would be more dispersed and/or less visible due to turbidity. These constructed regions of greater depth would provide this element.

Submerged Aquatic Vegetation – Vegetation could also provide cover from predators, especially for small fish. Widgeon grass (*Ruppia* spp.) is expected to become established in the SCH ponds. This vegetation would likely enhance food supplies by providing more microhabitat structure to support invertebrate diversity and productivity. Widgeon grass establishes from seed and needs sufficient light for photosynthesis to reach the pond bottom. Given the projected turbidity, it would be limited to shallow areas of SCH ponds.

Floating Islands – These artificial structures could be used to provide visual cover and shading for potential thermal refugia. Floating islands could be deployed in different areas, and would likely be most useful in shallower areas where other cover is limited. More information would be necessary to evaluate the applicability and feasibility of floating islands.

While many of these components would be considered part of the initial pond construction, placement and size of floating islands could be manipulated to test habitat function. Monitoring of their effectiveness would be a component of the adaptive management approach for the SCH design and operations.

D.4 Possible Operational Scenarios

Possible operational scenarios are shown in Tables D-2 to D-7. These scenarios are meant to test different concepts for creating sustainable saline habitat for fish and wildlife that minimizes risks of impacts such as fish die-offs, ecotoxicity from selenium, and diseases vectors. Upper and lower extremes of the operational range would be tested to detect any effect of that variable on Project performance. Operational values for each variable could be held constant over time or could be adjusted seasonally according to expected outcomes.

The ranges of operational variables to be tested are as follows:

Salinity – 20-40 ppt.

Storage – Approximately 80 to 100 percent of capacity (the volume would depend on the actual alternative selected and amount of ponds constructed). For example, for a constructed pond complex of 2,400 acres, storage could range from 6,000 to 7,200 acre-feet, assuming an average depth of 3 feet deep over 2,400 acres).

Residence Time – 2 to 32 weeks. This range reflects rate of inflow and outflow.

Fish Species – Fishes considered for initial introduction into SCH ponds would include one or more forms of tilapia, threadfin shad, desert pupfish, sailfin molly, and mosquitofish.

Several constraints and potential impacts were considered in the design of the operational scenarios:

Water Quality Tolerances of Target Fish – The fish species used in the ponds would have to survive and reproduce given the expected water quality conditions, both managed (salinity) and uncontrolled (air temperature, wind mixing, DO) conditions. Tilapia appear to meet many of the requirements for a productive, sustainable fishery resource for piscivorous birds. For some tilapia species or strains, cold tolerance (below 13°C [55°F]) is impaired at higher salinities (Lorenzi and Schlenck, in preparation). Hydrological modeling suggests that water temperatures could drop below 11-13°C (52-55°F) during December through February. DO concentrations could dip below tilapia minimum tolerances. Nutrient concentrations are high in the New and Alamo rivers, due to contributions from agricultural runoff. Water quality modeling suggests high levels of algal growth are possible, along with oxygen deprivation problems that accompany hot weather algal blooms (B. Barry and M. Anderson, University of California Riverside, unpublished data). Also, seasonal anoxia could be more frequent and prolonged in spring (March through May) and fall (October) due to algal blooms.

Relative Selenium Loading – Selenium in river water supplying the ponds could bioaccumulate through the food web from invertebrates and fish to birds (see Appendix I, Selenium Management Strategies). Shorter residence time and lower salinity means greater inputs of river water, which would increase overall selenium loading to the ponds.

Vector Risk – Mosquitoes that breed at the ponds could pose a potential human health risk. The likelihood for mosquito vector impacts is based on (1) breeding season (March through November) and (2) salinity tolerance of mosquito larvae (can survive up to 25 ppt, some reduction in populations between 25-28 ppt, < 28 ppt, reduced population 28-34 ppt, control 35 ppt).

Emergent Vegetation Control – The SCH ponds would be managed using elevated salinity to reduce establishment of emergent vegetation, such as cattails and bulrush. Most vegetation is inhibited by 10 ppt salinity, but some strains could tolerate salinities up to 35 ppt (Table D-2).

Table D-2 Constant Salinity (20 ppt) and Constant Storage Operational Scenario

	Scenario Name	Water Year											
		Oct	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
1a	**Constant Salinity (low range), Constant Storage**												
Operating Variables	Salinity (ppt)	20	20	20	20	20	20	20	20	20	20	20	20
	Storage (% capacity)	100	100	100	100	100	100	100	100	100	100	100	100%
	Residence time (weeks)	4	4	4	4	4	4	4	4	4	4	4	4
Potential Constraints and Impacts	Dissolved oxygen	Anoxia					Anoxia more common						
	Fish temperature tolerance			Potentially too cold									
	Selenium loading[1]	High relative selenium loading											
	Mosquito vector relative risk[2]	High	Low mosquito risk				High mosquito risk						
1b	Residence time (weeks)	16	16	16	16	16	16	16	16	16	16	16	16
	Selenium loading[1]	Medium relative selenium loading											

1. Relative selenium loading – shorter residence time and lower salinity means greater inputs of river water, which increases selenium loading.

2. Vector risk of mosquitoes based on salinity tolerance (survive <28 ppt, reduced population 28-34 ppt, control 35 ppt) and breeding season (Mar-Nov).

Relative Selenium Loading

Residence Time	Salinity range ppt 10-19	20-29	30-39	40 50
4-8 weeks	Higher	High	Medium	Low
10-16 weeks	High	Medium	Low	Lower

Table D-3 Constant Salinity (35 ppt) and Constant Storage Operational Scenario

	Scenario Name	Water Year Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2	**Constant Salinity (high range), Constant Storage**												
Operating Variables	Salinity (ppt)	35	35	35	35	35	35	35	35	35	35	35	35
	Storage (% capacity)	100	100	100	100	100	100	100	100	100	100	100	100
	Residence time (weeks)	16	16	16	16	16	16	16	16	16	16	16	16
Potential Constraints and Impacts	Dissolved oxygen	Anoxia					Anoxia more common						
	Fish temperature tolerance			Potentially too cold									
	Selenium loading[1]	Low relative selenium loading											
	Mosquito vector relative risk[2]	Low mosquito risk											

1. Relative selenium loading – shorter residence time and lower salinity means greater inputs of river water, which increases selenium loading.

2. Vector risk of mosquitoes based on salinity tolerance (survive <28 ppt, reduced population 28-34 ppt, control 35 ppt) and breeding season (Mar-Nov).

Relative Selenium Loading

Residence Time	Salinity range ppt 10-19	20-29	30-39	40 50
4-8 weeks	Higher	High	Medium	Low
10-16 weeks	High	Medium	Low	Lower

Table D-4 Variable Salinity (20-35 ppt) and Variable Storage Operational Scenario

	Scenario Name	Water Year Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
3	**Variable Salinity, Variable Storage**												
Operating Variables	Salinity (ppt)	20	20	20	20	20	20	25	30	35	35	30	25
	Storage (% of capacity)	100	100	100	100	100	95	90	85	80	80	90	95
	Residence time (weeks)	8	6	4	4	6	8	10	12	16	16	12	10
Potential Constraints and Impacts	Dissolved oxygen	Anoxia					Anoxia more common						
	Fish temperature tolerance			Potentially too cold									
	Selenium loading[1]	High relative selenium loading						Med-ium	Low relative selenium loading				Med-ium
	Mosquito vector relative risk[2]	High	Low mosquito risk				High	Medium		Low risk		Medium	

1. Relative selenium loading – shorter residence time and lower salinity means greater inputs of river water, which increases selenium loading.
2. Vector risk of mosquitoes based on salinity tolerance (survive <28 ppt, reduced population 28-34 ppt, control 35 ppt) and breeding season (Mar-Nov).

Relative Selenium Loading

Residence Time	Salinity range ppt 10-19	20-29	30-39	40 50
4-8 weeks	Higher	High	Medium	Low
10-16 weeks	High	Medium	Low	Lower

Table D-5 Variable Salinity (20-35 ppt) and Constant Storage Operational Scenario

	Scenario Name	Water Year Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
4	**Variable Salinity, Constant Storage**												
Operating Variables	Salinity (ppt)	20	20	20	20	20	20	25	30	35	35	30	25
	Storage (% capacity)	100	100	100	100	100	100	100	100	100	100	100	100
	Residence time (weeks)	8	6	4	4	6	8	10	12	16	16	12	10
Potential Constraints and Impacts	Dissolved oxygen	Anoxia					Anoxia more common						
	Fish temperature tolerance			Potentially too cold									
	Selenium loading[1]	High relative selenium loading						Medium		Low relative		Medium	
	Mosquito vector relative risk[2]	High	Low mosquito risk				High	Medium		Low		Medium	

1. Relative selenium loading – shorter residence time and lower salinity means greater inputs of river water, which increases selenium loading.

2. Vector risk of mosquitoes based on salinity tolerance (survive <28 ppt, reduced population 28-34 ppt, control 35 ppt) and breeding season (Mar-Nov).

Relative Selenium Loading

Residence Time	Salinity range ppt 10-19	20-29	30-39	40 50
4-8 weeks	Higher	High	Medium	Low
10-16 weeks	High	Medium	Low	Lower

Table D-6 Highly Variable Salinity (20-40 ppt) and Constant Storage Operational Scenario

	Scenario Name	Water Year											
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
5	**Variable Salinity, Constant Storage**												
Operating Variables	Salinity (ppt)	20	20	20	20	20	20	30	40	40	40	40	30
	Storage (% capacity)	100	100	100	100	100	100	100	100	100	100	100	100
	Residence time (weeks)	12	10	8	8	10	12	16	20	20	20	20	16
Potential Constraints and Impacts	Dissolved oxygen	Anoxia					Anoxia more common						
	Fish temperature tolerance			Potentially too cold									
	Selenium loading[1]	High relative selenium loading				Medium		Low	Lower relative loading				Low
	Mosquito vector relative risk[2]	High	Low mosquito risk				High	Med-ium	Low				Med-ium

1. Relative selenium loading – shorter residence time and lower salinity means greater inputs of river water, which increases selenium loading.

2. Vector risk of mosquitoes based on salinity tolerance (survive <28 ppt, reduced population 28-34 ppt, control 35 ppt) and breeding season (Mar-Nov).

Relative Selenium Loading

Residence Time	Salinity range ppt			
	10-19	20-29	30-39	40 50
4-8 weeks	Higher	High	Medium	Low
10-16 weeks	High	Medium	Low	Lower

Table D-7 Highly Variable Salinity (20-40 ppt) and Variable Storage Operational Scenario

	Scenario Name	Water Year Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
6	**Variable Salinity, Variable Storage**												
Operating Variables	Salinity (ppt)	20	20	20	20	20	20	30	40	40	40	40	30
	Storage (% capacity)	100	100	100	100	100	95	90	85	80	80	90	95
	Residence time (weeks)	12	10	8	8	10	12	16	20	16	20	20	16
Potential Constraints and Impacts	Dissolved oxygen	Anoxia					Anoxia more common						
	Fish temperature tolerance			Potentially too cold									
	Selenium loading[1]	High relative loading				Medium		Low	Very Low relative loading				Low
	Mosquito vector relative risk[2]	High	Low mosquito risk				High	Med-ium	Low				Med-ium

1. Relative selenium loading –shorter residence time and lower salinity means greater inputs of river water, which increases selenium loading.

2. Vector risk of mosquitoes based on salinity tolerance (survive <28 ppt, reduced population 28-34 ppt, control 35 ppt) and breeding season (Mar-Nov).

Relative Selenium Loading

Residence Time	Salinity range ppt 10-19	20-29	30-39	40 50
4-8 weeks	Higher	High	Medium	Low
10-16 weeks	High	Medium	Low	Lower

D.5 Testing Operational Scenarios

Different operational scenarios would be tested in the proof-of-concept period for approximately 10 years (estimated 2015–2025). Two or more operational scenarios would be implemented simultaneously in separate ponds, and outcomes monitored to test performance in meeting objectives and minimizing impacts. Key indicators of important physical, water quality, and biological attributes would be monitored.

Certain indicators of flow and water quality would be frequently monitored to guide daily or weekly pond operations. These operational triggers include pumping or inflow rates of river water and saline water, outflow rates, and salinity of water at inflow and in ponds.

Indicators of Project performance would be identified based on the SCH objectives. Thresholds or desired conditions for each indicator would be defined, and progress toward meeting those objectives measured according to the Monitoring and Adaptive Management Framework (Appendix E). For example, measuring abundance and community composition of fishes in different ponds would be an indicator of SCH Project effectiveness at providing foraging habitat for piscivorous birds (Objective 1) and creating sustainable aquatic habitat (Objective 3).

D.6 Maintenance Activities

SCH Project implementation would also include standard maintenance that would not be varied experimentally. These types of operations would include:

- Sedimentation basin operations;
- Infrastructure maintenance;
- Erosion control structure maintenance;
- Vegetation control; and
- Vector control (see Appendix F, Mosquito Control Plan).

D.6.1 Sedimentation Basin Operations

There would be two sedimentation basins. Operation and maintenance would occur throughout the year and at the end of the year. One basin would be operated at any given time, storing water and settling sediment. The other basin would be drained of water, the sediment dried, and sediment excavated down to original design elevation. Excavated sediment would be used on the Project to maintain berms, offset settling of berms, and create additional habitat islands if necessary.

D.6.2 Infrastructure Maintenance

Monitoring of physical structures would be conducted on a regular basis to check condition, and and maintenance or repairs implemented on an ongoing basis as needed. Project infrastructure for the water supply includes pumps, pump facilities and pipelines and inlet structures. Infrastructure for the water control structures includes culverts, gates, and weirs between ponds and from the ponds to the Salton Sea.

D.6.3 Erosion Control

Berm structure, riprap, and roadways on the crown would be checked periodically for seepage, cracking, erosion, and extensive burrowing by animals. Areas that would potentially receive more wave action due to extended wind fetch would receive closer scrutiny. Typical maintenance activities could include adding riprap, filling cracks or eroded areas, or spreading gravel on the roadway.

D.6.4 Vegetation Control

Unwanted vegetation at SCH infrastructure could include cattails, tules and salt cedar. Measures would be implemented to control vegetation on berms that could compromise structural integrity. Vegetation would also be removed from the sedimentation basin, interception ditch, and around the river pump station to maintain storage and flow capacity. Best management practices for vegetation control would be implemented as appropriate, including but not limited to physical removal and chemical control appropriate near waterways.

D.7 Emergency Operations

Under certain circumstances, it may be necessary to enact rapid response operations in response to a sudden threat or emergency, such as:

- Avian disease outbreak;
- Rapid drawdown of ponds for emergency actions; and
- Mosquito-borne diseases (see Appendix F, Mosquito Control Plan).

D.7.1 Avian Disease Outbreak

Birds would be monitored regularly for signs of disease outbreaks, and monitoring would be intensified if signs of disease are present. Dead and dying birds would be collected to disrupt cycles of infectious diseases. Potentially infectious carcasses would be incinerated at the Sonny Bono Refuge. For diseases that can be treated, such as the early stages of botulism, sick birds would be collected for rehabilitation and release, as is currently done on the Salton Sea.

D.7.2 Pond Drawdown

Under certain conditions it may become necessary to rapidly reduce water elevations a pond, such as emergency repair of water control structures or berms, sudden change in pond water quality, or noxious species control. The drawdown would involve raising the flashboards on the outlet control structure(s) to release water to the Sea. Draining of the ponds could occur as a result of a breach in one or more berms, but complete draining would not be utilized as a typical pond management action. Under certain emergency conditions, such as a pesticide spill in the SCH source waters, or to eradicate a noxious aquatic invader, SCH ponds could be deliberately drained. In such an event, low areas of the ponds' would retain water and act as temporary refugia for fish by design, by allowing either the salvage of the remaining fish or leaving fish in place as recruitment stocks for re-establishing fish populations.

D.8 References

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APPENDIX G-2

Air Quality/Greenhouse Gas Emissions Calculations

G-1 & G-2 Emissions Summary

Table G-1 Estimated Construction Energy Consumption for Proposed Project (mitigated)						
Onroad Vehicle Type	Project Alternative					
	1	2	3	4	5	6
	gallons	gallons	gallons	gallons	gallons	gallons
California Ultra-Low Sulfur Diesel Fuel	562,000	465,000	644,000	329,000	296,000	384,000
Source: EPA 1996						
Note:						
Values shown rounded to nearest 1,000 gallons						

Table G-2 Estimated Construction Trip Counts for Proposed Project (mitigated)						
Onroad Vehicle Type	Project Alternative					
	1	2	3	4	5	6
	trips	trips	trips	trips	trips	trips
Tractor Trailer (heavy heavy duty) - Local	6,450	5,520	7,920	2,100	2,000	2,160
Tractor Trailer (heavy heavy duty) - Import	190	130	150	160	100	130
Water Truck (medium duty)	470	470	470	470	470	470
Pickup/SUV (light duty)	6,540	5,340	7,740	4,140	3,740	4,940
Source: Applicant						
Notes:						
For Tractor Trailer, local is construction-related trips						
For Tractor Trailer, import is bringing in equipment from other areas in state (SD, LA, SF, SAC)						
Applicant real number data converted to up-rounded integer values to avoid undercounts						
Trip count values shown rounded to nearest 10 to reflect approximate nature of estimates						

G-3 Schedule

Table G-3 Estimated Equipment and Vehicle Schedule for Proposed Project Alternatives													
Phase or Activity	Equipment and Vehicles			Two-Year Construction Schedule					Annual Maintenance Schedule				
	Type	Category	BHP	quantity	days	hrs/day	trips/day	mi/trip	quantity	days/yr	hrs/day	trips/day	mi/trip
ALTERNATIVE 1 - New River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		50	43		3	50	1	37		2	50
Import equipment from other areas	Tractor Trailer	onroad HHD		17	11		1	280					
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	3	325	8			1	28	8		
Low ground pressure haulers	Dump Truck	offroad	300	12	261	8			1	18	8		
Tracked excavator	Excavator	offroad	200	3	375	8			1	35	8		
Low ground pressure dozer	Dozer	offroad	125	2	233	8			1	5	8		
Small motor grader	Grader	offroad	140	1	25	8			1	25	8		
Barge with crane and clamshell bucket	Crane	offroad	500	3	265	8							
Hydraulic Dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	1	91	20							
Truck with crane for installed pilings	Crane Rig	offroad	350	1	20	8							
Medium backhoe loader	Backhoe	offroad	100	1	200	8			1	24	8		
Agricultural tractor with mower	Tractor	offroad	175						1	3	8		
Fugitive dust control	Water Truck	onroad HHD		1	470		1	10	1	25		1	10
Manager	Pickup/SUV	onroad LD		2	470		0.50	65	1	235		1	65
Foreman	Pickup/SUV	onroad LD		3	470		0.33	65					
Equipment Operator	Pickup/SUV	onroad LD		36	400		0.33	65	1	235		1	65
Laborers	Pickup/SUV	onroad LD		6	400		0.33	65					
ALTERNATIVE 2 - New River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		40	46		3	50	1	34	8	2	50
Import equipment from other areas	Tractor Trailer	onroad HHD		11	12		1	280					
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	3	264	8			1	27	8		
Low ground pressure haulers	Dump Truck	offroad	300	10	265	8			1	19	8		
Tracked excavator	Excavator	offroad	200	3	291	8			1	38	8		
Low ground pressure dozer	Dozer	offroad	125	2	163	8			1	6	8		
Small motor grader	Grader	offroad	140	1	28	8			1	25	8		
Barge with crane and clamshell bucket	Crane	offroad	500	2	269	8							
Hydraulic Dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	1	91	20							
Truck with crane for installed pilings	Crane Rig	offroad	350	1	21	8							
Medium backhoe loader	Backhoe	offroad	100	1	235	8			1	11	8		
Agricultural tractor with mower	Tractor	offroad	175						1	3	8		
Fugitive dust control	Water Truck	onroad HHD		1	470		1	10	1	25		1	10
Manager	Pickup/SUV	onroad LD		2	470		0.50	65	1	235		1	65
Foreman	Pickup/SUV	onroad LD		2	470		0.50	65					
Equipment Operator	Pickup/SUV	onroad LD		27	400		0.33	65	1	235		1	65
Laborers	Pickup/SUV	onroad LD		6	400		0.33	65					
ALTERNATIVE 3 - New River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		60	44		3	50	1	45	8	2	50
Import equipment from other areas	Tractor Trailer	onroad HHD		14	11		1	280					
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	4	265	8			1	28	8		
Low ground pressure haulers	Dump Truck	offroad	300	14	267	8			1	19	8		
Tracked excavator	Excavator	offroad	200	4	291	8			1	44	8		
Low ground pressure dozer	Dozer	offroad	125	3	146	8			1	6	8		
Small motor grader	Grader	offroad	140	1	34	8			1	25	8		
Barge with crane and clamshell bucket	Crane	offroad	500	4	264	8							
Hydraulic Dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	1	91	20							
Truck with crane for installed pilings	Crane Rig	offroad	350	1	21	8							
Medium backhoe loader	Backhoe	offroad	100	1	200	8			1	28	8		
Agricultural tractor with mower	Tractor	offroad	175						1	3	8		
Fugitive dust control	Water Truck	onroad HHD		1	470		1	10	1	25		1	10
Manager	Pickup/SUV	onroad LD		2	470		0.50	65	1	235		1	65
Foreman	Pickup/SUV	onroad LD		3	470		0.33	65					
Equipment Operator	Pickup/SUV	onroad LD		45	400		0.33	65	1	235		1	65
Laborers	Pickup/SUV	onroad LD		6	400		0.33	65					

G-3 Schedule

ALTERNATIVE 4 - Alamo River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		20	35		3	50	1	20	8	2	50
Import equipment from other areas	Tractor Trailer	onroad HHD		18	9		1	280					
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	2	307	8			1	26	8		
Low ground pressure haulers	Dump Truck	offroad	300	7	260	8			1	18	8		
Tracked excavator	Excavator	offroad	200	2	309	8			1	26	8		
Low ground pressure dozer	Dozer	offroad	125	2	156	8			1	5	8		
Small motor grader	Grader	offroad	140	1	14	8			1	25	8		
Barge with crane and clamshell bucket	Crane	offroad	500	1	296	8							
Hydraulic Dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	1	91	20							
Truck with crane for installed pilings	Crane Rig	offroad	350	1	21	8							
Medium backhoe loader	Backhoe	offroad	100	1	200	8			1	6	8		
Agricultural tractor with mower	Tractor	offroad	175						1	3	8		
Fugitive dust control	Water Truck	onroad HHD		1	470		1	10	1	25		1	10
Manager	Pickup/SUV	onroad LD		2	470		0.50	65	1	235		1	65
Foreman	Pickup/SUV	onroad LD		2	470		0.50	65					
Equipment Operator	Pickup/SUV	onroad LD		18	400		0.33	65	1	235		1	65
Laborers	Pickup/SUV	onroad LD		6	400		0.33	65					
ALTERNATIVE 5 - Alamo River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		18	37		3	50	1	20	8	2	50
Import equipment from other areas	Tractor Trailer	onroad HHD		10	10		1	280					
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	2	258	8			1	26	8		
Low ground pressure haulers	Dump Truck	offroad	300	7	250	8			1	18	8		
Tracked excavator	Excavator	offroad	200	2	220	8			1	27	8		
Low ground pressure dozer	Dozer	offroad	125	2	102	8			1	5	8		
Small motor grader	Grader	offroad	140	1	19	8			1	25	8		
Barge with crane and clamshell bucket	Crane	offroad	500	1	253	8							
Hydraulic Dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	1	91	20							
Truck with crane for installed pilings	Crane Rig	offroad	350	1	21	8							
Medium backhoe loader	Backhoe	offroad	100	1	200	8			1	7	8		
Agricultural tractor with mower	Tractor	offroad	175						1	3	8		
Fugitive dust control	Water Truck	onroad HHD		1	470		1	10	1	25		1	10
Manager	Pickup/SUV	onroad LD		2	470		0.50	65	1	235		1	65
Foreman	Pickup/SUV	onroad LD		2	470		0.50	65					
Equipment Operator	Pickup/SUV	onroad LD		15	400		0.33	65	1	235		1	65
Laborers	Pickup/SUV	onroad LD		6	400		0.33	65					
ALTERNATIVE 6 - Alamo River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		24	30		3	50	1	26	8	2	50
Import equipment from other areas	Tractor Trailer	onroad HHD		16	8		1	280					
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	3	222	8			1	27	8		
Low ground pressure haulers	Dump Truck	offroad	300	10	239	8			1	18	8		
Tracked excavator	Excavator	offroad	200	2	284	8			1	29	8		
Low ground pressure dozer	Dozer	offroad	125	2	133	8			1	5	8		
Small motor grader	Grader	offroad	140	1	22	8			1	25	8		
Barge with crane and clamshell bucket	Crane	offroad	500	2	249	8							
Hydraulic Dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	1	91	20							
Truck with crane for installed pilings	Crane Rig	offroad	350	1	21	8							
Medium backhoe loader	Backhoe	offroad	100	1	200	8			1	13	8		
Agricultural tractor with mower	Tractor	offroad	175						1	3	8		
Fugitive dust control	Water Truck	onroad HHD		1	470		1	10	1	25		1	10
Manager	Pickup/SUV	onroad LD		2	470		0.50	65	1	235		1	65
Foreman	Pickup/SUV	onroad LD		2	470		0.50	65					
Equipment Operator	Pickup/SUV	onroad LD		24	400		0.33	65	1	235		1	65
Laborers	Pickup/SUV	onroad LD		6	400		0.33	65					

Source: Applicant

Notes:

LD = light duty, MD = medium duty, HHD = heavy heavy duty, BHP = brake horsepower

Overall project life expected to be 2 years, 47 weeks/year average to account for holidays, vacations, weather, illness, etc.

