The Salton Sea Authority

DESERT SHORES | RESTORATION PROJECT

REQUEST FOR QUALIFICATIONS / PROPOSALS

Feasibility Study comprising Geotechnical, Geologic, and Hydrogeologic Services for the proposed restoration project in Imperial County, California.

ISSUED *September 11, 2024*

DEADLINE *October 11, 2024*

gafcon MANAGEMENT

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Part 1 – General Information

The Desert Shores Restoration Project ("***the Project***") located in Imperial County is a community-initiated endeavor aimed at revitalizing five dry shoreline channels previously connected to the Salton Sea. The Project proposes constructing a berm at the mouth of the south channel and refilling the channels to support wildlife, fish and recreational activities using groundwater from an adjacent location where a well will be drilled.

The Desert Shores channels, which were originally connected to the Salton Sea, became isolated in the early 2000s due, in large part, to declining agricultural water inflows to the Salton Sea (***Figure 1***). This has left the channels in a dry condition, except for stormwater runoff which creates areas of stagnant water. This residual water is highly concentrated saltwater making the channels unsuitable for fish, birds, wildlife, and recreation. Among the consequences of the dry channels are increased local dust levels, compromised air quality, blight where there was once beauty, and diminished property values.

The Project's overarching goal is to repair, restore, and maintain the Desert Shores channels following the ecological disaster that has impacted this community.

Figure 1: *Historical Photos via Google Earth of the Desert Shores channels.*

The Salton Sea Authority ("***Owner***", "***SSA***"), is a California Joint Powers Agency, whose members include the County of Imperial, the County of Riverside, the Coachella Valley Water District, the Imperial Irrigation District, and the Torres Martinez Desert Cahuilla Indians. SSA and the State of California, principally through the California Natural Resources Agency ("***CNRA***"), are pursuing projects to protect human health, revitalize the environment and economy of the Sea. To learn more about Owner's vision, values and mission, please visit their website:

https://saltonsea.com/about/our-mission/

Owner is soliciting Statements of Qualifications ("***SOQs***") and Proposals from qualified and invited firms ("***Proposers***") to conduct a Feasibility Study comprising Geotechnical (including Seismic), Geologic, and Hydrogeologic Services (collectively referred to as "***Services***") for the Project.

Part 2 – Submission Instructions

2.01 Questions & Clarifications

Proposing firms shall read the entire RFQ/P and all accompanying information before preparing its proposal. Proposers shall seek clarification of any requirements they do not fully understand.

All questions must be received no later than September 25, 2024.

Respondents shall address any issue or question via email to:

Paul Najar (Sr. Vice President & General Counsel, Gafcon) pnajar@gafcon.com

Addenda and additional information related to the RFQ/P will be emailed directly to each Proposer's designated Project Manager. Proposers are responsible for any addenda and their incorporation into the SOQ/P.

2.02 Submission of RFQ/P Response

RFQ/P responses shall be emailed no later than October 11, 2024 to:

Paul Najar (Sr. Vice President & General Counsel, Gafcon) pnajar@gafcon.com

Brevity and clarity are of utmost importance; each submission shall provide a concise and straightforward description of the Firm's ability to meet the requirements of the RFQ/P. Standard marketing materials shall be minimized as firms have been pre-selected for participation in this RFQ/P.

The responses to this RFQ/P shall be 8 ½" x 11" portrait in electronic portable document format (PDF). The responses shall not exceed thirty (30) single-sided pages. Requested appendices shall **not** be counted towards the page limit.

Responses that do not comply with all applicable requirements may be deemed non-responsive and rejected.

2.03 Mandatory Pre-Submission Job-walk

Site visits and/or job walks shall be arranged with Gafcon for September 19, and/or 20, 2024.

2.04 Owner Contact

Gafcon PM-CM LLC ("***Gafcon***") has been retained as the Owner's Representative. All communication regarding this RFQ/P and the scope contained therein will be directed to Gafcon. Gafcon and Owner will review and evaluate each response in-depth in preparation for final interviews, if deemed necessary. Based on the RFQ/P response and interviews, if required, Gafcon will recommend the best-qualified firm to the Owner for final selection. Gafcon will then proceed with final negotiations. Should negotiations fail to attain full agreement, Gafcon will proceed to the next highest-rated proposing team.

Respondents shall not contact the Owner in conjunction with this RFQ/P solicitation at any time. Any contact with Owner regarding this RFQ/P may be grounds for rejection of the response.

Part 3 – RFQ/P Schedule

RFQ/P SCHEDULE	
Activity	**Date**
RFQ/P Issuance	September 11, 2024
Mandatory Pre-Submission Job Walk	September 19, and/or 20, 2024
Requests for Clarification Due	September 25, 2024
Addendum 1 Issued *(if required)*	October 2, 2024
RFQ/P Responses Due	October 11, 2024
Interviews (at Owner's discretion)	October 16, 2024
Scoring of SOQ/P and Decision	October 18, 2024
Notice of Intent	October 23, 2024
Contract Execution	October 25, 2024

Part 4 – Project Description

4.01 General Project Scope

SSA has secured resources for determining the feasibility of the Desert Shores Restoration Project. The Project proposes constructing a berm at the mouth of the south channel and refilling the channels to support wildlife, fish and recreational activities using groundwater from an adjacent location where a well will be drilled.

***Figure 2**: Desert Shores Restoration Project.*

Summary of Anticipated Services: The Services anticipated under this RFQ/P include but are not limited to Geotechnical (incl. Seismic), Geologic, and Hydrogeologic analyses for the purposes of determining the feasibility of the Project, taking into consideration the location, quantity, and quality of available water which will be necessary to fill and maintain the channels for the long-term. SSA expects a phased approach to allow for SSA to make decisions after each phase and task has been completed. SSA assumes a production requirement of 300 acre-feet per year, which may be re-evaluated based on a variety of factors.

The Project will require intensive and close collaboration between the selected firm, Owner, Gafcon, (collectively referred to as ***"the Project Team"***) and the local public.

The successful Proposer will be responsible for the planning, execution, and oversight of the Services, including schedule management.

4.02 Feasibility Study

As a reminder, the Owner's stated goal is to repair, restore, and maintain the Desert Shores channels. The goal of this RFQ/P is to complete a feasibility study that will inform the appropriate approach, schedule, and budget with respect to achieving the stated goal above. Generally anticipated scopes of work are noted below – and previously summarized in ***Section 4.01*** – but these summaries should be considered guidelines that are not intended to be exhaustive or prescriptive. We are relying on Proposers' expertise and experience to guide Owner on the appropriate approach to achieve the stated goal.

A. Geotechnical, Seismic, and Soils Investigation

a. Review and investigate any relevant documents relating to the Project or nearby relevant conditions.
b. Coordination of activities and scope of services with SSA, Project Manager and Hydrogeologic consultants
c. Undertake field reconnaissance of the Desert Shores Channels and under the direction of SSA coordinate with property owners to mark out the testing site and proposed boring locations.
d. Investigation of the underlying geotechnical and soils conditions at the site by exploratory borings at selected locations. It is expected that approximately 10-15 exploratory borings will be undertaken. Upon reviewing the existing soils, reports provide input on how many borings you feel are necessary to meet requirements.
e. Based on conditions and access to the channels, undertaking borings may be challenging and require unique approaches. Describe the way you would propose to undertake the scope and successfully complete the scope, The borings should be backfilled. Repair work to match the existing surface conditions.
f. Conduct laboratory testing on selected soil samples to help assess the pertinent engineering characteristics of the site soil. Testing may include particle size analysis, moisture content, contaminants, dry density soil corrosion. Suggest other laboratory tests, or field investigation to achieve project goals.
g. Investigate and prepare a seismic report including risks relating to liquefaction.
h. Analyze and prepare report of the geotechnical and soils data obtained.

B. Hydrogeological Study and Groundwater Analyses

a. Owner has located a possible well built in the 1950s (***Figure 3,*** below). The Services should include locating this possible; access will need to be is provided by the property owner, or under an easement. The well would require an evaluation of its condition, viability as a water supply, and any repairs needed.
b. **Data Collection**: Collect and review all data for the project area to calculate project water demand requirements; Owner can be a potential source of information for this task. This information may be necessary to design an appropriately sized well that meets project goals while balancing expense.
    i. Infiltration Rate Analysis
        1. Provide infiltration information for the channels production rate requirement calculation.
        2. Provide methods for measuring infiltration rates, one that captures rates during the period which the channels are being filled and the other that captures rates after the channels have been filled and the soils are saturated.
    ii. Channel Geometry Mapping
        1. Provide channel geometry to analyze aspects of groundwater production requirement calculation to assist in accurately calculated well production rate requirements for the project.

iii. Data Summary and Preliminary Feasibility Report

1. Results from all data collection and analyses must be presented in a report that will include, among all findings, a preliminary feasibility evaluation for a single well to meet the anticipated project water demand. The volume of water required to fill the channels to the desired target depth will be calculated, and the flow rate necessary to maintain that depth when subsurface infiltration and evaporation are factored in, will be used to estimate a minimum required production rate

c. **Test Drilling**: Collect subsurface data by drilling exploratory boreholes and conducting geophysical surveys as needed to calculate the required well production rate using a combination of the infiltration rate testing and channel geometry data collected from Phase 1, published free water surface evaporation rates for the Salton Sea, and water quality results. Once one or more required production rates have been established, the feasibility of achieving them will be evaluated in the context of the borehole geophysical surveys, cuttings, and interval testing data. A recommendation will be provided to SSA as to whether a production well at the exploratory borehole location would meet project needs and if continuing to the next phase is appropriate.

C. Data Summary and Feasibility Study Findings, Conclusions, and Recommendations

a. Results from all data collection and analyses must be presented in a report that will summarize all findings, and recommendations.

b. A budgetary estimate of cost should accompany any specific recommendations. It shall be understood that any estimates of cost will be rough orders of magnitude in nature until the scope of work is sufficiently developed.

***Figure 3**: Potential well location.*

4.03 Project Schedule

Time is of the essence. A detailed Critical Path Method schedule will need to be developed by the Proposer for all Services proposed, identifying key milestones and activities required, including any anticipated review periods and/or input required by Owner, or External Agencies.

4.04 Compliance with Applicable Laws

All work associated with the Project shall be undertaken, designed, tested, inspected, and implemented in accordance with all Federal, State, and local construction codes, laws, ordinances, rules and regulations governing Proposer's Services during the term of the contract, including but not limited to all requirements of Title 24, ADA and EEO requirements.

Part 5 – Selection Process

5.01 RFQ/P Evaluation Criteria & Ranking

Firms must respond to each of the RFQ/P criteria demonstrating their qualifications, providing examples of how the team meets the evaluation criteria and presenting your approach with respect to delivering this project. SOQ/Ps will be evaluated based on these criteria and weighting. Clear, concise communication is valued.

5.02 SOQ/P & Appendix

Each Proposer must submit a Statement of Qualifications and Proposal responding to the criteria described in this RFQ/P.

Additionally, the SOQ/P shall contain the elements as identified in ***Appendix C (RFQ/P Submission Checklist)***, or otherwise listed in this RFQ/P.

5.03 Interview

After receipt of the SOQ/Ps, the evaluation committee (Owner and Gafcon, "***the Committee***") will review and determine if an Interview is required as part of the selection process. If required, the Committee will shortlist a maximum of three (3) finalists and will schedule interviews to be held in-person with the Owner and Gafcon on October 16, 2024.

Part 6 – RFQ/P Requirements

6.01 Statement of Qualifications (Not Scored)

Submit a letter confirming the Firm meets the Qualifications criteria indicated in the RFQ/P.

6.02 Cover Letter (Not Scored)

The cover letter must contain a statement that the Firm acknowledges all documents submitted pursuant to this RFQ/P process.

The letter must also contain the following:

a. The Firm's legal name, address, email, and phone number. If the work will be performed at a location other than the provided address indicate the office where the work will be performed.

b. Number of years the firm has been in business.

c. A statement that the submission is a firm and irrevocable offer, good for 90 days.

d. A statement expressing the Firm's willingness to perform the services as described in this RFQ/P.

e. A statement expressing the Firm's availability of staff and other required resources to perform all services and provide all deliverables within the specified time frames as described in the RFQ/P.

f. The name, title or position, email, and phone number of the individual signing the cover letter.

g. A statement indicating the signatory is authorized to bind the Firm contractually.

h. The name, title or position, email, and phone number of the primary contact and/or account administrator, if different from the individual signing the cover letter.

An unsigned cover letter may be cause for the submission to be rejected.

6.03 Team Members & Firm Experience (30 Points)

a. **PROPOSED TEAM AND FIRM EXPERIENCE** (capacity to perform and technical qualifications)

Present your team organization. Demonstrate your firm's and the proposed team's experience with projects and sites relevant to the Project (i.e. specific experience in groundwater well feasibility studies, well design projects, relevant geotechnical, geological, and hydrogeological work, groundwater monitoring and sampling, groundwater resource assessments and investigations, similar municipal water projects and regulatory compliance, and/or similar experience that is specific to your proposed approach). Clearly illustrate how team members have worked together in the past or how they are prepared to do so on this project. Indicate which of these individuals you consider key to the successful completion of the project

For each member of your team, please provide a resume with relevant experience and skills. Resumes should highlight projects that the individual worked on that were used as examples in the SOQ/P. Each resume is limited to a one-sided single page and submitted in the SOQ/P Appendix.

A complete list of references must be provided for similar projects completed within the last five years.

Qualifications and capabilities of any sub-consultants/contractors shall be included.

b. **FIRM DNA**
What describes your firm's DNA? Demonstrate from past projects how your philosophy for building teams, people, partnerships, and legacies with your clients and partners has led to Owner goals being met or project issues being mitigated. How did you cultivate that identity at the staff level and how did that DNA appear to your clients over the course of your projects.

6.04 Project Work Plan & Schedule (50 Points)

Defining and executing the Work to meet time and budget requirements is critical to the Project's success. A detailed work plan is therefore required to be presented and should outline your overall project understanding, approach, and list all tasks determined to be necessary to accomplish the overall scope of the project, in addition to key project hurdles and how you intend to manage and overcome them.

The work plan shall be sufficiently detailed and clear to identify the progress milestones, i.e. when project elements, measures, and deliverables are to be completed. Additional project elements suggested by the proposer and thought to be necessary for the completion of the Project are to be included in the work plan and identified as proposer-suggested elements. Identify all of those, if any, who will be subcontracted to assist you with this project, and the extent of work for which they will be responsible.

a. Describe your approach to meeting the Project goals.

b. Define resources needed for each task (title and labor hours) and staff persons completing the project element tasks

c. Include all assumptions, deviations, clarifications, and exceptions to the scope of work.

d. Include a Critical Path Method schedule depicting the sequence and duration of tasks, demonstrating how the work will be organized and executed. For all Services and tasks proposed, identify key milestones and activities required, including any anticipated review periods or input required by Owner, and/or External Agencies.

e. Identify three (3) relevant and critical risks for this Project. Provide a brief narrative for the risk describing why the risk is critical, the impact the risk will have on the Project, and strategies that may be implemented to mitigate the risk.

6.05 Fee Proposal (50 Points)

Provide an appropriate and competitive Fee proposal for the Work requested herein. Provide in Appendix.

a. Provide breakdown by deliverable and by consultant (if applicable).

b. Provide a 'rate sheet' detailing your schedule of hourly rates by employee classification, including terms and rates of overtime for additional work if requested, and all Services required for the Work. The rate sheet should be applicable throughout the scheduled construction period (i.e. no escalation will be considered unless a schedule extension is required beyond the original dates contemplated).

c. Provide a list of exclusions.

d. **Prevailing wage is a requirement**.

6.06 Insurance (Pass / Fail)

Provide a letter from Firm's insurance carrier, indicating that the insurance requirements of the contract can be met by the proposer. Letter to be submitted as part of the Appendix.

6.07 Corporate Information (Not Scored)

a. Owner expressly reserves the right to reject the qualifications and proposal of any Firm who, upon investigation, has been determined to fail to complete similar contracts in a timely fashion or in a satisfactory manner. Such rejection would, if applicable, be based upon the principle that the proposer is "non-responsible" and poses a substantial risk of being unable to complete the work in a cost-effective, professional, and timely manner.

b. In performing the above-described responsibility determination, Owner reserves the right to utilize all possible sources of information in making its determination.

c. The Firm shall provide the following corporate information:

- Legal form of the company (individual, corporation, partnership, joint venture, etc.). If a corporation or LLC, provide Corporate Identification Number.
- If the company is a subsidiary of a parent company, identify the parent company
- If the company is a joint venture, identify all firms in association
- The Firm's California License Number and License expiration date
- Number of years Firm has conducted business under its present name

d. The Firm shall provide explanation if any of the following events are in process or have occurred within the past five (5) years:

- Claim or demand filed against Firm's License or License Bond
- Lawsuits, judgements, or other administrative, legal, arbitration or other proceedings, ever brought or commenced by or against the Firm or any of its principals, officers, or equity owners in connection with any architectural contract or construction contract.
- Failure to complete a contract.

6.08 Contract Comments (0 to -25 Points)

In an effort to expedite the award and contract execution, a draft of the contract language has been provided with this RFQ/P which has been reviewed by Owner, Gafcon, and Owner's Legal Representative.

Comments and/or revision requests related to contract language **must** be provided as part of the RFQ/P response to be considered. Acceptance of the contract language 'as-is' will be scored favorably in the evaluation of RFQ/P responses. All responses to this section shall bear the signature of the authorized legal representative of the proposing Firm.

Additional comments received after submission of the SOQ/P – i.e. during contract finalization and execution – will **not** be considered and will result in negotiations proceeding with the next highest rated Respondent.

6.09 Interview (40 Points, if required)

After receipt of the SOQ/Ps, the evaluation committee will schedule an interview with no more than three (3) finalists. The primary/key members of the proposed team should be in attendance. The focus of the interview is to expand on the approach to delivering the project, and provide an opportunity to convey any other important information not requested or provided in your SOQ/P. Owner may also provide additional topics to be discussed.

Part 7 – Exhibits

7.01 RFQ/P Exhibits

- **Appendix A – PROJECT INFORMATION**
  - Exhibit A1 – "*Salton Sea Funding and Feasibility Action Plan, Benchmark 7: Project Summary*", dated May 2016, prepared by Tetra Tech, for the Salton Sea Authority.
    - ***Note**: Exhibit A1 sets forth different strategies for restoring the entire Sea, and while it does not specifically address Desert Shores, there may be information (i.e. References) of relevant interest to your efforts.*
  - Exhibit A2 – "*Design-Build Proposal: Salton Sea Desert Shores Habitat Restoration Project*", dated July 1, 2022, prepared by Tetra Tech, for the Salton Sea Authority.

- *Appendix B – N/A*

- **Appendix C – RFQ/P SUBMISSION CHECKLIST**

- **Appendix D – ADDENDA ACKNOWLEDGEMENT** *(if applicable)*

- **Appendix E – PROFESSIONAL SERVICES AGREEMENT**

- **Appendix F – INSURANCE REQUIREMENTS**

- *Appendix G – N/A*

- **Appendix H – EVALUATION SHEET**

- **Appendix I – NON-DISCLOSURE AGREEMENT**

Part 8 – General Conditions

This RFQ/P is neither a commitment nor a contract of any kind. The Owner reserves the right to pursue any, or none of the proposals generated by this request. Costs for developing the proposal are entirely the responsibility of the Proposers and shall not be reimbursed. The Owner reserves the right to: make any changes to this RFQ/P and/or sample contract that it believes are necessary to best protect its interests; select the proposal that is in the Owner's best interests; to reject any and all proposals at any time and for any reason; to terminate the RFQ/P process; and to waive any requirements of this RFQ/P when it determines that doing so is in its best interests. Further, while every effort has been made to ensure the information presented in this RFQ/P is accurate and thorough, the Owner assumes no liability for any unintentional errors or omissions in this document.

Appendix A

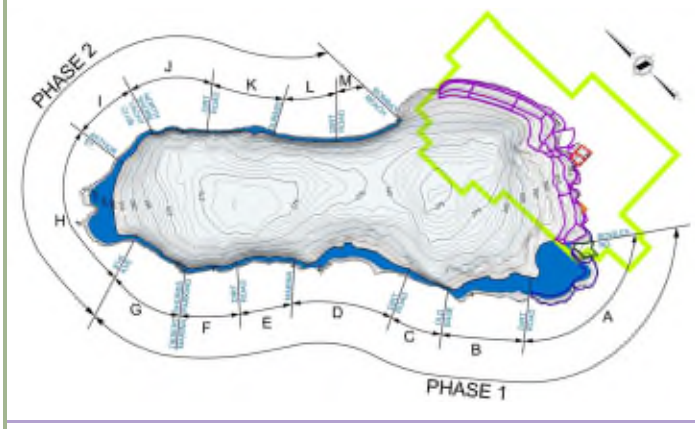
PROJECT INFORMATION

Exhibit A1

Salton Sea Funding and Feasibility Action Plan

Benchmark 7: Project Summary

May 2016



Prepared by:

TETRA TECH

Prepared for:

Salton Sea Authority

This document is prepared as a living document for public review and comment. Comments may be provided to:

Salton Sea Authority
82995 Hwy 111, Suite 200
Indio, CA 92201

Email: info@ssajpa.org

Comments will be reviewed and incorporated as appropriate. If substantive comments are received, a revised document may be produced and distributed.

Executive Summary

The Salton Sea Funding and Feasibility Action Plan constitutes a set of scientific, engineering, and economic analyses to develop recommendations for future restoration and development activities at the Sea, performed over 2014-2016. This work was funded by a grant from the California Natural Resources Agency to the Salton Sea Authority. The grant was managed by the Authority and by a consulting team led by Tetra Tech Inc., with the support of key subcontractors. The primary objective of the work was to develop a roadmap toward a comprehensive solution to the Salton Sea's numerous environmental concerns in the context of current funding opportunities and constraints, while satisfying regulatory and regional requirements. This work was performed in parallel with a similar large-scale effort performed by the Imperial Irrigation District and Imperial County, identified as the Salton Sea Restoration and Renewable Energy Initiative (SSRREI). The SSRREI, or Initiative, considers the development of shallow habitat, potential geothermal energy development, and air quality mitigation over playa that is exposed as the Salton Sea recedes. Project concepts developed as part of this Action Plan are intended to work in concert with concepts developed through the Initiative as well as smaller projects such as the Red Hill Bay Restoration and the Species Conservation Habitat (SCH) projects and do not overlap geographically. It is anticipated that elements of the Action Plan and the Initiative and the other smaller projects will together form the basis of the Salton Sea Management Plan now being developed by the State of California.

This project was completed in a series of seven Benchmarks with separate reports for each Benchmark. Each of these reports was reviewed by stakeholders and final versions of all these documents and supporting data and analysis tools are in the public domain. Benchmark 1 was the Work Plan, which laid out the scopes for the remaining Benchmark documents. This Benchmark 7 report provides a summary of the material presented in the documents prepared for Benchmarks 2 through 6.

Benchmark 2: Review and Update Existing Condition Data presents an overview of historical and current hydrology and water quality of the Sea and its tributaries, projected inflows and salinity, dust mitigation alternatives from areas of exposed playa, and future data needs for management. The report is intended to inform those who are engaged in designing options for the restoration and management of the Sea. Because many of the topics addressed in this report have been considered in prior efforts, the particular

focus was on recent data and trends in the Salton Sea, the New, Alamo and Whitewater Rivers and several major agricultural drains. New data have been analyzed and compiled in a way that emphasizes these near-term changes. Trends in hydrology and water quality are important for modeling future conditions that can be used to evaluate alternatives and options. The Benchmark 2 document is summarized in Chapter 2 of this report.

Benchmark 3: Evaluation of Alternatives with Respect to Existing Conditions provides a review of past alternatives that have been considered for management of the Salton Sea over the past few decades. This work includes a review of full-sea restoration alternatives and other restoration concepts that may help to control salinity and/or manage water levels. Significant prior alternatives, including the State of California's preferred approach in 2007 and the Salton Sea Authority's preferred plan in 2006 were evaluated in the context of current and projected hydrology. A summary of the material presented in the Benchmark 3 document is provided in Chapter 3 of this report, which specifically focuses on the preferred alternatives previously developed by Salton Sea Authority and the State of California. In addition, although not a full restoration alternative, the State's SCH Project is discussed because it is in the process of being implemented at this time and forms a key part of the overall feasibility study.

Benchmark 4: Conceptual Plans and Cost Estimates was divided into two volumes:

- Volume 1: Water Import and Export Options; and
- Volume 2: Smaller Sea Options.

Benchmark 4, Volume 1 is summarized in Chapter 4 of this report. Volume 1 explores various options for importing and exporting water to and from the Salton Sea to support current water levels. Ten potential inflow conveyance alternatives were evaluated, including the Santa Ana Regional Interceptor (SARI) Pipeline, the Metropolitan Water District of Southern California (MWD) Concentrate Pipeline and pipelines to the Gulf of California and the Pacific Ocean. Conceptual plans were developed, and in each case, the export/import alternatives were ranked according to the following elements: water quantity, water quality, operational cost, capital cost, approvals and environmental requirements, and community impacts and the need for easements. Benchmark 4, Volume 2, summarized in Chapter 5 of this report, presents smaller lake and other options within the existing Salton Sea footprint. This document introduces the Perimeter Lake concept. This takes into account the immediate need for action, the limitations on water supply for the lake, and the possibility of constructing a project with incremental funding. The proposed approach would involve constructing a lake around the perimeter of the Sea along with a central saline pool within the current

Sea footprint. This concept is anticipated to work with other projects such as the Salton Sea Restoration and Renewable Energy Initiative discussed above, as well as other future projects that may be developed by the State of California as part of an overall Salton Sea Management Program. As part of Benchmark, the following evaluation was performed for the Perimeter Lake: presentation of conceptual construction details; water inflow requirements and water quality improvement in inflow; conceptual design of spillways and air quality mitigation; geotechnical feasibility study; and a construction scenario, cost estimates, and cost comparisons to past alternatives. .