For 235 work days in a year, managers and foremen commute 2 or 3 per vehicle, all other workers commute 3 per vehicle, 65 miles per round trip average (New River or Alamo River).

Short Trip: Hauling gravel and riprap rock into the project site from nearby quarries; assume 50 miles per round trip.

Long Trip: Hauling construction equipment and facility materials to the project site from major distribution centers, such as San Diego; assume 280 miles round trip.

Daily equipment operating hours assume typical average utilization over the life of the project to allow for staging, breaks, lunch, maintenance, repairs, etc.

G-4 Activity

Table G-4 Estimated Equipment and Vehicle Activity for Proposed Project Alternatives													
Phase or Activity	Equipment and Vehicles			Const. Daily		Const. Total		Maint. Daily		Maint. Total		Total Trip Counts	
	Type	Category	BHP	hrs	VMT	hrs	VMT	hrs	VMT	hrs	VMT	Const.	Maint.
ALTERNATIVE 1 - New River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD			7,500		322,500		100		3,700	6,450	74
Import equipment from other areas	Tractor Trailer	onroad HHD			4,760		52,360		-		-	187	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	24		7,800		8		224			
Low ground pressure haulers	Dump Truck	offroad	300	96		25,056		8		144			
Tracked excavator	Excavator	offroad	200	24		9,000		8		280			
Low ground pressure dozer	Dozer	offroad	125	16		3,728		8		40			
Small motor grader	Grader	offroad	140	8		200		8		200			
Barge with crane and clamshell bucket	Crane	offroad	500	24		6,360		-		-			
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	20		1,820		-		-			
Truck with crane for installed pilings	Crane Rig	offroad	350	8		160		-		-			
Medium backhoe loader	Backhoe	offroad	100	8		1,600		8		192			
Agricultural tractor with mower	Tractor	offroad	175	-		-		8		24			
Fugitive dust control	Water Truck	onroad HHD			10		4,700		10		250	470	25
Manager	Pickup/SUV	onroad LD			65		30,550		65		15,275	470	235
Foreman	Pickup/SUV	onroad LD			65		30,550		-		-	470	-
Equipment Operator	Pickup/SUV	onroad LD			780		312,000		65		15,275	4,800	235
Laborers	Pickup/SUV	onroad LD			130		52,000		-		-	800	-
ALTERNATIVE 2 - New River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD			6,000		276,000		100		3,400	5,520	68
Import equipment from other areas	Tractor Trailer	onroad HHD			3,080		36,960		-		-	132	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	24		6,336		8		216			
Low ground pressure haulers	Dump Truck	offroad	300	80		21,200		8		152			
Tracked excavator	Excavator	offroad	200	24		6,984		8		304			
Low ground pressure dozer	Dozer	offroad	125	16		2,608		8		48			
Small motor grader	Grader	offroad	140	8		224		8		200			
Barge with crane and clamshell bucket	Crane	offroad	500	16		4,304		-		-			
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	20		1,820		-		-			
Truck with crane for installed pilings	Crane Rig	offroad	350	8		168		-		-			
Medium backhoe loader	Backhoe	offroad	100	8		1,880		8		88			
Agricultural tractor with mower	Tractor	offroad	175	-		-		8		24			
Fugitive dust control	Water Truck	onroad HHD			10		4,700		10		250	470	25
Manager	Pickup/SUV	onroad LD			65		30,550		65		15,275	470	235
Foreman	Pickup/SUV	onroad LD			65		30,550		-		-	470	-
Equipment Operator	Pickup/SUV	onroad LD			585		234,000		65		15,275	3,600	235
Laborers	Pickup/SUV	onroad LD			130		52,000		-		-	800	-

G-4 Activity

ALTERNATIVE 3 - New River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD			9,000		396,000	72	100		4,500	7,920	72
Import equipment from other areas	Tractor Trailer	onroad HHD			3,920		43,120		-		-	154	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	32		8,480		8		224			
Low ground pressure haulers	Dump Truck	offroad	300	112		29,904		8		152			
Tracked excavator	Excavator	offroad	200	32		9,312		8		352			
Low ground pressure dozer	Dozer	offroad	125	24		3,504		8		48			
Small motor grader	Grader	offroad	140	8		272		8		200			
Barge with crane and clamshell bucket	Crane	offroad	500	32		8,448		-		-			
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	20		1,820		-		-			
Truck with crane for installed pilings	Crane Rig	offroad	350	8		168		-		-			
Medium backhoe loader	Backhoe	offroad	100	8		1,600		8		224			
Agricultural tractor with mower	Tractor	offroad	175	-		-		8		24			
Fugitive dust control	Water Truck	onroad HHD			10		4,700		10		250	470	25
Manager	Pickup/SUV	onroad LD			65		30,550		65		15,275	470	235
Foreman	Pickup/SUV	onroad LD			65		30,550		-		-	470	-
Equipment Operator	Pickup/SUV	onroad LD			975		390,000		65		15,275	6,000	235
Laborers	Pickup/SUV	onroad LD			130		52,000		-		-	800	-
ALTERNATIVE 4 - Alamo River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD			3,000		105,000		100		2,000	2,100	40
Import equipment from other areas	Tractor Trailer	onroad HHD			5,040		45,360		-		-	162	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	16		4,912		8		208			
Low ground pressure haulers	Dump Truck	offroad	300	56		14,560		8		144			
Tracked excavator	Excavator	offroad	200	16		4,944		8		208			
Low ground pressure dozer	Dozer	offroad	125	16		2,496		8		40			
Small motor grader	Grader	offroad	140	8		112		8		200			
Barge with crane and clamshell bucket	Crane	offroad	500	8		2,368		-		-			
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	20		1,820		-		-			
Truck with crane for installed pilings	Crane Rig	offroad	350	8		168		-		-			
Medium backhoe loader	Backhoe	offroad	100	8		1,600		8		48			
Agricultural tractor with mower	Tractor	offroad	175	-		-		8		24			
Fugitive dust control	Water Truck	onroad HHD			10		4,700		10		250	470	25
Manager	Pickup/SUV	onroad LD			65		30,550		65		15,275	470	235
Foreman	Pickup/SUV	onroad LD			65		30,550		-		-	470	-
Equipment Operator	Pickup/SUV	onroad LD			390		156,000		65		15,275	2,400	235
Laborers	Pickup/SUV	onroad LD			130		52,000		-		-	800	-

ALTERNATIVE 5 - Alamo River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD			2,700		99,900	98	100		2,000	1,998	98
Import equipment from other areas	Tractor Trailer	onroad HHD			2,800		28,000		-		-	100	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	16		4,128		8		208			
Low ground pressure haulers	Dump Truck	offroad	300	56		14,000		8		144			
Tracked excavator	Excavator	offroad	200	16		3,520		8		216			
Low ground pressure dozer	Dozer	offroad	125	16		1,632		8		40			
Small motor grader	Grader	offroad	140	8		152		8		200			
Barge with crane and clamshell bucket	Crane	offroad	500	8		2,024		-		-			
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	20		1,820		-		-			
Truck with crane for installed pilings	Crane Rig	offroad	350	8		168		-		-			
Medium backhoe loader	Backhoe	offroad	100	8		1,600		8		56			
Agricultural tractor with mower	Tractor	offroad	175	-		-		8		24			
Fugitive dust control	Water Truck	onroad HHD			10		4,700		10		250	470	10
Manager	Pickup/SUV	onroad LD			65		30,550		65		15,275	470	64
Foreman	Pickup/SUV	onroad LD			65		30,550		-		-	470	-
Equipment Operator	Pickup/SUV	onroad LD			325		130,000		65		15,275	2,000	64
Laborers	Pickup/SUV	onroad LD			130		52,000		-		-	800	-
ALTERNATIVE 6 - Alamo River													
Haul equipment and materials to site	Tractor Trailer	onroad HHD			3,600		108,000	98	100		2,600	2,160	98
Import equipment from other areas	Tractor Trailer	onroad HHD			4,480		35,840		-		-	128	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	24		5,328		8		216			
Low ground pressure haulers	Dump Truck	offroad	300	80		19,120		8		144			
Tracked excavator	Excavator	offroad	200	16		4,544		8		232			
Low ground pressure dozer	Dozer	offroad	125	16		2,128		8		40			
Small motor grader	Grader	offroad	140	8		176		8		200			
Barge with crane and clamshell bucket	Crane	offroad	500	16		3,984		-		-			
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	20		1,820		-		-			
Truck with crane for installed pilings	Crane Rig	offroad	350	8		168		-		-			
Medium backhoe loader	Backhoe	offroad	100	8		1,600		8		104			
Agricultural tractor with mower	Tractor	offroad	175	-		-		8		24			
Fugitive dust control	Water Truck	onroad HHD			10		4,700		10		250	470	10
Manager	Pickup/SUV	onroad LD			65		30,550		65		15,275	470	64
Foreman	Pickup/SUV	onroad LD			65		30,550		-		-	470	-
Equipment Operator	Pickup/SUV	onroad LD			520		208,000		65		15,275	3,200	64
Laborers	Pickup/SUV	onroad LD			130		52,000		-		-	800	-

Trip Count Totals					
ALTERNATIVE 1	Tractor Trailer (loc)	onroad HHD		6,450	74
	Tractor Trailer (imp)	onroad HHD		187	-
	Water Truck	onroad HHD		470	25
	Pickup/SUV	onroad LD		6,540	470
ALTERNATIVE 2	Tractor Trailer (loc)	onroad HHD		5,520	68
	Tractor Trailer (imp)	onroad HHD		132	-
	Water Truck	onroad HHD		470	25
	Pickup/SUV	onroad LD		5,340	470
ALTERNATIVE 3	Tractor Trailer (loc)	onroad HHD		7,920	72
	Tractor Trailer (imp)	onroad HHD		154	-
	Water Truck	onroad HHD		470	25
	Pickup/SUV	onroad LD		7,740	470
ALTERNATIVE 4	Tractor Trailer (loc)	onroad HHD		2,100	40
	Tractor Trailer (imp)	onroad HHD		162	-
	Water Truck	onroad HHD		470	25
	Pickup/SUV	onroad LD		4,140	470
ALTERNATIVE 5	Tractor Trailer (loc)	onroad HHD		1,998	98
	Tractor Trailer (imp)	onroad HHD		100	-
	Water Truck	onroad HHD		470	10
	Pickup/SUV	onroad LD		3,740	128
ALTERNATIVE 6	Tractor Trailer (loc)	onroad HHD		2,160	98
	Tractor Trailer (imp)	onroad HHD		128	-
	Water Truck	onroad HHD		470	10
	Pickup/SUV	onroad LD		4,940	128

Source: Applicant

Notes:

LD = light duty, MD = medium duty, HHD = heavy heavy duty, BHP = brake horsepower

Overall project life expected to be 2 years, 47 weeks/year average to account for holidays, vacations, weather, illness, etc.

For 235 work days in a year, managers and foremen commute 2 or 3 per vehicle, all other workers commute 3 per vehicle, 65 miles per round trip average (New River or Alamo River).

Short Trip: Hauling gravel and riprap rock into the project site from nearby quarries; assume 50 miles per round trip.

Long Trip: Hauling construction equipment and facility materials to the project site from major distribution centers, such as San Diego; assume 280 miles round trip.

Daily equipment operating hours assume typical average utilization over the life of the project to allow for staging, breaks, lunch, maintenance, repairs, etc.

Table G-5 Emission Factors for Proposed Project Alternatives													
Phase or Activity	**Equipment and Vehicles**			**VOC**	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH_4**	**N_20**	**CO_2 eqv**
	Type	**Category**	**BHP**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**
ALTERNATIVE 1													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Import equipment from other areas	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	0.28128	0.98313	2.51652	0.00284	0.09758	0.08977	276.64526	0.02538	0.01128	280.67495
Low ground pressure haulers	Dump Truck	offroad	300	0.15537	0.43417	1.34715	0.00203	0.04566	0.04201	187.70309	0.01402	0.00623	189.92895
Tracked excavator	Excavator	offroad	200	0.12195	0.56261	0.97411	0.00144	0.04656	0.04284	127.70865	0.01100	0.00489	129.45575
Low ground pressure dozer	Dozer	offroad	125	0.13278	0.50931	0.81266	0.00083	0.06805	0.06261	70.84486	0.01198	0.00532	72.74703
Small motor grader	Grader	offroad	140	0.13313	0.60498	0.89885	0.00107	0.06596	0.06068	92.76728	0.01201	0.00534	94.67452
Barge with crane and clamshell bucket	Crane	offroad	500	0.15509	0.52921	1.42304	0.00177	0.05183	0.04769	180.10128	0.01399	0.00622	182.32308
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	0.52457	1.67930	6.00668	0.00563	0.18046	0.16602	559.60311	0.04733	0.02104	567.11825
Truck with crane for installed pilings	Crane Rig	offroad	350	0.12445	0.38855	1.16607	0.00146	0.04179	0.03845	139.33583	0.01123	0.00499	141.11880
Medium backhoe loader	Backhoe	offroad	100	0.07512	0.34343	0.40872	0.00055	0.03416	0.03143	45.61918	0.00678	0.00301	46.69540
Agricultural tractor with mower	Tractor	offroad	175	0.20452	0.83349	1.53367	0.00147	0.08711	0.08014	130.41728	0.01845	0.00820	133.34733
Fugitive dust control	Water Truck	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Manager	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Foreman	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Equipment Operator	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Laborers	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
ALTERNATIVE 2													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Import equipment from other areas	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	0.28128	0.98313	2.51652	0.00284	0.09758	0.08977	276.64526	0.02538	0.01128	280.67495
Low ground pressure haulers	Dump Truck	offroad	300	0.15537	0.43417	1.34715	0.00203	0.04566	0.04201	187.70309	0.01402	0.00623	189.92895
Tracked excavator	Excavator	offroad	200	0.12195	0.56261	0.97411	0.00144	0.04656	0.04284	127.70865	0.01100	0.00489	129.45575
Low ground pressure dozer	Dozer	offroad	125	0.13278	0.50931	0.81266	0.00083	0.06805	0.06261	70.84486	0.01198	0.00532	72.74703
Small motor grader	Grader	offroad	140	0.13313	0.60498	0.89885	0.00107	0.06596	0.06068	92.76728	0.01201	0.00534	94.67452
Barge with crane and clamshell bucket	Crane	offroad	500	0.15509	0.52921	1.42304	0.00177	0.05183	0.04769	180.10128	0.01399	0.00622	182.32308
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	0.52457	1.67930	6.00668	0.00563	0.18046	0.16602	559.60311	0.04733	0.02104	567.11825
Truck with crane for installed pilings	Crane Rig	offroad	350	0.12445	0.38855	1.16607	0.00146	0.04179	0.03845	139.33583	0.01123	0.00499	141.11880
Medium backhoe loader	Backhoe	offroad	100	0.07512	0.34343	0.40872	0.00055	0.03416	0.03143	45.61918	0.00678	0.00301	46.69540
Agricultural tractor with mower	Tractor	offroad	175	0.20452	0.83349	1.53367	0.00147	0.08711	0.08014	130.41728	0.01845	0.00820	133.34733
Fugitive dust control	Water Truck	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Manager	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Foreman	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Equipment Operator	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Laborers	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
ALTERNATIVE 3													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Import equipment from other areas	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	0.28128	0.98313	2.51652	0.00284	0.09758	0.08977	276.64526	0.02538	0.01128	280.67495
Low ground pressure haulers	Dump Truck	offroad	300	0.15537	0.43417	1.34715	0.00203	0.04566	0.04201	187.70309	0.01402	0.00623	189.92895
Tracked excavator	Excavator	offroad	200	0.12195	0.56261	0.97411	0.00144	0.04656	0.04284	127.70865	0.01100	0.00489	129.45575
Low ground pressure dozer	Dozer	offroad	125	0.13278	0.50931	0.81266	0.00083	0.06805	0.06261	70.84486	0.01198	0.00532	72.74703
Small motor grader	Grader	offroad	140	0.13313	0.60498	0.89885	0.00107	0.06596	0.06068	92.76728	0.01201	0.00534	94.67452
Barge with crane and clamshell bucket	Crane	offroad	500	0.15509	0.52921	1.42304	0.00177	0.05183	0.04769	180.10128	0.01399	0.00622	182.32308
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	0.52457	1.67930	6.00668	0.00563	0.18046	0.16602	559.60311	0.04733	0.02104	567.11825
Truck with crane for installed pilings	Crane Rig	offroad	350	0.12445	0.38855	1.16607	0.00146	0.04179	0.03845	139.33583	0.01123	0.00499	141.11880
Medium backhoe loader	Backhoe	offroad	100	0.07512	0.34343	0.40872	0.00055	0.03416	0.03143	45.61918	0.00678	0.00301	46.69540
Agricultural tractor with mower	Tractor	offroad	175	0.20452	0.83349	1.53367	0.00147	0.08711	0.08014	130.41728	0.01845	0.00820	133.34733
Fugitive dust control	Water Truck	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Manager	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Foreman	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Equipment Operator	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Laborers	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
ALTERNATIVE 4													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Import equipment from other areas	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	0.28128	0.98313	2.51652	0.00284	0.09758	0.08977	276.64526	0.02538	0.01128	280.67495
Low ground pressure haulers	Dump Truck	offroad	300	0.15537	0.43417	1.34715	0.00203	0.04566	0.04201	187.70309	0.01402	0.00623	189.92895
Tracked excavator	Excavator	offroad	200	0.12195	0.56261	0.97411	0.00144	0.04656	0.04284	127.70865	0.01100	0.00489	129.45575
Low ground pressure dozer	Dozer	offroad	125	0.13278	0.50931	0.81266	0.00083	0.06805	0.06261	70.84486	0.01198	0.00532	72.74703
Small motor grader	Grader	offroad	140	0.13313	0.60498	0.89885	0.00107	0.06596	0.06068	92.76728	0.01201	0.00534	94.67452
Barge with crane and clamshell bucket	Crane	offroad	500	0.15509	0.52921	1.42304	0.00177	0.05183	0.04769	180.10128	0.01399	0.00622	182.32308
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	0.52457	1.67930	6.00668	0.00563	0.18046	0.16602	559.60311	0.04733	0.02104	567.11825
Truck with crane for installed pilings	Crane Rig	offroad	350	0.12445	0.38855	1.16607	0.00146	0.04179	0.03845	139.33583	0.01123	0.00499	141.11880
Medium backhoe loader	Backhoe	offroad	100	0.07512	0.34343	0.40872	0.00055	0.03416	0.03143	45.61918	0.00678	0.00301	46.69540
Agricultural tractor with mower	Tractor	offroad	175	0.20452	0.83349	1.53367	0.00147	0.08711	0.08014	130.41728	0.01845	0.00820	133.34733
Fugitive dust control	Water Truck	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Manager	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Foreman	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Equipment Operator	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Laborers	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070

ALTERNATIVE 5													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Import equipment from other areas	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	0.28128	0.98313	2.51652	0.00284	0.09758	0.08977	276.64526	0.02538	0.01128	280.67495
Low ground pressure haulers	Dump Truck	offroad	300	0.15537	0.43417	1.34715	0.00203	0.04566	0.04201	187.70309	0.01402	0.00623	189.92895
Tracked excavator	Excavator	offroad	200	0.12195	0.56261	0.97411	0.00144	0.04656	0.04284	127.70865	0.01100	0.00489	129.45575
Low ground pressure dozer	Dozer	offroad	125	0.13278	0.50931	0.81266	0.00083	0.06805	0.06261	70.84486	0.01198	0.00532	72.74703
Small motor grader	Grader	offroad	140	0.13313	0.60498	0.89885	0.00107	0.06596	0.06068	92.76728	0.01201	0.00534	94.67452
Barge with crane and clamshell bucket	Crane	offroad	500	0.15509	0.52921	1.42304	0.00177	0.05183	0.04769	180.10128	0.01399	0.00622	182.32308
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	0.52457	1.67930	6.00668	0.00563	0.18046	0.16602	559.60311	0.04733	0.02104	567.11825
Truck with crane for installed pilings	Crane Rig	offroad	350	0.12445	0.38855	1.16607	0.00146	0.04179	0.03845	139.33583	0.01123	0.00499	141.11880
Medium backhoe loader	Backhoe	offroad	100	0.07512	0.34343	0.40872	0.00055	0.03416	0.03143	45.61918	0.00678	0.00301	46.69540
Agricultural tractor with mower	Tractor	offroad	175	0.20452	0.83349	1.53367	0.00147	0.08711	0.08014	130.41728	0.01845	0.00820	133.34733
Fugitive dust control	Water Truck	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Manager	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Foreman	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Equipment Operator	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Laborers	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
ALTERNATIVE 6													
Haul equipment and materials to site	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Import equipment from other areas	Tractor Trailer	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	400	0.28128	0.98313	2.51652	0.00284	0.09758	0.08977	276.64526	0.02538	0.01128	280.67495
Low ground pressure haulers	Dump Truck	offroad	300	0.15537	0.43417	1.34715	0.00203	0.04566	0.04201	187.70309	0.01402	0.00623	189.92895
Tracked excavator	Excavator	offroad	200	0.12195	0.56261	0.97411	0.00144	0.04656	0.04284	127.70865	0.01100	0.00489	129.45575
Low ground pressure dozer	Dozer	offroad	125	0.13278	0.50931	0.81266	0.00083	0.06805	0.06261	70.84486	0.01198	0.00532	72.74703
Small motor grader	Grader	offroad	140	0.13313	0.60498	0.89885	0.00107	0.06596	0.06068	92.76728	0.01201	0.00534	94.67452
Barge with crane and clamshell bucket	Crane	offroad	500	0.15509	0.52921	1.42304	0.00177	0.05183	0.04769	180.10128	0.01399	0.00622	182.32308
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1000	0.52457	1.67930	6.00668	0.00563	0.18046	0.16602	559.60311	0.04733	0.02104	567.11825
Truck with crane for installed pilings	Crane Rig	offroad	350	0.12445	0.38855	1.16607	0.00146	0.04179	0.03845	139.33583	0.01123	0.00499	141.11880
Medium backhoe loader	Backhoe	offroad	100	0.07512	0.34343	0.40872	0.00055	0.03416	0.03143	45.61918	0.00678	0.00301	46.69540
Agricultural tractor with mower	Tractor	offroad	175	0.20452	0.83349	1.53367	0.00147	0.08711	0.08014	130.41728	0.01845	0.00820	133.34733
Fugitive dust control	Water Truck	onroad HHD		0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784
Manager	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Foreman	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Equipment Operator	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Laborers	Pickup/SUV	onroad LD		0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Sources: SCAQMD 2008, EPA 2010													

Notes:

SCAQMD emission factors for 2013

Offroad diesel exhaust $PM_{2.5}$ = 92% of PM_{10} per EMFAC 2007 version 2.3

Offroad N_2O per Annex 3, Table A-101

Non-matching application-specific values interpolated or extrapolated

EPA GWPs for CO_2 eqv (1, 21, 310)

Table G-6 Daily Emissions for Proposed Project Alternatives														
Phase or Activity	**Equipment and Vehicles**		**Maximum Daily**		**VOC**	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH_4**	**N_20**	**CO_2 eqv**
	Type	**Category**	**hours**	**VMT**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**
ALTERNATIVE 1														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		7,500	16.97	69.88	205.72	0.31	10.03	8.60	31,614	0.78	0.74	31,859
Import equipment from other areas	Tractor Trailer	onroad HHD		4,760	10.77	44.35	130.56	0.19	6.36	5.46	20,064	0.50	0.47	20,220
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	24		6.75	23.60	60.40	0.07	2.34	2.15	6,639	0.61	0.27	6,736
Low ground pressure haulers	Dump Truck	offroad	96		14.92	41.68	129.33	0.20	4.38	4.03	18,019	1.35	0.60	18,233
Tracked excavator	Excavator	offroad	24		2.93	13.50	23.38	0.03	1.12	1.03	3,065	0.26	0.12	3,107
Low ground pressure dozer	Dozer	offroad	16		2.12	8.15	13.00	0.01	1.09	1.00	1,134	0.19	0.09	1,164
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	24		3.72	12.70	34.15	0.04	1.24	1.14	4,322	0.34	0.15	4,376
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	20		10.49	33.59	120.13	0.11	3.61	3.32	11,192	0.95	0.42	11,342
Truck with crane for installed pilings	Crane Rig	offroad	8		1.00	3.11	9.33	0.01	0.33	0.31	1,115	0.09	0.04	1,129
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Equipment Operator	Pickup/SUV	onroad LD		780	0.58	5.53	0.56	0.01	0.07	0.05	859	0.05	0.02	866
Laborers	Pickup/SUV	onroad LD		130	0.10	0.92	0.09	0.00	0.01	0.01	143	0.01	0.00	144
ALTERNATIVE 2														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		6,000	13.58	55.91	164.58	0.25	8.02	6.88	25,291	0.63	0.59	25,487
Import equipment from other areas	Tractor Trailer	onroad HHD		3,080	6.97	28.70	84.48	0.13	4.12	3.53	12,983	0.32	0.30	13,083
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	24		6.75	23.60	60.40	0.07	2.34	2.15	6,639	0.61	0.27	6,736
Low ground pressure haulers	Dump Truck	offroad	80		12.43	34.73	107.77	0.16	3.65	3.36	15,016	1.12	0.50	15,194
Tracked excavator	Excavator	offroad	24		2.93	13.50	23.38	0.03	1.12	1.03	3,065	0.26	0.12	3,107
Low ground pressure dozer	Dozer	offroad	16		2.12	8.15	13.00	0.01	1.09	1.00	1,134	0.19	0.09	1,164
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	16		2.48	8.47	22.77	0.03	0.83	0.76	2,882	0.22	0.10	2,917
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	20		10.49	33.59	120.13	0.11	3.61	3.32	11,192	0.95	0.42	11,342
Truck with crane for installed pilings	Crane Rig	offroad	8		1.00	3.11	9.33	0.01	0.33	0.31	1,115	0.09	0.04	1,129
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Equipment Operator	Pickup/SUV	onroad LD		585	0.44	4.15	0.42	0.01	0.05	0.03	644	0.04	0.02	650
Laborers	Pickup/SUV	onroad LD		130	0.10	0.92	0.09	0.00	0.01	0.01	143	0.01	0.00	144
ALTERNATIVE 3														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		9,000	20.37	83.86	246.86	0.37	12.03	10.32	37,937	0.94	0.88	38,231
Import equipment from other areas	Tractor Trailer	onroad HHD		3,920	8.87	36.53	107.52	0.16	5.24	4.49	16,524	0.41	0.39	16,652
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	32		9.00	31.46	80.53	0.09	3.12	2.87	8,853	0.81	0.36	8,982
Low ground pressure haulers	Dump Truck	offroad	112		17.40	48.63	150.88	0.23	5.11	4.70	21,023	1.57	0.70	21,272
Tracked excavator	Excavator	offroad	32		3.90	18.00	31.17	0.05	1.49	1.37	4,087	0.35	0.16	4,143
Low ground pressure dozer	Dozer	offroad	24		3.19	12.22	19.50	0.02	1.63	1.50	1,700	0.29	0.13	1,746
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	32		4.96	16.93	45.54	0.06	1.66	1.53	5,763	0.45	0.20	5,834
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	20		10.49	33.59	120.13	0.11	3.61	3.32	11,192	0.95	0.42	11,342
Truck with crane for installed pilings	Crane Rig	offroad	8		1.00	3.11	9.33	0.01	0.33	0.31	1,115	0.09	0.04	1,129
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Equipment Operator	Pickup/SUV	onroad LD		975	0.73	6.91	0.69	0.01	0.09	0.06	1,073	0.07	0.03	1,083
Laborers	Pickup/SUV	onroad LD		130	0.10	0.92	0.09	0.00	0.01	0.01	143	0.01	0.00	144
ALTERNATIVE 4														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		3,000	6.79	27.95	82.29	0.12	4.01	3.44	12,646	0.31	0.29	12,744
Import equipment from other areas	Tractor Trailer	onroad HHD		5,040	11.41	46.96	138.24	0.21	6.74	5.78	21,245	0.53	0.50	21,409
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	16		4.50	15.73	40.26	0.05	1.56	1.44	4,426	0.41	0.18	4,491
Low ground pressure haulers	Dump Truck	offroad	56		8.70	24.31	75.44	0.11	2.56	2.35	10,511	0.79	0.35	10,636
Tracked excavator	Excavator	offroad	16		1.95	9.00	15.59	0.02	0.74	0.69	2,043	0.18	0.08	2,071
Low ground pressure dozer	Dozer	offroad	16		2.12	8.15	13.00	0.01	1.09	1.00	1,134	0.19	0.09	1,164
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	8		1.24	4.23	11.38	0.01	0.41	0.38	1,441	0.11	0.05	1,459
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	20		10.49	33.59	120.13	0.11	3.61	3.32	11,192	0.95	0.42	11,342
Truck with crane for installed pilings	Crane Rig	offroad	8		1.00	3.11	9.33	0.01	0.33	0.31	1,115	0.09	0.04	1,129
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Equipment Operator	Pickup/SUV	onroad LD		390	0.29	2.77	0.28	0.00	0.04	0.02	429	0.03	0.01	433
Laborers	Pickup/SUV	onroad LD		130	0.10	0.92	0.09	0.00	0.01	0.01	143	0.01	0.00	144

ALTERNATIVE 5														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		2,700	6.11	25.16	74.06	0.11	3.61	3.09	11,381	0.28	0.27	11,469
Import equipment from other areas	Tractor Trailer	onroad HHD		2,800	6.34	26.09	76.80	0.11	3.74	3.21	11,803	0.29	0.28	11,894
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	16		4.50	15.73	40.26	0.05	1.56	1.44	4,426	0.41	0.18	4,491
Low ground pressure haulers	Dump Truck	offroad	56		8.70	24.31	75.44	0.11	2.56	2.35	10,511	0.79	0.35	10,636
Tracked excavator	Excavator	offroad	16		1.95	9.00	15.59	0.02	0.74	0.69	2,043	0.18	0.08	2,071
Low ground pressure dozer	Dozer	offroad	16		2.12	8.15	13.00	0.01	1.09	1.00	1,134	0.19	0.09	1,164
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	8		1.24	4.23	11.38	0.01	0.41	0.38	1,441	0.11	0.05	1,459
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	20		10.49	33.59	120.13	0.11	3.61	3.32	11,192	0.95	0.42	11,342
Truck with crane for installed pilings	Crane Rig	offroad	8		1.00	3.11	9.33	0.01	0.33	0.31	1,115	0.09	0.04	1,129
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Equipment Operator	Pickup/SUV	onroad LD		325	0.24	2.30	0.23	0.00	0.03	0.02	358	0.02	0.01	361
Laborers	Pickup/SUV	onroad LD		130	0.10	0.92	0.09	0.00	0.01	0.01	143	0.01	0.00	144
ALTERNATIVE 6														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		3,600	8.15	33.54	98.75	0.15	4.81	4.13	15,175	0.38	0.35	15,292
Import equipment from other areas	Tractor Trailer	onroad HHD		4,480	10.14	41.74	122.88	0.18	5.99	5.14	18,884	0.47	0.44	19,030
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	24		6.75	23.60	60.40	0.07	2.34	2.15	6,639	0.61	0.27	6,736
Low ground pressure haulers	Dump Truck	offroad	80		12.43	34.73	107.77	0.16	3.65	3.36	15,016	1.12	0.50	15,194
Tracked excavator	Excavator	offroad	16		1.95	9.00	15.59	0.02	0.74	0.69	2,043	0.18	0.08	2,071
Low ground pressure dozer	Dozer	offroad	16		2.12	8.15	13.00	0.01	1.09	1.00	1,134	0.19	0.09	1,164
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	16		2.48	8.47	22.77	0.03	0.83	0.76	2,882	0.22	0.10	2,917
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	20		10.49	33.59	120.13	0.11	3.61	3.32	11,192	0.95	0.42	11,342
Truck with crane for installed pilings	Crane Rig	offroad	8		1.00	3.11	9.33	0.01	0.33	0.31	1,115	0.09	0.04	1,129
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Equipment Operator	Pickup/SUV	onroad LD		520	0.39	3.69	0.37	0.01	0.05	0.03	572	0.03	0.01	578
Laborers	Pickup/SUV	onroad LD		130	0.10	0.92	0.09	0.00	0.01	0.01	143	0.01	0.00	144
Maximum Daily Construction Emissions														
ALTERNATIVE 1, LBS					17.8	77.4	206.7	0.3	10.1	8.7	32,801	1.4	0.8	33,056
ALTERNATIVE 2, LBS					14.2	62.0	165.5	0.3	8.1	6.9	26,264	1.2	0.6	26,468
ALTERNATIVE 3, LBS					21.3	92.7	248.0	0.4	12.2	10.4	39,338	1.7	0.9	39,645
ALTERNATIVE 4, LBS					11.0	38.3	120.9	0.1	4.1	3.5	13,403	1.0	0.4	13,508
ALTERNATIVE 5, LBS					11.0	37.8	120.8	0.1	3.7	3.4	12,067	1.0	0.4	12,161
ALTERNATIVE 6, LBS					13.0	40.4	121.0	0.2	4.9	4.2	16,076	1.2	0.5	16,201
Sources: SCAQMD 2008, EPA 2010														

Notes:

SCAQMD emission factors for 2013

Offroad diesel exhaust $PM_{2.5}$ = 92% of PM_{10} per EMFAC 2007 version 2.3

Offroad N_2O per Annex 3, Table A-101

Non-matching application-specific values interpolated or extrapolated

EPA GWPs for CO_2 eqv (1, 21, 310)

Special Note: Daily maximums do not include importing equipment from other areas in state (local emissions only)

Table G-7 Total Emissions for Proposed Project Alternatives														
Phase or Activity	Equipment and Vehicles		Project Total		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
	Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
ALTERNATIVE 1														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		322,500	730	3,005	8,846	13	431	370	1,359,397	34	32	1,369,929
Import equipment from other areas	Tractor Trailer	onroad HHD		52,360	118	488	1,436	2	70	60	220,707	5	5	222,417
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	7,800		2,194	7,668	19,629	22	761	700	2,157,833	198	88	2,189,265
Low ground pressure haulers	Dump Truck	offroad	25,056		3,893	10,879	33,754	51	1,144	1,053	4,703,089	351	156	4,758,860
Tracked excavator	Excavator	offroad	9,000		1,098	5,063	8,767	13	419	386	1,149,378	99	44	1,165,102
Low ground pressure dozer	Dozer	offroad	3,728		495	1,899	3,030	3	254	233	264,110	45	20	271,201
Small motor grader	Grader	offroad	200		27	121	180	0	13	12	18,553	2	1	18,935
Barge with crane and clamshell bucket	Crane	offroad	6,360		986	3,366	9,051	11	330	303	1,145,444	89	40	1,159,575
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1,820		955	3,056	10,932	10	328	302	1,018,478	86	38	1,032,155
Truck with crane for installed pilings	Crane Rig	offroad	160		20	62	187	0	7	6	22,294	2	1	22,579
Medium backhoe loader	Backhoe	offroad	1,600		120	549	654	1	55	50	72,991	11	5	74,713
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		4,700	11	44	129	0	6	5	19,811	0	0	19,965
Manager	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Foreman	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Equipment Operator	Pickup/SUV	onroad LD		312,000	233	2,213	222	3	28	18	343,473	21	8	346,539
Laborers	Pickup/SUV	onroad LD		52,000	39	369	37	1	5	3	57,245	3	1	57,757
ALTERNATIVE 2														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		276,000	625	2,572	7,571	11	369	316	1,163,391	29	27	1,172,405
Import equipment from other areas	Tractor Trailer	onroad HHD		36,960	84	344	1,014	2	49	42	155,793	4	4	157,000
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	6,336		1,782	6,229	15,945	18	618	569	1,752,824	161	71	1,778,356
Low ground pressure haulers	Dump Truck	offroad	21,200		3,294	9,204	28,560	43	968	891	3,979,306	297	132	4,026,494
Tracked excavator	Excavator	offroad	6,984		852	3,929	6,803	10	325	299	891,917	77	34	904,119
Low ground pressure dozer	Dozer	offroad	2,608		346	1,328	2,119	2	177	163	184,763	31	14	189,724
Small motor grader	Grader	offroad	224		30	136	201	0	15	14	20,780	3	1	21,207
Barge with crane and clamshell bucket	Crane	offroad	4,304		667	2,278	6,125	8	223	205	775,156	60	27	784,719
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1,820		955	3,056	10,932	10	328	302	1,018,478	86	38	1,032,155
Truck with crane for installed pilings	Crane Rig	offroad	168		21	65	196	0	7	6	23,408	2	1	23,708
Medium backhoe loader	Backhoe	offroad	1,880		141	646	768	1	64	59	85,764	13	6	87,787
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		4,700	11	44	129	0	6	5	19,811	0	0	19,965
Manager	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Foreman	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Equipment Operator	Pickup/SUV	onroad LD		234,000	174	1,660	167	3	21	14	257,605	16	6	259,904
Laborers	Pickup/SUV	onroad LD		52,000	39	369	37	1	5	3	57,245	3	1	57,757

Table G-7 Total Emissions for Proposed Project Alternatives														
Phase or Activity	Equipment and Vehicles		Project Total		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
	Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
ALTERNATIVE 3														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		396,000	896	3,690	10,862	16	529	454	1,669,213	41	39	1,682,146
Import equipment from other areas	Tractor Trailer	onroad HHD		43,120	98	402	1,183	2	58	49	181,759	5	4	183,167
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	8,480		2,385	8,337	21,340	24	827	761	2,345,952	215	96	2,380,124
Low ground pressure haulers	Dump Truck	offroad	29,904		4,646	12,983	40,285	61	1,365	1,256	5,613,073	419	186	5,679,635
Tracked excavator	Excavator	offroad	9,312		1,136	5,239	9,071	13	434	399	1,189,223	102	46	1,205,492
Low ground pressure dozer	Dozer	offroad	3,504		465	1,785	2,848	3	238	219	248,240	42	19	254,906
Small motor grader	Grader	offroad	272		36	165	244	0	18	17	25,233	3	1	25,751
Barge with crane and clamshell bucket	Crane	offroad	8,448		1,310	4,471	12,022	15	438	403	1,521,496	118	53	1,540,265
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1,820		955	3,056	10,932	10	328	302	1,018,478	86	38	1,032,155
Truck with crane for installed pilings	Crane Rig	offroad	168		21	65	196	0	7	6	23,408	2	1	23,708
Medium backhoe loader	Backhoe	offroad	1,600		120	549	654	1	55	50	72,991	11	5	74,713
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		4,700	11	44	129	0	6	5	19,811	0	0	19,965
Manager	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Foreman	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Equipment Operator	Pickup/SUV	onroad LD		390,000	291	2,766	278	4	35	23	429,341	26	11	433,174
Laborers	Pickup/SUV	onroad LD		52,000	39	369	37	1	5	3	57,245	3	1	57,757
ALTERNATIVE 4														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		105,000	238	978	2,880	4	140	120	442,594	11	10	446,024
Import equipment from other areas	Tractor Trailer	onroad HHD		45,360	103	423	1,244	2	61	52	191,201	5	4	192,682
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	4,912		1,382	4,829	12,361	14	479	441	1,358,882	125	55	1,378,675
Low ground pressure haulers	Dump Truck	offroad	14,560		2,262	6,321	19,614	30	665	612	2,732,957	204	91	2,765,365
Tracked excavator	Excavator	offroad	4,944		603	2,782	4,816	7	230	212	631,392	54	24	640,029
Low ground pressure dozer	Dozer	offroad	2,496		331	1,271	2,028	2	170	156	176,829	30	13	181,577
Small motor grader	Grader	offroad	112		15	68	101	0	7	7	10,390	1	1	10,604
Barge with crane and clamshell bucket	Crane	offroad	2,368		367	1,253	3,370	4	123	113	426,480	33	15	431,741
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1,820		955	3,056	10,932	10	328	302	1,018,478	86	38	1,032,155
Truck with crane for installed pilings	Crane Rig	offroad	168		21	65	196	0	7	6	23,408	2	1	23,708
Medium backhoe loader	Backhoe	offroad	1,600		120	549	654	1	55	50	72,991	11	5	74,713
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		4,700	11	44	129	0	6	5	19,811	0	0	19,965
Manager	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Foreman	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Equipment Operator	Pickup/SUV	onroad LD		156,000	116	1,106	111	2	14	9	171,736	10	4	173,270
Laborers	Pickup/SUV	onroad LD		52,000	39	369	37	1	5	3	57,245	3	1	57,757

Table G-7 Total Emissions for Proposed Project Alternatives														
Phase or Activity	Equipment and Vehicles		Project Total		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
	Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
ALTERNATIVE 5														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		99,900	226	931	2,740	4	134	115	421,097	10	10	424,360
Import equipment from other areas	Tractor Trailer	onroad HHD		28,000	63	261	768	1	37	32	118,025	3	3	118,940
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	4,128		1,161	4,058	10,388	12	403	371	1,141,992	105	47	1,158,626
Low ground pressure haulers	Dump Truck	offroad	14,000		2,175	6,078	18,860	28	639	588	2,627,843	196	87	2,659,005
Tracked excavator	Excavator	offroad	3,520		429	1,980	3,429	5	164	151	449,534	39	17	455,684
Low ground pressure dozer	Dozer	offroad	1,632		217	831	1,326	1	111	102	115,619	20	9	118,723
Small motor grader	Grader	offroad	152		20	92	137	0	10	9	14,101	2	1	14,391
Barge with crane and clamshell bucket	Crane	offroad	2,024		314	1,071	2,880	4	105	97	364,525	28	13	369,022
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1,820		955	3,056	10,932	10	328	302	1,018,478	86	38	1,032,155
Truck with crane for installed pilings	Crane Rig	offroad	168		21	65	196	0	7	6	23,408	2	1	23,708
Medium backhoe loader	Backhoe	offroad	1,600		120	549	654	1	55	50	72,991	11	5	74,713
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		4,700	11	44	129	0	6	5	19,811	0	0	19,965
Manager	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Foreman	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Equipment Operator	Pickup/SUV	onroad LD		130,000	97	922	93	1	12	8	143,114	9	4	144,391
Laborers	Pickup/SUV	onroad LD		52,000	39	369	37	1	5	3	57,245	3	1	57,757
ALTERNATIVE 6														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		108,000	244	1,006	2,962	4	144	124	455,240	11	11	458,767
Import equipment from other areas	Tractor Trailer	onroad HHD		35,840	81	334	983	1	48	41	151,072	4	4	152,243
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	5,328		1,499	5,238	13,408	15	520	478	1,473,966	135	60	1,495,436
Low ground pressure haulers	Dump Truck	offroad	19,120		2,971	8,301	25,757	39	873	803	3,588,883	268	119	3,631,441
Tracked excavator	Excavator	offroad	4,544		554	2,556	4,426	7	212	195	580,308	50	22	588,247
Low ground pressure dozer	Dozer	offroad	2,128		283	1,084	1,729	2	145	133	150,758	25	11	154,806
Small motor grader	Grader	offroad	176		23	106	158	0	12	11	16,327	2	1	16,663
Barge with crane and clamshell bucket	Crane	offroad	3,984		618	2,108	5,669	7	207	190	717,524	56	25	726,375
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	1,820		955	3,056	10,932	10	328	302	1,018,478	86	38	1,032,155
Truck with crane for installed pilings	Crane Rig	offroad	168		21	65	196	0	7	6	23,408	2	1	23,708
Medium backhoe loader	Backhoe	offroad	1,600		120	549	654	1	55	50	72,991	11	5	74,713
Agricultural tractor with mower	Tractor	offroad	-		-	-	-	-	-	-	-	-	-	-
Fugitive dust control	Water Truck	onroad HHD		4,700	11	44	129	0	6	5	19,811	0	0	19,965
Manager	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Foreman	Pickup/SUV	onroad LD		30,550	23	217	22	0	3	2	33,632	2	1	33,932
Equipment Operator	Pickup/SUV	onroad LD		208,000	155	1,475	148	2	19	12	228,982	14	6	231,026
Laborers	Pickup/SUV	onroad LD		52,000	39	369	37	1	5	3	57,245	3	1	57,757