The **Benchmark 5: Infrastructure Financing Feasibility Analysis** was conducted by a subconsultant team led by Development Planning and Financing Group (DPFG) with support from the Concord Group, Economics and Politics Inc., and FORMA. The results of their analysis are summarized in Chapter 6 of this document. This work finds that the Authority has statutory authority to form Infrastructure Financing Districts ("IFD") in part or all of the Authority's area "for the purpose of funding the construction of, and purchasing power for, projects for the reclamation and environmental restoration of the Salton Sea…"(Calif. Gov. Code 53395.9). This work assumes that IFDs will be funded by property tax increments generated by development that is enabled by the funded seaside infrastructure. This analysis considers that the Authority will have the ability to fashion the Salton Sea along the former shoreline with combinations of dikes and dredging to produce water features that will be able to sustain recreationally attractive water near the shoreline (defined as "Seaside Improvements"). This Infrastructure Financing Feasibility analysis was prepared to estimate the total revenues generated by development attracted by the recreational water and Seaside Improvements ("Landside Development"), and the total estimated Seaside Improvement costs that can be repaid with such revenues. While the potential revenues from improvements occur over a long-term horizon, the improvements need to occur over a shorter duration, creating a funding gap in the early years that needs to be met through other sources. Different scenarios were developed, taking into account the percentage of the tax increment that may be available to the IFD and the interest rate, to be paid back on State, Federal, or other loans obtained to fund the Seaside Improvement costs.

As part of the Funding and Feasibility Action Plan, the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) was commissioned to conduct financing evaluations for **Benchmark 6: The Potential for Renewable Energy Development to Benefit Restoration of the Salton Sea: Analysis of Technical and Market Potential**. This study was focusing on refining potential revenue estimates, provide a technical review

of the renewable energy technologies under consideration, and develop estimates of the region's developable production potential through the year 2030. Of the commercially available renewable energy technologies, geothermal, solar photovoltaics (PV) and concentrating solar power (CSP) have the greatest technical potential for development. Technologies and revenue streams considered in this work included electricity production from solar PV; CSP; geothermal technologies; and mineral recovery from geothermal fluids. Wind was not evaluated in the report due to the minimal resource potential within the Salton Sea region. Despite their large total resource potentials, this study found that constraints such as proximity to transmission access and regional cost-competitiveness of the electricity generated may limit the technical potential of the power generation technologies before 2030. Further, development on the playa itself will be constrained by the rate at which the shoreline recedes, and although playa may be exposed in a given year, there will likely be an additional lag in development due to variability in Salton Sea water levels and potentially muddy site conditions. Based on extensive modeling of potential scenarios, it was determined that any additional tax on generation to support Salton Sea development could significantly disadvantage the development of these resources by making them more expensive than the competing regional supply pool, and thus limiting the potential revenue stream for restoration. The results of the NREL evaluation are summarized in Chapter 7 of this report.

Chapter 8 of this report provides recommendations for additional design, engineering, a demonstration projects that would advance the concepts presented in the Benchmark reports. References used in the project are provided in Chapter 9.

Acronyms and Abbreviations

Acronyms and abbreviations used in the Work Plan are listed below.

ATEs	Affected Tax Agencies
Authority	Salton Sea Authority
BACM	Best Available Control Measures
BACT	Best Available Control Technologies
BAM	Beta Attenuation Monitor
BLM	Bureau of Land Management
CAAA	Clean Air Act Amendments
CAISO	California Independent System Operator
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFD	Community Facilities District
CNRA	California Natural Resources Agency
CSP	Concentrating Solar Power
CVWD	Coachella Valley Water District
DCM	Dust Control Measure
DO	Dissolved Oxygen
DOE	Department of Energy
DRECP	Desert Renewable Energy Conservation Plan
DWR	California Department of Water Resources
EIFD	Enhanced Infrastructure Financing District
EIS	Environmental Impact Statement
EIR	Environmental Impact Report
ERAF	Educational Revenue Augmentation Fund
FAQ	Frequently Asked Questions
GIS	Geographic Information Systems
IFD	Infrastructure Financing District
IID	Imperial Irrigation District
IRFD	Infrastructure and Revitalization Financing District
MAP	Monitoring and Assessment Plan
MMRP	Mitigation Monitoring and Reporting Plan
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act

NGO	Non-governmental Organization
O&M	Operations & Management
OHV	Off-Highway Vehicle
OMER	Operation, maintenance, energy and repair
PEIR	Programmatic Environmental Impact Report
PFA	Public Financing Authority
PUC	California Public Utilities Commission
PV	Photovoltaic
QSA	Quantification Settlement Agreement
R&D	Research & Development
RE	Renewable Energy
Reclamation	US Bureau of Reclamation
RFP	Request for Proposals
RFQ	Request for Qualifications
ROI	Resolution of Issuance
RPS	California Renewables Portfolio Standard
SCAQMD	South Coast Air Quality Management District
SCH	Species Conservation Habitat (Project)
SIP	State Implementation Plan
SWAMP	Surface Water Ambient Monitoring Program
SRA	
TCT	Technical Coordination Team
TEOM	Tapered Element Oscillating Microbalance Monitor
TMDL	Total Maximum Daily Load
TOT	Transient Occupancy Taxes
TSS	Total Suspended Solids
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VLF	Motor Vehicle in-lieu Fees
VOC	Volatile Organic Carbon

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1.0 Introduction

The Salton Sea Funding and Feasibility Action Plan was developed using a grant from the California Natural Resources Agency to the Salton Sea Authority in 2014. The project was completed in a series of Benchmarks over 2014-2016 with separate reports for each Benchmark. These included a review of existing conditions; previous alternatives for restoration; review of options for importing and exporting water from the Sea, and for performing in-Sea improvements; opportunities for funding improvements through the development of real estate around the Sea; and estimation of funding streams from development of alternative energy sources around the Sea. This chapter provides an overview of these analysis topics, with key findings associated with each topic summarized in individual chapters of this final report (Benchmark 7). This work was performed in parallel with a similar large-scale effort performed by the Imperial Irrigation District and Imperial County, identified as the Salton Sea Restoration and Renewable Energy Initiative (SSRREI). It is anticipated that elements of the Action Plan and the Initiative will together form the basis of the Salton Sea Management Plan now being developed by the State of California.

1.1 Background

The Salton Sea is located in a closed portion of the Colorado River basin in Riverside and Imperial Counties within the Colorado River Basin Regional Water Quality Control Board (CRBRWQCB). The Sea is currently at about 233 feet below mean sea level (msl) and has no natural outlet. The Salton Basin is part of the Lower Colorado River Delta system. Lakes have historically existed in the basin as the course of the Colorado River shifted, most recently several hundred years ago.

The climate in the Salton Basin is one of great extremes. The local rainfall is about 2.5 inches per year while the temperatures can often reach above 110° F in the summer and below freezing in the winter (DWR and DFG 2011). The presence of the Sea has a micro-climate effect in the Imperial Valley which provides some regulation of extremes in temperature and humidity which is beneficial to agriculture. However, the temperature extremes can have an adverse effect on the fish population in the Sea (DWR and DFG 2011). Low temperatures in the winter can result in fish mortality while high

temperatures in the summer can suppress oxygen levels in the water which can also lead to fish mortality.

Water temperature stratification occurs annually and sometimes more frequently, causing oxygen depletion in the lower portion (hypolimnion). When the Sea mixes, oxygen can be depleted throughout the water column, causing fish die offs and releasing toxic ammonia and hydrogen sulfide. On the other hand, reducing conditions in the bottom of the lake appears to be an important mechanism that enables selenium sequestration in sediments. Due to selenium concerns, research has been conducted to quantify the release of selenium from sediments. Water quality data indicate that there will be an initial, temporary flush of selenium released but the effects can be mitigated (DWR and DFG 2011). These factors need to be considered when planning for habitat expansion.

The Sea and its adjacent areas have supported a diverse wildlife habitat for over 400 bird species (Shuford et al. 2000, 2002 and 2004). The Sea also serves as a critical link on the 5,000 mile international Pacific Flyway for bird migration as most of the remaining rest stops for birds--such as the Colorado River delta in Mexico--have dried up (Hurlbert et al. 2007, Cohen and Hyun 2006, Detwiler et al. 2002, and Cohen 2014).

Even though the Sea was relatively stable in size and elevation over the last 40 years, the dissolved salts present in the inflow water (about 2.5 tons per acre-foot) have been continuously accumulating in the water (except for the amount that precipitates and settles to the bottom). Declines in the inflow discharge have caused the Sea's water surface elevation to drop by about 5 feet over the past 10 years. Consequently, salt concentrations are rising even faster than before and are currently about 55 grams per liter (g/L). This is about 50% saltier than ocean water. If no remedial actions are taken, the Sea will become so saline within 15 years (over 60 g/L salt) that the remaining fish that serve as a food source for piscivorous birds will be effectively eliminated. If the current inflow projections are correct, the Sea will evolve into a hypersaline water body (over 120 g/L salt) within 20 years, similar to Mono Lake in Inyo County. Some have suggested an even more rapid deterioration in habitat values (Pacific Institute, 2006). As inflows are reduced by water transfers and other factors as discussed below, the Sea will eventually become a semi-solid brine pool (over 200 g/L salt) surrounded by hard-surface salt flats similar to the Great Salt Lake in Utah and the Laguna Salada basin southwest of Mexicali.

In addition to high salinity, the Sea is also highly eutrophic, meaning that it has high levels of phosphorus and nitrogen compounds that result from

agricultural (fertilizer) drainage and municipal wastewater, a significant fraction of which, until 2007, was discharged without treatment into the New River from Mexicali south of the border. These nutrients stimulate algal growth which settles to the bottom of the Sea, and upon decay, creates oxygen deficiencies in the water. The near absence of oxygen in the deep bottom-water of the Sea leads to the formation and accumulation of substances such as hydrogen sulfide and ammonia that have unpleasant odors and can be toxic to fish in water and to humans when inhaled. When wind events overturn the Sea's natural stratification, these harmful gases rise to the surface and have caused sudden fish kills involving millions of fish. The Sea's eutrophic state also causes the unpleasant odors that permeate the residential areas surrounding the Sea (and occasionally as far away as Los Angeles and the San Fernando Valley) in certain months of the year (Salton Sea Authority 2006).

Projected inflow reductions in the upcoming years will shrink the Sea's wetted surface area and further concentrate salinity and possibly increase eutrophication problems. There are two primary reasons for the projected inflow reductions. First, the Quantification Settlement Agreement (QSA) was signed in October 2003 by Imperial Irrigation District (IID), Coachella Valley Water District (CVWD), other California Colorado River water users, the U.S. Department of Interior, and the California Department of Water Resources (DWR). Under this landmark agreement, about 300,000 AFY of Colorado River water (counting both contractual transfers and other reductions) that previously flowed into the Salton Sea will be supplied instead to other users outside the Salton Sea basin. Second, New River inflows from Mexico, recently estimated at about 61,600 AFY, are projected to decline as a result of plans by the city of Mexicali to reclaim treated-effluent and farm-drainage flows. Some of this decline has already occurred.

There have been numerous attempts to address the water quality, biology, recreational and economic issues at the Salton Sea over the past five decades. Many investigations have sought to control the salinity and elevation with large engineering projects but recently a shift in thinking has renewed focus on achievable, incremental progress toward avoiding the imminent human health and ecological disaster caused by the shrinking Sea. One of the first reports on the subject was authored by the Colorado River Basin Regional Water Pollution Control Board in 1963 and recommended a partial Sea concept with a concentration pond for removing salts. Two years later the California State Water Quality Control Board concluded that the fishing and recreational values of the Sea would decline sooner than anticipated without immediate measures of action and also recommended a partial Sea (Pomeroy, Johnston and Bailey Engineers, 1965). A wider range of

alternatives was proposed by the US Department of the Interior, Aerospace Corporation, and the California Natural Resources Agency from 1969-1971. During this time, controlling nutrients, salinity and sediment were identified as the highest priority, and eutrophication was seen as the most insurmountable issue (DOI and The California Resources Agency, 1969). The idea of incorporating geothermal energy was evaluated in 1976 and 1978 by the Lawrence Livermore Laboratory and the California Institute of Technology (Layton 1976). In 1983 the California Department of Fish and Game (now the California Fish and Wildlife Service) evaluated the potential to expand geothermal development and put in a large solar pond. The California Resources Agency (now the California Natural Resources Agency) in 1988 evaluated three main solutions to the problems of salinity and flood control at the Sea, including evaporation ponds, solar ponds and a canal to the Gulf of California (that was written off as unfeasible). Previous alternatives were evaluated in 1994 by the newly-created Salton Sea Authority. Components included a smaller diked Sea, solar ponds, constructed wetlands, import-export to the Gulf of California with energy generation, desalination plants to reduce salinity for freshwater wetlands, and called for studies on selenium toxicity. Other restoration alternatives continued to be proposed and evaluated based on maintaining elevation and salinity throughout the 1990's and 2000's.

In 2005 Reclamation and USGS reviewed the Salton Sea Authority's 2004 preferred project report and identified several issues that were not recognized in the report: dust control, selenium management and the accommodation of seasonal and annual inflow fluctuations. The Programmatic Environmental Impact Report (PEIR) completed by the Department of Water Resources (DWR) and the Department of Fish and Game (DFG) in 2007 evaluated and analyzed potential environmental impacts of alternatives developed for the restoration of the Salton Sea. The Bureau of Reclamation produced a study in 2007 that determined a preferred alternative action for restoring the Salton Sea.

In 2013 an EIR/EIS was completed to evaluate the impacts of alternative methods of implementing the Species Conservation Habitat Project (SCH Project), which is a proof of concept for restoring shallow water habitat that supports fish and wildlife dependent upon the Sea. Key restoration alternatives are described in detail in the Benchmark 3 document. As a result of the most recent environmental impact studies, extensive water quality analysis and modeling was performed. Local and state agencies have conducted pilot projects to control salinity, establish habitat ponds (fresh, saline and in between), and to control dust. Academic studies have characterized the Sea's salinity, biological communities, nutrient dynamics,

selenium dynamics, and other water quality parameters. Even though there have been advances in those research areas, major gaps in knowledge still exist that prevent a complete understanding of the consequences of the proposed alternatives or even the future under the status quo.

1.2 Scope of the Document

This project was completed in a series of seven Benchmarks with separate reports for each Benchmark. The present report constitutes Benchmark 7 and is a summary of the material presented in the documents prepared for Benchmarks 2 through 6. Key technical analysis in each of the prior Benchmarks is summarized in individual chapters as outlined below.

Chapter 2 is based on Benchmark 2: Review and Update Existing Condition Data and presents an overview of historical and current hydrology and water quality of the Sea and its tributaries, projected inflows and salinity, dust mitigation alternatives from areas of exposed playa, and future data needs for management.

Chapter 3 is based on Benchmark 3: Evaluation of Alternatives with Respect to Existing Conditions and provides a review of past alternatives that have been considered for management of the Salton Sea over the past few decades, and serve as a starting point for future management plans.

Chapter 4 is based on Volume 1 of Benchmark 4: Conceptual Plans and Cost Estimates, Water Import and Export Options and explores various options for importing and exporting water to and from the Salton Sea to support current water levels. Ten potential inflow conveyance alternatives were evaluated, including the Santa Ana Regional Interceptor (SARI) Pipeline, the Metropolitan Water District of Southern California (MWD) Concentrate Pipeline and pipelines to the Gulf of California and the Pacific Ocean.

Chapter 5 is based on Volume 2 of Benchmark 4: Conceptual Plans and Cost Estimates, Smaller Sea Options. This chapter introduces the Perimeter Lake concept. This concept takes into account the immediate need for action, the limitations on water supply for the lake, and the possibility of constructing a project with incremental funding. The proposed approach would involve constructing a lake around the perimeter of the Sea along with a central saline pool within the current Sea footprint. The Perimeter Lake concept was developed through the presentation of conceptual construction details; water inflow requirements and water quality improvement in inflow; conceptual design of spillways and air quality mitigation; geotechnical feasibility study; and a construction scenario, cost estimates, and cost comparisons to past alternatives.

Chapter 6 is based on Benchmark 5: Infrastructure Financing Feasibility Analysis. This analysis considers that the Authority will have the ability to fashion the Salton Sea along the former shoreline with combinations of dikes and dredging to produce water features that will be able to sustain recreationally attractive water near the shoreline (defined as Seaside Improvements). This Infrastructure Financing Feasibility analysis was prepared to estimate the total revenues generated by development attracted by the recreational water and Seaside Improvements ("Landside Development"), and the total estimated Seaside Improvement costs that can be repaid with such revenues.

Chapter 7 presents a summary of Benchmark 6: The Potential for Renewable Energy Development to Benefit Restoration of the Salton Sea: Analysis of Technical and Market Potential. This study was focusing on refining potential revenue estimates for future Salton Sea management through the development of renewable energy in the region.

Chapter 8 of this report provides recommendations for additional design, engineering, a demonstration projects that would advance the concepts presented in this report.

1.3 Relationship of this Work to Other Activities in the Salton Sea

The Salton Sea is currently the focus of a significant restoration effort by the State of California, managed by the California Natural Resources Agency. Specifically, the State is in the process of developing the Salton Sea Management Plan (SSMP) to address the multiple environmental concerns in the region. Also, this work was performed in parallel with a similar large-scale effort performed by the Imperial Irrigation District and Imperial County, identified as the Salton Sea Restoration and Renewable Energy Initiative (SSRREI). The SSRREI, or Initiative, considers the development of shallow habitat, potential geothermal energy development, and air quality mitigation over playa that is exposed as the Salton Sea recedes. Project concepts developed as part of this Action Plan are intended to work in concert with concepts developed through the Initiative and do not overlap geographically. It is anticipated that elements of the Action Plan and the Initiative, and other project components, will together form the basis of the SSMP.

2.0 Review and Update of Existing Condition Data: Hydrology, Water Quality, and Air Quality

A description of the riverine inflows to the Sea, in terms of flow volumes and water quality, as well as measurements of the elevation and water quality in the Sea, can explain recent trends and provide the background for future management activities. This chapter is based on the Benchmark 2 report, and highlights recent changes in water surface elevation, future projections of elevation, area, and salinity, and the potential exposure of emissive playa area. Trends in other parameters which are important for sustaining current and future beneficial uses of the Sea, such as nutrients and selenium, are described. Future data needs for improved characterization of the physical, chemical, and biological processes in the Sea are also discussed.

2.1 Introduction

The Salton Sea Funding and Feasibility Action Plan Benchmark 2: Review and Update of Existing Condition Data report provides an overview of historical and current hydrology and water quality of the Sea and its tributaries, projected inflows and salinity, dust mitigation alternatives from areas of exposed playa, and future data needs for management. The report is intended to inform those who are engaged in designing options for the restoration and management of the Sea. Because many of the topics addressed in this report have been considered in prior efforts, the particular focus here is recent data and trends in the Salton Sea, the New, Alamo and Whitewater Rivers and several major agricultural drains. New data have been analyzed and compiled in a way that emphasizes these near-term changes. Trends in hydrology and water quality are important for modeling future conditions that can be used to evaluate alternatives and restoration options.

Major findings from each of the topic areas discussed in the Benchmark 2 report are summarized below.

2.2 Hydrology

Stream flow observations provide insight into the changes in the hydrology of Salton Sea basin. Recent changes include reductions in flows from Mexico, and with the full implementation of the Quantification Settlement

Agreement in the near future, stream flows are expected to decrease further. Historical flow data from the Alamo, New and Whitewater River Basins, focusing on the last two decades, are summarized to provide a general understanding of the flow contributions in the basin, and to provide a baseline for this work.

Key features of the Salton Sea hydrology include the following:

- The elevation of the Salton Sea is now at about -234 feet below mean sea level (National Geodetic Vertical Datum of 1929 or NGVD 29) as of February 2015.
- The elevation of the Sea declined at an accelerated rate after 1995 and has decreased by 5.5 feet since 1987 (Figure 1).

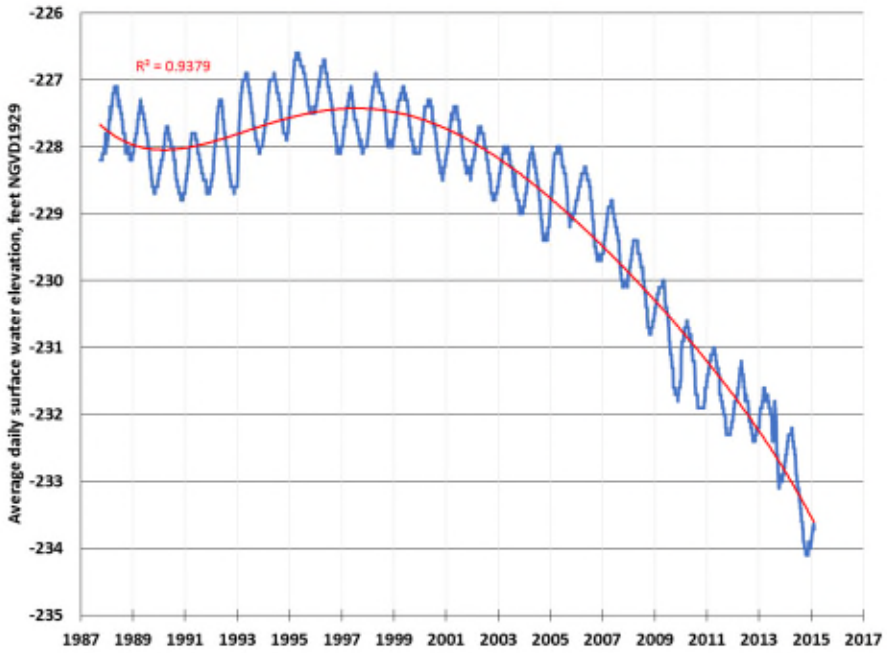

Figure 1: Daily surface water elevation above NGVD1929 for Station 10254005 located along Salton Sea near Westmorland, CA from October 1987 to February 28, 2015 (USGS). Trend line (polynomial fit) with R^2 shown in red.

- New River inflows to the Sea averaged 411,760 acre feet/year (2004-2014). Daily discharge averaged 568 cubic feet per second (cfs) from 2004-2014.
- Flows from Mexico have decreased over the past 10-20 years, reducing flows into the New River and the Sea.

- Alamo River inflows to the Sea averaged 592,500 acre feet/year (2004-2014). Daily discharge averaged 829 cubic feet per second (cfs) from 2004-2014.
- Flows from the Alamo River have decreased at the border but flows to the Sea have remained fairly consistent.
- New and Alamo Rivers reach their highest flows during the months of March to May during peak irrigation season.
- Whitewater River/Coachella Valley Stormwater Channel (CVSC) inflows to the Sea averaged 39,600 acre feet/year (2004-2014). Daily discharge averaged 55 cubic feet per second (cfs) from 2004-2014.
- Whitewater River/CVSC flow showed the sharpest decline among the rivers and the hydrograph has levelled off considerably.
- Other drains and channels that flow directly to the Sea averaged 128,000 acre feet/year (2004-2014).
- Total Salton Sea inflows averaged 1,221,000 acre feet/year (2004-2014).

2.3 Salinity and Other Water Quality Parameters

Salinity originates from imported Colorado River water that is used to irrigate agricultural fields where salt is concentrated via evaporation and subsequently leached from soils. The water is routed through surface and subsurface drains to the major rivers or directly to the sea. Imperial Valley contributes the majority of flows and salt to the Salton Sea (DWR and DFW 2013). In 2002, Holdren and Montaño calculated total dissolved salt loading of 3,434,000 tonnes/year, consistent with other calculated salt loads to the sea (Holdren and Moñtano 2002; Amrhein et al. 2001). These estimates were updated in the present work. Average flow from the Alamo, New and Whitewater Rivers was multiplied by the corresponding average TDS concentration to obtain annual dissolved salt loads. Direct drain flow loads were calculated by multiplying measured TDS in 2010 by typical drain flow (10% of combined Alamo River and New River flow; DWR and DFW 2007). The average annual TDS load from 2004-2014 was 3,236,000 metric tons, varying annually by 287,000 tonnes. Agricultural drains from Imperial Valley that discharge directly into the sea accounted for 10% of the salt load at 312,000 metric tons per year from 2004-2014.

The salt in the inflows accumulates in the Salton Sea with time, resulting in continually increasing salinity in the remaining water. Key features of the Salton Sea salinity include the following:

- Salinity in the Sea has increased steadily since 2004 to an average of 55.7 g/L total dissolved solids (TDS) in 2014 (Figure 2).
- Average salinity concentrations over the past decade were lowest in the Whitewater River/CSVC, followed by the Alamo River and New River, which averaged 1.2, 2.1, and 2.7 g/L TDS, respectively.
- Annual average salt load to the Sea was about 3.2 million metric tons/year. The Alamo River contributed 47%, the New River 42%, 2% was from the Whitewater River/CVSC and 10% was from other drains and small watercourses.