G-7 Total

Table G-7 Total Emissions for Proposed Project Alternatives														
Phase or Activity	Equipment and Vehicles		Project Total		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
	Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Total Construction Emissions														
ALTERNATIVE 1, TONS					5.5	19.6	48.4	0.07	1.9	1.8	6,310	0.5	0.2	6,388
ALTERNATIVE 2, TONS					4.5	16.1	40.3	0.05	1.6	1.4	5,227	0.4	0.2	5,292
ALTERNATIVE 3, TONS					6.2	22.2	55.1	0.08	2.2	2.0	7,241	0.5	0.3	7,330
ALTERNATIVE 4, TONS					3.3	11.8	29.3	0.04	1.1	1.0	3,701	0.3	0.1	3,748
ALTERNATIVE 5, TONS					2.9	10.4	26.3	0.03	1.0	0.9	3,328	0.3	0.1	3,370
ALTERNATIVE 6, TONS					3.8	13.4	33.6	0.05	1.3	1.2	4,311	0.3	0.2	4,366
Sources: SCAQMD 2008, EPA 2010														

Notes:

SCAQMD emission factors for 2013

Offroad diesel exhaust $PM_{2.5}$ = 92% of PM_{10} per EMFAC 2007 version 2.3

Offroad N_2O per Annex 3, Table A-101

Non-matching application-specific values interpolated or extrapolated

EPA GWPs for CO_2 eqv (1, 21, 310)

G-8 Daily Maintenance

Table G-8 Daily Maintenance Emissions for Proposed Project Alternatives														
Phase or Activity	Equipment and Vehicles		Daily Maint,		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2 eqv
	Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
ALTERNATIVE 1														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		100	0.23	0.93	2.74	0.00	0.13	0.11	422	0.01	0.01	425
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	8		2.25	7.87	20.13	0.02	0.78	0.72	2,213	0.20	0.09	2,245
Low ground pressure haulers	Dump Truck	offroad	8		1.24	3.47	10.78	0.02	0.37	0.34	1,502	0.11	0.05	1,519
Tracked excavator	Excavator	offroad	8		0.98	4.50	7.79	0.01	0.37	0.34	1,022	0.09	0.04	1,036
Low ground pressure dozer	Dozer	offroad	8		1.06	4.07	6.50	0.01	0.54	0.50	567	0.10	0.04	582
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	8		1.64	6.67	12.27	0.01	0.70	0.64	1,043	0.15	0.07	1,067
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
ALTERNATIVE 2														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		100	0.23	0.93	2.74	0.00	0.13	0.11	422	0.01	0.01	425
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	8		2.25	7.87	20.13	0.02	0.78	0.72	2,213	0.20	0.09	2,245
Low ground pressure haulers	Dump Truck	offroad	8		1.24	3.47	10.78	0.02	0.37	0.34	1,502	0.11	0.05	1,519
Tracked excavator	Excavator	offroad	8		0.98	4.50	7.79	0.01	0.37	0.34	1,022	0.09	0.04	1,036
Low ground pressure dozer	Dozer	offroad	8		1.06	4.07	6.50	0.01	0.54	0.50	567	0.10	0.04	582
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	8		1.64	6.67	12.27	0.01	0.70	0.64	1,043	0.15	0.07	1,067
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-

Table G-8 Daily Maintenance Emissions for Proposed Project Alternatives														
Phase or Activity	Equipment and Vehicles		Daily Maint,		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2 eqv
	Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
ALTERNATIVE 3														
Haul equipment and materials to site	Tractor Trailer	onroad HHD	72	100	0.16	0.67	1.97	0.00	0.10	0.08	303	0.01	0.01	306
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	8		2.25	7.87	20.13	0.02	0.78	0.72	2,213	0.20	0.09	2,245
Low ground pressure haulers	Dump Truck	offroad	8		1.24	3.47	10.78	0.02	0.37	0.34	1,502	0.11	0.05	1,519
Tracked excavator	Excavator	offroad	8		0.98	4.50	7.79	0.01	0.37	0.34	1,022	0.09	0.04	1,036
Low ground pressure dozer	Dozer	offroad	8		1.06	4.07	6.50	0.01	0.54	0.50	567	0.10	0.04	582
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	8		1.64	6.67	12.27	0.01	0.70	0.64	1,043	0.15	0.07	1,067
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
ALTERNATIVE 4														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		100	0.23	0.93	2.74	0.00	0.13	0.11	422	0.01	0.01	425
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	8		2.25	7.87	20.13	0.02	0.78	0.72	2,213	0.20	0.09	2,245
Low ground pressure haulers	Dump Truck	offroad	8		1.24	3.47	10.78	0.02	0.37	0.34	1,502	0.11	0.05	1,519
Tracked excavator	Excavator	offroad	8		0.98	4.50	7.79	0.01	0.37	0.34	1,022	0.09	0.04	1,036
Low ground pressure dozer	Dozer	offroad	8		1.06	4.07	6.50	0.01	0.54	0.50	567	0.10	0.04	582
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	8		1.64	6.67	12.27	0.01	0.70	0.64	1,043	0.15	0.07	1,067
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-

G-8 Daily Maintenance

ALTERNATIVE 5														
Haul equipment and materials to site	Tractor Trailer	onroad HHD	98	100	0.22	0.91	2.69	0.00	0.13	0.11	413	0.01	0.01	416
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	8		2.25	7.87	20.13	0.02	0.78	0.72	2,213	0.20	0.09	2,245
Low ground pressure haulers	Dump Truck	offroad	8		1.24	3.47	10.78	0.02	0.37	0.34	1,502	0.11	0.05	1,519
Tracked excavator	Excavator	offroad	8		0.98	4.50	7.79	0.01	0.37	0.34	1,022	0.09	0.04	1,036
Low ground pressure dozer	Dozer	offroad	8		1.06	4.07	6.50	0.01	0.54	0.50	567	0.10	0.04	582
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	8		1.64	6.67	12.27	0.01	0.70	0.64	1,043	0.15	0.07	1,067
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
ALTERNATIVE 6														
Haul equipment and materials to site	Tractor Trailer	onroad HHD	98	100	0.22	0.91	2.69	0.00	0.13	0.11	413	0.01	0.01	416
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	8		2.25	7.87	20.13	0.02	0.78	0.72	2,213	0.20	0.09	2,245
Low ground pressure haulers	Dump Truck	offroad	8		1.24	3.47	10.78	0.02	0.37	0.34	1,502	0.11	0.05	1,519
Tracked excavator	Excavator	offroad	8		0.98	4.50	7.79	0.01	0.37	0.34	1,022	0.09	0.04	1,036
Low ground pressure dozer	Dozer	offroad	8		1.06	4.07	6.50	0.01	0.54	0.50	567	0.10	0.04	582
Small motor grader	Grader	offroad	8		1.07	4.84	7.19	0.01	0.53	0.49	742	0.10	0.04	757
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	8		0.60	2.75	3.27	0.00	0.27	0.25	365	0.05	0.02	374
Agricultural tractor with mower	Tractor	offroad	8		1.64	6.67	12.27	0.01	0.70	0.64	1,043	0.15	0.07	1,067
Fugitive dust control	Water Truck	onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Manager	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		65	0.05	0.46	0.05	0.00	0.01	0.00	72	0.00	0.00	72
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Maximum Daily Maintenance Emissions														
ALTERNATIVE 1, LBS					2.4	8.9	20.5	0.0	0.8	0.7	2,398	0.2	0.1	2,432
ALTERNATIVE 2, LBS					2.4	8.9	20.5	0.0	0.8	0.7	2,398	0.2	0.1	2,432
ALTERNATIVE 3, LBS					2.4	8.9	20.5	0.0	0.8	0.7	2,398	0.2	0.1	2,432
ALTERNATIVE 4, LBS					2.4	8.9	20.5	0.0	0.8	0.7	2,398	0.2	0.1	2,432
ALTERNATIVE 5, LBS					2.4	8.9	20.5	0.0	0.8	0.7	2,398	0.2	0.1	2,432
ALTERNATIVE 6, LBS					2.4	8.9	20.5	0.0	0.8	0.7	2,398	0.2	0.1	2,432
Sources: SCAQMD 2008, EPA 2010														

Notes:

SCAQMD emission factors for 2013

Offroad diesel exhaust $PM_{2.5}$ = 92% of PM_{10} per EMFAC 2007 version 2.3

Offroad N_2O per Annex 3, Table A-101

Non-matching application-specific values interpolated or extrapolated

EPA GWPs for CO_2 eqv (1, 21, 310)

Special Note: Daily maximums do not include importing equipment from other areas in state (local emissions only)

G-9 Annual Maintenance

Table G-9 Annual Maintenance Emissions for Proposed Project Alternatives														
Phase or Activity	Equipment and Vehicles		Annual Maint,		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
	Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
ALTERNATIVE 1														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		3,700	8	34	101	0	5	4	15,596	0	0	15,717
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	224		63	220	564	1	22	20	61,969	6	3	62,871
Low ground pressure haulers	Dump Truck	offroad	144		22	63	194	0	7	6	27,029	2	1	27,350
Tracked excavator	Excavator	offroad	280		34	158	273	0	13	12	35,758	3	1	36,248
Low ground pressure dozer	Dozer	offroad	40		5	20	33	0	3	3	2,834	0	0	2,910
Small motor grader	Grader	offroad	200		27	121	180	0	13	12	18,553	2	1	18,935
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	192		14	66	78	0	7	6	8,759	1	1	8,966
Agricultural tractor with mower	Tractor	offroad	24		5	20	37	0	2	2	3,130	0	0	3,200
Fugitive dust control	Water Truck	onroad HHD		250	1	2	7	0	0	0	1,054	0	0	1,062
Manager	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
ALTERNATIVE 2														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		3,400	8	32	93	0	5	4	14,332	0	0	14,443
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	216		61	212	544	1	21	19	59,755	5	2	60,626
Low ground pressure haulers	Dump Truck	offroad	152		24	66	205	0	7	6	28,531	2	1	28,869
Tracked excavator	Excavator	offroad	304		37	171	296	0	14	13	38,823	3	1	39,355
Low ground pressure dozer	Dozer	offroad	48		6	24	39	0	3	3	3,401	1	0	3,492
Small motor grader	Grader	offroad	200		27	121	180	0	13	12	18,553	2	1	18,935
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	88		7	30	36	0	3	3	4,014	1	0	4,109
Agricultural tractor with mower	Tractor	offroad	24		5	20	37	0	2	2	3,130	0	0	3,200
Fugitive dust control	Water Truck	onroad HHD		250	1	2	7	0	0	0	1,054	0	0	1,062
Manager	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-

G-9 Annual Maintenance

ALTERNATIVE 3														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		4,500	10	42	123	0	6	5	18,968	0	0	19,115
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	224		63	220	564	1	22	20	61,969	6	3	62,871
Low ground pressure haulers	Dump Truck	offroad	152		24	66	205	0	7	6	28,531	2	1	28,869
Tracked excavator	Excavator	offroad	352		43	198	343	1	16	15	44,953	4	2	45,568
Low ground pressure dozer	Dozer	offroad	48		6	24	39	0	3	3	3,401	1	0	3,492
Small motor grader	Grader	offroad	200		27	121	180	0	13	12	18,553	2	1	18,935
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	224		17	77	92	0	8	7	10,219	2	1	10,460
Agricultural tractor with mower	Tractor	offroad	24		5	20	37	0	2	2	3,130	0	0	3,200
Fugitive dust control	Water Truck	onroad HHD		250	1	2	7	0	0	0	1,054	0	0	1,062
Manager	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
ALTERNATIVE 4														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		2,000	5	19	55	0	3	2	8,430	0	0	8,496
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	208		59	204	523	1	20	19	57,542	5	2	58,380
Low ground pressure haulers	Dump Truck	offroad	144		22	63	194	0	7	6	27,029	2	1	27,350
Tracked excavator	Excavator	offroad	208		25	117	203	0	10	9	26,563	2	1	26,927
Low ground pressure dozer	Dozer	offroad	40		5	20	33	0	3	3	2,834	0	0	2,910
Small motor grader	Grader	offroad	200		27	121	180	0	13	12	18,553	2	1	18,935
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	48		4	16	20	0	2	2	2,190	0	0	2,241
Agricultural tractor with mower	Tractor	offroad	24		5	20	37	0	2	2	3,130	0	0	3,200
Fugitive dust control	Water Truck	onroad HHD		250	1	2	7	0	0	0	1,054	0	0	1,062
Manager	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
ALTERNATIVE 5														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		2,000	5	19	55	0	3	2	8,430	0	0	8,496
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	208		59	204	523	1	20	19	57,542	5	2	58,380
Low ground pressure haulers	Dump Truck	offroad	144		22	63	194	0	7	6	27,029	2	1	27,350
Tracked excavator	Excavator	offroad	216		26	122	210	0	10	9	27,585	2	1	27,962
Low ground pressure dozer	Dozer	offroad	40		5	20	33	0	3	3	2,834	0	0	2,910
Small motor grader	Grader	offroad	200		27	121	180	0	13	12	18,553	2	1	18,935

Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	56		4	19	23	0	2	2	2,555	0	0	2,615
Agricultural tractor with mower	Tractor	offroad	24		5	20	37	0	2	2	3,130	0	0	3,200
Fugitive dust control	Water Truck	onroad HHD		250	1	2	7	0	0	0	1,054	0	0	1,062
Manager	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
ALTERNATIVE 6														
Haul equipment and materials to site	Tractor Trailer	onroad HHD		2,600	6	24	71	0	3	3	10,959	0	0	11,044
Import equipment from other areas	Tractor Trailer	onroad HHD		-	-	-	-	-	-	-	-	-	-	-
Agricultural tractor with carryall scrapers	Tractor Scraper	offroad	216		61	212	544	1	21	19	59,755	5	2	60,626
Low ground pressure haulers	Dump Truck	offroad	144		22	63	194	0	7	6	27,029	2	1	27,350
Tracked excavator	Excavator	offroad	232		28	131	226	0	11	10	29,628	3	1	30,034
Low ground pressure dozer	Dozer	offroad	40		5	20	33	0	3	3	2,834	0	0	2,910
Small motor grader	Grader	offroad	200		27	121	180	0	13	12	18,553	2	1	18,935
Barge with crane and clamshell bucket	Crane	offroad	-		-	-	-	-	-	-	-	-	-	-
Hydraulic dredge, 16-inch boat-mounted	Other Industrial	offroad	-		-	-	-	-	-	-	-	-	-	-
Truck with crane for installed pilings	Crane Rig	offroad	-		-	-	-	-	-	-	-	-	-	-
Medium backhoe loader	Backhoe	offroad	104		8	36	43	0	4	3	4,744	1	0	4,856
Agricultural tractor with mower	Tractor	offroad	24		5	20	37	0	2	2	3,130	0	0	3,200
Fugitive dust control	Water Truck	onroad HHD		250	1	2	7	0	0	0	1,054	0	0	1,062
Manager	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Foreman	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Equipment Operator	Pickup/SUV	onroad LD		15,275	11	108	11	0	1	1	16,816	1	0	16,966
Laborers	Pickup/SUV	onroad LD		-	-	-	-	-	-	-	-	-	-	-
Total Maintenance Emissions														
ALTERNATIVE 1, TONS					0.10	0.46	0.74	0.001	0.04	0.03	104	0.009	0.004	106
ALTERNATIVE 2, TONS					0.10	0.45	0.73	0.001	0.04	0.03	103	0.009	0.004	104
ALTERNATIVE 3, TONS					0.11	0.49	0.81	0.001	0.04	0.04	112	0.010	0.004	114
ALTERNATIVE 4, TONS					0.09	0.40	0.64	0.001	0.03	0.03	90	0.008	0.003	92
ALTERNATIVE 3, TONS					0.09	0.40	0.64	0.001	0.03	0.03	91	0.008	0.003	92
ALTERNATIVE 4, TONS					0.09	0.42	0.68	0.001	0.03	0.03	96	0.008	0.004	97
Sources: SCAQMD 2008, EPA 2010														

Notes:

SCAQMD emission factors for 2013

Offroad diesel exhaust $PM_{2.5}$ = 92% of PM_{10} per EMFAC 2007 version 2.3

Offroad N_2O per Annex 3, Table A-101

Non-matching application-specific values interpolated or extrapolated

EPA GWPs for CO_2 eqv (1, 21, 310)

G-10 Offroad Dust

Table G-10 Offroad Fugitive Dust Emissions for Proposed Alternatves

Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
ALTERNATIVE 1																	
Tractor Scraper	24	7,800	B+C	20		3	5			30	0.04216	0.15507	95%	0.05	0.19	16.4	60.5
Dump Truck	96	25,056	B	20		6				30	0.06849	0.00316	95%	0.33	0.02	85.8	4.0
Excavator	24	9,000	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.01	0.00	2.6	0.4
Dozer	16	3,728	A	20	9						0.30548	0.17057	95%	0.24	0.14	56.9	31.8
Grader	8	200	C	20			4				1.98400	0.15360	95%	0.79	0.06	19.8	1.5
Clamshell Derrick	24	6,360	B	20		9				30	0.09097	0.00493	95%	0.11	0.01	28.9	1.6
Crane Rig	8	160	C	20			1				0.03100	0.00120	95%	0.01	0.00	0.2	0.0
Backhoe	8	1,600	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.2	0.0
Tractor	-	-	C	20			3				0.83700	0.05612	95%	0.00	0.00	0.0	0.0
ALTERNATIVE 2																	
Tractor Scraper	24	6,336	B+C	20		3	5			30	0.04216	0.15507	95%	0.05	0.19	13.4	49.1
Dump Truck	80	21,200	B	20		6				30	0.06849	0.00316	95%	0.27	0.01	72.6	3.3
Excavator	24	6,984	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.01	0.00	2.0	0.3
Dozer	16	2,608	A	20	9						0.30548	0.17057	95%	0.24	0.14	39.8	22.2
Grader	8	224	C	20			4				1.98400	0.15360	95%	0.79	0.06	22.2	1.7
Clamshell Derrick	16	4,304	B	20		9				30	0.09097	0.00493	95%	0.07	0.00	19.6	1.1
Crane Rig	8	168	C	20			1				0.03100	0.00120	95%	0.01	0.00	0.3	0.0
Backhoe	8	1,880	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.2	0.0
Tractor	-	-	C	20			3				0.83700	0.05612	95%	0.00	0.00	0.0	0.0
ALTERNATIVE 3																	
Tractor Scraper	32	8,480	B+C	20		3	5			30	0.04216	0.15507	95%	0.07	0.25	17.9	65.8
Dump Truck	112	29,904	B	20		6				30	0.06849	0.00316	95%	0.38	0.02	102.4	4.7
Excavator	32	9,312	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.01	0.00	2.7	0.4
Dozer	24	3,504	A	20	9						0.30548	0.17057	95%	0.37	0.20	53.5	29.9
Grader	8	272	C	20			4				1.98400	0.15360	95%	0.79	0.06	27.0	2.1
Clamshell Derrick	32	8,448	B	20		9				30	0.09097	0.00493	95%	0.15	0.01	38.4	2.1
Crane Rig	8	168	C	20			1				0.03100	0.00120	95%	0.01	0.00	0.3	0.0
Backhoe	8	1,600	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.2	0.0
Tractor	-	-	C	20			3				0.83700	0.05612	95%	0.00	0.00	0.0	0.0

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ALTERNATIVE 4																	
Tractor Scraper	16	4,912	B+C	20		3	5			30	0.04216	0.15507	95%	0.03	0.12	10.4	38.1
Dump Truck	56	14,560	B	20		6				30	0.06849	0.00316	95%	0.19	0.01	49.9	2.3
Excavator	16	4,944	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	1.4	0.2
Dozer	16	2,496	A	20	9						0.30548	0.17057	95%	0.24	0.14	38.1	21.3
Grader	8	112	C	20			4				1.98400	0.15360	95%	0.79	0.06	11.1	0.9
Clamshell Derrick	8	2,368	B	20		9				30	0.09097	0.00493	95%	0.04	0.00	10.8	0.6
Crane Rig	8	168	C	20			1				0.03100	0.00120	95%	0.01	0.00	0.3	0.0
Backhoe	8	1,600	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.2	0.0
Tractor	-	-	C	20			3				0.83700	0.05612	95%	0.00	0.00	0.0	0.0
ALTERNATIVE 5																	
Tractor Scraper	16	4,128	B+C	20		3	5			30	0.04216	0.15507	95%	0.03	0.12	8.7	32.0
Dump Truck	56	14,000	B	20		6				30	0.06849	0.00316	95%	0.19	0.01	47.9	2.2
Excavator	16	3,520	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	1.0	0.2
Dozer	16	1,632	A	20	9						0.30548	0.17057	95%	0.24	0.14	24.9	13.9
Grader	8	152	C	20			4				1.98400	0.15360	95%	0.79	0.06	15.1	1.2
Clamshell Derrick	8	2,024	B	20		9				30	0.09097	0.00493	95%	0.04	0.00	9.2	0.5
Crane Rig	8	168	C	20			1				0.03100	0.00120	95%	0.01	0.00	0.3	0.0
Backhoe	8	1,600	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.2	0.0
Tractor	-	-	C	20			3				0.83700	0.05612	95%	0.00	0.00	0.0	0.0
ALTERNATIVE 6																	
Tractor Scraper	24	5,328	B+C	20		3	5			30	0.04216	0.15507	95%	0.05	0.19	11.2	41.3
Dump Truck	80	19,120	B	20		6				30	0.06849	0.00316	95%	0.27	0.01	65.5	3.0
Excavator	16	4,544	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	1.3	0.2
Dozer	16	2,128	A	20	9						0.30548	0.17057	95%	0.24	0.14	32.5	18.1
Grader	8	176	C	20			4				1.98400	0.15360	95%	0.79	0.06	17.5	1.4
Clamshell Derrick	16	3,984	B	20		9				30	0.09097	0.00493	95%	0.07	0.00	18.1	1.0
Crane Rig	8	168	C	20			1				0.03100	0.00120	95%	0.01	0.00	0.3	0.0
Backhoe	8	1,600	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.2	0.0
Tractor	-	-	C	20			3				0.83700	0.05612	95%	0.00	0.00	0.0	0.0

Onsite Equipment	lbs/day	lbs/day	tons	tons
ALTERNATIVE 1	**1.5**	**0.4**	**0.11**	**0.05**
ALTERNATIVE 2	**1.5**	**0.4**	**0.09**	**0.04**
ALTERNATIVE 3	**1.8**	**0.5**	**0.12**	**0.05**
ALTERNATIVE 4	**1.3**	**0.3**	**0.06**	**0.03**
ALTERNATIVE 5	**1.3**	**0.3**	**0.05**	**0.02**
ALTERNATIVE 6	**1.5**	**0.4**	**0.07**	**0.03**

G-11 Onroad Dust

Table G-11 Onroad Fugitive Dust Emissions for Proposed Alternatves					
All Roads Travelled	Vehicle Category	Activity		Usage	
		Pk. Daily	Project	Unpaved	Paved
		VMT	VMT	%	%
ALTERNATIVE 1					
Tractor Trailer (materials/hauling)	onroad HHD	7,500	322,500	11%	89%
Tractor Trailer (equipment/supplies)	onroad HHD	4,760	52,360	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	4,700	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	30,550	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	65	30,550	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	780	312,000	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	130	52,000	6%	94%
ALTERNATIVE 2					
Tractor Trailer (materials/hauling)	onroad HHD	6,000	276,000	11%	89%
Tractor Trailer (equipment/supplies)	onroad HHD	3,080	36,960	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	4,700	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	30,550	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	65	30,550	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	585	234,000	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	130	52,000	6%	94%
ALTERNATIVE 3					
Tractor Trailer (materials/hauling)	onroad HHD	9,000	396,000	2%	98%
Tractor Trailer (equipment/supplies)	onroad HHD	3,920	43,120	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	4,700	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	30,550	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	65	30,550	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	975	390,000	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	130	52,000	6%	94%