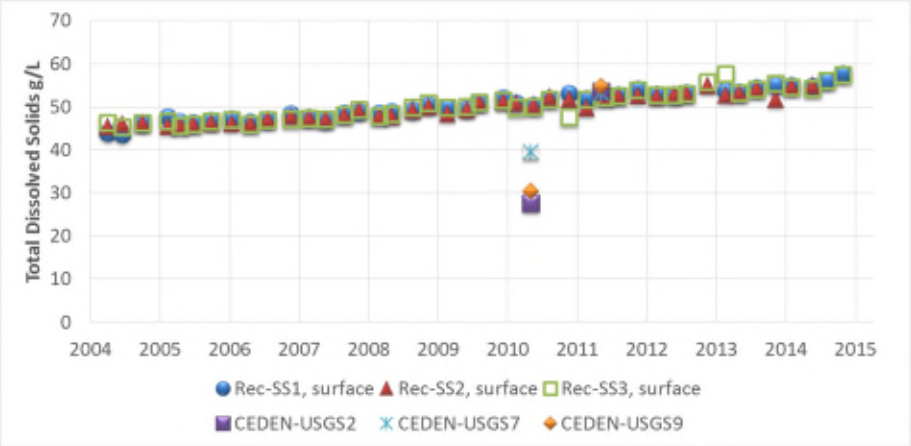

Figure 2: Salinity as total dissolved solids (TDS; g/L or ppt) of Salton Sea Stations. CEDEN data stations and Reclamation (Rec) stations.

2.4 Nutrients and Other Water Quality Parameters

Excess nutrients in the Salton Sea are a major issue affecting many physical and biological processes. Two important nutrients are nitrogen (as total N) and phosphorus (as total P). In excess amounts, nutrients stimulate exponential algal growth. Algal respiration and decay reduces oxygen in the water to levels toxic for fish. This process is known as eutrophication. Untreated wastewater was a significant portion of flows from Mexico into the New River and delivered nutrients to the sea until 2007 when wastewater treatment improved in Mexico and was routed away from the New River (DWR and DFG 2011). Although reduced in volume, partially treated wastewater remains a part of the New River flow. Fertilizer application in the Salton Sea watershed is also a significant contributor of nutrients, and nutrient levels remain high in the Sea and rivers.

Key features of nutrient loading in the Sea are as follows:

- Annual average P load (mostly as ortho-phosphorus) to the Sea was about 1,130 metric tons, with the New and Alamo Rivers contributing 43% and 42%, respectively, and the Whitewater River and other drains contributed 7% and 10%, respectively of the Total P load.
- Annual average N load (mostly as ammonia and organic-N) to the Sea was 11,550 metric tons; the Alamo River added 47%, the New River contributed 36%, the Whitewater River contributed 7% and other drains accounted for 10%.

Dissolved oxygen depletion at depth coincided with stratification. During the summer months the average DO concentration was 2.15 mg/L, less than the threshold of 4 mg/L recommended for aquatic organism survival. Tilapia can survive in oxygen concentrations less than 1 mg/L and can migrate upward when oxygen is low (DWR and DFG 2011). Thus, low dissolved oxygen concentrations are a bigger concern for relatively immobile benthic organisms that form the basis of the food web (DWR and DFG 2011; Anderson et al 2009). As algae photosynthesize during the day, oxygen saturates the epilimnion (upper layer). The abundance of nutrients, warm temperatures, and an available carbon source encourages rapid, short-lived algal growth. The warm summer temperatures and algal production increases oxygen depletion during the night when algal respiration and algal decay demands oxygen in already low DO water. When oxygen depletion occurs along the entire depth profile, it typically corresponds to an algal bloom and often immense fish kills.

2.5 Selenium

Selenium (Se) is a naturally occurring element found in seleniferous rocks in the Colorado River Valley. Selenium enters waterways as selenate via weathering and erosion of rock and soil in the region. It is an essential nutrient for organisms but becomes toxic at elevated concentrations that are very near ideal concentrations.

The biogeochemistry of selenium in aquatic systems is complex and controlled by several factors. Similar to sulfur, selenium can exist in four different oxidation states (6 species): organo-Se (Se-II), elemental selenium (Se 0), selenite (Se 4+ or SeO_3 2-), and selenate (Se 6+ or SeO4 2-; Presser and Luoma 2010). Under reducing conditions that occur frequently in the Sea, selenium can be converted to elemental Se, which is relatively insoluble and settles out of the water column.

Conditions related to Se in the Salton Sea and inflows can be summarized as follows:

- Dissolved selenium (Se) levels in the Sea water column are considered to be below the level of concern for aquatic life within the Sea, generally below 2 micrograms per liter (µg/L),
- Total Se measured in sediment samples ranged from 1.5-11.8 µg/g and averaged 5.37 µg/g between 2005 and 2014 and are a concern for toxicity. Sediment-bound Se may also leach out when aquatic chemistry changes.
- Higher concentrations of dissolved Se were found in the source Rivers, averaging 6 and 6.8 µg/L at the New and Alamo Rivers, respectively.

2.6 Inflow Projections

Hydrology is projected based on the best available estimates of inflows in Chapter 4 of the Benchmark 2 report. Historical data were used as a baseline for future inflows predicted for the Salton Sea by the Salton Sea Accounting Model (SSAM). The reduction of flows due to Mexicali's plans to reclaim treated effluent and agriculture drainage that would typically flow from the New River into the Sea were identified as the major causes for declining inflows. This analysis focused on the transition period of 2014-2025 which includes the end of Quantification Settlement Agreement (QSA) mitigation flows in 2018. Less flow from Mexico, agricultural efficiency, urban water demand, climate change, drought and less groundwater inflow are additional factors that will contribute to lower elevations at the Sea. The future inflows to the Sea are discussed as components of flow from the Imperial Valley, Coachella Valley and Mexico.

Under the most recent projected inflows to the Sea by Imperial Irrigation District (IID), two conditions were examined utilizing a similar methodology to previous reports: California Environmental Quality Act (CEQA) conditions and variability conditions. CEQA conditions yielded higher estimated annual inflows that were based solely on known inflows, and the effects of the QSA transfer agreements. Under variability conditions, anticipated conditions and projects will result in a somewhat lower inflow estimate; the result of many factors as discussed in this document. Since the future contains uncertainty regarding water supply and availability, these two conditions provide a range of possibilities for future inflows. The range of estimated flows is useful for engineering design considerations.

- Imperial Valley will contribute 558,000 – 667,000 acre feet/year (AFY), or 76 - 78% of the total inflow.
- Coachella Valley flows to the Sea will be an estimated 61,000 – 98,000 AFY or 9 - 11% of total inflow. This estimate is much lower

than previous estimates because Coachella Valley Water District (CVWD) intends to recycle more water, desalinate and use more water for recharging aquifers, and comply with new water conservation mandates due to the drought.

- Flows from Mexico will average 40,390 - 96,834 AFY, contributing about 6 - 11% of total inflow to the Sea. This is due to a 30% reduction in flows relative to 2010 as Mexico intends to reuse its dry weather flows and agricultural water use efficiency increases.
- Groundwater flows to the Sea have not been adequately characterized and contribute a relatively minor quantity of flow.
- Due to the severe and potentially long-term drought, flows from the watershed (minor channels and washes) will be increasingly allocated and decreasing in reliability.
- Therefore the estimated "Other" flow contribution is likely 20,000 AFY or 2-3% of the total inflow.

All estimates of future flows contain a certain amount of uncertainty but will provide a design criteria in order to progress with alternative planning and evaluation. It is still a reasonable assumption that inflows to the Sea can vary by up to 200,000 AFY. Evaporation will be much larger than total inflows by 2020, and the inflows will also need to be used for air quality management and habitat creation. Habitat flows will be returned to the Sea after evaporation and transpiration losses occur.

2.7 Salinity and Elevation Forecasts

Using hydrology inflow projections and current plans for shallow habitat development, anticipated changes in the area of the Sea and in-Sea salinity is evaluated over the 21st century. The US Bureau of Reclamation's Salton Sea Accounting Model (SSAM), originally developed in 2000, was used for this evaluation with several modifications to represent current inflows and bathymetry. Two flow scenarios were considered: baseline and uncertainty, the latter allowing for lower flows (Figure 3). Updated bathymetry data for the Salton Sea was used in this analysis to obtain a more accurate area-volume-depth relationship that is essential for siting future habitat and potential barriers and dikes. The model shows a continued drop in elevation, with a major change in 2018 following the end of mitigation flows to the Sea (Figure 4), and accompanying decreases in area and increasing salinity (Figure 5).

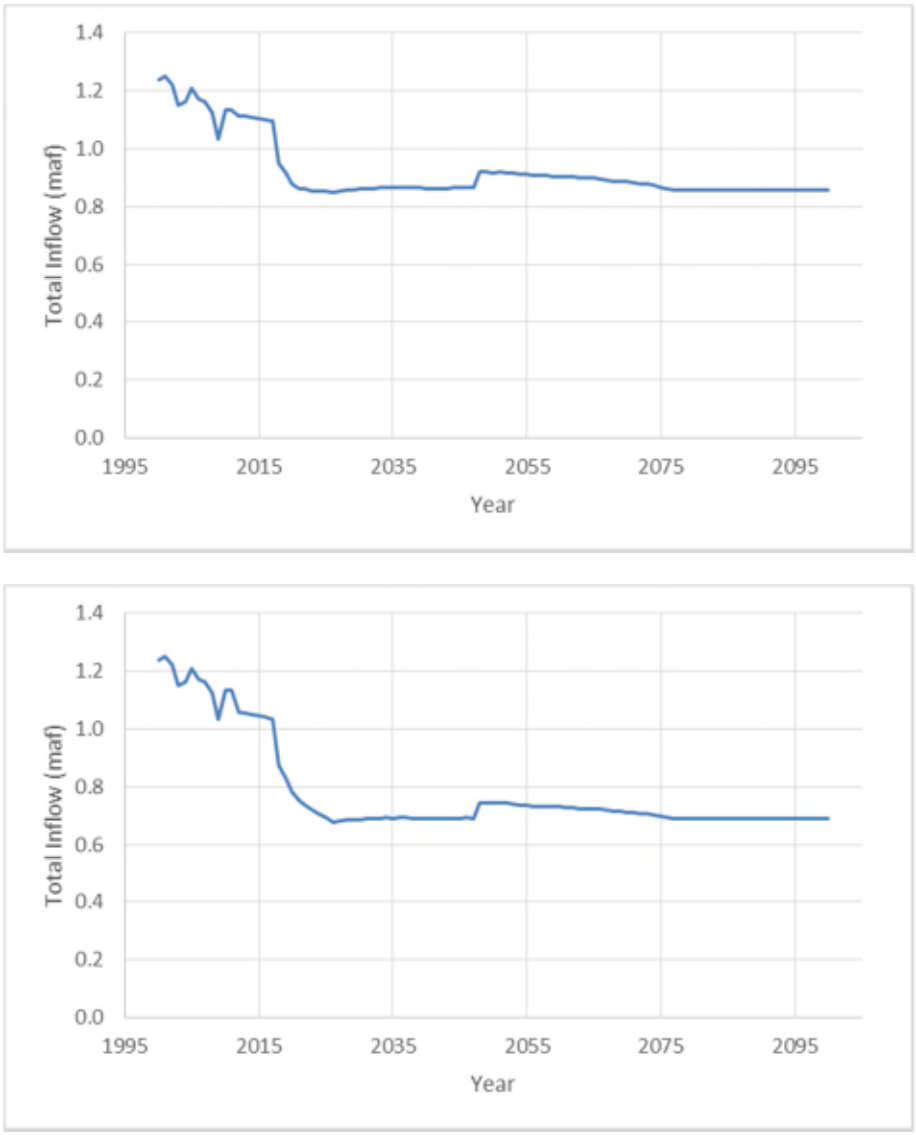

Figure 3: Inflows used in SSAM implementation: baseline flow scenario (top) and uncertainty flow scenario (bottom)

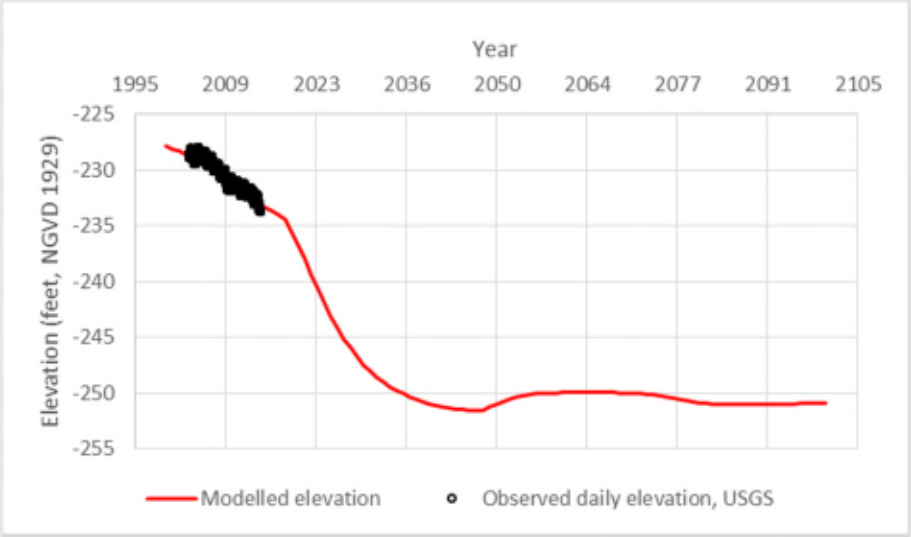

Figure 4: Elevation change over time predicted by the SSAM utilizing implementation: baseline flow scenario.

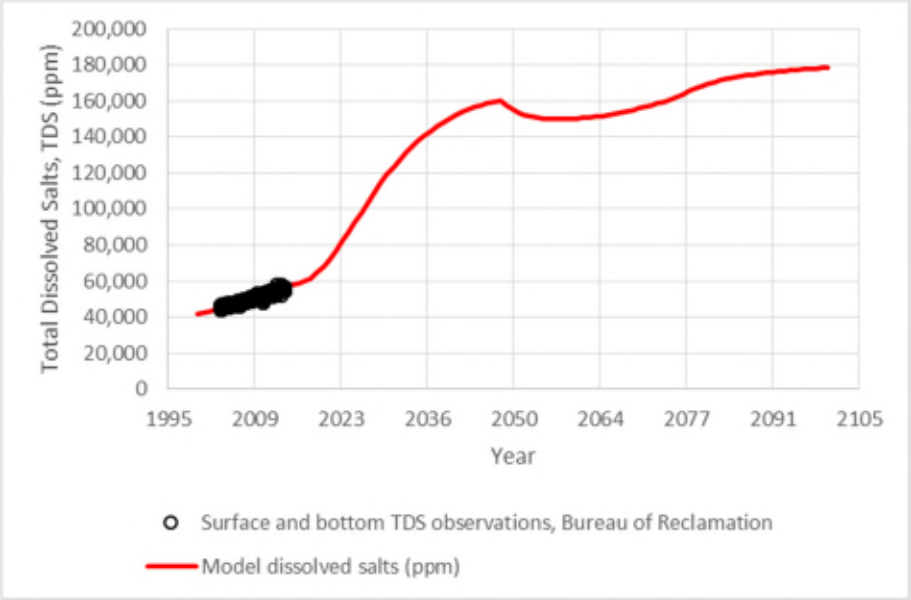

Figure 5: Salinity change over time predicted by the SSAM utilizing implementation: baseline flow scenario.

2.8 Air Quality and Dust Mitigation Review

Air quality conditions and dust mitigation strategies for exposed playa that are essential for any restoration alternative are evaluated in Chapter 6 of the Benchmark 2 report. Significant data disparities exist regarding the extent and variability of Salton Sea playa emissivity (dust-emitting), future emissivity, and dust loading of particulate matter less than 10 microns (PM_{10}) in the region. Exposed playa is expected to increase substantially over the

next 15 years (2015-2030), creating a significant health risk that has yet to be fully characterized. The Imperial Irrigation District's JPA Dust Mitigation Plan includes an adaptive management framework to monitor ambient air quality, research and monitoring efforts to identify and map playa surface characteristics related to erosion and emission potential. Pollutants of concern include PM10, particulate matter less than 2.5 microns ($PM_{2.5}$), ozone, hydrogen sulfide, arsenic, Se and others.

IID's JPA Dust Mitigation Plan includes an adaptive management framework to monitor ambient air quality, research and monitoring efforts to identify and map playa surface characteristics related to erosion and emission potential. Pollutants of concern include PM_{10}, $PM_{2.5}$, ozone, hydrogen sulfide, arsenic, selenium and others.

The IID Air Quality Mitigation Program contains four components that contribute toward the implementation of a science-based adaptive management plan to detect, locate, assess and mitigate PM_{10} emissions associated with the Water Transfer Project. Each component of the Air Quality Program will attempt to answer a set of questions or achieve a goal. The **Air Quality and Playa Characterization** component seeks to differentiate the emissions sources, whether they are a direct consequence of the Water Transfer Project or not by analyzing data from an extensive ambient air quality monitoring network. In order to capture intermittent dust events, PM_{10} and $PM_{2.5}$ will be measured with continuous monitors (i.e. Tapered Element Oscillating Microbalance Monitor (TEOM) or a Beta Attenuation Monitor (BAM)) and verified with filter-based federal reference method monitors (i.e. BGI or Partisol). The filters could initially be analyzed for contaminants (i.e. arsenic, selenium, pesticides) at regular intervals to characterize the problem of contaminated dust particle transport (IID 2013). Permanent and portable air quality stations will be used as necessary to document the spatial heterogeneity of dust emissions.

Hydrologic modeling will use the hydrologic analysis from the Water Transfer EIR/EIS and high-resolution bathymetry data to yield the estimated extent and time frame for additional playa exposure. The result will be planning level information about the location of projected playa exposure and ownership information. Research and monitoring will aid the understanding of salt crust formation, vulnerability to erosion and overall emission potential of various salt crust surfaces. The potential sources of PM_{10} emissions include playa salt crusts, sand sheets, beach deposits and soil surfaces. The main focus of research will be assessing the vulnerability of each potential emission source to erosion.

The **Dust Control Measure (DCM) Research and Monitoring** component will test and evaluate DCMs for feasibility and cost-effectiveness. Existing DCMs will be derived from a literature review, modeling studies and screening-level tests. Novel and untested measures will be incorporated into the DCM research via pilot field testing. The performance of DCMs will be monitored at the pilot project scale for overall performance and sensitive parameters such as habitat quality.

Potential DCMs in Imperial County include surface stabilizers, vegetated swales, plant community enhancement, moat and row, water-efficient vegetation, tillage, alternative land use, species conservation habitat and other habitat-based uses (IID 2013).

The **Dust Prevention and Mitigation** component will answer the question: how can dust emissions including from off-highway vehicle (OHV) use be prevented or mitigated? Off-highway vehicles cause considerable surface disturbance and erodibility. An adaptive management framework will be in place to prevent dust emissions from OHVs. Dust mitigation strategies include creating or purchasing off-setting emission reduction credits, similar to a cap-and-trade program and direct emissions reductions at the sea. IID would negotiate with the local air pollution control districts to create a long-term program that would enable the creation or purchase of off-setting PM_{10} emission reduction credits (IID 2013).

Plan Implementation will occur throughout the duration of the Water Transfer Project. In fact, ambient air quality and DCM pilot projects have already begun. IID will coordinate with regulatory agencies and provide periodic updates on the implementation of the Air Quality Program. As of 3013, IID has installed six ambient air quality stations in 2009, playa exposure modeling, playa shoreline monitoring, playa surface characterization, and playa emission characteristics have been underway. Pilot projects including a surface stabilizer product evaluation, shallow flooding at the New River and plant community enhancement at the New River have been completed. In addition, a vegetation swale pilot project is being planned (IID 2013). Remote sensing and advanced satellite-based radar techniques have been employed to characterize active OHV traffic areas on the playa.

2.9 Future Data Needs

Key aspects of the additional data that might be required are divided into three general categories: water quality processes, biological uptake processes, and air emission and dust control processes. The most important areas to focus on include mixing and nutrient dynamics in a shrinking Sea, especially ammonia and hydrogen sulfide production and release,

quantification and transport of dust emitted from the exposed playa surfaces, and Se fate, transport, and potential biological uptake.

2.9.1 Water Quality Processes

There is a need to continue the monitoring in the Sea as well as in the new habitats that are created as part of any restoration plan.

For newly created shallow habitat, both saltwater and brackish, an extensive effort at characterization is needed. The most important water quality concerns identified in the SCH final EIS/EIR are salinity, temperature, dissolved oxygen, nutrients, and Se (also a concern in sediment, bird eggs and other biota). These key indicators will be monitored within the SCH habitat in order to determine the effects of various operational scenarios under an adaptive management framework (DWR and CDFW 2013; CNRA 2015). The water quality science panel created by the Salton Sea PEIR process in 2007 identified Se, hydrogen sulfide, water temperature and dissolved oxygen as a potential problem for birds and fish (DWR and DFG 2007). A similar protocol of monitoring and analysis needs to be developed for brackish water and lower salinity habitats, some of which are already in existence.

Monitoring in the Sea needs to be continued so that changes associated with increasing salinity, and reduced area and depth can be evaluated. The annual loading of nutrients, proportional to the volume of the Sea, may increase over time and change the eutrophication characteristics. Numerous gaps in knowledge create uncertainty for restoration. Important areas to focus on include:

- Selenium dynamics (characterization of inorganic/organic, different oxidative states, elemental species and their distributions) and biogeochemical cycling in the Sea, including sediment settling, re-suspension and volatilization
- Projected Se concentrations in brine sink under declining inflows
- Phosphorus in sediment and re-suspension: effect on internal cycling and water column concentrations
- Temperature and dissolved oxygen dynamics related to mixing and the effects on nutrient cycling and ammonia and hydrogen sulfide production.

2.9.2 Biological uptake processes

Because of the terminal character of the Sea, all contaminants that flow into it accumulate in water or sediments, unless there is a volatilization pathway. This last pathway has not been quantified for many contaminants in the Sea, and a conservative assumption is that all inflowing contaminants will

continue to add to the sediment and water concentrations over time. Given the ecological importance of the Sea, it is very important to understand the transfer and uptake of the contaminants into the food web, from plankton to fish to bird eggs. To date, the characterization of contaminants in tissues has been limited, and a more systematic approach is needed. A recent US Geological Survey Monitoring and Assessment Plan (MAP) provides a strong foundation for the data needs for the Sea (Case III et al., 2013). The full scope of the MAP is broad, and includes characterization of biological resources (bird, fish, and algae species), water column concentrations, and tissue concentrations. The characterization is focused on the Sea as well as the different created habitats. Some of the key data requirements identified in that report include:

- Algal and zooplankton species composition
- Fish type and abundance
- Endangered desert pupfish abundance in Sea and inflowing waters, as well as created habitats
- Avian use of different habitats, both existing and created
- Selenium transfer into particulate matter and bioaccumulation/ effects in piscivorous birds at the Salton Sea

2.9.3 Air Emission and Dust Control Processes

The changing volume and elevation of the Sea over the next 15 years is expected to result in tens of thousands of acres of newly exposed playa. Managing the emission of PM10 from these areas effectively is a high priority component of any planned restoration. Some of the key data needs associated include:

- Playa surface mineralogy dynamics including crust formation, erodibility and potential to contribute fine particulate matter
- Evaluation and design of multiple dust control measures
- Plant community optimization for dust control
- Water availability and requirements for dust control measures

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3.0 Previous Alternatives for Management of the Salton Sea

A review of past alternatives was conducted and documented in the Salton Sea Funding and Feasibility Action Plan, Benchmark 3: Evaluation of Alternatives with Respect to Existing Conditions. A summary of the material presented in the Benchmark 3 document is provided in this chapter, which specifically focuses on the preferred alternatives previously developed by Salton Sea Authority and the State of California. In addition, although not a full restoration alternative, the State's SCH Project is discussed.

3.1 Introduction

Management of the Salton Sea has been an on-going process occurring over the past twenty plus years. Various organizations, including the SSA and the CA Department of Water Resources, have conducted on-going research into Salton Sea restoration alternatives and their components to determine how well they would perform under current and future inflows. Alternatives are considered with respect to existing hydrologic conditions at the Sea, as of 2014, and projected future hydrology. Research is intended to expect the changing conditions at the sea, and it is intended to inform those who are engaged in planning the restoration and management of the Sea. The Salton Sea Funding and Feasibility Action Plan Benchmark 3 report provides an overview of previous alternatives that have been considered for management or restoration of the Salton Sea. Some of the most important of these alternatives are discussed in this chapter.

3.2 Salton Sea Authority Preferred Restoration Plan, 2006

In 2006, the Salton Sea Authority (The Authority) formulated a plan to provide a restored Sea along the current shoreline that could stimulate the development and improve the economic conditions for the Tribe and Imperial and Riverside counties. The plan involved five essential components: in-Sea barrier and circulation channels; water treatment facilities; habitat enhancement features; Colorado River water storage; and park, open space, and wildlife areas. Clear objectives in the plan are not placed in order of priority, but they include both human and ecological concerns.

Figure 6: Salton Sea Authority Preferred Restoration Plan, 2006.

3.2.1 Restoration Objectives of the Authority

The Authority developed a combined, multi-purpose revitalization/ restoration project with six clear objectives: (1) restoring the Sea as a nationally important wildlife refuge, (2) maintaining the Sea as a vital link along the international Pacific Flyway, (3) preserving local tribal heritage and cultural values associated with the Sea, (4) reducing odor and other water and air quality problems, (5) reestablishing the Sea as a tourist destination and recreational playground, and (6) revitalizing the Sea as a local economic development engine.

The Authority's proposed project design was also being considered as an alternative in the separate Salton Sea restoration project feasibility studies that were conducted concurrently by the Resources Agency of the State of California (the Agency) and Reclamation. In this regard, the Authority's project objective was to achieve the habitat restoration and air and water quality goals set out in State and Federal legislation, while simultaneously meeting the needs of the residents of the region, local property owners, and civic leaders in the Imperial, Coachella and Mexicali Valleys. These interests expressed a desire for a large, sustainable recreational lake with reduced odor which could serve as a catalyst for regional economic development.

In 2006, the Authority proposed a "Large Lake" program to address the following issues: harmful nutrient buildups, air quality, and funding. In relation to harmful buildups of nutrients, the Authority's program was designed to be essentially self-mitigating, and it would allow for Selenium sequestration in sediments to act as a control on the bioavailability of naturally occurring contaminants in the Sea (a mechanism that has previously prevented selenium-related wildlife impacts at the Sea). In relation to air quality issues, the current lakebed in the 60,000-acre salt deposit area in the south basin in the Authority project design would be covered with a thick, hard-surface sodium-chloride salt deposit that was designed to control dust emissions as the water level recedes in that basin. However, other dust control methods identified by the State and posted on their website were also considered for use in selected areas. Finally, in relation to funding, it was proposed that critical components in the Authority project design could be heavily financed with local funds, and it was proposed that all project components can be completed within 20 years.

3.2.2 Conceptual Plan

The basic conceptual project design for the Authority's Plan that was outlined in 2006 is illustrated below. This locally-preferred project design included the following essential components:

- **In-Sea Barrier & Circulation Channels** were proposed to separate the Sea into two separate bodies (an outer "two lake" water system and multiple habitat complex areas, salt deposit area, and brine pool) with a channel for circulating water between the two lakes in the outer water system.
- **Water Treatment Facilities** were proposed to improve both the existing water in the Sea and the inflow water as necessary to lessen or greatly reduce the Sea's eutrophication problem and to improve the clarity and quality of the water in both lakes to meet the recreational water quality standards set by the Regional Water Quality Control Board.
- **Habitat Enhancement Features** were proposed to meet the needs of fish and bird populations consistent with State laws that required the "maximum feasible attainment" of specified ecosystem restoration goals.
- **A Colorado River Water Storage Reservoir** was proposed to enable the water agency to store Colorado River water to have greater flexibility for balancing supply and demand of Colorado River water use.
- **Park, Open Space, and Wildlife Areas** including the Salton Sea State Recreation Area and the Sonny Bono National Wildlife Refuge would be preserved although it was envisioned that the boundaries of the Refuge would be modified to match the newly created habitat features.

In addition to the previously outlined features that were designed to address water quality problems and the potential air quality concerns associated with exposed lakebed, a plan for development of areas around the Sea was prepared. The plan was prepared to guide creation of "Seaside Villages" and the build-out of over 250,000 new homes with accompanying entertainment, recreational, retail and business establishments within specified areas of the Authority's 300,000-acre planning and financing district around the Sea.

The signature feature of the Authority's project was an approximately 33.5-mile-long, rock-fill, in-Sea barrier. This engineered structure would have permanently separated the present 360-sq.-mile Sea into two separate water bodies, namely:

- **An outer 180-sq.-mile lake water system**. This outer water body was proposed to provide a relatively stable elevation so the shorelines of the two newly created lakes and the interconnecting boating channel on the west shore would remain unchanged as long-term inflows

decrease. According to the plan, the water in the two joint-use recreational/habitat lakes would be treated as required and circulated to maintain recreational water-quality standards. The larger northern salt water lake (140 sq. miles) would be maintained at ocean-like salinity (35,000 mg/L salt), and the smaller southern estuary lake (40 sq.-miles) would be held at a lower salinity (20,000 mg/L salt). The south lake elevation (-228' msl) would be held at about 2 feet above the north lake (-230' msl) since a slight hydraulic gradient would be needed for circulating the water in both lakes in a continuous counter clockwise loop for blending and aeration. An earthen channel would be excavated along the east shore of the south basin to convey north lake water to the south lake and to support the 12,000-acre saline habitat complex in the south basin. Furthermore, the Authority proposed a pumping plant that would be built at the end of this channel to lift the extracted and treated north lake water into the south lake to blend with the Alamo and New River inflows.

- **An inner 180-sq.mile habitat and salt deposit area in the south end of the current Sea**. According to the plan proposed in 2004, the wetted surface area of this inner water body would shrink, and its elevation was predicted to decline as inflows decrease over time. A salt-purge stream from the north lake was designed to discharge into the inner basin after being used in the saline habitat complex. The purpose of this purge stream was to balance salt inflows and outflows in the outer lake-water system. By sending salt to the inner basin in this manner, the two lakes could be held at relatively constant and controlled salinity levels. The lower inner basin would also serve as an overflow basin in the event of storm activity. According to previous statements by the Authority, salt pond pilot projects conducted at the Salton Sea indicate that if the shoreline inside the inner basin recedes, hard-surface salt deposits 12-to-24 inches thick would form on top of the old lakebed. The cement-like salt deposits would prevent blowing dust, but other air-quality mitigation techniques would also be used if needed. Furthermore, a permanent hypersaline brine pool was expected to eventually form in the lower depths.

3.2.3 Water Treatment Facilities

The Authority anticipated that water treatment facilities would include a bottom drain and treatment system for the removal and destruction of hydrogen sulfide, ammonia, and other contaminants from the 50-foot-deep saltwater lake. A second treatment plant was planned to remove phosphorus and other contaminants from the Alamo River inflows. The lake-water

circulation system of the plan was designed to change out the larger saltwater lake's water volume every four to five years. The circulation system would also serve to increase oxygen levels and avoid stagnation in the saltwater lake, and the circulation system would reduce selenium levels in the southern estuary lake. These measures would also improve overall water quality and fish habitat and greatly reduce odors.

3.2.4 Whitewater, New and Alamo Rivers Wetlands

The Authority's plan included water treatment wetlands along the New and Alamo Rivers in Imperial County. Similar wetlands were planned on Torres Martinez tribal land using water from the Whitewater River. These wetlands coupled with a stable, better quality lake should significantly improve conditions for the Tribe and stimulate economic opportunities. Although designed primarily for improving water quality (i.e., removing silt, nitrogen and phosphorus and increasing dissolved oxygen levels), these wetlands also provide wildlife habitat. The value of this type habitat has been questioned because of the potential for bioaccumulation of selenium, although pilot wetlands along the New River have not shown significant bioaccumulation in the limited data available.

3.2.5 Habitat Enhancement Features

The Authority has stated that the greatest ecosystem benefit of its conceptual project design is the retention of a 90,000-acre, 50-foot-deep lake that would be restored to ocean-like salinity (35 g/L salt) and would be managed to maintain habitat-safe water quality. This restored saltwater lake would enhance the existing fishery and thus reestablish an abundant food source for the fish-eating birds that have historically resided at the Sea or migrated along the Pacific Flyway. The Authority project design also includes a 12,000-acre saline habitat complex (SHC) located in the south and a 1,250-acre estuarine habitat complex near the mouth of the Whitewater River. In addition, half of the 26,000-acre estuary lake located in the south basin and a 6,000-acre area in front of the barrier across the north lake would be designated "habitat zones" in which motorized watercraft would be prohibited.

3.2.6 Colorado River Water Storage Reservoir

At the time of the Authority's planning process, the IID was considering a storage reservoir within the district's water system. A storage reservoir incorporated into the Authority Plan was designed to address this need. This facility would have been created by constructing a second barrier in 30-feet of water outside the initial barrier. The enclosed 11,000-acre area would create a 250,000 AF storage reservoir creating wildlife habitat. In addition,

the reservoir would provide air quality mitigation by covering areas that would otherwise have exposed sediments.

3.2.7 Park, Open Space, and Wildlife Areas

The Authority's plan accounts for the preservation of park, open space, and wildlife areas. These areas include the following: Salton Sea State Recreation Area (SRA, commonly referred to as the State Park), and the Sonny Bono National Wildlife Refuge. While the Wildlife Refuge will be preserved, it is envisioned that the boundaries of the Refuge would have to be modified to match the newly created habitat features. The SRA provides camping, fishing and boating opportunities and the Wildlife Refuge provides bird watching opportunities. With five campgrounds totaling approximately 1,600 campsites, the SRA provides more public access points than any other single shoreline access area. The estimated historic peak seasonal use of the SRA was approximately 660,000 visitors in 1961-62, and the last three years reveal evidence of a resurgence in public attendance, with a doubling of the total number of visitors in that period to 275,000. With improved water quality and habitat values at the Salton Sea, the recreation experience at both the SRA and the Wildlife Refuge is expected to be significantly improved.

3.2.8 Master Plan for Planning District around the Sea

In December 2005, the Authority released a Master Development Plan for the 300,000-acre planning district surrounding the Sea. Conceptual plans for creating separate and distinct seaside villages that incorporate smart growth and sustainable development concepts have been developed. This plan could accommodate 250,000 new homes with associated entertainment, recreational, retail and business establishments being built over the next 75 years on 78,000 acres (less than 25% of the 300,000-acre planning district). Under this plan, over 50% of the land around the Sea would remain as habitat, parks and open space; and 20% would remain as farmland.

Historical water quality data from the Alamo and New River Basins were compiled and summarized for this study. Sources of data included state and federal government agencies, international agencies, and universities. Data were compiled for several key locations in each river basin. These locations included multiple sites on each of the rivers, major agricultural drains, and the Salton Sea itself. For each of these sites, available data for nutrients, suspended solids, or key parameters of concern (e.g., total coliforms and selenium) were compiled. A more detailed discussion of the historical data collected from the rivers and agricultural drains can be accessed in Benchmark 3.

Historical water quality data collected within the Salton Sea and the Alamo, New and Whitewater Rivers were compiled from USGS's NWIS database, the

Imperial Irrigation District (IID), the Bureau of Reclamation Salton Sea website, and the State Water Resources Control Board's CEDEN website. The CEDEN website contained water quality data collected as part of the Surface Water Ambient Monitoring Program (SWAMP) that assesses water quality in California's surface waters to fulfill the requirements of the federal Clean Water Act, i.e. TMDL development. The period of record and number of analysis varied depending on the parameter. The following parameters were consistently analyzed at the Sea: total nitrogen, total phosphorus and selenium. Temperature, dissolved oxygen and total suspended solids (TSS) and coliform data are also examined for the Salton Sea.

The majority of the historical water quality data for the New and Alamo Rivers came from the Bureau of Reclamation and the SWRCB's CEDEN website. The Reclamation sampling sites are in close proximity to the USGS gage site near the outlet to the Sea. The USGS NWIS database included two sites on the New River: the international boundary and near Westmorland, two sites on the Alamo River: Drop 3 near Calipatria and near Niland, and one site on the Whitewater River near Mecca.

Data were obtained from the Imperial Irrigation District (IID) in several electronic databases (Excel spreadsheets). The IID data were collected from agricultural drains in the area on a monthly basis from 2004-2014. The parameters of interest included in this data set were the following: total N, total P, and TSS. In 2005 water quality data on suspended solids, nutrients, coliforms, and selenium, were analyzed at river, drain, and pilot wetland stations in the Imperial Valley. The results of the synoptic study are presented for the New River and drain stations.

More recent data from the Alamo River at the international border, Drop 3, Niland, numerous agricultural drains and up to 5 USGS sampling locations within the Salton Sea were obtained from the State Water Resources Control Board's CEDEN. Data for New River at the international boundary and the outlet, along with major and minor agricultural drains were obtained from CEDEN. Data were also obtained from the Whitewater River, Salt Creek and agricultural drains from CEDEN. Similar to other water quality databases in the region, the period of record and number of analysis varied depending on the parameter. The following parameters were analyzed in this study: total salinity, specific conductivity, total nitrogen, total phosphorus, ortho-P, dissolved selenium and total suspended solids (TSS). Several agricultural drains located along the New and Alamo Rivers between the international boundary and outlet were also sampled in 2002, 2010 and salinity, selenium and specific conductivity in 2012.

A consistent set of data collected on a monthly basis from 2004 to 2014 was provided by the Bureau of Reclamation Salton Sea website (http://www.usbr.gov/lc/region/programs/saltonsea.html). Some of the measured constituents include salinity (TDS and specific conductivity), TSS, selenium, nitrogen, and phosphorus.

3.3 State Preferred Alternative, 2007

3.3.1 Preferred Alternative

Eight alternatives were evaluated in the Draft PEIR. The Preferred Alternative closely resembles a previous alternative, Alternative 5, but takes aspects from many of the other alternatives that have been evaluated. The Preferred Alternative, shown below, includes Saline Habitat Complex in the northern and southern seabed, a Marine Sea that extends around the northern shoreline from San Felipe Creek to Bombay Beach in a "horseshoe" shape, Air Quality Management facilities to reduce particulate emissions from the exposed playa, brine sink for discharge of salts, Sedimentation/Distribution facilities, and Early Start Habitat to provide habitat prior to construction of the habitat components. The Preferred Alternative also could be configured to accommodate future geothermal development. These components are described below.

3.3.2 Saline Habitat Complex (SHC)

Bordering parts of the Marine Sea and the exposed playa will be a Saline Habitat Complex to support indigenous food webs present in the area. Excavated areas of up to 15 feet in depth would be incorporated to increase habitat diversity and provide shelter for fish and invertebrates, as shown in the figure below. To reduce vegetation growth, selenium ecorisk, and vector populations the salinity in the complex will range from 20,000 mg/L to 200,000 mg/L. Water supplied would come from the New, Alamo and Whitewater rivers plus water recycled from the brine sink or upgradient Saline Habitat Complex cells to achieve a minimum salinity of 20,000 mg/L. The first rows of the eastern and western southern Saline Habitat Complex would serve as a mixing zone for the inflows and saline water and would be maintained at a salinity of 20,000 to 30,000 mg/L. Berms would be constructed of suitable earthfill materials excavated from the seabed with 3:1 side slopes. A 20-foot wide gravel road on top of each Berm would allow access for maintenance. Rock slope protection would be placed on the water side of the Berm. Water depths would be less than 6 feet (2 meters). Berms could not be constructed until the brine sink (residual Salton Sea) recedes to an elevation below the Berm location

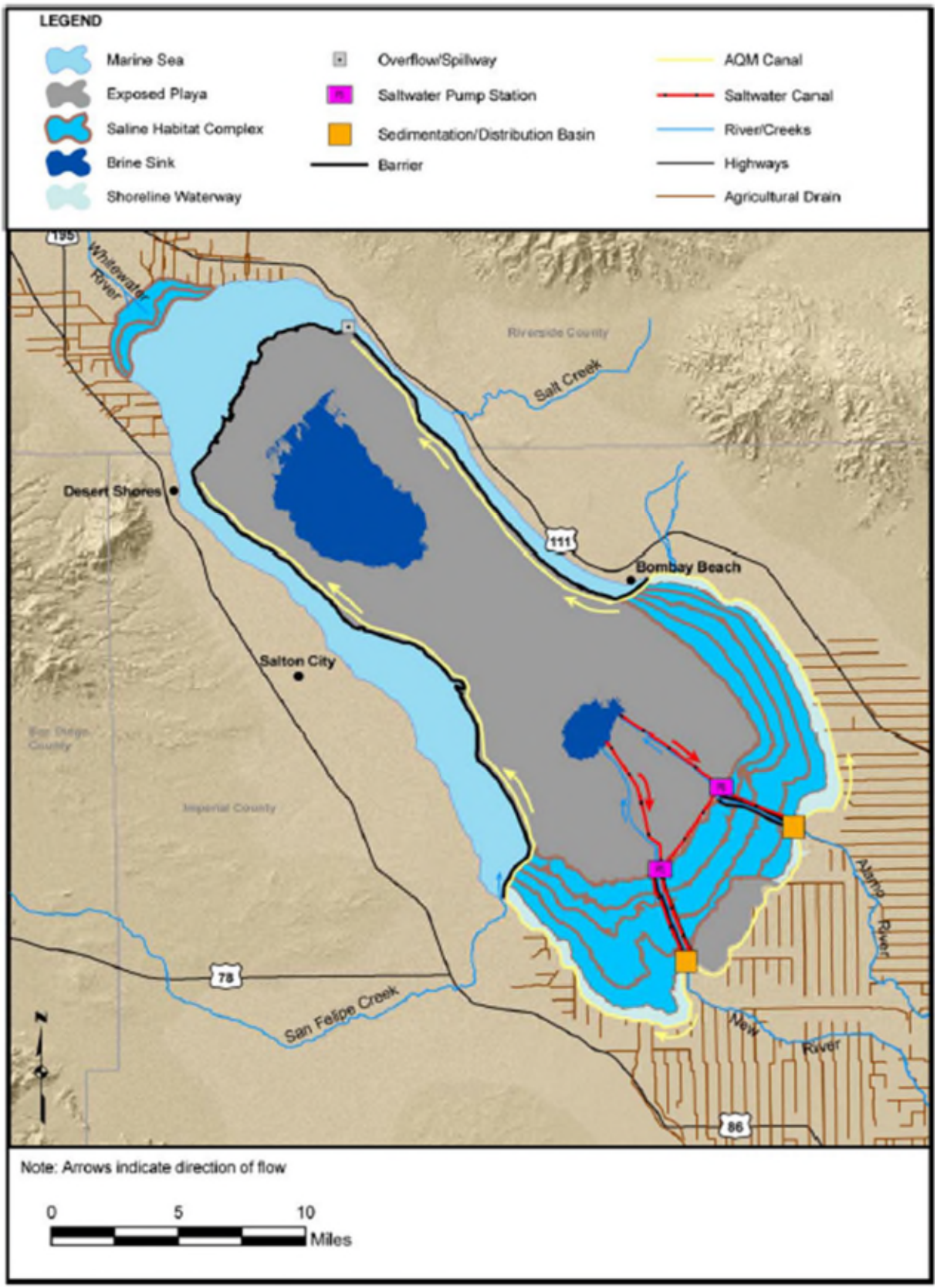

Figure 7: State's Preferred Alternative Layout.

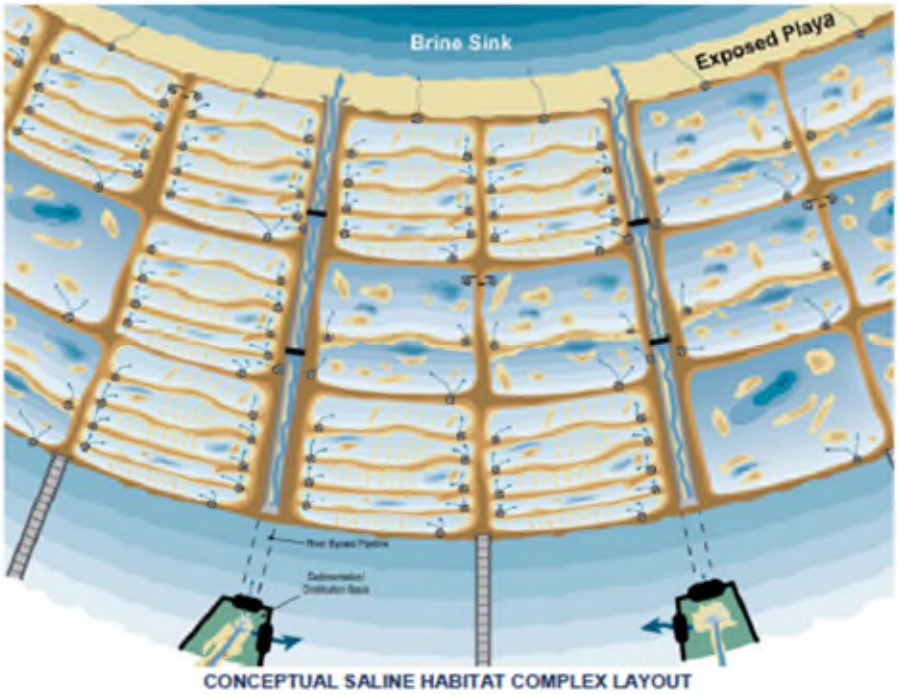

Figure 8: Conceptual Saline Habitat Complex Layout

3.3.3 Marine Sea

A Marine Sea would be formed through the construction of a Barrier. The Marine Sea would stabilize at a surface water elevation of -230 feet msl with salinity levels between 30,000 mg/L and 40,000 mg/L. Air quality Management Canals, Sedimentation/Distribution Basins, and Early Start Habitat would be constructed between the -228 and -230 foot msl contours and would avoid conflicts with existing land uses along the shoreline. Sources of inflows would include the Whitewater River, Coachella Valley drains, Salt Creek, San Felipe Creek, and local drainages. Flows from the New and Alamo rivers would be blended in a large Air Quality Management Canal and diverted into the Saline Habitat Complex and the southeastern and southwestern portions of Marine Sea. The portion of the Air Quality Management Canal located between the Sedimentation/Distribution Basins and Marine Sea would be located along the shoreline of the Saline Habitat Complex and would be siphoned under major drainages and agricultural drains. Air Quality Management Canals would continue on the interior side of the Barrier where the Marine Sea is located. Flows from the Marine Sea would be spilled to the brine sink to maintain salinity and elevation control.

The water depth would be less than 12 meters (39 feet), but additional data should be collected and the maximum water depth should be re-evaluated prior to final design in project-level analysis. The barrier would be

constructed of rock with a seepage barrier on the upstream base. The Barrier would be up to 47 feet above the existing seabed and up to a half-mile wide at the base. The final slope of the Barrier would be 10:1 on the Marine side and 15:1 on the down gradient side, and it would need to comply with DWR, Division of Safety of Dams regulations. The barrier would be constructed using barges, and would need to be constructed before the brine sink recedes. Efficient methods of construction are still in need of evaluation.

3.3.4 Sedimentation/Distribution Basins

Inflows from the New and Alamo rivers would be captured in two 200-acre Sedimentation/Distribution Basins to divert desilted river water into one of Several Air Quality Management Canals or bypass flows into the brine sink. The unlined Sedimentation/Distribution Basins would be excavated along the shoreline and would be located from -228 to -230 feet msl. Water depths would be about 6 feet. Sediment collected in the basins would be periodically dredged and flushed into the brine sink.

3.3.5 Air Quality Management

For the purposes of the PEIR and the Preferred Alternative, assumptions were used to define Air Quality Management components:

- 30 percent of the total exposed playa would be non-emissive and require no actions;
- 20 percent of the exposed playa would use management options that do not require freshwater supplies, such as Brine Stabilization, sand fences, or chemical stabilizers; and
- 50 percent of the exposed playa would use water efficient vegetation that is irrigated with a portion of the inflows to the Salton Sea.

To control dust emission, Air Quality Management Canals could be used to convey water from the Sedimentation/Distribution Basins to a series of 2-square mile units on the exposed playa that would include water filtration and chemical treatment units. The drip irrigators would be buried to reduce potential for selenium toxicity to wildlife from the ponded water, and facilities would be included in each unit to increase the salinity of the water to 10,000 mg/L, if needed. Drains would be constructed under the irrigated area and drainage water would be conveyed to the brine sink. Construction of the irrigation system would require excavations up to 8 feet deep for trenches throughout the exposed playa. Salt bush, or similar vegetation, would be planted every 5 feet apart in rows that would be separated by 10 feet.

3.3.6 Brine Sink

The brine sink would provide the repository necessary to store excess salts, water discharged from the Saline Habitat Complex; Marine Sea; and Air Quality Management areas, and excess inflows. The elevation would fluctuate seasonally based upon the patterns of these tributary flows. During project-level analyses, partitioning of the brine sink could be considered to provide another area with salinities of less than 200,000 mg/L that could support invertebrates and provide additional habitat on the seabed.

3.3.7 Early Start Habitat

An Early Start Habitat would include 2,000 acres of shallow saline habitat for birds. Early Start Habitat was assumed to be located at elevations between -228 and -232 feet msl and could either be a permanent or temporary feature to be eliminated or assimilated as other components are constructed. The Early Start Habitat area would be located along the southern shoreline because the flat slope of the seabed would provide a stable source of inflows into the Early Start Habitat. Saline water from the Salton Sea would be pumped into the cells to be mixed with freshwater from the drains to provide salinity between 20,000 and 60,000 mg/L.

The area would be divided into cells with Berms excavated from seabed materials. Average water depths within each cell would be less than four feet, although deep holes located away from the Berms may extend to 15-foot depths. Specific design and testing criteria would be developed in a project-level analysis.

3.3.8 Land Ownership Assumptions

The Preferred Alternative assumes that easements or deeds would be obtained for the entire seabed below elevation -228 feet msl to allow construction and operations and maintenance activities. If other land uses extend into the seabed, the Preferred Alternative would need to be modified in project-level analyses. For example, if exposed lands were to be converted to cultivated agriculture to an elevation of -235 feet msl, either the components would need to be constructed at lower elevations or displacement dikes would be required to protect the agricultural land.

3.3.9 Implementing Entities Assumptions

The Preferred Alternative was defined and evaluated as if one entity or group of entities implemented the program in a uniform manner. However, the State acknowledged that it would be possible for several entities to implement facilities under separate programs with some level of coordination. For example, facilities located in the northern and southern area of the seabed could be implemented by separate entities with coordinated operations for conveyance of inflows. As another example,

separate entities could implement components with different functions, such as conveyance, Air Quality Management, Marine Seas, and/or Saline Habitat Complex.