G-11 Onroad Dust

ALTERNATIVE 4					
Tractor Trailer (materials/hauling)	onroad HHD	3,000	105,000	2%	98%
Tractor Trailer (equipment/supplies)	onroad HHD	5,040	45,360	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	4,700	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	30,550	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	65	30,550	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	390	156,000	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	130	52,000	6%	94%
ALTERNATIVE 5					
Tractor Trailer (materials/hauling)	onroad HHD	2,700	99,900	6%	94%
Tractor Trailer (equipment/supplies)	onroad HHD	2,800	28,000	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	4,700	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	30,550	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	65	30,550	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	325	130,000	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	130	52,000	6%	94%
ALTERNATIVE 6					
Tractor Trailer (materials/hauling)	onroad HHD	3,600	108,000	6%	94%
Tractor Trailer (equipment/supplies)	onroad HHD	4,480	35,840	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	4,700	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	30,550	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	65	30,550	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	520	208,000	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	130	52,000	6%	94%

G-11 Onroad Dust

Unpaved Road Dust	Vehicle Category	Activity		Required Variables						Uncontrolled		Controlled Emissions				
		Pk. Daily	Project	EET	Moist (M)	Silt (s)	Weight (W)	Speed (S)	Precip (P)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		VMT	VMT	code	percent	percent	tons	mph	days/yr	lb/VMT	lb/VMT	%	lb/day	lb/day	lbs	lbs
ALTERNATIVE 1																
Tractor Trailer (materials/hauling)	onroad HHD	825	35,475	G	20	9	30	20	20	1.89491	0.18933	95%	78.2	7.8	3,176.9	317.4
Tractor Trailer (equipment/supplies)	onroad HHD	48	524	G	20	9	30	20	20	1.89491	0.18933	95%	4.5	0.5	46.9	4.7
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	4,230	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	352.5	35.2
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (supervisors/foremen)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (operators/drivers)	onroad LD	47	18,720	G	20	9	3	20	20	0.84222	0.08407	95%	2.0	0.2	745.1	74.4
Pickup/SUV (tradesmen/laborers)	onroad LD	8	3,120	G	20	9	3	20	20	0.84222	0.08407	95%	0.3	0.0	124.2	12.4
ALTERNATIVE 2																
Tractor Trailer (materials/hauling)	onroad HHD	660	30,360	G	20	9	30	20	20	1.89491	0.18933	95%	62.5	6.2	2,718.9	271.7
Tractor Trailer (equipment/supplies)	onroad HHD	31	370	G	20	9	30	20	20	1.89491	0.18933	95%	2.9	0.3	33.1	3.3
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	4,230	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	352.5	35.2
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (supervisors/foremen)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (operators/drivers)	onroad LD	35	14,040	G	20	9	3	20	20	0.84222	0.08407	95%	1.5	0.1	558.8	55.8
Pickup/SUV (tradesmen/laborers)	onroad LD	8	3,120	G	20	9	3	20	20	0.84222	0.08407	95%	0.3	0.0	124.2	12.4
ALTERNATIVE 3																
Tractor Trailer (materials/hauling)	onroad HHD	180	7,920	G	20	9	30	20	20	1.89491	0.18933	95%	17.1	1.7	709.3	70.9
Tractor Trailer (equipment/supplies)	onroad HHD	39	431	G	20	9	30	20	20	1.89491	0.18933	95%	3.7	0.4	38.6	3.9
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	4,230	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	352.5	35.2
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (supervisors/foremen)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (operators/drivers)	onroad LD	59	23,400	G	20	9	3	20	20	0.84222	0.08407	95%	2.5	0.2	931.4	93.0
Pickup/SUV (tradesmen/laborers)	onroad LD	8	3,120	G	20	9	3	20	20	0.84222	0.08407	95%	0.3	0.0	124.2	12.4

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ALTERNATIVE 4																
Tractor Trailer (materials/hauling)	onroad HHD	60	2,100	G	20	9	30	20	20	1.89491	0.18933	95%	5.7	0.6	188.1	18.8
Tractor Trailer (equipment/supplies)	onroad HHD	50	454	G	20	9	30	20	20	1.89491	0.18933	95%	4.8	0.5	40.6	4.1
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	4,230	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	352.5	35.2
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (supervisors/foremen)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (operators/drivers)	onroad LD	23	9,360	G	20	9	3	20	20	0.84222	0.08407	95%	1.0	0.1	372.6	37.2
Pickup/SUV (tradesmen/laborers)	onroad LD	8	3,120	G	20	9	3	20	20	0.84222	0.08407	95%	0.3	0.0	124.2	12.4
ALTERNATIVE 5																
Tractor Trailer (materials/hauling)	onroad HHD	162	5,994	G	20	9	30	20	20	1.89491	0.18933	95%	15.3	1.5	536.8	53.6
Tractor Trailer (equipment/supplies)	onroad HHD	28	280	G	20	9	30	20	20	1.89491	0.18933	95%	2.7	0.3	25.1	2.5
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	4,230	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	352.5	35.2
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (supervisors/foremen)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (operators/drivers)	onroad LD	20	7,800	G	20	9	3	20	20	0.84222	0.08407	95%	0.8	0.1	310.5	31.0
Pickup/SUV (tradesmen/laborers)	onroad LD	8	3,120	G	20	9	3	20	20	0.84222	0.08407	95%	0.3	0.0	124.2	12.4
ALTERNATIVE 6																
Tractor Trailer (materials/hauling)	onroad HHD	216	6,480	G	20	9	30	20	20	1.89491	0.18933	95%	20.5	2.0	580.3	58.0
Tractor Trailer (equipment/supplies)	onroad HHD	45	358	G	20	9	30	20	20	1.89491	0.18933	95%	4.2	0.4	32.1	3.2
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	4,230	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	352.5	35.2
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (supervisors/foremen)	onroad LD	4	1,833	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	73.0	7.3
Pickup/SUV (operators/drivers)	onroad LD	31	12,480	G	20	9	3	20	20	0.84222	0.08407	95%	1.3	0.1	496.7	49.6
Pickup/SUV (tradesmen/laborers)	onroad LD	8	3,120	G	20	9	3	20	20	0.84222	0.08407	95%	0.3	0.0	124.2	12.4

Special Note: Daily maximums do not include importing equipment from other areas in state (local emissions only)

Unpaved Roads	lbs/day	lbs/day	tons	tons
ALTERNATIVE 1	**81.6**	**8.2**	**2.30**	**0.23**
ALTERNATIVE 2	**65.5**	**6.5**	**1.97**	**0.20**
ALTERNATIVE 3	**21.0**	**2.1**	**1.15**	**0.11**
ALTERNATIVE 4	**8.1**	**0.8**	**0.61**	**0.06**
ALTERNATIVE 5	**17.6**	**1.8**	**0.75**	**0.07**
ALTERNATIVE 6	**23.2**	**2.3**	**0.87**	**0.09**

G-12 Maintenance Offroad Dust

Table G-12 Offroad Fugitive Dust Emissions for Maintenance Activities																	
	Activity		Required Variables								Uncontrolled		Controlled Emissions				
Earthmoving	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
ALTERNATIVE 1																	
Tractor Scraper	8	224	B+C	20		3	5			30	0.04216	0.15507	95%	0.02	0.06	0.5	1.7
Dump Truck	8	144	B	20		6				30	0.06849	0.00316	95%	0.03	0.00	0.5	0.0
Excavator	8	280	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	0.1	0.0
Dozer	8	40	A	20	9						0.30548	0.17057	95%	0.12	0.07	0.6	0.3
Grader	8	200	C	20			4				1.98400	0.15360	95%	0.79	0.06	19.8	1.5
Clamshell Derrick	-	-	B	20		9				30	0.09097	0.00493	95%	0.00	0.00	0.0	0.0
Crane Rig	-	-	C	20			1				0.03100	0.00120	95%	0.00	0.00	0.0	0.0
Backhoe	8	192	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.0	0.0
Tractor	8	24	C	20			3				0.83700	0.05612	95%	0.33	0.02	1.0	0.1
ALTERNATIVE 2																	
Tractor Scraper	8	216	B+C	20		3	5			30	0.04216	0.15507	95%	0.02	0.06	0.5	1.7
Dump Truck	8	152	B	20		6				30	0.06849	0.00316	95%	0.03	0.00	0.5	0.0
Excavator	8	304	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	0.1	0.0
Dozer	8	48	A	20	9						0.30548	0.17057	95%	0.12	0.07	0.7	0.4
Grader	8	200	C	20			4				1.98400	0.15360	95%	0.79	0.06	19.8	1.5
Clamshell Derrick	-	-	B	20		9				30	0.09097	0.00493	95%	0.00	0.00	0.0	0.0
Crane Rig	-	-	C	20			1				0.03100	0.00120	95%	0.00	0.00	0.0	0.0
Backhoe	8	88	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.0	0.0
Tractor	8	24	C	20			3				0.83700	0.05612	95%	0.33	0.02	1.0	0.1
ALTERNATIVE 3																	
Tractor Scraper	8	224	B+C	20		3	5			30	0.04216	0.15507	95%	0.02	0.06	0.5	1.7
Dump Truck	8	152	B	20		6				30	0.06849	0.00316	95%	0.03	0.00	0.5	0.0
Excavator	8	352	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	0.1	0.0
Dozer	8	48	A	20	9						0.30548	0.17057	95%	0.12	0.07	0.7	0.4
Grader	8	200	C	20			4				1.98400	0.15360	95%	0.79	0.06	19.8	1.5
Clamshell Derrick	-	-	B	20		9				30	0.09097	0.00493	95%	0.00	0.00	0.0	0.0
Crane Rig	-	-	C	20			1				0.03100	0.00120	95%	0.00	0.00	0.0	0.0
Backhoe	8	224	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.0	0.0
Tractor	8	24	C	20			3				0.83700	0.05612	95%	0.33	0.02	1.0	0.1
ALTERNATIVE 4																	
Tractor Scraper	8	208	B+C	20		3	5			30	0.04216	0.15507	95%	0.02	0.06	0.4	1.6
Dump Truck	8	144	B	20		6				30	0.06849	0.00316	95%	0.03	0.00	0.5	0.0
Excavator	8	208	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	0.1	0.0
Dozer	8	40	A	20	9						0.30548	0.17057	95%	0.12	0.07	0.6	0.3
Grader	8	200	C	20			4				1.98400	0.15360	95%	0.79	0.06	19.8	1.5
Clamshell Derrick	-	-	B	20		9				30	0.09097	0.00493	95%	0.00	0.00	0.0	0.0
Crane Rig	-	-	C	20			1				0.03100	0.00120	95%	0.00	0.00	0.0	0.0
Backhoe	8	48	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.0	0.0
Tractor	8	24	C	20			3				0.83700	0.05612	95%	0.33	0.02	1.0	0.1

ALTERNATIVE 5																	
Tractor Scraper	8	208	B+C	20		3	5			30	0.04216	0.15507	95%	0.02	0.06	0.4	1.6
Dump Truck	8	144	B	20		6				30	0.06849	0.00316	95%	0.03	0.00	0.5	0.0
Excavator	8	216	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	0.1	0.0
Dozer	8	40	A	20	9						0.30548	0.17057	95%	0.12	0.07	0.6	0.3
Grader	8	200	C	20			4				1.98400	0.15360	95%	0.79	0.06	19.8	1.5
Clamshell Derrick	-	-	B	20		9				30	0.09097	0.00493	95%	0.00	0.00	0.0	0.0
Crane Rig	-	-	C	20			1				0.03100	0.00120	95%	0.00	0.00	0.0	0.0
Backhoe	8	56	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.0	0.0
Tractor	8	24	C	20			3				0.83700	0.05612	95%	0.33	0.02	1.0	0.1
ALTERNATIVE 6																	
Tractor Scraper	8	216	B+C	20		3	5			30	0.04216	0.15507	95%	0.02	0.06	0.5	1.7
Dump Truck	8	144	B	20		6				30	0.06849	0.00316	95%	0.03	0.00	0.5	0.0
Excavator	8	232	D	20				6.7	1.5	60	0.00577	0.00089	95%	0.00	0.00	0.1	0.0
Dozer	8	40	A	20	9						0.30548	0.17057	95%	0.12	0.07	0.6	0.3
Grader	8	200	C	20			4				1.98400	0.15360	95%	0.79	0.06	19.8	1.5
Clamshell Derrick	-	-	B	20		9				30	0.09097	0.00493	95%	0.00	0.00	0.0	0.0
Crane Rig	-	-	C	20			1				0.03100	0.00120	95%	0.00	0.00	0.0	0.0
Backhoe	8	104	D	20				6.7	1.5	20	0.00192	0.00030	95%	0.00	0.00	0.0	0.0
Tractor	8	24	C	20			3				0.83700	0.05612	95%	0.33	0.02	1.0	0.1

Onsite Equipment	lbs/day	lbs/day	tons	tons
ALTERNATIVE 1	**1.3**	**0.2**	**0.011**	**0.002**
ALTERNATIVE 2	**1.3**	**0.2**	**0.011**	**0.002**
ALTERNATIVE 3	**1.3**	**0.2**	**0.011**	**0.002**
ALTERNATIVE 4	**1.3**	**0.2**	**0.011**	**0.002**
ALTERNATIVE 5	**1.3**	**0.2**	**0.011**	**0.002**
ALTERNATIVE 6	**1.3**	**0.2**	**0.011**	**0.002**

Construction Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
Bulldozer (tracked)			A	7	9						1.32827	0.66775	56%	0.00	0.00	0.0	0.0
Bulldozer (wheeled)			A	7	9						0.99621	0.50081	56%	0.00	0.00	0.0	0.0
Scraper			B+C	7		3	5			30	0.89477	0.15562	56%	0.00	0.00	0.0	0.0
Dump Truck/ADT			B	7		6				30	0.09385	0.00432	56%	0.00	0.00	0.0	0.0
Clamshell Derrick			B	7		9				30	0.12465	0.00675	56%	0.00	0.00	0.0	0.0
Dragline (small)			B	7		12				60	0.30491	0.01854	56%	0.00	0.00	0.0	0.0
Grader			C	7			4				1.98400	0.15360	56%	0.00	0.00	0.0	0.0
Tractor			C	7			3				0.83700	0.05612	56%	0.00	0.00	0.0	0.0
Compactor			C	7			2				0.24800	0.01358	56%	0.00	0.00	0.0	0.0
Crane			C	7			1				0.03100	0.00120	56%	0.00	0.00	0.0	0.0
Backhoe			D	7				6.7	1.5	20	0.00836	0.00129	56%	0.00	0.00	0.0	0.0
Bobcat			D	7				6.7	1.5	10	0.00418	0.00065	56%	0.00	0.00	0.0	0.0
Drill auger			D	7				6.7	1.5	10	0.00418	0.00065	56%	0.00	0.00	0.0	0.0
Excavator			D	7				6.7	1.5	60	0.02507	0.00387	56%	0.00	0.00	0.0	0.0
Front end loader			D	7				6.7	1.5	30	0.01254	0.00194	56%	0.00	0.00	0.0	0.0
Concrete grinder			E	10					1.9	40	0.18240	0.03040	78%	0.00	0.00	0.0	0.0
Screener (coarse)			F	18					1.9	40	0.66120	0.04560	92%	0.00	0.00	0.0	0.0

EET Code A

AP-42 Chapter 11.9 for bulldozer, tractor dozer (Tables 11.9-1):

$E = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4}$ for PM_{10}

$E = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3}$ for $PM_{2.5}$

Simplifies to $E = 0.75 * (s)^{1.5} / (M)^{1.4}$ for PM_{10}

Simplifies to $E = 0.60 * (s)^{1.2} / (M)^{1.3}$ for $PM_{2.5}$

E = lb/hr fugitive

s = silt content, percent

M = moisture content, percent

EET Code B

AP-42 Chapter 11.9 for small dragline, clamshell, dumping, scraper (Table 11.9-1):

$E = 0.75 * 0.0021 * (d)^{0.7} / (M)^{0.3}$ for PM_{10}

$E = 0.017 * 0.0021 * (d)^{1.1} / (M)^{0.3}$ for $PM_{2.5}$

Simplifies to $E = 1.6e\text{-}3 * (d)^{0.7} / (M)^{0.3}$ for PM_{10}

Simplifies to $E = 3.6e\text{-}5 * (d)^{1.1} / (M)^{0.3}$ for $PM_{2.5}$

E = lb/cy * cy/hr = lb/hr fugitive

M = moisture content, percent

d = drop distance = 12 feet (small dragline)

d = drop distance = 9 feet (clamshell)

d = drop distance = 6 feet (dump truck/ADT)

d = drop distance = 3 feet (scraper)

EET Code C

AP-42 Chapter 11.9 for scraper, grader, tractor, compactor, crane (Table 11.9-1) :

$E = S * 0.60 * 0.051 \times (S)^{2.0}$ for PM_{10}

$E = S * 0.031 * 0.040 \times (S)^{2.5}$ for $PM_{2.5}$

Simplifies to $E = 0.031 \times (S)^{3.0}$ for PM_{10}

Simplifies to $E = 0.0012 \times (S)^{3.5}$ for $PM_{2.5}$

E = lb/VMT * VMT/hr = lb/hr fugitive

S = Mean Vehicle Speed = 5 mph (scrapers)

S = Mean Vehicle Speed = 4 mph (graders)

S = Mean Vehicle Speed = 3 mph (tractors)

S = Mean Vehicle Speed = 2 mph (compactors)

S = Mean Vehicle Speed = 1 mph (cranes)

EET Code D

AP-42 Chapter 13.2.4 Loading/Handling (backhoe, Bobcat, drill auger, excavator, backhoe, front end loader):

E = V * D * 0.35 * 0.0032 * $(U/5)^{1.3}$/ $(M/2)^{1.4}$ for PM_{10}

E = V * D * 0.053 * 0.0032 * $(U/5)^{1.3}$/ $(M/2)^{1.4}$ for $PM_{2.5}$

Simplifies to E = V * D * 1.1e-3 * $(U/5)^{1.3}$/ $(M/2)^{1.4}$ for PM_{10}

Simplifies to E = V * D * 1.7e-4 * $(U/5)^{1.3}$/ $(M/2)^{1.4}$ for $PM_{2.5}$

V = cy/hr

M = moisture content, percent

E = lb/ton * tons/cy * cy/hr = lb/hr fugitive

D = 1.3 tons/cy for sand or cinder concrete

D = 1.5 tons/cy for soil (typical)

D = 1.9 tons/cy for sandstone or stone concrete

D = 2.1 tons/cy for granite rock

U = wind speed = 1 m/s or 2.2 mi/hr (light air)

U = wind speed = 2 m/s or 4.5 mi/hr (light breeze)

U = wind speed = 3 m/s or 6.7 mi/hr (light breeze)

U = wind speed = 4 m/s or 8.9 mi/hr (gentle breeze)

U = wind speed = 5 m/s or 11.2 mi/hr (gentle breeze)

U = wind speed = 6 m/s or 13.4 mi/hr (moderate breeze)

U = wind speed = 7 m/s or 15.7 mi/hr (moderate breeze)

EET Code E

AP-42 Chapter 11.19.2 Coarse Tertiary Crushing

E = 0.0024 lb/ton uncontrolled PM_{10}

E = 0.0004 lb/ton uncontrolled $PM_{2.5}$

E = D * V * 0.0024 lb/hr uncontrolled PM10

E = D * V* 0.0004 lb/hr uncontrolled PM2.5

V = cy/hr

E = lb/ton * tons/cy * cy/hr = lb/hr fugitive

D = 1.3 tons/cy for sand or cinder concrete

D = 1.9 tons/cy for sandstone or stone concrete

D = 2.1 tons/cy for granite rock

Control efficiency = 78% where applicable (water spray)

EET Code F

AP-42 Chapter 11.19.2 Coarse Screening

E = 0.0087 lb/ton uncontrolled PM_{10}

E = 0.0006 lb/ton uncontrolled $PM_{2.5}$

E = D * V * 0.0087 lb/hr uncontrolled PM10

E = D * V * 0.0006 lb/hr uncontrolled PM2.5

V = cy/hr

E = lb/ton * tons/cy * cy/hr = lb/hr fugitive

D = 1.3 tons/cy for sand or cinder concrete

D = 1.9 tons/cy for sandstone or stone concrete

D = 2.1 tons/cy for granite rock

Control efficiency = 92% where applicable (water spray)

G-13 Maintenance Onroad Dust

Table G-13 Onroad Fugitive Dust Emissions for Maintenance Activities					
All Roads Travelled	Vehicle Category	Activity		Usage	
		Pk. Daily	Project	Unpaved	Paved
		VMT	VMT	%	%
ALTERNATIVE 1					
Tractor Trailer (materials/hauling)	onroad HHD	100	3,700	11%	89%
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	250	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	6%	94%
ALTERNATIVE 2					
Tractor Trailer (materials/hauling)	onroad HHD	100	3,400	11%	89%
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	250	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	6%	94%
ALTERNATIVE 3					
Tractor Trailer (materials/hauling)	onroad HHD	100	4,500	2%	98%
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	250	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	6%	94%

G-13 Maintenance Onroad Dust

Table G-13 Onroad Fugitive Dust Emissions for Maintenance Activities					
All Roads Travelled	Vehicle Category	Activity		Usage	
		Pk. Daily	Project	Unpaved	Paved
		VMT	VMT	%	%
ALTERNATIVE 4					
Tractor Trailer (materials/hauling)	onroad HHD	100	2,000	2%	98%
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	250	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	6%	94%
ALTERNATIVE 5					
Tractor Trailer (materials/hauling)	onroad HHD	100	2,000	6%	94%
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	250	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	6%	94%
ALTERNATIVE 6					
Tractor Trailer (materials/hauling)	onroad HHD	100	2,600	6%	94%
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	1%	99%
Cement Truck (concrete/pumping)	onroad HHD				
Dump Truck (soil/sand/gravel transport)	onroad HHD				
Water Truck (dust control)	onroad HHD	10	250	90%	10%
Work Truck (all trades)	onroad MD				
Pickup/SUV (managers/engineers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	6%	94%
Pickup/SUV (operators/drivers)	onroad LD	65	15,275	6%	94%
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	6%	94%

G-13 Maintenance Onroad Dust

Unpaved Road Dust	Vehicle Category	Activity		Required Variables						Uncontrolled		Controlled Emissions				
		Pk. Daily	Project	EET	Moist (M)	Silt (s)	Weight (W)	Speed (S)	Precip (P)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		VMT	VMT	code	percent	percent	tons	mph	days/yr	lb/VMT	lb/VMT	%	lb/day	lb/day	lbs	lbs
ALTERNATIVE 1																
Tractor Trailer (materials/hauling)	onroad HHD	11	407	G	20	9	30	20	20	1.89491	0.18933	95%	1.0	0.1	36.4	3.6
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	G	20	9	30	20	20	1.89491	0.18933	95%	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	225	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	18.7	1.9
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
ALTERNATIVE 2																
Tractor Trailer (materials/hauling)	onroad HHD	11	374	G	20	9	30	20	20	1.89491	0.18933	95%	1.0	0.1	33.5	3.3
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	G	20	9	30	20	20	1.89491	0.18933	95%	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	225	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	18.7	1.9
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
ALTERNATIVE 3																
Tractor Trailer (materials/hauling)	onroad HHD	2	90	G	20	9	30	20	20	1.89491	0.18933	95%	0.2	0.0	8.1	0.8
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	G	20	9	30	20	20	1.89491	0.18933	95%	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	225	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	18.7	1.9
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-