3.3.10 Construction Materials Assumptions

For the purposes of the PEIR, development of new rock sources or transportation facilities are not considered part of the Preferred Alternative. For stabilizing components of the Barrier Design rocks or boulders between 1 to 5 feet in diameter are ideal. This rock size was not found to be available in large quantities at existing quarries during the preparation of this PEIR. However, the Preferred Alternative assumption is that this rock would be provided from a permitted quarry and transported to within 10 miles of the shoreline by methods other than trucks. Gravel would also be necessary for the road needed on top of the Berms and Barriers.

3.4 Species Conservation Habitat

Although not a full Salton Sea management option, the SCH project was the first major program developed by the State following completion of their environmental planning process.

In the Frequently Asked Questions (FAQ) section of their website, written in August of 2011, the State of California defines the SCH. “The species conservation Habitat Project (SCH Project) is a State project that will be constructed at the Salton Sea to implement conservation measures necessary to protect the fish and wildlife species dependent upon the Sea. Up to 3,770 acres of shallow water habitat ponds may be constructed depending upon funding availability.” The SCH Project was developed under the authorization of California Fish and Game Code, Section 2932, which established the Salton Sea Restoration Fund.

The Species Conservation Habitat project is different from previously discussed restoration alternatives, as it is a proof-of-concept project for creating habitat ponds on playa as the Sea recedes. A list of six Alternatives was examined before the Preferred Alternative, Alternative 3, was selected. Three of the Alternatives cited the Alamo River as a potential location, and the other Alternatives cited the New River as a potential location. Some of the Alternatives would use pumped diversion while others would use gravity diversion, and some of the alternatives included Cascading Ponds. The Preferred Alternative, discussed below, will be located in the New River and implement a combination of pumped diversion with cascading ponds.

The California Department of Fish and Wildlife (DFW), on behalf of the California Natural Resources Agency, proposed 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 Preferred Alternative 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, and the ponds would be constructed with the necessary infrastructure to allow for the management of water into and through the Project area. 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.

3.4.1 Summary of SCH Alternatives

According to the State, the SCH Project goals are two-fold: (1) develop a range of aquatic habitats that will support fish and piscivorous birds dependent on the Salton Sea; and (2) develop and refine information needed to manage successfully the SCH Project habitat through an adaptive management process. Here is a brief summary of the alternatives proposed for the SCH:

- **Alternative 1 – New River, Gravity Diversion + Cascading Ponds2:** 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 (Preferred Alternative):** 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 environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA (National Environmental Policy 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 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. The Corps has identified Alternative 3, New River, Pumped Diversion + Cascading Ponds as its preferred alternative/LEDPA.

3.4.2 Alternative 3 New River, Pumped Diversion + Cascading Ponds:

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. 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.

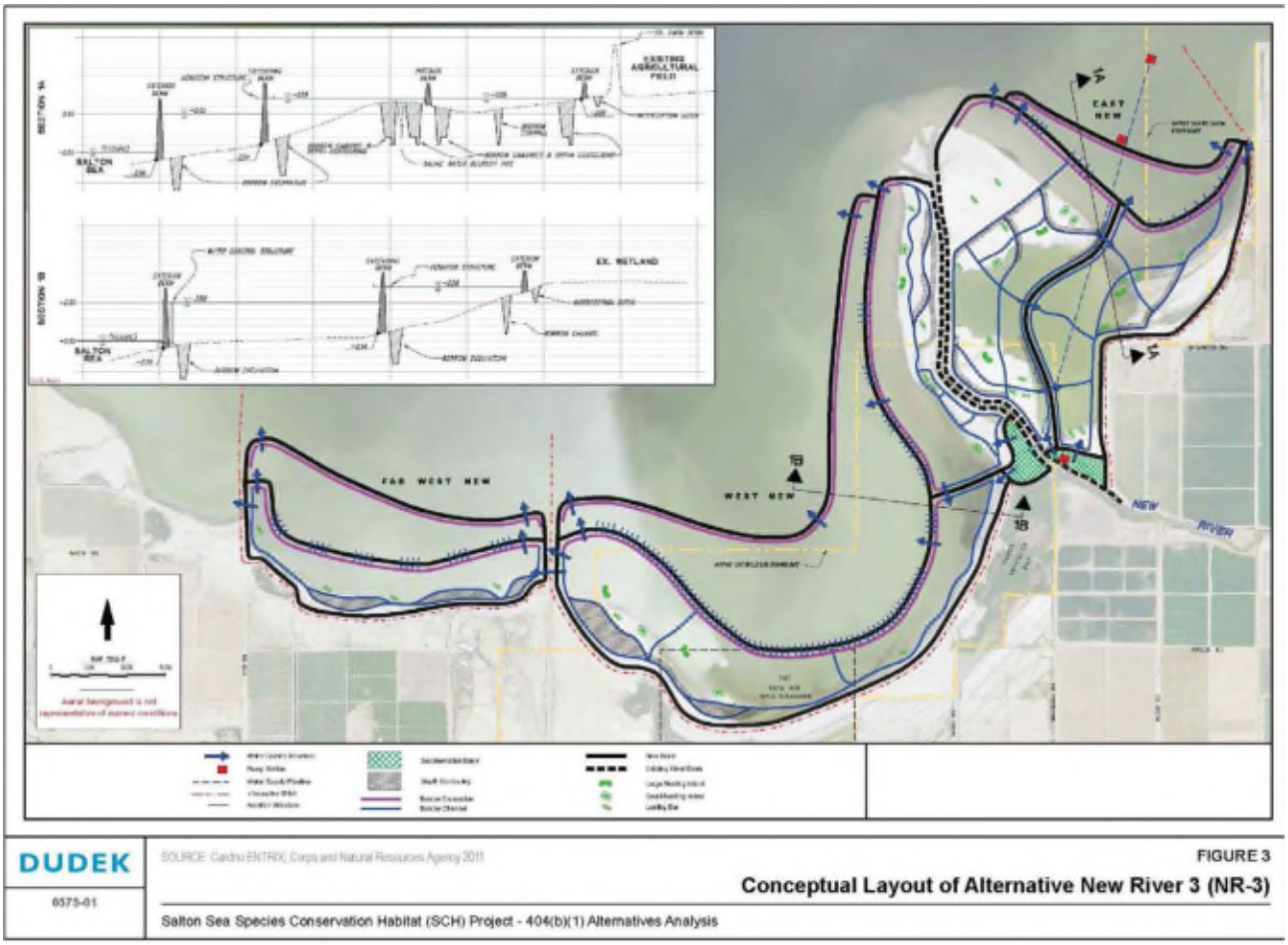

Figure 9: SCH Alternative 3, Preferred Alternative

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4.0 Import and Export Options

The Sea has high salinity and no outlet to remove accumulated salt, a high evaporation rate, and in the near future the Sea will undergo a period of inflow reduction. This task evaluated the potential for transport of water sources that can offset future inflow reductions and provide habitat benefits within and surrounding the Sea. Both small and large improvements will be required to slow or prevent rapid increase in salinity, and support species habitat conservation being planned at Salton Sea. A minimum of 50,000 AFY was identified as the low end of the beneficial supply quantity to the Salton Sea to warrant conceptual level design and cost analysis. Ten potential inflow conveyance alternatives are evaluated including the Santa Ana Regional Interceptor (SARI) Pipeline, the Metropolitan Water District of Southern California (MWD) Concentrate Pipeline, and pipelines to the Gulf of California and the Pacific Ocean.

4.1 Introduction

Benchmark 4 Volume 1 presents an overview of conveyance methods for importing and exporting water from the Salton Sea. In addition, Benchmark 4 Volume 1 also covers In-Sea Partitioning, Salinity and Water Quality Improvements, Air Quality and Dust Mitigation, and Habitat Improvements. When considering methods of conveyance, the following components were discussed: water quantity, water quality, conveyance system and hydraulics, consideration of capital and operational costs, institutional considerations, conceptual plans, cost evaluation, and summary. Benchmark 4 Volume 1 is intended to inform those who are engaged in designing options for the restoration and management of the Sea.

4.2 Inflow Conveyance

The Sea has high salinity and no outlet to remove accumulated salt, a high evaporation rate, and in the near future the Sea will undergo a period of inflow reduction. Due to these reasons, it is important to identify water sources that can offset future inflow reductions and provide habitat benefits within and surrounding the Sea. Both small and large improvements will be required to slow or prevent rapid increase in salinity, and support species habitat conservation being planned at the Salton Sea. A minimum of 50,000 AFY was identified as the low end of the beneficial supply quantity to the

Salton Sea to warrant conceptual level design and cost analysis. Several options that do not achieve this amount are discussed in more general terms. Concerning the issue of inflow conveyance, ten potential inflow conveyance alternatives are discussed in Benchmark 4 Volume 1:

- Santa Ana Regional Interceptor (SARI) Pipeline
- Metropolitan Water District of Southern California (MWD) Concentrate Pipeline
- Yuma Desalting Plant (YDP) Concentrate Pipeline
- Main Outlet Drain Extension (MODE) Pipeline
- Gulf of California
- Pacific Ocean
- Excess Colorado River Water
- Wastewater Treatment Plant (WWTP) Effluent
- Palm Desert Area – WWTP Effluent or Recycled Water Supplies
- Lining of Coachella Valley Stormwater Channel

Figure 10 presents an overview of the water sources evaluated, and other relevant figures for each of the alternatives can be accessed in Benchmark 4 Volume 2. Additionally, each of the alternatives is discussed in Benchmark 4 Volume 2 in terms of the following important aspects: water quantity, water quality, conveyance system and hydraulics, consideration of capital and operational costs, institutional costs. The report also includes a screening level analysis performed using the Modified SSAM for each of the ten inflow conveyance alternatives.

The screening analyses suggest that some of the concepts presented would have only minimal benefits to the full Salton Sea under the projected inflows. However, some of these options could be reviewed again when combined with smaller lake plans.

4.3 Conveyance of Water from the Sea

Due to the lack of an outlet at the Salton Sea, the salt content transferred to the Sea concentrates over time as evaporation occurs. To reduce or maintain salinity at the Salton Sea requires removal of salt content to a disposal location, or it may require evaporation in the Sea's nearby vicinity. Removal of salt is even more critical if one assumes that inflows to the Salton Sea will be reduced starting in 2018, and conveying water from the Sea has been studied to address the drastic rise of salinity that is expected to occur under No Action. A review of previously considered disposal sites and uses of Salton

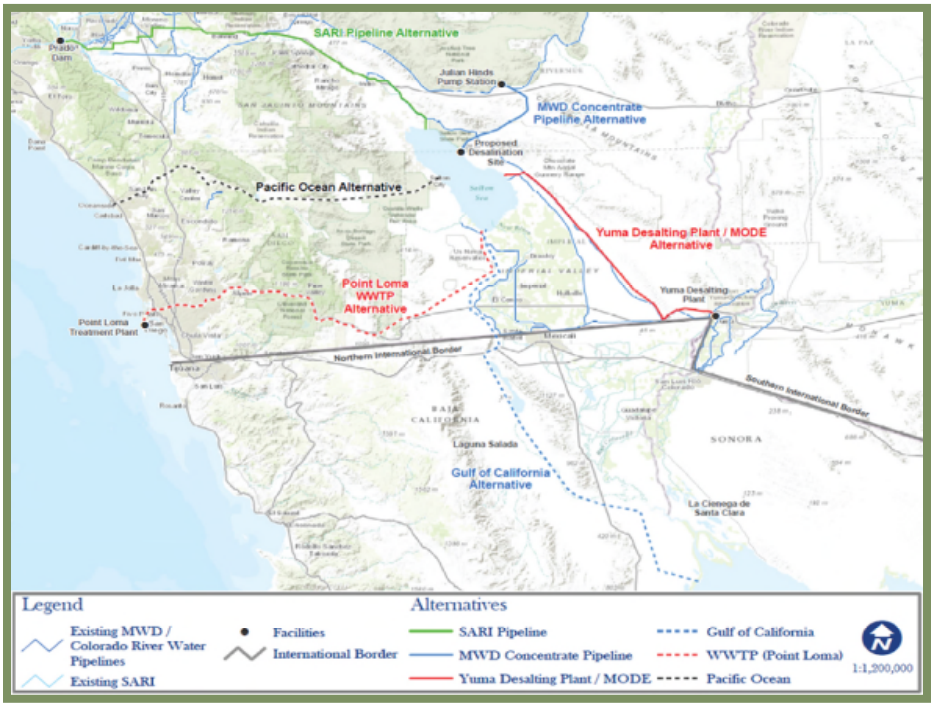

Figure 10: Overview of Alternatives - Inflow to Salton Sea

Sea water was completed and presented in Benchmark 4 Volume 1. In the report, five potential outflow conveyance alternatives are discussed:

- Laguna Salada
- La Cienega de Santa Clara
- Gulf of California
- Palen Dry Lake
- Local Water Use and Evaporative Systems

Figure 16 presents an overview of the conveyance methods evaluated, and other relevant figures for each of the alternatives can be accessed in Benchmark 4 Volume 1. Additionally, each of the alternatives is discussed in terms of the following important aspects: water quantity, water quality, conveyance system and hydraulics, consideration of capital and operational costs, institutional costs. The report also includes a screening level analysis performed using the Modified SSAM for each of the four outflow conveyance alternatives.

4.4 Combined Water Source and Outlet Systems

To both offset inflow reductions and better reduce salt and nutrient accumulations in the Sea, combined solutions which provide inflow sources and outflow destinations have been considered at the Salton Sea. These

Figure 11: Overview of Alternatives - Outflow from Salton Sea

combined solutions of inflow and outflow conveyance are also discussed in section Benchmark 3 Volume 1. In the report, three potential inflow/outflow conveyance alternatives are discussed:

- Salton Sea to Gulf of California
- Salton Sea to Pacific Ocean
- Local Desalination

Relevant figures for each of the alternatives can be accessed in Benchmark 4 Volume 1. Additionally, each of the alternatives is discussed in terms of the following important aspects: water quantity, water quality, conveyance system and hydraulics, consideration of capital and operational costs, institutional costs. The report also includes a screening level analysis performed using the Modified SSAM for each of the three combined water source and outlet systems.

4.5 Performance of Alternatives

A screening level performance analysis was conducted for each of the alternatives using a modified version of the Salton Sea Accounting Model (Modified SSAM). The SSAM model was modified by Tetra Tech using the latest available bathymetry for the Salton Sea lake bottom. It was also adapted to operate in a user-friendly manner to evaluate various inflow and outflow options.

For each of the alternatives, the Modified SSAM was run for two future inflow scenarios. The baseline case assumes a future inflow of approximately 865,000 AFY by 2077, long after QSA mitigation flows end in 2017. The uncertainty future inflow scenario of about 689,000 AFY was also evaluated. The Modified SSAM and the future inflow assumptions are discussed in Salton Sea Funding and Feasibility Action Plan, Benchmark 2: Review and Update Existing Condition Data.

Running the model for No Action requires inputting a scenario of no pump in or pump out. The figures in this section will show the predicted impacts of No Action in the Modified SSAM, and these predicted impacts will provide a reference point for other alternatives discussed in subsequent sections. For No Action, the results of the model run for the baseline future inflow case of 865,000 AFY are shown in Figure 12, and the results of the model run for the baseline uncertainty inflow case of 689,000 AFY are shown in Figure 13.

For the baseline inflow case, the results shown in Figure 12 indicate that the lake level would fall about 14 feet below current sea level by the year 2030. Salinity would also continue to rise under No Action.

Key results of the baseline inflow model run are as follows:

- The water surface would stabilize around the year 2030 at an average elevation of around -248' NGVD which would result in an average water depth of around 19 to 20 feet and a maximum depth of about 25 to 26 feet.
- Salinity would continuously rise with this alternative, and the lake would be around 180 to 190 ppt by the year 2100.
- The lake area would stabilize at about 260 to 270 sq mi after the year 2030.
- The volume of water in the lake in the year 2050 is projected to be 3.06 MAF or about 40.2% of the lake volume as it was in 2000.

For the uncertainty inflow case, the results shown in Figure 13 indicate that the lake would fall to a lower elevation and the salinity will increase to a greater degree. Additionally, the lake volume would be reduced to an even smaller size than for the baseline inflow case, with the volume dropping to approximately 28.7% of the year 2000 volume.

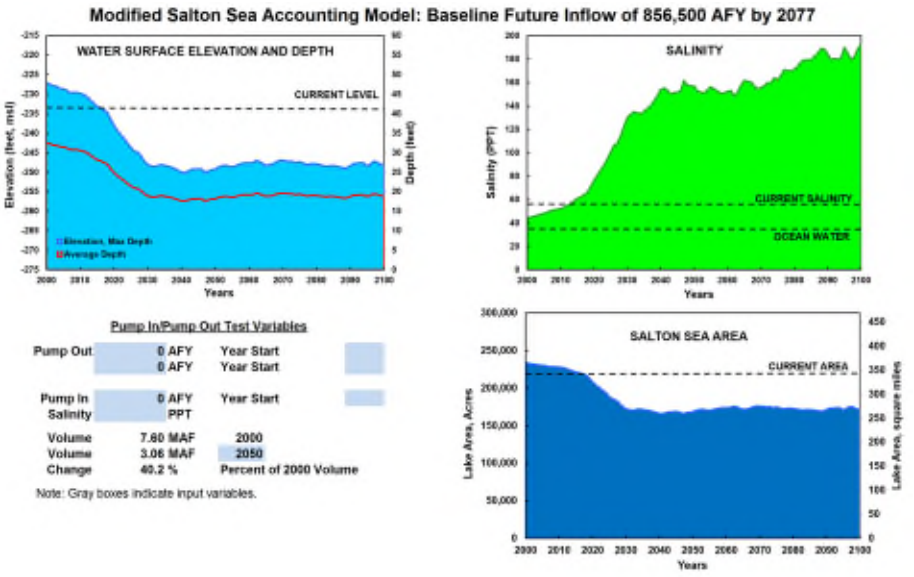

Figure 12: No Action Baseline Future Inflow

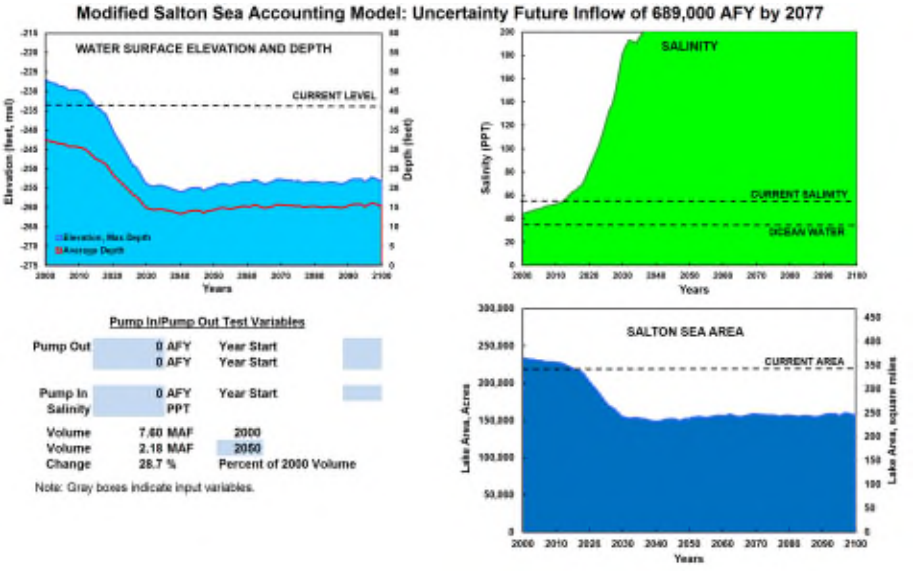

Figure 13: No Action Uncertainty Future Inflow

All of the other alternatives were analyzed using the modified SSAM, and they were compared to the No Action Scenario shown above.

4.6 Evaluation of Import/Export Alternatives

The feasibility of the alternatives presented in Benchmark 4 Volume 1 were assessed, and a ranking system was developed to compare alternatives in terms of cost and effectiveness. Three matrices were developed for inflow conveyance (Table 1), outflow conveyance (Table 2), and combined solutions

(Table 3). Each of the matrices ranks the alternatives on the basis of the following:

- Water Quantity
- Water Quality
- Operational Cost benefit
- Capital Cost Benefit
- Approvals and Environmental
- Community Impacts and Easements

Table 1: Ranking Matrix of Alternatives for Inflow to Salton Sea

	Water Source		Conveyance System		Institutional Considerations		
SALTON SEA IMPORTS	Water Quantity	Water Quality	Operational Cost Benefit	Capital Cost Benefit	Approvals and Environmental	Community Impacts and Easements	TOTAL
SARI	1	1	1	1	2	1	7
MWD	2	3	4	3	3	4	19
Yuma Desalting Plant (Concentrate)	2	3	3	3	3	4	18
MODE Pipeline	4	3	4	4	1	1	17
From Gulf of California	5	2	1	1	1	2	12
In from Pacific Ocean	5	2	1	1	1	1	11
Colorado Excess	n/a	-	-	-	-	-	-
Hyperion WWTP	5	4	1	1	1	1	13
Point Loma WWTP	5	4	1	1	1	1	13
Local WWTPs	2	4	4	4	2	3	19
Coachella Channel	1	4	5	3	1	3	17

Table 2: Ranking Matrix for Outlet Alternatives

	Outlet		Conveyance System		Institutional Considerations		
SALTON SEA EXPORTS	Water Quantity	Outlet Impact	Operational Cost Benefit	Capital Cost Benefit	Approvals and Environmental	Community Impacts and Easements	TOTAL
Laguna Salada	5	2	5	5	2	2	21
La Cienega de Santa Clara	5	1	5	4	1	1	17
To Gulf of California	5	4	4	3	2	1	19
Evaporation Facilities Dust Mitigation Evaporation Ponds Enhanced Evaporation	2	4	5	4	3	3	21
To Pacific Ocean	5	4	2	3	1	1	16
Palen Dry Lake	5	1	1	5	3	2	17

Table 3: Ranking Matrix of Combined Inlet and Outlet Alternatives

	Water Source		Conveyance System		Institutional Considerations		
SALTON SEA – COMBINED IN/OUT	Water Quantity	Outlet Impact	Operational Cost Benefit	Capital Cost Benefit	Approvals and Environmental	Community Impacts and Easements	TOTAL
Sea to Sea Gulf	5	1	2	2	2	1	13
Sea to Sea Pacific	5	1	1	2	1	1	11
Local Desalination	4	5	4	3	3	4	23

Part of the work put into Benchmark 4, Volume 1 also included evaluating the cost of each of the alternatives. Table 4 shows a summary of the cost evaluations. More detailed information on these estimates can be found in the Benchmark 4, Volume 1 report.

Table 4: Summary of Cost Evaluations

Alternatives	Flow (AF)	Subtotal	Contingency (30%)	Total
Inflow to Salton Sea - MWD Concentrate	43,000	$132,845,000	$39,854,000	$172,699,000
Inflow to Salton Sea - YDP Concentrate	32,000	$243,775,000	$73,133,000	$316,908,000
Inflow to Salton Sea - Local WWTPs	15,700	$24,783,000	$7,435,000	$32,218,000
Outflow from Salton Sea - Laguna Salada	150,000	$405,142,000	$121,543,000	$526,685,000
Outflow from Salton Sea - Gulf of California	150,000	$910,043,000	$273,013,000	$1,183,056,000
Outflow from Salton Sea - Evaporation Ponds	50,000	$34,765,000	$10,430,000	$45,195,000
Inflow/Outflow at Salton Sea - Desalination	75,000	$950,997,000	$285,299,000	$1,236,296,000

5.0 In-Sea Improvements

Following reviews of the features and benefits of past management plans for the Salton Sea, a new smaller lake concept has emerged, referred to as the Perimeter Lake for the Salton Sea. It takes into account the immediate need for action, the limitations on water supply for the lake, and the possibility of constructing a project with incremental funding. The new approach would involve constructing a lake around the perimeter of the Sea along with a central saline pool within the current Sea footprint. This concept is anticipated to work with other projects being planned by the State and the Imperial Irrigation District as part of an overall Salton Sea management program. Important aspects of the concept that are evaluated include the following: conceptual construction details; water inflow requirements and water quality improvement in inflow; conceptual design of spillways and air quality mitigation; geotechnical feasibility study; and construction scenario, cost estimate, funding, and cost comparisons to past alternatives.

5.1 Introduction

Following reviews of the features and benefits of past plans, a new smaller lake concept has emerged. The new concept is referred to as the Perimeter Lake for the Salton Sea. It takes into account the immediate need for action, the limitations on water supply for the lake, and the possibility of constructing a project with incremental funding.

The new approach would involve constructing a lake around the perimeter of the Sea along with a central saline pool within the current Sea footprint. This concept is anticipated to work with other projects being planned by the State and the Imperial Irrigation District (IID) as part of an overall Salton Sea management program. A complete management plan for the Salton Sea would include the Perimeter Lake concept combined with IID's SSRREI Initiative, an air quality management plan, and other smaller projects around the Sea such as the Red Hill Bay and SCH projects, as illustrated in Figure 14.