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ALTERNATIVE 4																
Tractor Trailer (materials/hauling)	onroad HHD	2	40	G	20	9	30	20	20	1.89491	0.18933	95%	0.2	0.0	3.6	0.4
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	G	20	9	30	20	20	1.89491	0.18933	95%	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	225	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	18.7	1.9
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
ALTERNATIVE 5																
Tractor Trailer (materials/hauling)	onroad HHD	6	120	G	20	9	30	20	20	1.89491	0.18933	95%	0.6	0.1	10.7	1.1
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	G	20	9	30	20	20	1.89491	0.18933	95%	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	225	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	18.7	1.9
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
ALTERNATIVE 6																
Tractor Trailer (materials/hauling)	onroad HHD	6	156	G	20	9	30	20	20	1.89491	0.18933	95%	0.6	0.1	14.0	1.4
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	G	20	9	30	20	20	1.89491	0.18933	95%	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Dump Truck (soil/sand/gravel transport)	onroad HHD			G	20	9	30	20	20	1.89491	0.18933	95%				
Water Truck (dust control)	onroad HHD	9	225	G	20	9	30	5	20	1.76315	0.17616	95%	0.8	0.1	18.7	1.9
Work Truck (all trades)	onroad MD			G	20	9	8	20	20	1.16343	0.11619	95%				
Pickup/SUV (managers/engineers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	4	917	G	20	9	3	20	20	0.84222	0.08407	95%	0.2	0.0	36.5	3.6
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	G	20	9	3	20	20	0.84222	0.08407	95%	-	-	-	-

Special Note: Daily maximums do not include importing equipment from other areas in state (local emissions only)

Unpaved Roads	lbs/day	lbs/day	tons	tons
ALTERNATIVE 1	**2.2**	**0.2**	**0.06**	**0.01**
ALTERNATIVE 2	**2.2**	**0.2**	**0.06**	**0.01**
ALTERNATIVE 3	**1.3**	**0.1**	**0.05**	**0.00**
ALTERNATIVE 4	**1.3**	**0.1**	**0.05**	**0.00**
ALTERNATIVE 5	**1.7**	**0.2**	**0.05**	**0.01**
ALTERNATIVE 6	**1.7**	**0.2**	**0.05**	**0.01**

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Paved Road Dust	Vehicle Category	Activity		Required Variables						Uncontrolled		Controlled Emissions				
		Pk. Daily	Project	EET	Moist (M)	Silt (sL)	Weight (W)	Speed (S)	Precip (P)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		VMT	VMT	code	percent	g/m^2	tons	mph	days/yr	lb/VMT	lb/VMT	%	lb/day	lb/day	lbs	lbs
ALTERNATIVE 1																
Tractor Trailer (materials/hauling)	onroad HHD	89	3,293	H	--	0.2	30	--	20	0.01633	0.00401	--	1.5	0.4	53.0	13.0
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	H	--	0.015	30	--	20	0.00155	0.00038	--	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Dump Truck (soil/sand/gravel transport)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Water Truck (dust control)	onroad HHD	1	25	H	--	0.2	30	--	20	0.01633	0.00401	--	0.0	0.0	0.4	0.1
Work Truck (all trades)	onroad MD			H	--	0.2	8	--	20	0.00424	0.00104	--				
Pickup/SUV (managers/engineers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
ALTERNATIVE 2																
Tractor Trailer (materials/hauling)	onroad HHD	89	3,026	H	--	0.2	30	--	20	0.01633	0.00401	--	1.5	0.4	48.7	12.0
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	H	--	0.015	30	--	20	0.00155	0.00038	--	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Dump Truck (soil/sand/gravel transport)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Water Truck (dust control)	onroad HHD	1	25	H	--	0.2	30	--	20	0.01633	0.00401	--	0.0	0.0	0.4	0.1
Work Truck (all trades)	onroad MD			H	--	0.2	8	--	20	0.00424	0.00104	--				
Pickup/SUV (managers/engineers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
ALTERNATIVE 3																
Tractor Trailer (materials/hauling)	onroad HHD	98	4,410	H	--	0.2	30	--	20	0.01633	0.00401	--	1.6	0.4	71.0	17.4
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	H	--	0.015	30	--	20	0.00155	0.00038	--	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Dump Truck (soil/sand/gravel transport)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Water Truck (dust control)	onroad HHD	1	25	H	--	0.2	30	--	20	0.01633	0.00401	--	0.0	0.0	0.4	0.1
Work Truck (all trades)	onroad MD			H	--	0.2	8	--	20	0.00424	0.00104	--				
Pickup/SUV (managers/engineers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-

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ALTERNATIVE 4																
Tractor Trailer (materials/hauling)	onroad HHD	98	1,960	H	--	0.2	30	--	20	0.01633	0.00401	--	1.6	0.4	31.6	7.7
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	H	--	0.015	30	--	20	0.00155	0.00038	--	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Dump Truck (soil/sand/gravel transport)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Water Truck (dust control)	onroad HHD	1	25	H	--	0.2	30	--	20	0.01633	0.00401	--	0.0	0.0	0.4	0.1
Work Truck (all trades)	onroad MD			H	--	0.2	8	--	20	0.00424	0.00104	--				
Pickup/SUV (managers/engineers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
ALTERNATIVE 5																
Tractor Trailer (materials/hauling)	onroad HHD	94	1,880	H	--	0.2	30	--	20	0.01633	0.00401	--	1.5	0.4	30.3	7.4
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	H	--	0.015	30	--	20	0.00155	0.00038	--	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Dump Truck (soil/sand/gravel transport)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Water Truck (dust control)	onroad HHD	1	25	H	--	0.2	30	--	20	0.01633	0.00401	--	0.0	0.0	0.4	0.1
Work Truck (all trades)	onroad MD			H	--	0.2	8	--	20	0.00424	0.00104	--				
Pickup/SUV (managers/engineers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
ALTERNATIVE 6																
Tractor Trailer (materials/hauling)	onroad HHD	94	2,444	H	--	0.2	30	--	20	0.01633	0.00401	--	1.5	0.4	39.4	9.7
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	H	--	0.015	30	--	20	0.00155	0.00038	--	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Dump Truck (soil/sand/gravel transport)	onroad HHD			H	--	0.2	30	--	20	0.01633	0.00401	--				
Water Truck (dust control)	onroad HHD	1	25	H	--	0.2	30	--	20	0.01633	0.00401	--	0.0	0.0	0.4	0.1
Work Truck (all trades)	onroad MD			H	--	0.2	8	--	20	0.00424	0.00104	--				
Pickup/SUV (managers/engineers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	61	14,359	H	--	0.2	3	--	20	0.00156	0.00038	--	0.1	0.0	22.1	5.4
Pickup/SUV (tradesmen/laborers)	onroad LD	0	0	H	--	0.2	3	--	20	0.00156	0.00038	--	-	-	-	-

G-13 Maintenance Onroad Dust

Special Note: Daily maximums do not include importing equipment from other areas in state (local emissions only)

Paved Roads	lbs/day	lbs/day	tons	tons
ALTERNATIVE 1	1.7	0.4	0.05	0.01
ALTERNATIVE 2	1.7	0.4	0.05	0.01
ALTERNATIVE 3	1.8	0.4	0.06	0.01
ALTERNATIVE 4	1.8	0.4	0.04	0.01
ALTERNATIVE 5	1.7	0.4	0.04	0.01
ALTERNATIVE 6	1.7	0.4	0.04	0.01

All Roads	lbs/day	lbs/day	tons	tons
ALTERNATIVE 1	3.8	0.6	0.11	0.02
ALTERNATIVE 2	3.8	0.6	0.11	0.02
ALTERNATIVE 3	3.1	0.6	0.11	0.02
ALTERNATIVE 4	3.1	0.6	0.09	0.01
ALTERNATIVE 5	3.4	0.6	0.09	0.01
ALTERNATIVE 6	3.4	0.6	0.09	0.02

EET Code G

Unpaved Road Dust (AP-42 Section 13.2.2):

$E = [1.5 * (s/12)^{0.9} * (W/3)^{0.45}] * P_C * (1-CE)$ for PM_{10}

$E = [1.8 * (s/12)^{1.0} * (S/30)^{0.5} / (M/0.5)^{0.2} - 0.00047] * P_C * (1-CE)$ for PM_{10}

$E = [0.15 * (s/12)^{0.9} * (W/3)^{0.45}] * P_C * (1-CE)$ for $PM_{2.5}$

$E = [0.18 * (s/12)^{1.0} * (S/30)^{0.5} / (M/0.5)^{0.2} - 0.00036] * P_C * (1-CE)$ for $PM_{2.5}$

Equation pairs calculated for average factoring of both vehicle weight and speed

s = silt content, percent

W = average vehicle weight (see below)

M = moisture content, percent

S = mean vehicle speed = 5-10 mph for watering trucks

S = mean vehicle speed = 15 mph for haul roads (general mitigation measure)

S = mean vehicle speed = 20 mph for graded dirt/gravel roads

E = lb/VMT fugitive

$P_C = (365-P)/365$

P = Number of wet days over 0.01 in precipitation for averaging period (from AP-42 Figure 13.2.1-2)

Note: precipitation correction not used ($P_C = 1$) for worst case day calculations

CE = control efficiency for watering (moisture content)

Light Duty = 3 tons average

Medium Duty = 8 tons average

Heavy Heavy Duty = 30 tons average (loaded 40 tons, unloaded 20 tons)

EET Code H

Paved Road Dust (New AP-42 Section 13.2.1):

$E = 0.0022 * (sL)^{0.91} * (W)^{1.02} * P_C$ for PM_{10}

$E = 0.00054 * (sL)^{0.91} * (W)^{1.02} * P_C$ for $PM_{2.5}$

E = lb/VMT fugitive

sL = Silt Loading from Table 13.2.1-2

W = Average weight of vehicles in tons (below)

$P_C = (1-P/4N)$

P = Number of wet days over 0.01 in precipitation for averaging period (from AP-42 Figure 13.2.1-2)

N = days of period = 365 days (4N = 1460)

Note: precipitation correction not used ($P_C = 1$) for worst case day calculations

Light Duty = 3 tons average (loaded)

Medium Duty = 8 tons average (loaded)

Heavy Heavy Duty = 30 tons average (loaded 40 tons, unloaded 20 tons)

G-14 Indirect GHG Emissions

Table G-14 Operational Indirect GHG Emissions from Electric Power Consumption (water pumping)							
Parameter	**Units**	**Alternative**					
		1	**2**	**3**	**4**	**5**	**6**
Total Pumping Ouput Power	BHP	975	838	1,288	600	350	1,013
Conversion Efficiency	percent	92%	92%	92%	92%	92%	92%
Input Power	KW	791	679	1,044	487	284	821
Daily Schedule	hours	24	24	24	24	24	24
Daily Power Requirement	KW-hrs	18,974	16,298	25,055	11,676	6,811	19,704
Annual Schedule	hours	8,760	8,760	8,760	8,760	8,760	8,760
Annual Power Requirement	**MW-hrs**	**6,925**	**5,949**	**9,145**	**4,262**	**2,486**	**7,192**
Carbon Dioxide (GHG - CO_2)	lb/MW-hr	724.12	724.12	724.12	724.12	724.12	724.12
Methane (GHG - CH_4)	lb/MW-hr	0.0302	0.0302	0.0302	0.0302	0.0302	0.0302
Nitrous Oxide (GHG - N_2O)	lb/MW-hr	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081
Carbon Dioxide Equivalents (CO_2 eqv)	lb/MW-hr	727.27	727.27	727.27	727.27	727.27	727.27
Carbon Dioxide (GHG - CO_2)	tonnes/yr	2,275	1,954	3,004	1,120	817	2,362
Methane (GHG - CH_4)	tonnes/yr	0.05	0.08	0.05	0.13	0.03	0.10
Nitrous Oxide (GHG - N_2O)	tonnes/yr	0.03	0.02	0.01	0.03	0.01	0.03
Carbon Dioxide Equivalents (CO_2 eqv)	**tonnes/yr**	**2,284**	**1,962**	**1,324**	**1,406**	**820**	**2,373**
Source: CCAR 2009 (CAMX - California), EPA 2010							

Table G-15 SCAB Fleet Average Emission Factors (Diesel)

A-19 Offroad 2013

Air Basin	**SC**

Equipment	**MaxHP**	**ROG** (lb/hr)	**CO** (lb/hr)	**NOX** (lb/hr)	**SOX** (lb/hr)	**PM10** (lb/hr)	**PM2.5** (lb/hr)	**CO2** (lb/hr)	**CH4** (lb/hr)	**N2O** (lb/hr)	**CO2 eqv** (lb/hr)
Extrapolation (down)	10	0.0068	0.0352	0.0424	0.0001	0.0018	0.0017	5.8	0.0006	0.0003	5.9
Aerial Lifts	15	0.0101	0.0528	0.0637	0.0001	0.0027	0.0025	8.7	0.0009	0.0004	8.8
	25	0.0166	0.0503	0.0937	0.0001	0.0051	0.0047	11.0	0.0015	0.0007	11.2
	50	0.0592	0.1757	0.1840	0.0003	0.0156	0.0143	19.6	0.0053	0.0024	20.5
Interpolation	85	0.0575	0.2091	0.2799	0.0004	0.0227	0.0209	28.8	0.0052	0.0023	29.7
	120	0.0558	0.2425	0.3758	0.0004	0.0299	0.0275	38.1	0.0050	0.0022	38.9
	500	0.1191	0.4671	1.5310	0.0021	0.0448	0.0413	213	0.0107	0.0048	214.6
	750	0.2221	0.8443	2.8534	0.0039	0.0825	0.0759	385	0.0200	0.0089	387.9
Extrapolation (up)	800	0.2369	0.9006	3.0436	0.0041	0.0880	0.0810	410.4	0.0214	0.0095	413.8
Aerial Lifts Composite		0.0529	0.1925	0.3059	0.0004	0.0202	0.0186	34.7	0.0048	0.0021	35.5
Air Compressors	15	0.0122	0.0484	0.0732	0.0001	0.0048	0.0044	7.2	0.0011	0.0005	7.4
	25	0.0266	0.0744	0.1306	0.0002	0.0081	0.0074	14.4	0.0024	0.0011	14.8
	50	0.0921	0.2546	0.2221	0.0003	0.0220	0.0203	22.3	0.0083	0.0037	23.6
	120	0.0825	0.3251	0.4991	0.0006	0.0456	0.0419	47.0	0.0074	0.0033	48.1
	175	0.1059	0.5054	0.8385	0.0010	0.0472	0.0434	88.5	0.0096	0.0042	90.0
	250	0.1007	0.2955	1.1320	0.0015	0.0347	0.0319	131	0.0091	0.0040	132.7
	500	0.1626	0.5399	1.7639	0.0023	0.0570	0.0525	232	0.0147	0.0065	234.1
	750	0.2547	0.8344	2.8139	0.0036	0.0898	0.0826	358	0.0230	0.0102	361.8
	1000	0.4190	1.4213	5.0841	0.0049	0.1474	0.1356	486	0.0378	0.0168	492.4
Air Compressors Composite		0.0913	0.3376	0.6065	0.0007	0.0434	0.0399	63.6	0.0082	0.0037	64.9
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0029	0.0027	10.3	0.0011	0.0005	10.5
	25	0.0193	0.0658	0.1226	0.0002	0.0049	0.0045	16.0	0.0017	0.0008	16.3
	50	0.0289	0.2282	0.2568	0.0004	0.0120	0.0110	31.0	0.0026	0.0012	31.5
	120	0.0447	0.4698	0.4583	0.0009	0.0257	0.0237	77.1	0.0040	0.0018	77.8
	175	0.0704	0.7538	0.6931	0.0016	0.0302	0.0277	141	0.0063	0.0028	142.1
	250	0.0795	0.3429	0.7632	0.0021	0.0221	0.0203	188	0.0072	0.0032	189.2
	500	0.1295	0.5517	1.1717	0.0031	0.0361	0.0332	311	0.0117	0.0052	313.2
	750	0.2565	1.0899	2.3376	0.0062	0.0715	0.0658	615	0.0231	0.0103	618.8
	1000	0.4163	1.6675	5.9553	0.0093	0.1544	0.1420	928	0.0376	0.0167	934.2
Bore/Drill Rigs Composite		0.0786	0.5044	0.8125	0.0017	0.0302	0.0278	165	0.0071	0.0032	166.1
Cement and Mortar Mixers	15	0.0074	0.0386	0.0470	0.0001	0.0021	0.0020	6.3	0.0007	0.0003	6.4
	25	0.0270	0.0813	0.1510	0.0002	0.0083	0.0076	17.6	0.0024	0.0011	17.9
Cement and Mortar Mixers Composite		0.0091	0.0421	0.0556	0.0001	0.0026	0.0024	7.2	0.0008	0.0004	7.4
Concrete/Industrial Saws	25	0.0199	0.0678	0.1257	0.0002	0.0049	0.0045	16.5	0.0018	0.0008	16.8
	50	0.0955	0.2918	0.2858	0.0004	0.0247	0.0227	30.2	0.0086	0.0038	31.6
	120	0.1065	0.4836	0.7154	0.0009	0.0589	0.0542	74.1	0.0096	0.0043	75.7
	175	0.1569	0.8701	1.3612	0.0018	0.0706	0.0649	160	0.0142	0.0063	162.4

Concrete/Industrial Saws Composite		0.1002	0.4088	0.5572	0.0007	0.0452	0.0416	58.5	0.0090	0.0040	59.9
Cranes	50	0.1015	0.2892	0.2394	0.0003	0.0239	0.0220	23.2	0.0092	0.0041	24.6
	120	0.0919	0.3618	0.5508	0.0006	0.0493	0.0453	50.1	0.0083	0.0037	51.5
	175	0.1031	0.4821	0.7769	0.0009	0.0445	0.0410	80.3	0.0093	0.0041	81.8
	250	0.1040	0.2948	0.9948	0.0013	0.0351	0.0323	112	0.0094	0.0042	113.6
	350	0.1245	0.3886	1.1661	0.0015	0.0418	0.0384	139.3	0.0112	0.0050	141.1
	500	0.1551	0.5292	1.4230	0.0018	0.0518	0.0477	180	0.0140	0.0062	182.3
	750	0.2625	0.8887	2.4614	0.0030	0.0885	0.0814	303	0.0237	0.0105	306.8
	1000	0.9491	3.3249	10.3665	0.0098	0.3189	0.2934	971	0.0856	0.0381	984.2
Cranes Composite		0.1348	0.4737	1.1934	0.0014	0.0508	0.0468	129	0.0122	0.0054	130.6
Crawler Tractors	50	0.1176	0.3246	0.2627	0.0003	0.0270	0.0248	24.9	0.0106	0.0047	26.6
	120	0.1293	0.4858	0.7686	0.0008	0.0677	0.0623	65.8	0.0117	0.0052	67.7
	125	0.1328	0.5093	0.8127	0.0008	0.0681	0.0626	70.8	0.0120	0.0053	72.7
	175	0.1674	0.7448	1.2529	0.0014	0.0713	0.0656	121	0.0151	0.0067	123.6
	250	0.1764	0.5000	1.5945	0.0019	0.0613	0.0564	166	0.0159	0.0071	168.7
	500	0.2542	0.9504	2.2389	0.0025	0.0868	0.0799	259	0.0229	0.0102	262.9
	750	0.4574	1.6983	4.1042	0.0047	0.1573	0.1447	465	0.0413	0.0183	471.2
	1000	0.6901	2.6950	7.3731	0.0066	0.2361	0.2172	658	0.0623	0.0277	668.0
Crawler Tractors Composite		0.1584	0.5900	1.1593	0.0013	0.0697	0.0641	114	0.0143	0.0064	116.3
Crushing/Proc. Equipment	50	0.1741	0.5009	0.4359	0.0006	0.0422	0.0389	44.0	0.0157	0.0070	46.5
	120	0.1402	0.5764	0.8552	0.0010	0.0779	0.0717	83.1	0.0127	0.0056	85.2
	175	0.1942	0.9615	1.5237	0.0019	0.0864	0.0795	167	0.0175	0.0078	170.0
	250	0.1848	0.5425	2.0202	0.0028	0.0620	0.0571	245	0.0167	0.0074	247.2
	500	0.2608	0.8480	2.7097	0.0037	0.0884	0.0813	374	0.0235	0.0105	377.4
	750	0.4147	1.3191	4.4498	0.0059	0.1418	0.1305	589	0.0374	0.0166	594.8
	1000	1.1270	3.6752	13.3218	0.0131	0.3880	0.3569	1,308	0.1017	0.0452	1323.9
Crushing/Proc. Equipment Composite		0.1733	0.6773	1.1752	0.0015	0.0748	0.0688	132	0.0156	0.0070	134.8
Dumpers/Tenders	25	0.0097	0.0320	0.0601	0.0001	0.0029	0.0027	7.6	0.0009	0.0004	7.8
Dumpers/Tenders Composite		0.0097	0.0320	0.0601	0.0001	0.0029	0.0027	7.6	0.0009	0.0004	7.8
Excavators	25	0.0198	0.0677	0.1253	0.0002	0.0047	0.0043	16.4	0.0018	0.0008	16.7
	50	0.0816	0.2841	0.2458	0.0003	0.0212	0.0195	25.0	0.0074	0.0033	26.2
	120	0.1086	0.5177	0.6791	0.0009	0.0586	0.0539	73.6	0.0098	0.0044	75.2
	175	0.1208	0.6668	0.8932	0.0013	0.0512	0.0471	112	0.0109	0.0048	114.0
	200	0.1220	0.5626	0.9741	0.0014	0.0466	0.0428	127.7	0.0110	0.0049	129.5
	250	0.1242	0.3541	1.1360	0.0018	0.0372	0.0343	159	0.0112	0.0050	160.5
	500	0.1735	0.5271	1.4763	0.0023	0.0516	0.0475	234	0.0157	0.0070	236.2
	750	0.2895	0.8731	2.5290	0.0039	0.0871	0.0802	387	0.0261	0.0116	391.6
Excavators Composite		0.1220	0.5338	0.9071	0.0013	0.0481	0.0442	120	0.0110	0.0049	121.3
Forklifts	50	0.0445	0.1623	0.1431	0.0002	0.0121	0.0111	14.7	0.0040	0.0018	15.3
	120	0.0438	0.2176	0.2788	0.0004	0.0241	0.0222	31.2	0.0040	0.0018	31.9
	175	0.0572	0.3307	0.4261	0.0006	0.0246	0.0226	56.1	0.0052	0.0023	56.9
	250	0.0570	0.1614	0.5281	0.0009	0.0168	0.0154	77.1	0.0051	0.0023	77.9
	500	0.0781	0.2208	0.6592	0.0011	0.0228	0.0210	111	0.0070	0.0031	112.1