Benchmark 4 Volume 2 describes the Perimeter Lake in more detail. Important aspects of the concepts that are outlined in Benchmark 4 Volume 2 include the following:

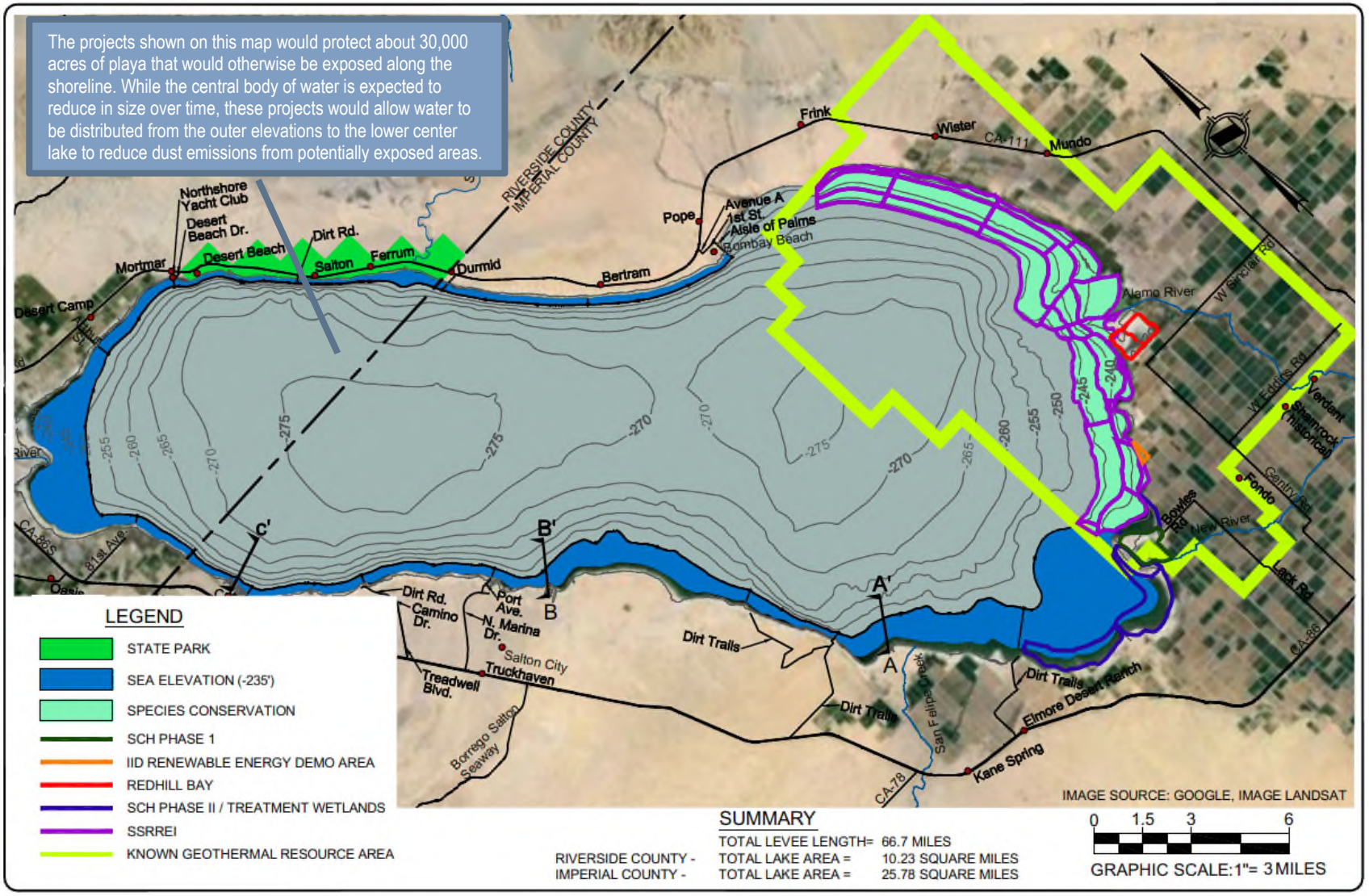

Figure 14: Perimeter Lake Concept

- Project goals and Perimeter Lake concept overview;
- Conceptual construction details;
- Water inflow requirements and water quality improvement in inflow;
- Conceptual design of spillways and air quality mitigation (AQM);
- Geotechnical feasibility study; and
- Construction Scenario, Cost Estimate, Funding, and Cost Comparisons to Past Alternatives

5.2 Project Goals and Perimeter Lake Overview

Without implementation of a sound management plan, the Salton Sea is expected to enter into a period of rapid decline over the next decade. The Perimeter Lake concept is designed to be a key part of such a management plan, and it is intended to meet a set of performance objectives proposed by the Authority that include the following:

- Preserve the Sea as a Repository for Agricultural Runoff
- Provide Lake with Stable Elevation
- Improve Water Quality: Salinity
- Improve Water Quality: Nutrients/Other Constituents
- Maintain and Improve Habitat
- Achieve Water Quality and Habitat Objectives in a Timely Manner
- Respond to Inflow Changes
- Increase Recreational and Economic Potential
- Address Air Quality (PM_{10}) Concerns
- Provide High Safety Rating/Low Risk of Failure
- Overcome Institutional Barriers/Public Acceptance (Permitting)
- Reasonable Cost/High Probability of Financing

5.3 Project Overview

The Perimeter Lake would rely upon a system of low profile levees to create a reasonably affordable and sustainable water body. This system would generally resemble an in-stream reservoir built along a slowly flowing river, it would include wider recreational areas in the north and south ends of the Sea, although boating would be accommodated along the entire 60+ mi of lake front property. The exposed playa on the southern end of the Sea near the Perimeter Lake project site would be designated for IID's SSRREI. Built

incrementally, the water used in the Perimeter Lake system would initially flow through a series of linked but separated elongated ponds.

Treatment wetlands, possibly those incorporated in the SCH project, are proposed near or upstream from the mouth of the New River to provide higher quality water entering the system, although no specific plans have been developed at this point. In sections ranging from 500 ft to over 2 mi in width, water entering the Perimeter Lake system would arrive in a wide area at the south end of the Sea, flow northward along the western shore, and arrive at another wide area in the north. Water would flow out of the northern area and move southward along the eastern shore to a terminus spillway. Here, at the terminus spillway, excess water would be channeled into a permanent saline pool in the center of the historic seabed.

Spillways at several locations within the system and the quantity and salinity of water diverted into the system would allow for management of salinity from near fresh to marine, with the expectation that the target salinity would be brackish (15-20 PPT). Excess salinity would concentrate in the saline pool located near the center of the Sea.

At full build out, the total length levee running parallel to the shore would be approximately 61 miles. Additionally, 13 perpendicular connector levees or dikes totaling 6 mi would connect to existing roads so that construction could proceed as individual cells. The total area of all 13 cells would be approximately 36 sq mi, with 10 sq mi in Riverside County and 26 sq mi in Imperial County. The levees would be constructed by dredging a channel along the lake side of the levee which would create a deep water habitat area of up to 25 ft in depth for the full length of the lake.

The annual inflow required to balance evaporative and seepage losses is estimated at 167,000 AFY (acre-ft per year). Initially, additional water could be run through the system to reduce salinity and nutrients in the water column and clean out detritus. Once in operation, the water body could be used to convey water to other habitat areas or for dust control.

As Figure 15 shows, salinity control is expected to occur near Bowles road and in the Bombay Beach area, and playa between those areas is expected to be used for SSRREI habitat and geothermal activity.

5.4 Conceptual Construction Details

The Perimeter Lake concept has evolved over time, and would work in concert with IID's SSRREI Initiative Project, the State of California's Species Conservation Habitat (SCH) project, Red Hill Bay Restoration Project, and Imperial County (AQM) objectives. The Benchmark 4, Volume 2 document

describes concept development and conceptual construction details for the Perimeter Lake. Various depths, levee configurations and lake sizes for the Perimeter Lake were considered. Three embankment configurations were considered for use as levees on the Seaside of the new lake configuration: Earthen Levees with broad 15:1 side slopes created from local dredging, Geotube® Levees, and Sheet Pile Levees. Each design was evaluated with respect to the following performance criteria: constructability, cost, maintenance, environmental considerations, permitting, footprint derived from angle of repose, and risk and uncertainty.

The earthen levee embankment was considered to have multiple advantages and was selected for further analysis in the Perimeter Lake concept. It was expected to be the lowest cost solution and rated best in constructability and related considerations. Furthermore, because a significant allocation of the construction cost would be for dredging which would have the advantage of creating deep water areas which would have ecological and recreational benefits. Figure 9 illustrates the earthen levee concept.

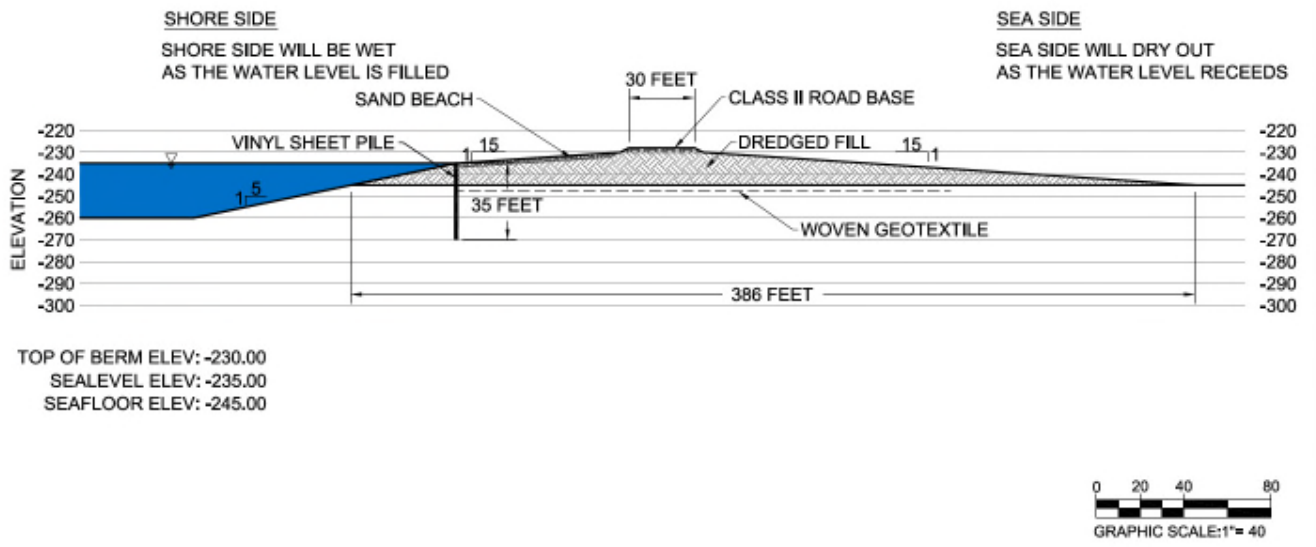

Figure 15: Levee Cross-Section Configuration with Seepage Barrier

Two possible scenarios were considered for construction of the levees. The levee construction could be completed with one team in approximately ten years, or it could be completed with two teams working in parallel in approximately five years. The selected scenario would depend on the availability of funding.

5.5 Water Inflow Requirements and Water Quality Improvement in Inflow

Benchmark 4, Volume 2 includes a water budget analysis and a discussion of the residual saline pool. The water budget and salinity analysis for the

Perimeter Lake is presented based on expected evaporation and seepage losses and other possible inflow considerations. Accounting for these variables, three scenarios were analyzed to estimate the water budget for the project: a base scenario that includes no releases for beneficial operations such as dust control, and two scenarios that would feature water releases for dust control or other beneficial uses.

Inflow water quality needs to be improved to achieve the full beneficial use potential of the Perimeter Lake. Treatment wetlands are proposed for this purpose and discussed in Section 4.0. These wetlands would be used to improve the water quality, particularly nutrients and suspended sediments, of the New River before they flow into the Perimeter Lake. Estimated area requirements are based on pilot wetland results from Brawley and Imperial, and to meet project targets of 2- 3 mg/l total nitrogen and 0.1-0.25 mg/l total phosphorus, the project would require surface areas from 590-1,150 acres under low infiltration conditions and 470-610 acres under mean infiltration conditions.

5.6 Conceptual Design of Spillways and Air Quality Mitigation

Although the Salton Sea is set in an arid region, it is subject to occasional floods, such that the Perimeter Lake design must account for them. Benchmark 4, Volume 2 includes conceptual designs of overflow spillways to address both the average annual inflow as well as the occasional flooding produced from the rare storm event. The intent of the structures is to allow the average inflow of water to circulate within the Perimeter Lake while maintaining a desired water level, provide emergency flood relief to prevent overtopping of the levee, and still maintain sufficient freeboard for safety purposes. The overflow structures include three 20 ft bellmouth spillways near the North Shore Yacht Club, the Bombay Beach and the old base; and a 1,000 ft wide broad crested weir near the North Shore Yacht Club. These structures would stimulate clockwise internal circulation and exchange water inside the Perimeter Lake up to a rate equal to the entire lake volume twice annually.

As the Salton Sea recedes due to declining inflows, windblown dust emissions from the exposed dry lakebed (the playa) would increase in some areas, potentially leading to violations of particulate matter standards and human health risks. Potential air quality impacts from exposed Salton Sea playa must be monitored and mitigated through various steps including restricted access, research and monitoring, dust control measure implementation, and purchase of emission reduction credits.

5.7 Geotechnical Feasibility Study

A feasibility-level geotechnical assessment was conducted to evaluate slope stability and seepage associated with the Perimeter Lake design. The evaluation did not identify any geotechnical factors that would preclude the successful design and construction of the project. However, several factors would require special consideration during the design, engineering and construction of the project. These factors would include dewatering of excavated materials and mechanical placement and compaction, mitigation of settlement and seepage, and soil liquefaction and seismic deformation mitigation, all of which were considered in developing the construction scenario and detailed cost estimates and schedules.

5.8 Construction Scenario and Cost Estimate

Construction would involve sheet pile installation, geotextile deployment, dredging and stockpiling of sediments, construction of spillway structures, grading and armoring of the levees, construct of roadways on top of the levees, and construction of causeways. Ferry barges or floating bridges would allow access to the levees for maintenance once causeways dividing the cells have been breached.

A detailed feasibility-level cost estimate was prepared for two construction scenarios: construction of Phase 1 and 2 in series and construction of Phase 1 and 2 in parallel. While funding sources are still being investigated, a review of the State's funding plan from 2007 is included. Details on the construction scenarios, the cost estimate, and the funding sources can be found in Benchmark 4, Volume 2. Table 5 provides a top-level cost estimate summary for each scenario. Alternative A is estimated at a total cost of $1.7 billion including contingencies. Alternative B is estimated at a total cost of $1.8 billion including contingencies. Table 6 shows an approximate breakdown of costs by cell. Cell locations are shown in Figure 16. Funding sources and more details on costs are presented in Benchmark 4 Volume 2.

5.9 Comparison to Past Alternatives

Table 7 provides a compares the Perimeter Lake to past alternatives. Note that is expected that a complete Salton Sea management plan would include the Perimeter Lake, IID's SSRREI, the State's SCH and other related projects.

5.10 Benefits of the Perimeter Lake Concept

The Perimeter Lake concept would revitalize the Salton Sea and the surrounding area by providing the following benefits: stable shoreline with elevation control in a lake with an area of 36 sq mi; improved water quality with reduced salinity; a source of water for AQM; compatibility with other Salton Sea management projects; and a deep water habitat that would also

Table 5: Summary of Cost Estimates for Perimeter Lake Construction Alternative Scenarios A and B

Permitting, Design and Construction of The Salton Sea Restoration Plan Alternative A and Alternative B Estimate Comparison PERIMETER LOW PROFILE LEVEE ALTERNATIVE					
Item	Description	Alternative A ($Millions)	Alternative B ($Millions)	Difference ($Millions)	Comments
1	Initial Activities for Project Approval	$24	$24	$0	
2	Permitting, Engineering and Procurement	$27	$28	$1	Additional Procurement and Inspection Expense for Equipment
3	Construction Management and Support	$163	$167	$5	Shorter Schedule Offset by Additional Personnel for Two Crews
4	Salton Sea Authority Management/Other Direct Expenses	$121	$109	($11)	SSA Management Organization on Site Less Time
5	Mobilization	$33	$47	$14	Mobilization and Assembly of Additional Equipment
6	Quarry Operation and Aggregate Production	$164	$191	$27	Increased Equipment Production and Operation Schedule
7	PVC Sheetpile Installation	$232	$238	$7	Added Another Independent Crew - Unit Price Slightly Higher
8	Install Spillways and Flood Control Structures	$65	$65	$0	
9	Dredging and Levee Construction	$509	$550	$41	Duplicate Equipment for Second Independent Crew
10	Grade and Armor Levee/Construct Access Points	$90	$100	$10	Increased Equipment and Operation Schedule
11	Other Miscellaneous Works to complete the Project	$10	$10	$0	Placeholder No Change
12	OM&M of the Constructed Project (10 Years is Assumed)	$47	$47	$0	No Change
	Subtotal	**$1,483**	**$1,576**	**$93**	
	Recommended Contingency (15%)	$222	$236	$14	
	Total	**$1,705**	**$1,813**	**$108**	

Table 6: Approximate Cost Distribution for Constructing Cells for Alternative A

Salton Sea Perimeter Levee Phased Cost Estimate
Direction: Clockwise Beginning from 6 O'Clock

Levee ID	Phase	Reach	Volume %	Sheetpile %	Earthwork ($M)	Sheetpile ($M)	Permit, Engineer, Procure & Owner Mgmt. ($M)	Total ($M)
Bowles Rd. to Dirt Rd	1	A	7.9%	7.8%	$95	$21	$13	**$129**
Dirt Rd to Old Base	1	B	9.5%	9.3%	114	25	16	**155**
Old Base to Dirt Road	1	C	4.5%	4.5%	54	12	8	**74**
Dirt Rd to Marina	1	D	14.1%	13.9%	170	38	24	**231**
Marina to Dirt road	1	E	6.4%	6.3%	77	17	11	**104**
Dirt Road to Desert Shores	1	F	5.2%	5.1%	63	14	9	**85**
Desert Shores to 81st Ave	1	G	6.5%	6.5%	79	17	11	**107**
81st Ave. to Arthur St.*	2	H	15.1%	12.0%	181	40	20	**242**
Arthur St to North Shore YC	2	I	4.4%	5.0%	53	12	8	**73**
North Shore YC to Dirt Rd	2	J	5.8%	6.5%	69	15	11	**96**
Dirt Rd to Crooker Dr	2	K	6.8%	7.6%	82	18	13	**113**
Crooker Dr to Dirt Rd	2	L	6.7%	7.6%	81	18	13	**112**
Dirt Rd to Bombay Beach	2	M	7.2%	8.1%	86	19	14	**119**
		Totals	100.0%	100.0%	$1,204	$266	$170	**$1,640**
							Initial Activities for Project Approval (e.g. Demonstration Project, NEPA/CEQA)	**$24**
							Program Mobilization	**$32**
							Initial Project Approval and Mobilization Contingencies	**$8**
						Total	**Total**	**$1,705**

* From 81st Ave. to Arthur St. there is a deepened levee section

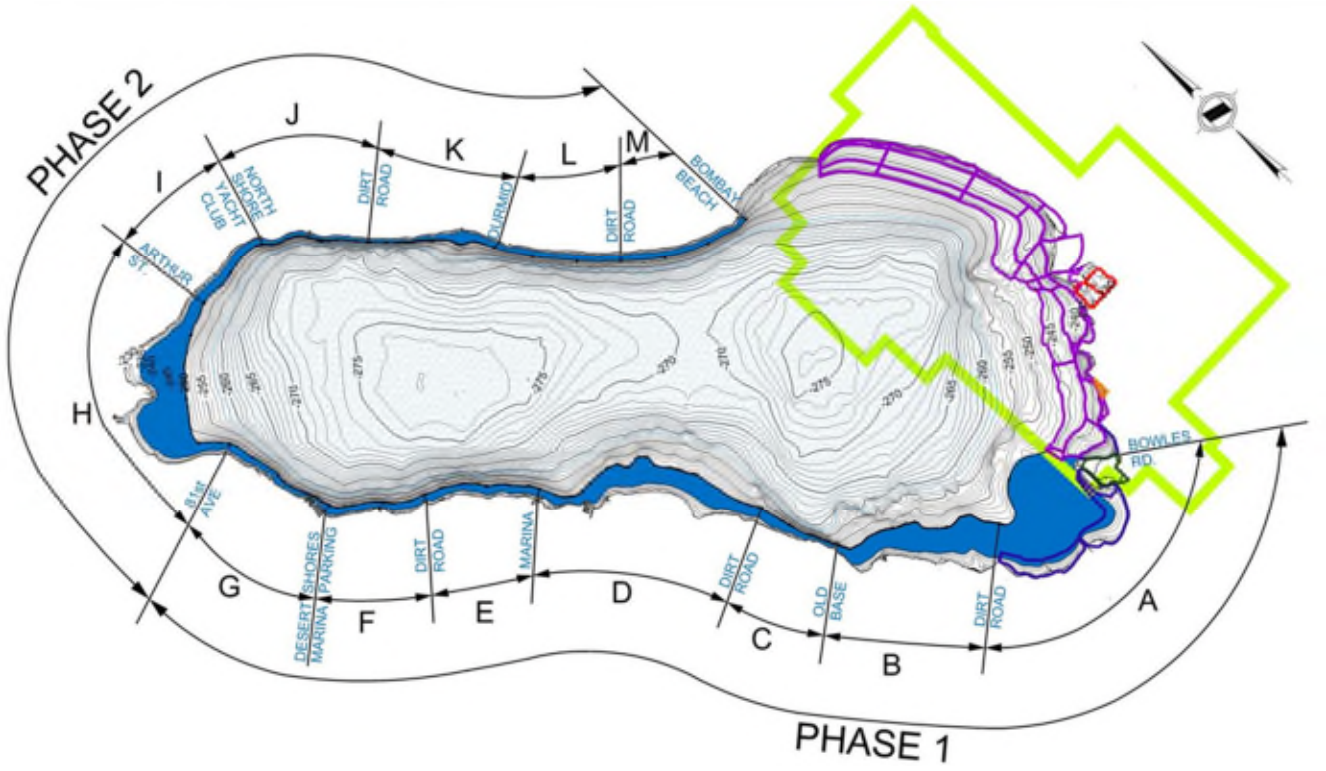

Figure 16: Access Levee Locations and Construction Phases

be suitable for recreational uses. Spillways in the north and south would provide salinity control and allow management of water in the Perimeter Lake at brackish levels (15-20 PPT). Initial flushing would help remove detritus and nutrients that are already present in the lake at high levels, and proposed treatment wetlands would improve the quality of water flowing in from the New River.

Lake elevation with this plan would be slightly below historic shorelines from 1960-2010 period; however, these levels would reduce the water requirement for the Perimeter Lake component to only 167,000 AFY, and remaining inflow (522,000-689,000 AFY) could be used for other projects such as SCH, IID's SSRREI, AQM, or other habitat projects. The Perimeter Lake is planned to be outside the boundaries of the KGRA and thus would not interfere with opportunities for development of geothermal or other renewable energy projects.

The deep water areas of up to 25 ft have recreational value for boating and fishing, and they would also benefit habitat by providing a food source for resident and migratory piscivorous birds. Additionally, the Perimeter Lake plan would include 130 mi of shallow habitat along the existing shoreline and

Table 7: Alternative Evaluation

Objectives	Perimeter Lake	State 2006	Authority 2006	Import/Export
Preserve the Sea as a Repository for Agricultural Runoff	Yes	Yes	Yes	Yes
Provide Large Lake with Stable Elevation	Yes / Smallest	Larger than Perimeter Lake	Larger than State	Full Sea
Improve Water Quality: Salinity	5 – 35 PPT	35 PPT	35 PPT	45 - 50 PPT
Improve Water Quality: Nutrients/Other Constituents	Yes	Yes	Yes	Yes
Maintain and Improve Habitat	Yes	Yes	Yes	Yes
Timeframe to Achieve Water Quality and Habitat Objectives	Short	Medium	Medium	Long
Respond to Inflow Changes (Required Water Inflow)	167,000 AFY for evap. and seepage	~700,000 AFY	~700,000 AFY	~700,000 AFY
Increase Recreational and Economic Potential	Yes	Yes	Yes	Yes
Air Quality Mitigation	Good	Good	Good	Very Good
Provide High Safety Rating/Low Risk of Failure	Low	Moderate	Moderate	Moderate
Institutional Barriers/ Permitting	Average	Average	Difficult	Very Difficult
Reasonable Cost/ High Probability of Financing	Lowest cost with the highest probability of financing from State and Federal sources	Higher cost than Authority 2006 plan with low probability of financing from State and Federal sources	Higher cost than Perimeter Lake with low probability of financing from State and Federal sources	Highest cost with the low probability of financing from State and Federal sources

levees for wading birds. At 36 sq mi, the Perimeter Lake would be significantly larger than all other lakes in southern California, including the 32-sq mi Lake Havasu. A comparison of the northern and southern areas of the Perimeter Lake to three California lakes is shown in Figure 17.

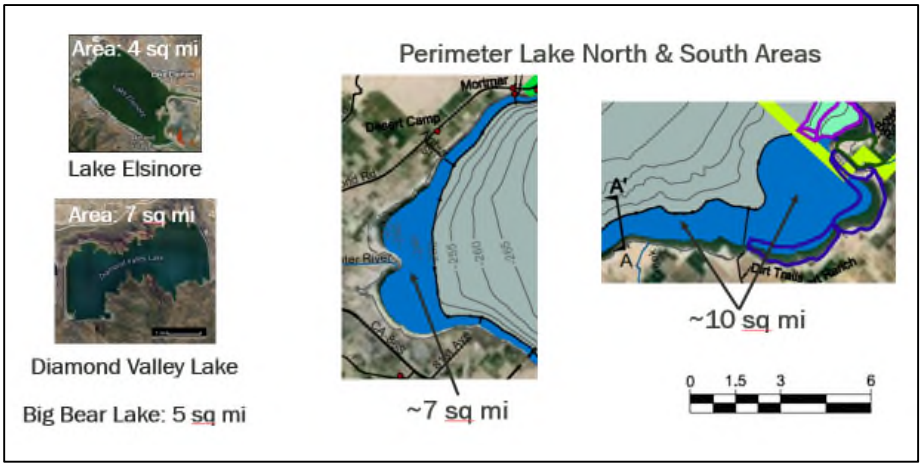

Figure 17: Comparison of North and South Areas of Perimeter Lake to Other Southern California Lakes

In addition to the general benefits of the Perimeter Lake plan, the plan would provide specific benefits in Imperial County and Riverside County.

Imperial County. Benefits in Imperial County include the following:

- A 26 square mile lake with areas up to 25 ft deep;
- A Lake with significantly cleaner and lower salinity water than the current Salton Sea;
- A stable shoreline for Imperial County communities such Bombay Beach, Desert Shores, Salton City & Salton Sea Beach;
- Dredging that would allow access to existing marinas;
- A deep reservoir in south to support the micro-climate for agriculture;
- A shallow habitat zone along nearly 100 miles along the existing shoreline and levees;
- Habitat/dust control in SSRREI area that allows full access to KGRA;
- Provisions for supporting the existing Air Quality Control Plan; and
- An irrigation source for emissive playa in Imperial County.

Riverside County. Benefits in Riverside County include the following:

- A 10 square mile lake with areas up to 25 ft deep;
- A shallow habitat zone along nearly 30 miles along the existing shoreline and levees;
- A lake with cleaner, lower salinity water;
- A Stable shoreline for Riverside County areas including the State Recreation Area;
- Dredging that would allow access to existing marinas such as North Shore Yacht Club; and
- An irrigation source for emissive playa in Riverside County.

As described in Benchmark 4 Volume 1, No Action would cause a rapid increase in salinity, a rapid decline in elevation, and a decreased Salton Sea area. Other efforts to address these concerns, such as importing and exporting large amounts of water, would require more money and water than what is needed for the Perimeter Lake Plan. As with any Salton Sea management project, funding and permitting the Perimeter Lake Plan would be a challenge; however, the needs (in terms of water and cost) along with the benefits of the plan make it a viable alternative.

6.0 Funding Options from Real Estate Sources

The Infrastructure Financing Feasibility analysis considers that the Authority will have the ability to fashion the Salton Sea along the former shoreline with combinations of dikes and dredging to produce water features that will be able to sustain recreationally attractive water near the shoreline (defined as "Seaside Improvements"). This Infrastructure Financing Feasibility analysis was prepared to estimate the total revenues generated by development attracted by the recreational water and Seaside Improvements ("Landside Development"), and the total estimated Seaside Improvement costs that can be repaid with such revenues. The Infrastructure Financing Feasibility Study was undertaken to determine if Landside Development could be a major funding source for Seaside Improvements. Objectives for this initiative are outlined, and the key tasks performed to create a comprehensive analysis are explained.

6.1 Introduction

The Salton Sea Authority ("Authority") has jurisdiction over approximately 300,000 acres adjacent to the Salton Sea in Riverside and Imperial Counties. The Authority has statutory authority to form Infrastructure Financing Districts ("IFD") in part or all of the Authority's area "for the purpose of funding the construction of, and purchasing power for, projects for the reclamation and environmental restoration of the Salton Sea…"(Calif. Gov. Code 53395.9). This "Feasibility Study" assumes that IFDs will be funded by property tax increments generated by development that is enabled by the funded seaside infrastructure. The Feasibility Study also considers the potential for sales tax and transient occupancy tax revenues.

Formation of an IFD requires a number of steps, one of which is the preparation of an infrastructure-financing plan (Section 53395.14). The Authority is asserting a leadership role in spearheading a reconnaissance level analysis of the feasibility of forming one or more Enhanced Infrastructure Financing Districts ("EIFD"s), Infrastructure and Revitalization Financing Districts ("IRFD"s), or a combination of both EIFDs and IRFDs (collectively referred to as "IFD"s), depending on existing legislation at the time of implementation. As the Salton Sea recedes, it is anticipated that the Authority will have the ability to fashion the Salton Sea along the former shoreline with combinations of dikes and dredging to produce water features

that will be able to sustain recreationally attractive water near the shoreline ("Seaside Improvements").

This Feasibility Study has been prepared to analyze and determine the following:

1. Total estimated revenues generated by development attracted by the recreational water and Seaside Improvements ("Landside Development")
2. Total estimated Seaside Improvement costs that can be repaid with such revenues

6.2 Sources and Uses Summary

This Feasibility Study analyzes the estimated sources generated by the Landside Development and the amount of estimated Seaside Improvement costs that could be paid back with these sources. Four scenarios (1A, 1B, 2A, 2B) have been prepared to look at the impacts of the following:

- Percentage of the tax increment available to the IFD after making statutory deductions for ERAF and schools
- Remaining amount of tax increment allocated to the IFD and local affected taxing agencies to provide basic services such as police and fire. (Chapter 2.2.1 provides a description of the allocation of the 1% ad valorem property taxes)
- Interest rate, if required, paid back on State, Federal, or other loans obtained to fund the Seaside Improvement costs

The funds potentially available for Seaside Improvements and the interest to be paid for the four scenarios are summarized in Table 8. These funds may support Seaside Improvements in part or in total. The total funding requirements for Seaside Improvements are not defined as part of this document, and are addressed separately (Benchmark 4, Volume 2).

6.3 Sources and Uses Detail

The Feasibility Study looks at a variety of revenue sources that may be applied to repay the costs of the Seaside Improvements in part or in total. These revenue sources become available as Landside Development occurs and include, but are not limited to, the following:

- IFD Net Bond Proceeds (Chapter 2.2.2)
- IFD Tax Increment and Pay Go revenues (Chapters 2.2.1 and 2.2.3)
- Transient Occupancy Tax ("TOT") revenues (Chapter 2.2.4)
- Sales Tax revenues (Chapter 2.2.5)

The estimated revenue amounts, by type and scenario, are illustrated in Table 9.

Table 8: Sources and Uses Summary

($ Millions)					
Scenario	Ref	1A	1B	2A	2B
IFD % Available	2.2.1	50%	50%	25%	25%
Interest Rate - State/Fed/Other	2.4	3%	0%	3%	0%
Total Sources		**$2,224.2**	**$2,224.2**	**$1,760.2**	**$1,760.2**
Uses:					
Funding Available for Seaside Improvements (a)	2.4	$ 904.5	$2,224.2	$ 715.8	$1,760.2
Interest	2.4	1,319.8	-	1,044.4	-
Total Uses		**$2,224.2**	**$2,224.2**	**$1,760.2**	**$1,760.2**

(a) 10 year timline. Annual costs spread evenly over ten year period.

Table 9: Sources and Uses Detail

($ Millions)					
Scenario	Ref	1A	1B	2A	2B
IFD % Available	2.2.1	50%	50%	25%	25%
Interest Rate - State/Fed/Other	2.4	3%	0%	3%	0%
Sources:					
IFD Net Bond Proceeds	2.2.2	$ 570.1	$ 570.1	$ 276.2	$ 276.2
Tax Increment/Pay Go	2.2.3	340.4	340.4	170.2	170.2
TOT Revenues	2.2.4	920.4	920.4	920.4	920.4
Sales Tax Revenue	2.2.5	393.4	393.4	393.4	393.4
Total Sources		**$2,224.2**	**$2,224.2**	**$1,760.2**	**$1,760.2**
Uses:					
Seaside Improvements	2.4	$ 904.5	$2,224.2	$ 715.8	$1,760.2
Interest/Other Costs	2.4	1,319.8	-	1,044.4	-
Total Uses		**$2,224.2**	**$2,224.2**	**$1,760.2**	**$1,760.2**

6.4 Study Period

The Feasibility Study financial model allows for the following time horizons, assuming year 0 to be the formal beginning of the planning:

- Two years of planning and California Environmental Quality Act (CEQA) planning and evaluation of projects, followed by ten years of construction related to Seaside Improvements
- Fifty years of Landside Development based on annual absorption of 1,475 residential units

6.5 Fifty Year Landside Development Period

Assuming a 50-year Landside Development period commencing in year 8 and continuing through year 57, Table 10 and Figure 18 illustrate in five year increments, the cumulative annual IFD tax increment and revenue source additions generated by the Landside Development.

The cumulative annual IFD tax increment is shown graphically in Figure 19.

6.6 Funding Gap

The revenue sources identified above are generated from Landside Development spurred by stabilized, recreationally attractive water. This Feasibility Study assumes that Landside Development will not be triggered until after Seaside Improvement costs have been incurred, creating a "Funding Gap" between the time costs are incurred and Landside Development revenue sources become available. Other forms of financing (e.g. state funding, state loans, federal grants, etc.) will be required to bridge the Funding Gap until IFD tax increment and other Landside Development revenue sources become available.

Table 10: Tax Increment and Revenue Sources (Scenario 1)

($ Millions)									
Period	**IFD Tax Increment**			**Sources**					
	Riv	**Imp**	**Total**	**Bond Sale**	**Pay Go**	**TOT Revenues**	**Sales Tax**	**Energy Revenues**	**Total**
Years									
1-5	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.1	$ -	$ 0.1
6-10	1.2	0.7	1.9	7.1	0.6	1.5	4.4	-	13.7
11-15	6.1	3.7	9.8	12.9	3.0	8.8	12.5	-	37.3
16-20	11.8	7.0	18.8	14.5	5.8	27.2	23.5	-	71.0
21-25	18.1	10.8	28.8	16.2	9.0	63.8	34.7	-	123.6
26-30	25.0	14.9	39.9	18.0	12.4	107.0	41.5	-	178.9
31-35	32.6	19.5	52.1	20.1	16.2	120.6	46.3	-	203.1
36-40	41.1	24.5	65.6	33.3	20.3	130.1	50.4	-	234.2
41-45	50.4	30.0	80.4	39.9	25.0	135.2	52.7	-	252.7
46-50	60.7	36.2	96.8	44.2	30.1	135.9	53.0	-	263.2
51-55	72.0	43.0	115.0	49.0	33.4	135.9	53.0	-	271.3
56-60	32.2	19.2	51.5	21.0	14.5	54.4	21.2	-	111.1
TOTAL	**$ 702.2**	**$ 418.9**	**$1,121.2**	**$ 570.1**	**$ 340.4**	**$ 920.4**	**$ 393.4**	**$ -**	**$2,224.2**

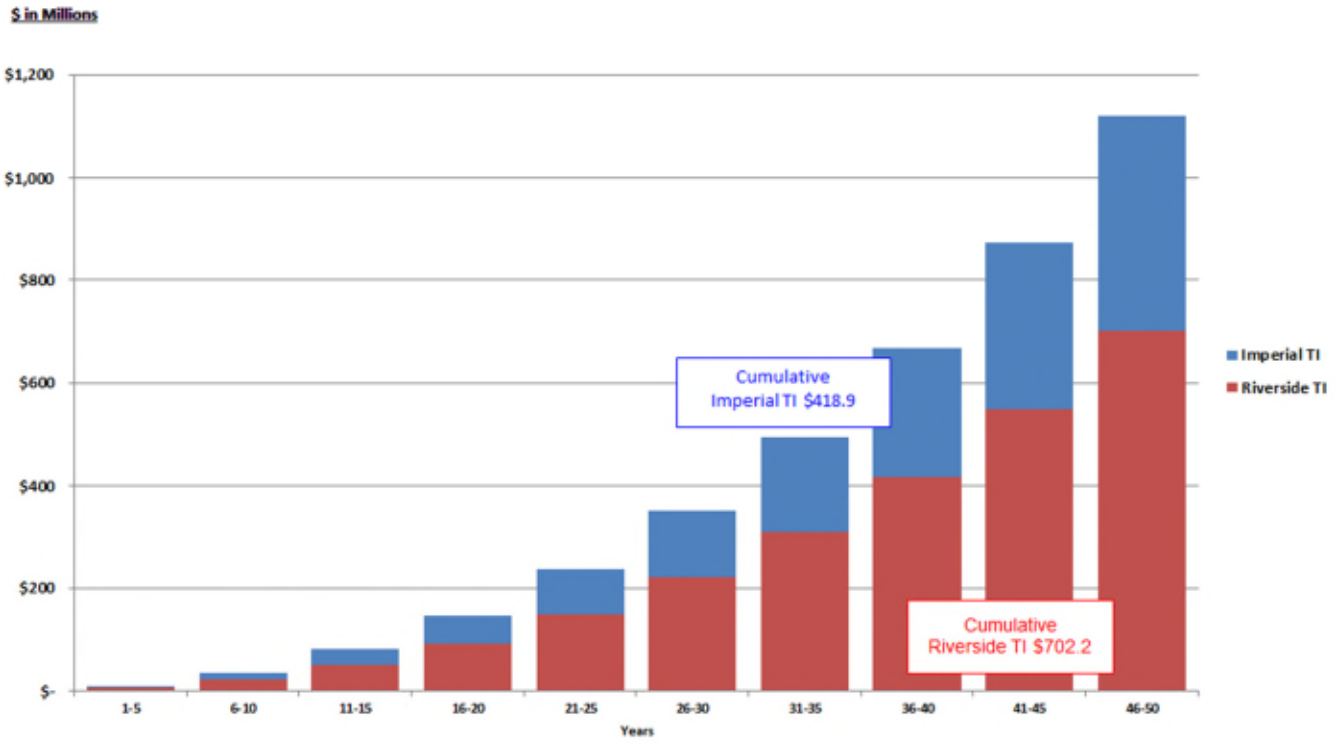

Figure 18: Cumulative IFD Tax Increment (Scenario 1)

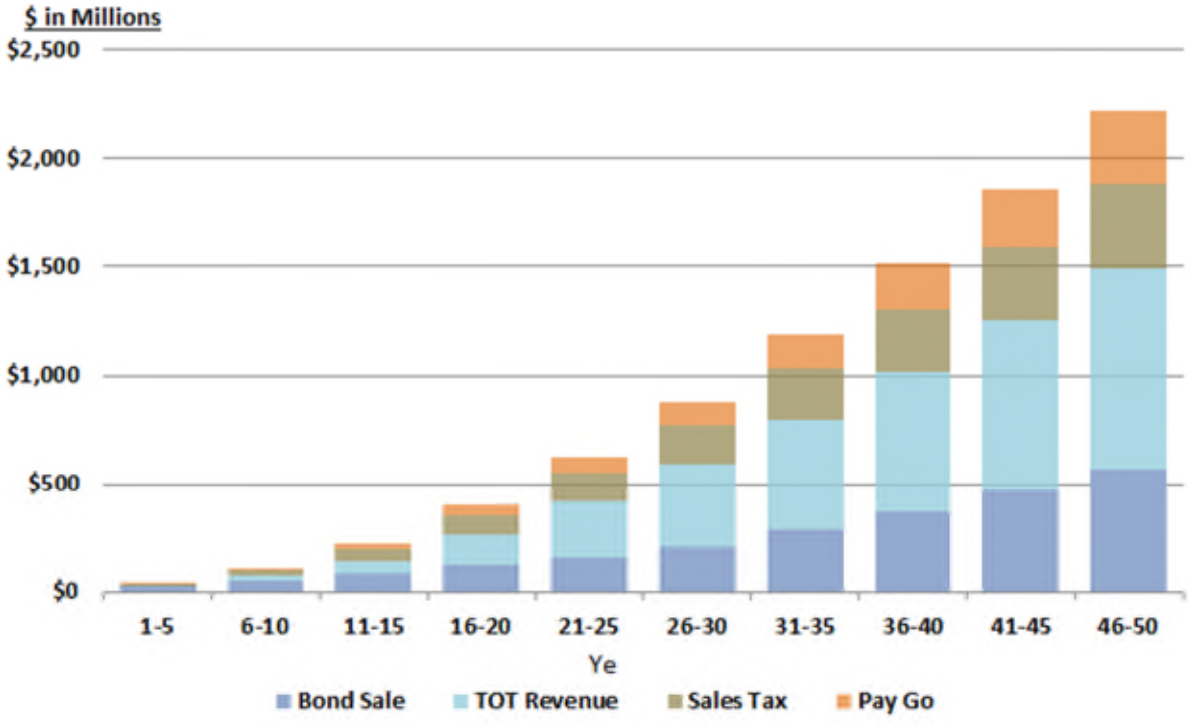

Figure 19: Cumulative Revenue Sources (Scenario 1)

The cumulative annual revenue sources are shown graphically in Figure 2.

Table 11 illustrates the Funding Gap between the timing of Seaside Improvements and Landside Development revenue sources, as well as loan additions and repayment, assuming a 3.0% interest-bearing loan, to bridge the Funding Gap. Note that the funding gap cannot be quantified fully until the seaside improvement costs are known. This table has been included for illustration purposes only, as the total funding requirements for Seaside Improvements are not defined as part of this document, and are addressed separately (Benchmark 4, Volume 2).

Table 11: Annual Sources Uses and Seaside Improvement Costs

($ Millions)					
		Uses			
Period	Total Sources	Loan Additions	Interest @ 3.0%/ Other	Loan Repayment	Seaside Improvement Costs
Years					
1-5	0.1	$ 308.5	$ 18.4	$ -	$ 308.6
6-10	22.4	403.2	84.1	-	425.6
11-15	55.0	151.7	147.2	(36.4)	170.2
16-20	93.1	-	164.8	(93.1)	-
21-25	150.5	-	172.0	(150.5)	-
26-30	211.1	-	170.4	(211.1)	-
31-35	241.1	-	161.4	(241.1)	-
36-40	289.6	-	145.3	(289.6)	-
41-45	319.2	-	119.6	(319.2)	-
46-50	339.2	-	86.2	(339.2)	-
51-55	355.5	-	44.6	(355.5)	-
56-60	147.3	-	5.7	(144.8)	-
TOTAL	**$2,224.2**	**$ 863.4**	**$1,319.8**	**$ (2,180.6)**	**$ 904.5**

6.7 Next Steps

The results of this Feasibility Study are subject to change based on the assumptions contained herein, and discussed in the attached Appendices. This Feasibility Study analyzes possible revenue sources that may be available to fund Seaside Improvements. Additionally, the estimated costs of the Seaside Improvements have not been calculated as part of this Feasibility Study, as such, any results are simply an illustration of potential scenarios.

Suggested next steps to move forward with infrastructure financing would include the following:

- Work with the Authority to identify Seaside Improvement costs
- Further analysis of the IFD allocation and preparation of the fiscal impact analysis
- IFD bonding assumptions (e.g. interest rate and debt service coverage)
- Development scenarios including timing of absorption
- Implementation steps for IFD
- Extend development scenario to 75 years

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7.0 Funding Options from Alternative Energy Sources

As part of the Funding and Feasibility Action Plan, the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) was commissioned to conduct a comprehensive analysis to evaluate the potential of various renewable energy technologies to provide funding support for management solutions at the Salton Sea.

7.1 Introduction

The U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) conducted a comprehensive analysis to evaluate the potential of various renewable energy technologies to provide financial contributions to management solutions at the Salton Sea.

In 2013, the Imperial Irrigation District (IID) commissioned a preliminary study on the potential for renewable energy projects in the Salton Sea region to provide partial funding of management actions at the Salton Sea. IID's feasibility study examined the revenue potential from land leases in the Imperial Valley for renewable energy projects, and estimated that roughly $4.1 billion might be realizable over the study period of 2016 to 2045.

The NREL report, The Potential for Renewable Energy Development to Benefit Restoration of the Salton Sea: Analysis of Technical and Market Potential (http://www.nrel.gov/docs/fy16osti/64969.pdf), was completed in November 2015. The NREL report specifically seeks to confirm and refine these prior revenue potential estimates, provide a technical review of the renewable energy technologies under consideration, and develop estimates of the region's developable production potential through the year 2030.

7.2 Study Areas

To identify the land available for renewable energy development in the Salton Sea study area (Figure 20), geographic information system methods were used to compile land use shapefiles from the multiple stakeholders in the region. The Desert Renewable Energy Conservation Plan (DRECP), Imperial County, Riverside County, Imperial Irrigation District, and the U.S. Bureau of Land Management (BLM) all contributed data to the analysis.

- The Salton Sea Study Area is as follows:

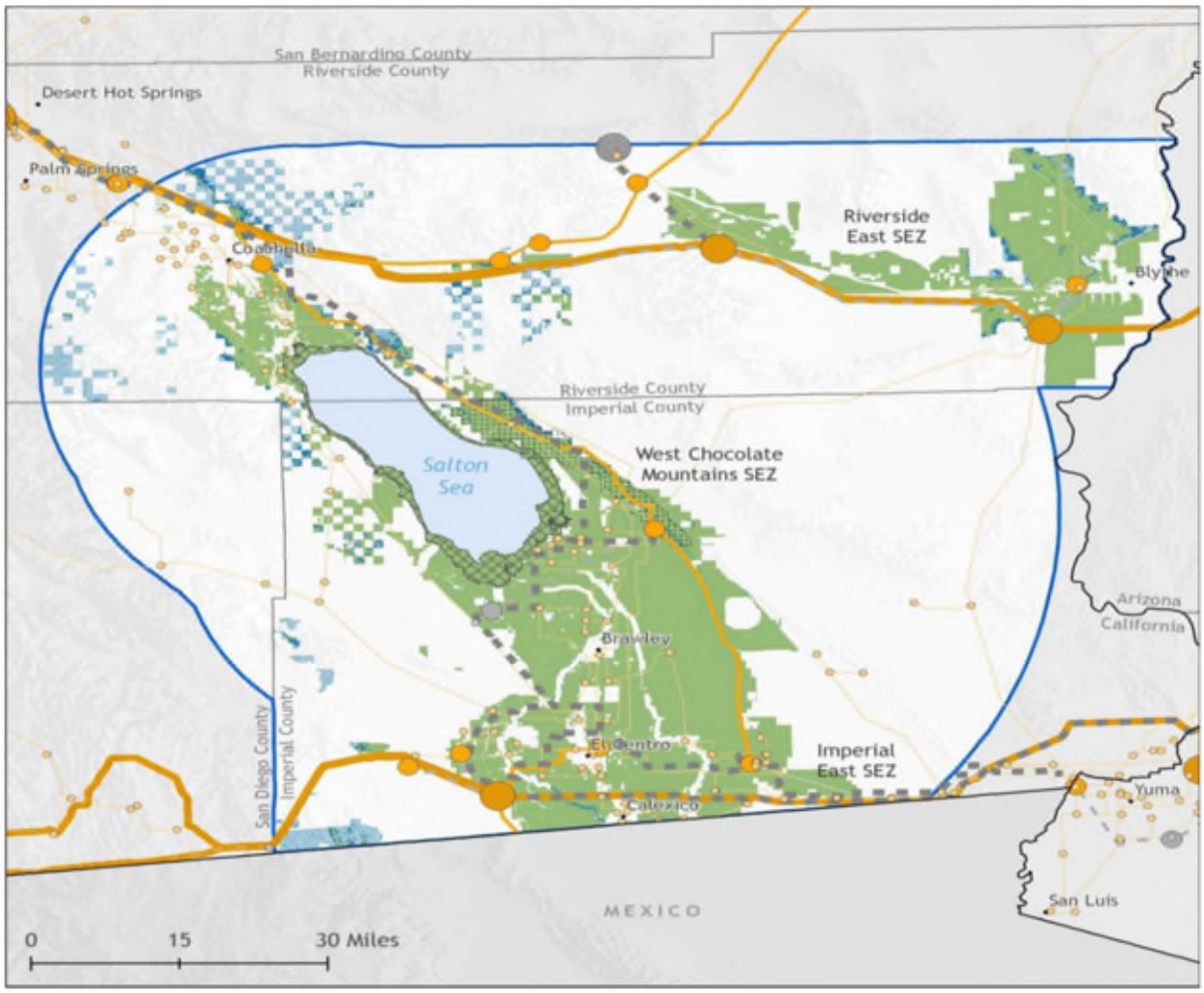

Figure 20: Total Developable Renewable Energy Land

- The national border with Mexico was established as the southern border.
- The northern and eastern borders were extended to the eastern extent of Riverside County in order to incorporate the BLM's Riverside East solar energy zone (SEZ).
- The western border was extended to roughly correspond to the DRECP.
- The Salton Sea playa was listed as a potentially developable area, although there is uncertainty concerning both the rate of recession and additional costs for development in this land area.

Within the Salton Sea study area, the southern half of the Salton Sea has been identified as the primary area of opportunity for significant development, primarily due to the presence of large tracts of potentially developable public and private land, existing and planned projects, and greater opportunity for

future transmission export. This does not preclude development in other areas; potentially developable solar resources exist within the West Chocolate Mountains SEZ as well.

7.3 Evaluations

Technologies considered in NREL's report are the following:

- Electricity production from geothermal
- Mineral recovery from geothermal fluids
- Electricity production from solar photovoltaics (PV), concentrating solar power (CSP), and salinity-gradient solar ponds (SGSP)
- Hydrogen production
- Biofuels and nutraceutical production from algae pond cultivation.