Forklifts Composite		0.0541	0.2235	0.3950	0.0006	0.0204	0.0188	54.4	0.0049	0.0022	55.2
Generator Sets	15	0.0149	0.0684	0.1016	0.0002	0.0058	0.0053	10.2	0.0013	0.0006	10.4
	25	0.0266	0.0908	0.1594	0.0002	0.0091	0.0083	17.6	0.0024	0.0011	18.0
	50	0.0872	0.2639	0.2847	0.0004	0.0234	0.0215	30.6	0.0079	0.0035	31.9
	120	0.1106	0.4905	0.7587	0.0009	0.0590	0.0543	77.9	0.0100	0.0044	79.5
	175	0.1347	0.7388	1.2314	0.0016	0.0592	0.0544	142	0.0122	0.0054	143.9
	250	0.1277	0.4365	1.6763	0.0024	0.0464	0.0427	213	0.0115	0.0051	214.3
	500	0.1818	0.7230	2.3955	0.0033	0.0690	0.0635	337	0.0164	0.0073	339.5
	750	0.3035	1.1671	3.9863	0.0055	0.1134	0.1044	544	0.0274	0.0122	548.1
	1000	0.7957	2.8065	10.2314	0.0105	0.2844	0.2616	1,049	0.0718	0.0319	1060.0
Generator Sets Composite		0.0767	0.3045	0.5430	0.0007	0.0324	0.0298	61.0	0.0069	0.0031	62.1
Graders	50	0.1080	0.3263	0.2772	0.0004	0.0262	0.0241	27.5	0.0097	0.0043	29.1
	120	0.1254	0.5310	0.7729	0.0009	0.0676	0.0622	75.0	0.0113	0.0050	76.8
	140	0.1331	0.6050	0.8989	0.0011	0.0660	0.0607	92.8	0.0120	0.0053	94.7
	175	0.1467	0.7345	1.1193	0.0014	0.0631	0.0581	124	0.0132	0.0059	126.0
	250	0.1492	0.4331	1.4184	0.0019	0.0494	0.0454	172	0.0135	0.0060	174.3
	500	0.1855	0.6289	1.6842	0.0023	0.0608	0.0559	229	0.0167	0.0074	232.1
	750	0.3952	1.3289	3.6674	0.0049	0.1306	0.1202	486	0.0357	0.0158	491.4
Graders Composite		0.1446	0.6053	1.1663	0.0015	0.0593	0.0546	133	0.0130	0.0058	134.8
Off-Highway Tractors	120	0.2113	0.7191	1.2368	0.0011	0.1078	0.0992	93.7	0.0191	0.0085	96.8
	175	0.2045	0.8335	1.5337	0.0015	0.0871	0.0801	130	0.0185	0.0082	133.3
	250	0.1641	0.4691	1.4453	0.0015	0.0601	0.0553	130	0.0148	0.0066	132.8
	750	0.6538	2.8815	5.8130	0.0057	0.2353	0.2165	568	0.0590	0.0262	577.5
	1000	0.9818	4.4978	10.0554	0.0082	0.3436	0.3161	814	0.0886	0.0394	828.4
Off-Highway Tractors Composite		0.2077	0.7649	1.7062	0.0017	0.0818	0.0753	151	0.0187	0.0083	154.4
Off-Highway Trucks	175	0.1441	0.7580	1.0305	0.0014	0.0602	0.0554	125	0.0130	0.0058	127.2
	250	0.1400	0.3837	1.2373	0.0019	0.0412	0.0379	167	0.0126	0.0056	168.6
	300	0. 554	0. 342	1.3471	0.0020	0.0457	0.0420	187.	0.0140	0.0062	189.9
	500	0.2170	0.6362	1.7865	0.0027	0.0634	0.0583	272	0.0196	0.0087	275.4
	750	0.3542	1.0311	2.9938	0.0044	0.1046	0.0962	442	0.0320	0.0142	446.8
	1000	0.5484	1.6691	5.9808	0.0063	0.1796	0.1652	625	0.0495	0.0220	632.6
Off-Highway Trucks Composite		0.2141	0.6361	1.8543	0.0027	0.0644	0.0593	260	0.0193	0.0086	263.1
Other Construction Equipment	15	0.0118	0.0617	0.0737	0.0002	0.0029	0.0026	10.1	0.0011	0.0005	10.3
	25	0.0160	0.0544	0.1013	0.0002	0.0041	0.0037	13.2	0.0014	0.0006	13.4
	50	0.0753	0.2653	0.2585	0.0004	0.0205	0.0189	28.0	0.0068	0.0030	29.1
	120	0.1006	0.5277	0.7025	0.0009	0.0567	0.0522	80.9	0.0091	0.0040	82.3
	175	0.0935	0.5873	0.8011	0.0012	0.0420	0.0386	107	0.0084	0.0038	107.9
	500	0.1452	0.5234	1.5187	0.0025	0.0491	0.0452	254	0.0131	0.0058	256.3

Other Construction Equipment Composite		0.0872	0.3765	0.7938	0.0013	0.0330	0.0304	123	0.0079	0.0035	123.9
Other General Industrial Equipmen	15	0.0066	0.0391	0.0466	0.0001	0.0018	0.0017	6.4	0.0006	0.0003	6.5
	25	0.0185	0.0632	0.1170	0.0002	0.0044	0.0040	15.3	0.0017	0.0007	15.6
	50	0.0980	0.2738	0.2243	0.0003	0.0232	0.0214	21.7	0.0088	0.0039	23.1
	120	0.1177	0.4487	0.6789	0.0007	0.0644	0.0593	62.0	0.0106	0.0047	63.7
	175	0.1261	0.5728	0.9333	0.0011	0.0549	0.0505	95.9	0.0114	0.0051	97.7
	250	0.1174	0.3177	1.2013	0.0015	0.0380	0.0350	136	0.0106	0.0047	137.3
	500	0.2135	0.6384	2.0642	0.0026	0.0693	0.0638	265	0.0193	0.0086	268.5
	750	0.3546	1.0522	3.5146	0.0044	0.1165	0.1072	437	0.0320	0.0142	442.5
	1000	0.5246	1.6793	6.0067	0.0056	0.1805	0.1660	560	0.0473	0.0210	567.1
Other General Industrial Equipmen Composite		0.1542	0.5159	1.3484	0.0016	0.0580	0.0533	152	0.0139	0.0062	154.4
Other Material Handling Equipment	50	0.1361	0.3789	0.3119	0.0004	0.0323	0.0297	30.3	0.0123	0.0055	32.3
	120	0.1144	0.4370	0.6628	0.0007	0.0628	0.0578	60.7	0.0103	0.0046	62.3
	175	0.1591	0.7257	1.1860	0.0014	0.0696	0.0640	122	0.0144	0.0064	124.4
	250	0.1241	0.3385	1.2829	0.0016	0.0405	0.0372	145	0.0112	0.0050	146.8
	275	0.1269	0.3506	1.3035	0.0017	0.0414	0.0381	149.7	0.0114	0.0051	151.5
	500	0.1521	0.4596	1.4883	0.0019	0.0498	0.0458	192	0.0137	0.0061	193.8
	1000	0.7021	2.2197	7.9424	0.0073	0.2379	0.2188	741	0.0634	0.0282	751.4
Other Material Handling Equipment Composite		0.1473	0.4951	1.3132	0.0015	0.0562	0.0517	141	0.0133	0.0059	143.3
Pavers	25	0.0247	0.0799	0.1500	0.0002	0.0075	0.0069	18.7	0.0022	0.0010	19.0
	50	0.1366	0.3592	0.2948	0.0004	0.0308	0.0283	28.0	0.0123	0.0055	29.9
	120	0.1387	0.5057	0.8357	0.0008	0.0729	0.0671	69.2	0.0125	0.0056	71.2
	175	0.1777	0.7784	1.3769	0.0014	0.0769	0.0707	128	0.0160	0.0071	130.8
	250	0.2072	0.6081	1.9469	0.0022	0.0756	0.0695	194	0.0187	0.0083	197.3
	500	0.2275	0.9254	2.1080	0.0023	0.0818	0.0752	233	0.0205	0.0091	236.5
Pavers Composite		0.1511	0.5357	0.8542	0.0009	0.0603	0.0555	77.9	0.0136	0.0061	80.1
Paving Equipment	25	0.0153	0.0520	0.0968	0.0002	0.0039	0.0036	12.6	0.0014	0.0006	12.8
	50	0. 166	0.3049	0. 514	0.0003	0.0263	0.0242	23.9	0.0105	0.0047	25.6
	120	0.1087	0.3958	0.6561	0.0006	0.0574	0.0528	54.5	0.0098	0.0044	56.1
	175	0.1387	0.6079	1.0816	0.0011	0.0602	0.0554	101	0.0125	0.0056	103.0
	250	0.1277	0.3763	1.2206	0.0014	0.0467	0.0430	122	0.0115	0.0051	124.1
Paving Equipment Composite		0.1142	0.4316	0.7709	0.0008	0.0536	0.0493	68.9	0.0103	0.0046	70.6
Plate Compactors	15	0.0050	0.0263	0.0314	0.0001	0.0012	0.0011	4.3	0.0005	0.0002	4.4
Plate Compactors Composite		0.0050	0.0263	0.0314	0.0001	0.0012	0.0011	4.3	0.0005	0.0002	4.4
Pressure Washers	15	0.0071	0.0328	0.0487	0.0001	0.0028	0.0025	4.9	0.0006	0.0003	5.0
	25	0.0108	0.0368	0.0646	0.0001	0.0037	0.0034	7.1	0.0010	0.0004	7.3
	50	0.0315	0.1037	0.1284	0.0002	0.0094	0.0086	14.3	0.0028	0.0013	14.7
	120	0.0302	0.1443	0.2235	0.0003	0.0157	0.0145	24.1	0.0027	0.0012	24.5
Pressure Washers Composite		0.0159	0.0619	0.0878	0.0001	0.0058	0.0053	9.4	0.0014	0.0006	9.6
Pumps	15	0.0125	0.0497	0.0752	0.0001	0.0049	0.0046	7.4	0.0011	0.0005	7.6
	25	0.0359	0.1004	0.1761	0.0002	0.0109	0.0100	19.5	0.0032	0.0014	20.0
	50	0.1052	0.3116	0.3228	0.0004	0.0275	0.0253	34.3	0.0095	0.0042	35.8
	120	0.1149	0.4984	0.7706	0.0009	0.0617	0.0568	77.9	0.0104	0.0046	79.6
	175	0.1385	0.7405	1.2344	0.0016	0.0611	0.0562	140	0.0125	0.0056	142.1
	250	0.1266	0.4210	1.6140	0.0023	0.0457	0.0421	201	0.0114	0.0051	203.2
	500	0.1952	0.7595	2.4849	0.0034	0.0734	0.0675	345	0.0176	0.0078	348.0
	750	0.3326	1.2556	4.2353	0.0057	0.1235	0.1136	571	0.0300	0.0133	575.5
	1000	1.0536	3.7127	13.3750	0.0136	0.3744	0.3444	1,355	0.0951	0.0423	1369.9

Pumps Composite		0.0748	0.2926	0.4705	0.0006	0.0323	0.0297	49.6	0.0067	0.0030	50.7
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	0.0016	6.3	0.0007	0.0003	6.4
	25	0.0161	0.0549	0.1023	0.0002	0.0041	0.0038	13.3	0.0015	0.0006	13.6
	50	0.1025	0.2911	0.2583	0.0003	0.0245	0.0225	26.0	0.0092	0.0041	27.5
	120	0.0986	0.4063	0.6253	0.0007	0.0534	0.0491	59.0	0.0089	0.0040	60.4
	175	0.1247	0.6199	1.0114	0.0012	0.0550	0.0506	108	0.0113	0.0050	109.9
	250	0.1262	0.3887	1.3124	0.0017	0.0451	0.0415	153	0.0114	0.0051	154.9
	500	0.1654	0.6313	1.6820	0.0022	0.0593	0.0545	219	0.0149	0.0066	221.5
Rollers Composite		0.0973	0.4060	0.6546	0.0008	0.0453	0.0417	67.1	0.0088	0.0039	68.4
Rough Terrain Forklifts	50	0.1181	0.3778	0.3316	0.0004	0.0300	0.0276	33.9	0.0107	0.0047	35.6
	120	0.0955	0.4327	0.5995	0.0007	0.0529	0.0487	62.4	0.0086	0.0038	63.8
	175	0.1352	0.7256	1.0448	0.0014	0.0592	0.0545	125	0.0122	0.0054	126.8
	250	0.1294	0.3798	1.2955	0.0019	0.0416	0.0382	171	0.0117	0.0052	172.7
	500	0.1824	0.5717	1.7096	0.0025	0.0584	0.0537	257	0.0165	0.0073	259.2
Rough Terrain Forklifts Composite		0.1009	0.4642	0.6526	0.0008	0.0532	0.0489	70.3	0.0091	0.0040	71.7
Rubber Tired Dozers	175	0.2119	0.8457	1.5561	0.0015	0.0893	0.0821	129	0.0191	0.0085	132.5
	250	0.2435	0.6833	2.0817	0.0021	0.0881	0.0810	183	0.0220	0.0098	187.0
	500	0.3211	1.4228	2.7305	0.0026	0.1133	0.1043	265	0.0290	0.0129	269.5
	750	0.4843	2.1329	4.1797	0.0040	0.1716	0.1579	399	0.0437	0.0194	405.7
	1000	0.7496	3.4322	7.4509	0.0060	0.2591	0.2384	592	0.0676	0.0301	602.6
Rubber Tired Dozers Composite		0.2986	1.1749	2.5452	0.0025	0.1064	0.0979	239	0.0269	0.0120	243.4
Rubber Tired Loaders	25	0.0204	0.0697	0.1292	0.0002	0.0050	0.0046	16.9	0.0018	0.0008	17.2
	50	0.1200	0.3641	0.3118	0.0004	0.0292	0.0269	31.1	0.0108	0.0048	32.9
	120	0.0971	0.4152	0.6015	0.0007	0.0525	0.0483	58.9	0.0088	0.0039	60.3
	175	0.1238	0.6274	0.9501	0.0012	0.0535	0.0492	106	0.0112	0.0050	108.1
	250	0.1259	0.3685	1.2125	0.0017	0.0417	0.0384	149	0.0114	0.0050	150.8
	500	0.1867	0.6397	1.7158	0.0023	0.0613	0.0564	237	0.0168	0.0075	239.7
	750	0.3850	1.3084	3.6184	0.0049	0. 276	0. 174	486	0.0347	0.0154	491.0
	1000	0.5190	1.8389	5.9660	0.0060	0.1795	0.1651	594	0.0468	0.0208	601.3
Rubber Tired Loaders Composite		0.1195	0.4763	0.9346	0.0012	0.0508	0.0467	109	0.0108	0.0048	110.3
Scrapers	120	0.1877	0.6943	1.1141	0.0011	0.0983	0.0904	93.9	0.0169	0.0075	96.6
	175	0.2070	0.9107	1.5564	0.0017	0.0884	0.0813	148	0.0187	0.0083	151.0
	250	0.2252	0.6408	2.0481	0.0024	0.0791	0.0727	209	0.0203	0.0090	212.7
	400	0.2813	0.9831	2.5165	0.0028	0.0976	0.0898	276.6	0.0254	0.0113	280.7
	500	0.3186	1.2113	2.8288	0.0032	0.1099	0.1011	321	0.0287	0.0128	326.0
	750	0.5525	2.0861	4.9949	0.0056	0.1918	0.1764	555	0.0499	0.0222	563.2
Scrapers Composite		0.2783	1.0395	2.4118	0.0027	0.1005	0.0925	262	0.0251	0.0112	266.5
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0018	0.0016	6.2	0.0006	0.0003	6.3
	50	0.1151	0.3456	0.3415	0.0005	0.0296	0.0272	36.2	0.0104	0.0046	37.8
	120	0.1176	0.5214	0.7807	0.0009	0.0644	0.0593	80.2	0.0106	0.0047	81.9
	175	0.1535	0.8341	1.3333	0.0017	0.0685	0.0630	155	0.0139	0.0062	156.7
	250	0.1632	0.5350	1.9963	0.0029	0.0580	0.0534	255	0.0147	0.0065	257.6
Signal Boards Composite		0.0192	0.0934	0.1399	0.0002	0.0077	0.0071	16.7	0.0017	0.0008	17.0
Skid Steer Loaders	25	0.0202	0.0620	0.1166	0.0002	0.0063	0.0058	13.8	0.0018	0.0008	14.1
	50	0.0517	0.2263	0.2279	0.0003	0.0157	0.0144	25.5	0.0047	0.0021	26.3
	120	0.0429	0.2748	0.3267	0.0005	0.0245	0.0225	42.8	0.0039	0.0017	43.4

Skid Steer Loaders Composite		0.0468	0.2309	0.2522	0.0004	0.0179	0.0165	30.3	0.0042	0.0019	30.9
Surfacing Equipment	50	0.0477	0.1403	0.1359	0.0002	0.0119	0.0109	14.1	0.0043	0.0019	14.8
	120	0.0970	0.4215	0.6523	0.0007	0.0517	0.0475	63.8	0.0088	0.0039	65.2
	175	0.0894	0.4730	0.7742	0.0010	0.0392	0.0360	85.8	0.0081	0.0036	87.1
	250	0.1025	0.3374	1.1177	0.0015	0.0376	0.0346	135	0.0092	0.0041	136.3
	500	0.1532	0.6418	1.6597	0.0022	0.0567	0.0522	221	0.0138	0.0061	223.4
	750	0.2443	1.0046	2.6697	0.0035	0.0900	0.0828	347	0.0220	0.0098	350.5
Surfacing Equipment Composite		0.1277	0.5182	1.2760	0.0017	0.0468	0.0431	166	0.0115	0.0051	167.8
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0034	0.0031	11.9	0.0011	0.0005	12.1
	25	0.0237	0.0808	0.1496	0.0002	0.0058	0.0054	19.6	0.0021	0.0009	20.0
	50	0.1048	0.3425	0.3055	0.0004	0.0271	0.0249	31.6	0.0095	0.0042	33.1
	120	0.1107	0.5147	0.6989	0.0009	0.0622	0.0573	75.0	0.0100	0.0044	76.6
	175	0.1439	0.7997	1.1204	0.0016	0.0637	0.0586	139	0.0130	0.0058	141.1
	250	0.1146	0.3382	1.1784	0.0018	0.0362	0.0333	162	0.0103	0.0046	163.7
Sweepers/Scrubbers Composite		0.1148	0.5145	0.6862	0.0009	0.0510	0.0469	78.5	0.0104	0.0046	80.2
Tractors/Loaders/Backhoes	25	0.0195	0.0657	0.1237	0.0002	0.0056	0.0052	15.9	0.0018	0.0008	16.1
	50	0.0893	0.3199	0.2893	0.0004	0.0238	0.0219	30.3	0.0081	0.0036	31.6
	100	0.0751	0.3434	0.4087	0.0005	0.0342	0.0314	45.6	0.0068	0.0030	46.7
	120	0.0694	0.3529	0.4565	0.0006	0.0383	0.0352	51.7	0.0063	0.0028	52.7
	175	0.0988	0.5861	0.7696	0.0011	0.0428	0.0394	101	0.0089	0.0040	102.8
	250	0.1204	0.3666	1.1658	0.0019	0.0370	0.0340	172	0.0109	0.0048	173.5
	500	0.2290	0.7443	2.0659	0.0039	0.0701	0.0645	345	0.0207	0.0092	348.1
	750	0.3462	1.1159	3.2041	0.0058	0.1072	0.0986	517	0.0312	0.0139	522.2
Tractors/Loaders/Backhoes Composite		0.0792	0.3782	0.5392	0.0008	0.0387	0.0356	66.8	0.0071	0.0032	67.9
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0024	0.0022	8.5	0.0009	0.0004	8.6
	25	0.0397	0.1355	0.2511	0.0004	0.0097	0.0090	32.9	0.0036	0.0016	33.5
	50	0.1566	0.4082	0.3432	0.0004	0.0353	0.0325	32.9	0.0141	0.0063	35.2
	120	0. 281	0. 684	0. 862	0.0008	0.0669	0.0615	64.9	0.0116	0.0051	66.
	175	0.1955	0.8632	1.5520	0.0016	0.0849	0.0781	144	0.0176	0.0078	146.7
	250	0.2354	0.7089	2.2485	0.0025	0.0880	0.0810	223	0.0212	0.0094	226.3
	500	0.2985	1.3011	2.8470	0.0031	0.1105	0.1016	311	0.0269	0.0120	315.6
	750	0.5663	2.4440	5.4715	0.0059	0.2099	0.1931	587	0.0511	0.0227	595.0
Trenchers Composite		0.1427	0.4675	0.6684	0.0007	0.0549	0.0505	58.7	0.0129	0.0057	60.8
Welders	15	0.0104	0.0416	0.0629	0.0001	0.0041	0.0038	6.2	0.0009	0.0004	6.4
	25	0.0208	0.0581	0.1020	0.0001	0.0063	0.0058	11.3	0.0019	0.0008	11.6
	50	0.0979	0.2753	0.2535	0.0003	0.0240	0.0221	26.0	0.0088	0.0039	27.4
	120	0.0654	0.2659	0.4099	0.0005	0.0358	0.0330	39.5	0.0059	0.0026	40.4
	175	0.1101	0.5455	0.9083	0.0011	0.0490	0.0451	98.2	0.0099	0.0044	99.8
	250	0.0855	0.2618	1.0026	0.0013	0.0301	0.0277	119	0.0077	0.0034	120.3
	500	0.1092	0.3838	1.2526	0.0016	0.0394	0.0363	168	0.0098	0.0044	169.2
Welders Composite		0.0646	0.2096	0.2564	0.0003	0.0225	0.0207	25.6	0.0058	0.0026	26.5

Notes:
SCAQMD emission factors for 2014 (SCAQMD 2008)
Offroad diesel exhaust $PM_{2.5}$ = 92% of PM_{10} per EMFAC 2007 version 2.3 (SCAQMD 2008)
Offroad N_2O per Annex 3, Table A-101(EPA 2010)
Non-matching application-specific values interpolated or extrapolated
EPA GWPs for CO_2 eqv (1, 21, 310)

G-16 Onroad 2013

Table G-16 SCAB Fleet Average Emission Factors

A-20 Onroad 2013

Air Basin	SC

	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)
Vehicle Type	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
Light Duty (pickup trucks)	0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087	0.00007	0.00003	1.11070
Medium Duty (work trucks)	0.00206	0.01408	0.01577	0.00003	0.00060	0.00050	2.78163	0.00010	0.00015	2.83046
Heavy Heavy Duty (tractor/trailers)	0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519	0.00010	0.00010	4.24784

Notes:
SCAQMD 2008
HHD includes tire & brake wear
Onroad N_2O per Annex 3, Table A-99

Table G-17 Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:

Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories:

Passenger Vehicles & Delivery Trucks.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: **2007**

All model years in the range 1965 to 2007

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.01155158**	CO	**0.02407553**
NOx	**0.00121328**	NOx	**0.02508445**
ROG	**0.00118234**	ROG	**0.00323145**
SOx	**0.00001078**	SOx	**0.00002626**
PM10	**0.00008447**	PM10	**0.00091020**
PM2.5	**0.00005243**	PM2.5	**0.00078884**
CO2	**1.10672236**	CO2	**2.72245619**
CH4	**0.00010306**	CH4	**0.00016030**
N2O	**0.00004173**	N2O	**0.00024936**
CO2 eqv	**1.12182256**	CO2 eqv	**2.80312488**

Scenario Year: **2008**

All model years in the range 1965 to 2008

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.01054844**	CO	**0.02194915**
NOx	**0.00110288**	NOx	**0.02371258**
ROG	**0.00107919**	ROG	**0.00299270**
SOx	**0.00001075**	SOx	**0.00002565**
PM10	**0.00008505**	PM10	**0.00085607**
PM2.5	**0.00005293**	PM2.5	**0.00073933**
CO2	**1.09953226**	CO2	**2.71943400**
CH4	**0.00009465**	CH4	**0.00014769**
N2O	**0.00003832**	N2O	**0.00022974**
CO2 eqv	**1.11340004**	CO2 eqv	**2.79375469**

Scenario Year: **2009**

All model years in the range 1965 to 2009

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00968562**	CO	**0.02016075**
NOx	**0.00100518**	NOx	**0.02236636**
ROG	**0.00099245**	ROG	**0.00278899**
SOx	**0.00001066**	SOx	**0.00002679**
PM10	**0.00008601**	PM10	**0.00080550**
PM2.5	**0.00005384**	PM2.5	**0.00069228**
CO2	**1.09755398**	CO2	**2.72330496**
CH4	**0.00008767**	CH4	**0.00013655**
N2O	**0.00003550**	N2O	**0.00021242**
CO2 eqv	**1.11039937**	CO2 eqv	**2.79202205**

Scenario Year: **2010**

All model years in the range 1966 to 2010

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00826276**	CO	**0.01843765**
NOx	**0.00091814**	NOx	**0.02062460**
ROG	**0.00091399**	ROG	**0.00258958**
SOx	**0.00001077**	SOx	**0.00002701**
PM10	**0.00008698**	PM10	**0.00075121**
PM2.5	**0.00005478**	PM2.5	**0.00064233**
CO2	**1.09568235**	CO2	**2.73222199**
CH4	**0.00008146**	CH4	**0.00012576**
N2O	**0.00003298**	N2O	**0.00019563**
CO2 eqv	**1.10761811**	CO2 eqv	**2.79550969**

Scenario Year: **2011**

All model years in the range 1967 to 2011

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00826276**	CO	**0.01693242**
NOx	**0.00084460**	NOx	**0.01893366**
ROG	**0.00085233**	ROG	**0.00241868**
SOx	**0.00001077**	SOx	**0.00002728**
PM10	**0.00008879**	PM10	**0.00070097**
PM2.5	**0.00005653**	PM2.5	**0.00059682**
CO2	**1.10235154**	CO2	**2.75180822**
CH4	**0.00007678**	CH4	**0.00011655**
N2O	**0.00003109**	N2O	**0.00018130**
CO2 eqv	**1.11360103**	CO2 eqv	**2.81046029**

Scenario Year: **2012**

All model years in the range 1968 to 2012

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00765475**	CO	**0.01545741**
NOx	**0.00077583**	NOx	**0.01732423**
ROG	**0.00079628**	ROG	**0.00223776**
SOx	**0.00001073**	SOx	**0.00002667**
PM10	**0.00008979**	PM10	**0.00064975**
PM2.5	**0.00005750**	PM2.5	**0.00054954**
CO2	**1.10152540**	CO2	**2.76628414**
CH4	**0.00007169**	CH4	**0.00010668**
N2O	**0.00002903**	N2O	**0.00016594**
CO2 eqv	**1.11202923**	CO2 eqv	**2.81996552**

Scenario Year: **2013**

All model years in the range 1969 to 2013

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00709228**	CO	**0.01407778**
NOx	**0.00071158**	NOx	**0.01577311**
ROG	**0.00074567**	ROG	**0.00206295**
SOx	**0.00001072**	SOx	**0.00002682**
PM10	**0.00009067**	PM10	**0.00059956**
PM2.5	**0.00005834**	PM2.5	**0.00050174**
CO2	**1.10087435**	CO2	**2.78163459**
CH4	**0.00006707**	CH4	**0.00009703**
N2O	**0.00002716**	N2O	**0.00015094**
CO2 eqv	**1.11070222**	CO2 eqv	**2.83046413**

Scenario Year: **2014**

All model years in the range 1970 to 2014

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00660353**	CO	**0.01284321**
NOx	**0.00065484**	NOx	**0.01425162**
ROG	**0.00070227**	ROG	**0.00189649**
SOx	**0.00001069**	SOx	**0.00002754**
PM10	**0.00009185**	PM10	**0.00054929**
PM2.5	**0.00005939**	PM2.5	**0.00045519**
CO2	**1.10257205**	CO2	**2.79845465**
CH4	**0.00006312**	CH4	**0.00008798**
N2O	**0.00002556**	N2O	**0.00013685**
CO2 eqv	**1.11181980**	CO2 eqv	**2.84272697**

Scenario Year: **2015**

All model years in the range 1971 to 2015

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00614108**	CO	**0.01169445**
NOx	**0.00060188**	NOx	**0.01285026**
ROG	**0.00066355**	ROG	**0.00173890**
SOx	**0.00001070**	SOx	**0.00002741**
PM10	**0.00009259**	PM10	**0.00050307**
PM2.5	**0.00006015**	PM2.5	**0.00041268**
CO2	**1.10192837**	CO2	**2.81247685**
CH4	**0.00005923**	CH4	**0.00008076**
N2O	**0.00002398**	N2O	**0.00012562**
CO2 eqv	**1.11060625**	CO2 eqv	**2.85311641**

Scenario Year: **2016**

All model years in the range 1972 to 2016

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00575800**	CO	**0.01080542**
NOx	**0.00055658**	NOx	**0.01172881**
ROG	**0.00063254**	ROG	**0.00161521**
SOx	**0.00001071**	SOx	**0.00002767**
PM10	**0.00009392**	PM10	**0.00046606**
PM2.5	**0.00006131**	PM2.5	**0.00037868**
CO2	**1.10677664**	CO2	**2.83134285**
CH4	**0.00005623**	CH4	**0.00007355**
N2O	**0.00002277**	N2O	**0.00011441**
CO2 eqv	**1.11501568**	CO2 eqv	**2.86835526**

Scenario Year: **2017**

All model years in the range 1973 to 2017

Passenger Vehicles (pounds/mile)	
CO	**0.00537891**
NOx	**0.00051297**
ROG	**0.00060109**
SOx	**0.00001079**
PM10	**0.00009446**
PM2.5	**0.00006192**
CO2	**1.10627489**
CH4	**0.00005300**
N2O	**0.00002146**
CO2 eqv	**1.11404119**

Delivery Trucks (pounds/mile)	
CO	**0.00998101**
NOx	**0.01070034**
ROG	**0.00150242**
SOx	**0.00002723**
PM10	**0.00043131**
PM2.5	**0.00034605**
CO2	**2.84005015**
CH4	**0.00006663**
N2O	**0.00010365**
CO2 eqv	**2.87358027**

Scenario Year: **2018**

All model years in the range 1974 to 2018

Passenger Vehicles (pounds/mile)	
CO	**0.00502881**
NOx	**0.00047300**
ROG	**0.00057178**
SOx	**0.00001071**
PM10	**0.00009494**
PM2.5	**0.00006234**
CO2	**1.10562643**
CH4	**0.00005003**
N2O	**0.00002026**
CO2 eqv	**1.11295662**

Delivery Trucks (pounds/mile)	
CO	**0.00923234**
NOx	**0.00979416**
ROG	**0.00139856**
SOx	**0.00002749**
PM10	**0.00040110**
PM2.5	**0.00031792**
CO2	**2.84646835**
CH4	**0.00006203**
N2O	**0.00009650**
CO2 eqv	**2.87768473**

Scenario Year: **2019**

All model years in the range 1975 to 2019

Passenger Vehicles (pounds/mile)	
CO	**0.00471820**
NOx	**0.00043716**
ROG	**0.00054654**
SOx	**0.00001072**
PM10	**0.00009523**
PM2.5	**0.00006259**
CO2	**1.10496100**
CH4	**0.00004743**
N2O	**0.00001920**
CO2 eqv	**1.11191031**

Delivery Trucks (pounds/mile)	
CO	**0.00857192**
NOx	**0.00900205**
ROG	**0.00130563**
SOx	**0.00002706**
PM10	**0.00037393**
PM2.5	**0.00029276**
CO2	**2.85060182**
CH4	**0.00005619**
N2O	**0.00008741**
CO2 eqv	**2.87887960**

Scenario Year: **2020**

All model years in the range 1976 to 2020

Passenger Vehicles (pounds/mile)	
CO	**0.00444247**
NOx	**0.00040506**
ROG	**0.00052463**
SOx	**0.00001073**
PM10	**0.00009550**
PM2.5	**0.00006279**
CO2	**1.10456157**
CH4	**0.00004495**
N2O	**0.00001820**
CO2 eqv	**1.11114749**

Delivery Trucks (pounds/mile)	
CO	**0.00799617**
NOx	**0.00831802**
ROG	**0.00122382**
SOx	**0.00002733**
PM10	**0.00035054**
PM2.5	**0.00027128**
CO2	**2.85148109**
CH4	**0.00005330**
N2O	**0.00008291**
CO2 eqv	**2.87830219**

Scenario Year: **2021**

All model years in the range 1977 to 2021

Passenger Vehicles (pounds/mile)	
CO	**0.00421218**
NOx	**0.00037757**
ROG	**0.00050573**
SOx	**0.00001073**
PM10	**0.00009640**
PM2.5	**0.00006364**
CO2	**1.11009559**
CH4	**0.00004322**
N2O	**0.00001750**
CO2 eqv	**1.11642895**

Delivery Trucks (pounds/mile)	
CO	**0.00748303**
NOx	**0.00773500**
ROG	**0.00115568**
SOx	**0.00002755**
PM10	**0.00033125**
PM2.5	**0.00025331**
CO2	**2.86434187**
CH4	**0.00004905**
N2O	**0.00007630**
CO2 eqv	**2.88902454**

Scenario Year: **2022**

All model years in the range 1978 to 2022

Passenger Vehicles (pounds/mile)	
CO	**0.00397866**
NOx	**0.00035150**
ROG	**0.00048658**
SOx	**0.00001072**
PM10	**0.00009661**
PM2.5	**0.00006389**
CO2	**1.11019931**
CH4	**0.00004121**
N2O	**0.00001669**
CO2 eqv	**1.11623782**

Delivery Trucks (pounds/mile)	
CO	**0.00699290**
NOx	**0.00722470**
ROG	**0.00108569**
SOx	**0.00002774**
PM10	**0.00031501**
PM2.5	**0.00023906**
CO2	**2.87006769**
CH4	**0.00004557**
N2O	**0.00007088**
CO2 eqv	**2.89299807**

Scenario Year: **2023**

All model years in the range 1979 to 2023

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00377527**	CO	**0.00658123**
NOx	**0.00032851**	NOx	**0.00679147**
ROG	**0.00046900**	ROG	**0.00102852**
SOx	**0.00001070**	SOx	**0.00002790**
PM10	**0.00009676**	PM10	**0.00030109**
PM2.5	**0.00006405**	PM2.5	**0.00022582**
CO2	**1.11023373**	CO2	**2.87466338**
CH4	**0.00003951**	CH4	**0.00004218**
N2O	**0.00001600**	N2O	**0.00006561**
CO2 eqv	**1.11602249**	CO2 eqv	**2.89588881**

Scenario Year: **2024**

All model years in the range 1980 to 2024

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00358611**	CO	**0.00625076**
NOx	**0.00030721**	NOx	**0.00647083**
ROG	**0.00045136**	ROG	**0.00096578**
SOx	**0.00001080**	SOx	**0.00002807**
PM10	**0.00009676**	PM10	**0.00029407**
PM2.5	**0.00006410**	PM2.5	**0.00021880**
CO2	**1.11061572**	CO2	**2.88010717**
CH4	**0.00003781**	CH4	**0.00004019**
N2O	**0.00001531**	N2O	**0.00006251**
CO2 eqv	**1.11615549**	CO2 eqv	**2.90033043**

Scenario Year: **2025**

All model years in the range 1981 to 2025

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00342738**	CO	**0.00595363**
NOx	**0.00028846**	NOx	**0.00615945**
ROG	**0.00043545**	ROG	**0.00092178**
SOx	**0.00001070**	SOx	**0.00002761**
PM10	**0.00009679**	PM10	**0.00028425**
PM2.5	**0.00006418**	PM2.5	**0.00020958**
CO2	**1.11078571**	CO2	**2.88143570**
CH4	**0.00003641**	CH4	**0.00003765**
N2O	**0.00001474**	N2O	**0.00005857**
CO2 eqv	**1.11611985**	CO2 eqv	**2.90038172**

Scenario Year: **2026**

All model years in the range 1982 to 2026

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	**0.00328779**	CO	**0.00569435**
NOx	**0.00027141**	NOx	**0.00589869**
ROG	**0.00042052**	ROG	**0.00088403**
SOx	**0.00001076**	SOx	**0.00002716**
PM10	**0.00009687**	PM10	**0.00027657**
PM2.5	**0.00006415**	PM2.5	**0.00020187**
CO2	**1.11105829**	CO2	**2.88298299**
CH4	**0.00003518**	CH4	**0.00003581**
N2O	**0.00001424**	N2O	**0.00005570**
CO2 eqv	**1.11621250**	CO2 eqv	**2.90100126**

Notes:

SCAQMD 2008

HHD-DSL composite includes tire & brake wear

Onroad N_2O per Annex 3, Table A-99

AQMD

Table G-18 Highest (Most Conservative) EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: **2007**
All model years in the range 1965 to 2007

HHDT-DSL (pounds/mile)	
CO	**0.01446237**
NOx	**0.04718166**
ROG	**0.00372949**
SOx	**0.00003962**
PM10	**0.00230900**
PM2.5	**0.00204018**
CO2	**4.22184493**
CH4	**0.00016312**
N2O	**0.00015353**
CO2 eqv	**4.27286406**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00216752**
PM2.5	**0.00199491**

Scenario Year: **2008**
All model years in the range 1965 to 2008

HHDT-DSL (pounds/mile)	
CO	**0.01361368**
NOx	**0.04458017**
ROG	**0.00351579**
SOx	**0.00004136**
PM10	**0.00215635**
PM2.5	**0.00189990**
CO2	**4.21067145**
CH4	**0.00016269**
N2O	**0.00015312**
CO2 eqv	**4.26155554**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00201296**
PM2.5	**0.00185303**

Scenario Year: **2009**
All model years in the range 1965 to 2009

HHDT-DSL (pounds/mile)	
CO	**0.01282236**
NOx	**0.04184591**
ROG	**0.00329320**
SOx	**0.00004013**
PM10	**0.00199572**
PM2.5	**0.00175227**
CO2	**4.21080792**
CH4	**0.00015249**
N2O	**0.00014352**
CO2 eqv	**4.25850077**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00185393**
PM2.5	**0.00170680**

Scenario Year: **2010**
All model years in the range 1966 to 2010

HHDT-DSL (pounds/mile)	
CO	**0.01195456**
NOx	**0.03822102**
ROG	**0.00304157**
SOx	**0.00004131**
PM10	**0.00183062**
PM2.5	**0.00160083**
CO2	**4.21120578**
CH4	**0.00014201**
N2O	**0.00013366**
CO2 eqv	**4.25562112**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00168861**
PM2.5	**0.00155435**

Scenario Year: **2011**

All model years in the range 1967 to 2011

HHDT-DSL (pounds/mile)	
CO	**0.01112463**
NOx	**0.03455809**
ROG	**0.00279543**
SOx	**0.00003972**
PM10	**0.00166087**
PM2.5	**0.00144489**
CO2	**4.22045680**
CH4	**0.00012910**
N2O	**0.00012150**
CO2 eqv	**4.26083358**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00151936**
PM2.5	**0.00139772**

Scenario Year: **2012**

All model years in the range 1968 to 2012

HHDT-DSL (pounds/mile)	
CO	**0.01021519**
NOx	**0.03092379**
ROG	**0.00252764**
SOx	**0.00004042**
PM10	**0.00149566**
PM2.5	**0.00129354**
CO2	**4.21590774**
CH4	**0.00011651**
N2O	**0.00010966**
CO2 eqv	**4.25234923**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00135537**
PM2.5	**0.00124837**

Scenario Year: **2013**

All model years in the range 1969 to 2013

HHDT-DSL (pounds/mile)	
CO	**0.00931790**
NOx	**0.02742935**
ROG	**0.00226308**
SOx	**0.00004086**
PM10	**0.00133697**
PM2.5	**0.00114629**
CO2	**4.21518556**
CH4	**0.00010441**
N2O	**0.00009827**
CO2 eqv	**4.24784287**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00119623**
PM2.5	**0.00109863**

Scenario Year: **2014**

All model years in the range 1970 to 2014

HHDT-DSL (pounds/mile)	
CO	**0.00846435**
NOx	**0.02418049**
ROG	**0.00201594**
SOx	**0.00004092**
PM10	**0.00118458**
PM2.5	**0.00100582**
CO2	**4.21279345**
CH4	**0.00009261**
N2O	**0.00008716**
CO2 eqv	**4.24175938**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00104243**
PM2.5	**0.00096059**

Scenario Year: **2015**

All model years in the range 1971 to 2015

HHDT-DSL (pounds/mile)	
CO	**0.00766891**
NOx	**0.02122678**
ROG	**0.00178608**
SOx	**0.00004082**
PM10	**0.00104715**
PM2.5	**0.00087977**
CO2	**4.20902225**
CH4	**0.00008369**
N2O	**0.00007877**
CO2 eqv	**4.23519770**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00090631**
PM2.5	**0.00083282**

Scenario Year: **2016**

All model years in the range 1972 to 2016

HHDT-DSL (pounds/mile)	
CO	**0.00704604**
NOx	**0.01887374**
ROG	**0.00161035**
SOx	**0.00003952**
PM10	**0.00094448**
PM2.5	**0.00078443**
CO2	**4.21063031**
CH4	**0.00007508**
N2O	**0.00007067**
CO2 eqv	**4.23411393**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00080419**
PM2.5	**0.00073898**

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Scenario Year: **2017**

All model years in the range 1973 to 2017

HHDT-DSL (pounds/mile)	
CO	**0.00650533**
NOx	**0.01690387**
ROG	**0.00145203**
SOx	**0.00004033**
PM10	**0.00084894**
PM2.5	**0.00069721**
CO2	**4.20820129**
CH4	**0.00006722**
N2O	**0.00006327**
CO2 eqv	**4.22922648**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00070873**
PM2.5	**0.00065111**

Scenario Year: **2018**

All model years in the range 1974 to 2018

HHDT-DSL (pounds/mile)	
CO	**0.00604721**
NOx	**0.01526414**
ROG	**0.00131697**
SOx	**0.00003934**
PM10	**0.00076808**
PM2.5	**0.00062383**
CO2	**4.20756838**
CH4	**0.00006182**
N2O	**0.00005818**
CO2 eqv	**4.22690378**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00062758**
PM2.5	**0.00057700**

Scenario Year: **2019**

All model years in the range 1975 to 2019

HHDT-DSL (pounds/mile)	
CO	**0.00565433**
NOx	**0.01389113**
ROG	**0.00120235**
SOx	**0.00004032**
PM10	**0.00070198**
PM2.5	**0.00056085**
CO2	**4.20637830**
CH4	**0.00005499**
N2O	**0.00005175**
CO2 eqv	**4.22357577**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00056085**
PM2.5	**0.00051320**

Scenario Year: **2020**

All model years in the range 1976 to 2020

HHDT-DSL (pounds/mile)	
CO	**0.00532242**
NOx	**0.01274755**
ROG	**0.00110621**
SOx	**0.00003957**
PM10	**0.00064574**
PM2.5	**0.00050904**
CO2	**4.20541416**
CH4	**0.00005216**
N2O	**0.00004909**
CO2 eqv	**4.22172889**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00050364**
PM2.5	**0.00046227**

Scenario Year: **2021**

All model years in the range 1977 to 2021

HHDT-DSL (pounds/mile)	
CO	**0.00503726**
NOx	**0.01179977**
ROG	**0.00103095**
SOx	**0.00004033**
PM10	**0.00059437**
PM2.5	**0.00046287**
CO2	**4.21495573**
CH4	**0.00004734**
N2O	**0.00004455**
CO2 eqv	**4.22976181**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00045411**
PM2.5	**0.00041729**

Scenario Year: **2022**

All model years in the range 1978 to 2022

HHDT-DSL (pounds/mile)	
CO	**0.00478830**
NOx	**0.01098794**
ROG	**0.00096142**
SOx	**0.00004106**
PM10	**0.00055427**
PM2.5	**0.00042597**
CO2	**4.21520828**
CH4	**0.00004448**
N2O	**0.00004186**
CO2 eqv	**4.22911963**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00041399**
PM2.5	**0.00037807**

Scenario Year: **2023**

All model years in the range 1979 to 2023

HHDT-DSL (pounds/mile)	
CO	**0.00457902**
NOx	**0.01031407**
ROG	**0.00090210**
SOx	**0.00004009**
PM10	**0.00052122**
PM2.5	**0.00039592**
CO2	**4.21483461**
CH4	**0.00004176**
N2O	**0.00003931**
CO2 eqv	**4.22789696**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00037922**
PM2.5	**0.00034915**

Scenario Year: **2024**

All model years in the range 1980 to 2024

HHDT-DSL (pounds/mile)	
CO	**0.00444444**
NOx	**0.00974372**
ROG	**0.00084009**
SOx	**0.00003930**
PM10	**0.00050766**
PM2.5	**0.00038320**
CO2	**4.19552935**
CH4	**0.00003930**
N2O	**0.00003699**
CO2 eqv	**4.20782175**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00036682**
PM2.5	**0.00033735**

Scenario Year: **2025**

All model years in the range 1981 to 2025

HHDT-DSL (pounds/mile)	
CO	**0.00431086**
NOx	**0.00932573**
ROG	**0.00080206**
SOx	**0.00004018**
PM10	**0.00048541**
PM2.5	**0.00036326**
CO2	**4.19512979**
CH4	**0.00003697**
N2O	**0.00003479**
CO2 eqv	**4.20669226**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00034397**
PM2.5	**0.00031664**

Scenario Year: **2026**

All model years in the range 1982 to 2026

HHDT-DSL (pounds/mile)	
CO	**0.00420297**
NOx	**0.00898990**
ROG	**0.00077178**
SOx	**0.00003946**
PM10	**0.00046717**
PM2.5	**0.00034564**
CO2	**4.19349747**
CH4	**0.00003630**
N2O	**0.00003417**
CO2 eqv	**4.20485099**

HHDT-DSL, Exh (pounds/mile)	
PM10	**0.00032670**
PM2.5	**0.00029830**

Notes:

SCAQMD 2008

HHD-DSL composite includes tire & brake wear

Onroad N_2O per Annex 3, Table A-99

G-19 Dry Air Composition

Table G-19 Standard Composition of Dry Air

Principal Gas	Chemical Symbol	MW g/mole	Concentration ppmv	Fraction percent	MW g/mole
Nitrogen	N_2	28.014	780,805.00	78.080500	21.873471
Oxygen	O_2	31.998	209,450.00	20.945000	6.701981
Argon	Ar	39.948	9,340.00	0.934000	0.373114
Carbon Dioxide	CO_2	44.009	377.76	0.037776	0.016625
Neon	Ne	20.183	18.21	0.001821	0.000368
Helium	He	4.003	5.24	0.000524	0.000021
Methane	CH_4	16.043	1.75	0.000175	0.000028
Krypton	Kr	83.800	1.14	0.000114	0.000096
Hydrogen	H_2	2.016	0.50	0.000050	0.000001
Nitrous Oxide	N_2O	44.013	0.31	0.000031	0.000014
Xenon	Xe	131.300	0.09	0.000009	0.000012
Totals			**1,000,000.00**	**100.000**	**28.966**

Sources: UIG 2008, USEPA 2010, du Pont 1971, Jennings 1970

Notes:

MW = molecular weight, g/mole

ppmv = parts per million by volume (10^{-6})

USEPA GHG Inventory 2010

Universal Industrial Gases, Inc., http://www.uigi.com/air.html

Condensed Laboratory Handbook, E.I. du Pont du Nemours & Co., Inc., Wilmington, DE, 1971

Environmental Engineering – Analysis and Practice, B. H. Jennings, International Textbook Company, 1970

Carbon dioxide varies with uptake by removal mechanisms, 365 (IPCC) to 380 ppmv (UIG)