Wind is not evaluated in the report due to the minimal resource potential within the region. In addition to renewable energy technologies and their coproducts, desalination of the Salton Sea from renewable energy is also discussed as a potential benefit to restoration.

7.4 Renewable Energy Potential

Of the commercially available renewable energy technologies, geothermal, solar photovoltaics (PV) and concentrating solar power (CSP) have the greatest technical potential for development. The resource potential, costs, and estimated revenue streams from these technologies are summarized in Table 12.

7.4.1 Constraints

Market factors are the biggest constraint on development. Development on the playa itself will be constrained by the rate at which the shoreline recedes, and although playa may be exposed in a given year, there will likely be an additional lag in development due to variability in Salton Sea water levels and potentially muddy site conditions.

Despite the large total resource potential, constraints such as proximity to transmission access and regional cost-competitiveness of the electricity generated may limit the technical potential of the power generation technologies before 2030.

Additionally, PV and CSP require between 5 and 10 acres per megawatt (MW), so larger scale projects over 20 MW could be limited by the availability of contiguous land parcels.

Table 12: Salton Sea Renewable Energy Resource Potential and Costs

Technology	Land Developable by 2030 (acres)	Undeveloped Energy Resource Potential	Resource Potential Developable by 2030	Current levelized-cost ($/MWh)***	Estimated levelized-cost in 2030 ($/MWh)***
New Geothermal power (KGRA*)	50,330	1.78 GW - 2.94 GW	1.05-1.81 GW	$107-$131	$107-$131
Mineral recovery from geothermal brines (KGRA)	50,330	115-222 thousand MT Lithium	54.3-122 thousand MT Lithium	Not commercial	Not available
Onshore Solar PV	14,405	31.9 GW	1.8 GW	$100-$113	$49-$94
Offshore Solar PV	9,938	4.2 GW	1.25 GW	$100-$113**	$49-$94**
Onshore CSP	13,147	23.9 GW	1.3 GW	$181	$84-$132
Offshore Algal Biofuels	32,821	39M gal/year	Not commercial	$>10/Gallon	$3/gallon
Offshore Salinity-Gradient Solar Ponds	9,938	0.444 GW	.1 GW	$80-110	Not available

*Known geothermal resource areas, **offshore playa construction requirements may result in higher LCOE,
***Exclude state and federal incentives, but are inclusive of MACRS depreciation. Deal provisions, such as: escalation rate, ITC, term length, state income and sales tax rates, project financing, and additional grid services can all result in a disparity between the LCOE and ultimate PPA price of a technology.

7.4.2 Assumptions and Conditions

Some key assumptions and conditions used by NREL include the following:

- The figures for geothermal power and mineral recovery include the developable land within the KGRAs for reference, but the resource potentials are solely calculated based on volumetric assessments of the geothermal resource.
- The figures for PV and CSP refer to developable land and resource potential within one mile of 138kV to 230kV transmission access, excluding the land within the KGRAs.
- The undeveloped potential for PV and CSP refers to developable land and resource potential within five miles of 138kV to 230kV transmission access.
- Resource potentials are mutually exclusive; developing a CSP system on a piece of land would preclude installing PV on the same piece of land.
- The underlying data set used for cost estimates in this report is the NREL Annual Technology Baseline and Standard Scenarios.

- The cost assumptions do not reflect state or federal incentives, such as the investment tax credit, but are inclusive of Modified Accelerated Cost Recovery System (MACRS) depreciation.
- Specific cost-related assumptions can be found in Appendix B of the full report.

7.4.3 Geothermal

The Salton Sea area has exceptional geothermal resources, with one of the largest geothermal anomalies in the United States located at the southern end of the Sea in Imperial County.

Electricity Production. There are roughly 232,000 acres of developable land within the various Imperial County KGRAs, of which 1,851 acres lie within 1 mile of a 138 kV to 230 kV substation. Approximately 50,000 acres lie within 5 miles of a 138 kV to 230 kV substation, which could allow for future geothermal development. Additionally, geothermal power plants have relatively small footprints; thus constructed wetlands, algae farms, and renewable energy projects could be interspersed with geothermal plants within the KGRA. An additional benefit of geothermal development is that infrastructure such as roads and berms will be created and can then be utilized by other projects.

The technical potential for geothermal development is constrained by both the availability of surface land area, as well as the underlying geothermal resource. For the purposes of this analysis, the required surface area is assumed to be available, and the technical potential is determined through volumetric resource estimates of the underlying reservoir. Using this volumetric resource assessment method, the maximum remaining developable geothermal capacity by 2030 within this area is roughly 1,800 MW. However, the Salton Sea KGRA comprises 1,350 MW of this capacity, and much of that resource is still under water within the Salton Sea.

Although the offshore resource is not currently accessible, Tetra Tech provided water recession forecasts that were used to estimate that 370 MW to 570 MW of the offshore resource could be developable by 2030.

Mineral Recovery. Mineral recovery of lithium from Salton Sea geothermal brines could potentially produce up to $860 million annually in total business revenues, with up to $25.8 million going to IID via annual royalties of 3% on gross revenues. For a high-temperature 50 MW geothermal power plant, mineral recovery of lithium at current market prices could yield $91 to $118 million in annual revenues. This is a nascent technology and revenue estimates are highly uncertain because: 1) the cost structure of such mineral

recovery operations may not be adequate to encourage businesses to enter the market, and 2) the degree to which potential increases in demand for lithium-based products may outstrip supply and impact market prices.

7.4.4 Solar Technologies

Given the generally strong solar resource in the Salton Sea area, a variety of solar electric or solar thermal technologies may be suitable for development within the region. However, note that because both PV and CSP require similar conditions, developing a CSP system on a piece of land would preclude installing PV systems on the same piece of land. Although electricity production from salinity -gradient solar ponds has been technically proven, it has not been established in the U.S. as an economically viable power production technology to date. The low-grade heat produced by this technology may also be supplied to other processes, including: desalination, algae pond heating, food processing, and other industrial processes.

Solar Photovoltaics. There are 815,271 acres in the Salton Sea study area with less than 5% slope that could potentially accommodate 103 GW of PV generation. Within this area, 14,405 acres lie within 1 mile of 138 kV to 230 kV transmission access and could accommodate 1.8 GW of PV, which is a conservative estimate of the resource that could be developable by 2030. Although the total capacity potential is extremely large, the developable potential is significantly smaller, due to proximity to transmission, land access, financing, and utility demand, among others.

Concentrating Solar Power. There are 771,656 acres in the Salton Sea study area with less than 3% slope, which could potentially accommodate 77 GW of CSP. Within this area, 13,147 acres lie within 1 mile of 138 kV to 230 kV transmission access which could accommodate 1.3 GW of CSP.

Due to the strong solar resource and relatively low slope constraints, there is a very high technical potential for CSP projects in the Salton Sea study area. However, as was noted in the solar PV section, while this capacity may be technically feasible, CSP development is also constrained by numerous other factors, including its relative economic competitiveness and potential avian impacts. Capacity factors for CSP technologies vary widely, with a range between 25% and 49%.

Salinity-Gradient Solar Ponds. The total salinity-gradient solar pond (SGSP) resource potential in this area is estimated to be 444 MW, based on 26,628 acres of potential playa within 1 mile of transmission, and an assumed power density of 60 acres/MW. The current cost of power from SGSP is estimated to be within the range of $80 $110/MWh, but the technology is still nascent,

making predictions about the likely cost in 2030 subject to significant uncertainty.

Given that SGSP projects have not yet been developed within the region, 100 MW was estimated to be technically developable by 2030, although this does not account for transmission or economic viability, which are still uncertain.

7.4.5 Hydrogen Production

Hydrogen can be produced by reforming natural gas or splitting water molecules using any primary energy resource, including the resources abundant in the Salton Sea region.

California has several policies in place to accelerate the adoption of hydrogen fuel cell electric vehicles (FCEV). The biggest market for FCEVs is expected to be Los Angeles, which currently leads California in hydrogen station installations. However, the Salton Sea is 150 miles from Los Angeles, with transportation/delivery costs adding significantly to the cost of the delivered hydrogen compared to facilities operating closer to the city, and there are considerable uncertainties surrounding the rate at which FCEVs might be deployed.

Current projections are that the total number of FCEVs in California might be roughly 18,500 by 2020. Based on projected FCEV adoption rates and due to the comparatively low cost of natural gas, it does not appear likely that hydrogen from the Salton Sea region would be competitive in the Los Angeles market until at least 2030.

7.4.6 Algae Pond Cultivation

Strains of algae have been identified that can grow in brackish, saline, and even hypersaline water.

Biofuels. The study area appears to be a favorable region for development of algal biomass resources due to the presence of large volumes of highly saline water, large tracts of unused playa and high insolation.

Algal ponds offer similar benefits as solar ponds to the local environment: covering the recently exposed soil and thereby reducing the potential for dust emissions. There are currently 32,821 acres of total developable land on the playa (unconstrained by transmission access), which could produce roughly 39 million gallons of biofuels per year.

Current costs are roughly $17/gallon and would need to decrease substantially for this technology to be viable. Algal biofuel production is still pre-commercial and is unlikely to be cost-competitive with crude oil by 2030,

barring the implementation of Renewable Fuel Standards for algal biofuel consumption.

Nutraceuticals. The production of cosmetic and dietary products, such as beta-carotene or spirulina, is commercial at scale, with operating plants in numerous countries. Notably, Synthetic Genomics, Inc. performs research and development and test-scale operations near the southern tip of the Salton Sea, and has been consulted concerning the feasibility of further development of algal ponds for nutraceutical products on the exposed Salton Sea playa. Further study of the Salton Sea's water quality is required, but development of an algal biomass pilot plant on exposed Salton Sea playa could verify whether this technology is viable in the region.

7.5 Economic Outlook

Table 13 summarizes potential mitigation revenues under current policy and technology conditions within the Salton Sea region. The development of geothermal and solar projects will generate tax revenues, environmental mitigation fees, regional economic development, geothermal royalty payments from development on BLM lands, and land lease revenues from development of IID owned playa for Salton Sea development from power generation projects.

Estimated restoration revenue streams in previous studies have typically assumed that development in the Salton Sea region is sufficiently attractive from an economic standpoint to absorb the additional impact of a restoration charge on a project's cash flows while still providing a regionally competitive return on investment. However, based on modeling of potential scenarios, it has been determined that any additional tax on generation to support Salton Sea restoration may disadvantage the development of these resources relative to other renewable resources in the region.

Any added tax would need to reflect market conditions, as even the addition of a relatively small $5 per megawatt-hour restoration charge to the cost of new Salton Sea geothermal projects could make them significantly more expensive than competing alternatives in the regional supply pool.

Similarly, a $5/MWh charge for solar could result in the area's best resources becoming more expensive than competing projects. As modeled in the CPUC RPS Calculator, the area's solar resources could slip by about 7 percentage points in competitiveness in the California renewable energy supply curve, meaning that 49,000 GWh of competing projects may become economically superior. For context, the modeled incremental demand from increasing California's RPS to 50% may be between 44,000 GWh and 74,000 GWh.

Table 13: Summary of Potential Mitigation Revenues under Current Conditions

	Current Conditions [Annual Millions]	Notes: See Appendix C for full calculations
Geothermal (KGRA)*	$7 to 15	Onshore: BLM land lease royalties: $1-3 Offshore: IID land lease royalties : $6 -12
Solar PV (onshore)	$0	Available onshore land is predominantly private, and BLM Solar Energy Zone royalties are currently fully allocated to the U.S. Treasury.
CSP (onshore)	$0	
Other:		
AB 1471 (CA 2014 Water Bond)	$0 to 14.3	Total CA water bond is $475M, $200M assumed as upper limit given other obligations.
Total (annual):	$7 to 29.3	Annual revenues calculated assuming 14 years, from 2016-2030. Figures do not account for inflation or the time value of money.
14 year total:	$98 to 410.2	Note: The mitigation revenues in Tables ES-2 and ES-3 are additive.

* Geothermal projects should be given first priority for development on the KGRA, but due to their small overall footprint once projects are established, this acreage may be developable for other technologies as well.

This might not be significant under scarcity conditions, but it could be a major handicap in a market characterized by large surpluses. There are some options, such as streamlined permitting or partnership with the North American Development Bank, that could be explored to improve the economic competitiveness of Salton Sea renewables such that they might be able to absorb a restoration tax while still remaining attractive to nearby power markets. However, in general developers are opposed to the concept of a restoration adder.

7.6 Future Revenue Potential

There is potential for greater demand for renewable energy beyond 2030, driven by California policy, such as AB 32, which calls for 80% greenhouse gas reductions below 1990 levels by 2050 and the recent passage of the 50% RPS target. However, with indications of minimal economic headroom for a Salton Sea restoration tax on renewable energy development in the region between 2015 and 2030, additional potential revenue generation mechanisms for the Salton Sea Authority were explored. The primary revenue potential mechanism examined was land lease royalties, as these are existing costs associated with development that would be less likely to disadvantage projects' regional cost-competitiveness. Table 14 summarizes these potential revenues in 2016 through 2030. Although there may be between $78.4 million and $1.09 billion in potential revenues, additional sources of revenues

Table 14: Summary of Potential Mitigation Revenues under Future Conditions

	Potential Future Conditions [Annual Millions]	Notes: See Appendix C for full calculations
Mineral recovery from geothermal brines (offshore KGRA)	$0 to 25.8	Assumes offshore development of up to 570 MW of geothermal, 3% IID royalty rate on gross lithium sales
Algal biofuels (offshore non-KGRA)*	$1.2 to 2.3	Assumes $3/gal cost competiveness by 2030, 1-2% IID land lease rate on gross proceeds.
Salinity Gradient Solar Ponds (offshore non-KGRA)*	$0.6 to 1.6	Assumes $80-$100/MWh PPA, 90% capacity factor, IID land lease rate (1-2% - gross proceeds).
Solar PV (offshore non-KGRA)*	$1 to 3	Assumes $40-60/MWh PPA, 23.2% capacity factor, IID land lease rate (1-2% - gross proceeds).
Solar PV (onshore BLM Solar Energy Zones)	$1.5-4.4	Assumes passage of S-1407and development of 1.8 GW of BLM SEZ's. Assumes $40-60/MWh PPA, 23.2% capacity factor, royalty rate between 1-2% of gross proceeds.
Other:		
Desert Renewable Energy Conservation Plan - Habitat Restoration	$3.5 to $44.6	Lower case based on allocable revenues to desert pupfish habitat, upper case is for full habitat restoration amounts for Imperial & Riverside Counties
Total (annual):	$5.6 to 77.8	The potential revenues above typically require a change in policy, development of the offshore playa, or technological developments.
14 year total:	$78.4 to 1,089.2	

* The potential development of off-shore acreage outside of the KGRA is mutually exclusive. e.g: Full development of the available acreage by algal biofuels precludes development by Solar PV or Salinity Gradient Solar Ponds. Total revenue estimates reflect the highest and lowest potential revenues from these three technologies ($0.6 to 3 million annually).

will still be required to fund the proposed restoration options ($2.3 billion to $8.9 billion).

7.7 Recommended Next Steps

7.7.1 Geothermal

Further analysis is required to refine estimates of the developable geothermal potential on the playa. The developable offshore potential is based on the percentage of playa exposed within the estimated bounds of the reservoir, but more accurate estimates can be achieved through volumetric assessment of the offshore resource. Further study of the geotechnical soil conditions of the playa, from a construction standpoint, would also be required to refine offshore cost estimates.

7.7.2 Geothermal Fluid Mineral Recovery

Since no geothermal recovery operations are commercially operating at the time of this report, a detailed manufacturing and supply chain study is needed to validate the likelihood that mineral recovery is a viable business opportunity for the region.

7.7.3 Salinity-Gradient Solar Ponds

Further analysis of the economic viability of salinity-gradient solar ponds, as well as the detailed investigation of the technical potential for synergy

between this technology and algae development or desalination, will be required to determine if a commercial-scale plant would be feasible.

7.7.4 Algal Biofuels

Further study of the Salton Sea's water quality is required, but development of an algal biomass pilot plant on exposed Salton Sea playa could verify whether this technology is viable in the region. Development of an algal biomass pilot plant on exposed Salton Sea playa could verify whether this proposed renewable energy restoration mechanism is viable. NREL has discussed this proposed mechanism with two organizations currently exploring pilot studies at this location, UCSD and Synthetic Genomics, Inc., which operates an R&D facility next to the Salton Sea.

7.7.5 Interactive Analysis Tool

As part of the analysis conducted above, NREL has developed an interactive, web-based mapping tool that incorporates the data used in the report's analysis. This tool is intended to enable stakeholders to visualize renewable energy development scenarios under various conditions, such as proximity to transmission, estimated playa recession, and land ownership. Due to data use restrictions, some data is not viewable at the sub-county level. If the layers under the Developable Land Substation Buffer directory do not display on the map, please zoom out until the layer becomes visible, or uncheck this layer to zoom in on other layers. A screenshot of this tool, available at http://maps.nrel.gov/salton-sea, is shown in Figure 21.

7.7.6 Market Competitiveness

Due to ongoing significant changes in federal regulatory policies, increasing state RPS goals, shifts in technology costs and adoption, and accelerated plant retirements, further study of the role and value of the Salton Sea's renewable resources within regional power systems and markets is required. A variety of models and tools exist that can be utilized to assess the opportunities and challenges of developing the Salton Sea's renewable resources within the broader and rapidly changing California and Western markets. Capacity expansion models can be used to develop future scenarios of the market potential and transmission needs of different renewable and non-renewable options at high spatial resolution for particular focus regions, such as Southern California. Production cost models can be used to assess the operational impacts—including renewable curtailment, plant operational flexibility, transmission congestion, and changing electricity imports and exports—under future infrastructure conditions. Running these models for the Salton Sea region, with a focus on geothermal and solar, can help demonstrate the ability of regional resources to cost-effectively meet California's energy and climate objectives. Development of this analysis would help provide valuable input to ongoing planning efforts such as the

DRECP and the recently announced Renewable Energy and Transmission Initiative (RETI) 2.0.

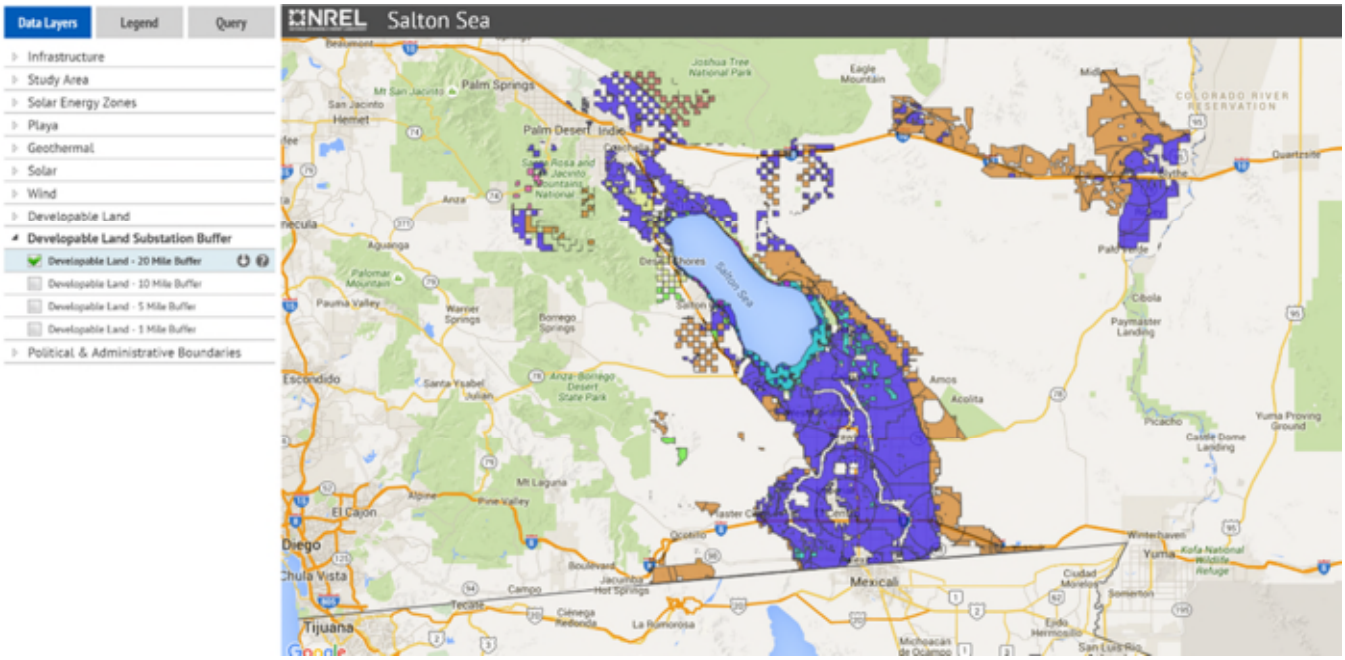

Figure 21: RE Development Scenario Mapping Tool Screenshot

7.7.7 Renewable Energy Policies

Policies favorable to renewable energy could create a unique benefit to development within the region. These could include utilizing the North American Development Bank for development expertise and to leverage interest rate cost savings, streamlining permitting requirements, and providing certainty surrounding environmental permitting costs. Additional potential developments which could affect these findings include the implementation of more aggressive in-state renewable energy capacity goals, and additional project cost declines uniquely benefitting the Salton Sea region (i.e., local incentives, exceptional transmission access).

7.7.8 Royalty Payment Structures

Geothermal royalty structures and mineral leasing receipts are current potential sources of funding for restoration efforts. Additional potential revenues could be realized through the passage of U.S. Senate bill 1407, which would amend the revenue distribution for solar and wind energy authorizations on BLM land to include distributions to states and counties. On payments associated with renewable energy development and production, the State of California could also make efforts to pass more specific support mechanisms, such as the CA Senate Bill 1139, which required 500 MW of geothermal energy between 2015 and 2024.

8.0 Recommendations

This chapter provides recommendations for additional design, engineering, a demonstration projects that would advance the concepts presented in the Benchmark reports.

8.1 Introduction

Continuing from the work completed for the Funding and Feasibility Action Plan, additional engineering evaluations will be needed to further develop the Salton Sea management concepts described in the Benchmark reports. An expanded engineering feasibility analysis is proposed to link Salton Sea management goals and engineering design requirements for the Perimeter Lake and to further develop the design concept. During this phase, the results of a demonstration project could be integrated into the Perimeter Lake and habitat design concepts. Current engineering cost estimates would be further refined to match the expanded conceptual engineering designs.

8.2 Design and Engineering

A preliminary list of design tasks for the next phase is provided below. The specific list and scope of design tasks will be developed in discussions with the State and other stakeholders as appropriate and incorporated into the Phase 2 work plan.

Feasibility Conceptual Details and Pricing for:

- Dust control system for irrigation of emissive playas
- Floating bridges or other access methods at causeways for levee maintenance
- Landside roadway access points
- Causeway section designs
- Deterrents to public access and safety systems around spillway structures
- Determination of potential economic benefits
- Determination of land ownership and necessary title transfers
- Levee alignment for maximum economic benefit and recreational use

Initial Cell:

- Tie in details and coordination with SCH levees and SSRREI geotubes along New River
- Dredging requirements for the New River Delta
- Improve levee alignment in the Phase 1 cell for economic benefits

Determination of Construction Means, Methods, and Sequence including:

- Soil/sediment sampling
- Sheet pile alternatives and construction
- Dredging alternatives and methods
- Environmental controls for suspended sediment plume during dredging
- Water level and water quality management within construction project

Geotechnical and Hydraulic Analysis for Final Condition of Single Cell Lake:

- Seismic modeling
- Stability and seepage analysis using field soil data
- Liquefaction analysis
- Sheet pile design
- Woven geotextile design
- Wick drain design
- Analysis of source quarry rock
- Access road section design
- Hydrology study for precipitation design event in the New River and San Felipe Creek
- Hydraulic analysis of spillway structures in single cell lake
- Determination of average annual flowrates through coordination with surrounding projects
- Analysis of desired salinity levels and water quality of single cell lake

10% Construction Documents for Permit Purposes:

- Road improvements
- Levee alignment and cross sections

- Spur levee alignments and cross sections
- Tie-in details with SCH and SSRREI
- Water level and salinity control features
- Overflow structures
- Energy dissipater structures
- Outline and Initialize Permitting Process

Any additional tasks and the scope of work for each task would need to be developed in coordination with various stakeholders. A summary engineering report will be prepared in draft form and submitted for review and a final report will be prepared which incorporates comments on the draft report.

8.3 Water Quality Evaluation and Conceptual Designs for Treatment Wetlands

Poor water quality in the Sea and its inflowing waters has been a long-standing concern for ecological and human health. For overall sustainability in the region, there is a need to improve water quality in the Sea and newly created habitats. This work will evaluate expected water quality changes (related to nutrients, dissolved oxygen, pathogens and selenium) in the Perimeter Lake, and how the adverse conditions might be addressed. The work will include a water quality and hydrodynamic model of the Perimeter Lake. The model will include an evaluation of multiple constituents including salt. The model will also evaluate flow velocities through the system. As part of the modeling effort, various treatment wetland scenarios will be assessed with a goal to determine the size and location of possible treatment wetland cells and develop conceptual designs.

8.4 Infrastructure Financing Phase 2

The current on-going infrastructure financing analysis indicates that infrastructure financing has a high probability of helping to fund Salton Sea management plans. The Phase 2 analysis will build on the work completed in Phase 1. The work will include development of bonding scenarios and work with the investment community and as well as local public officials. We anticipate the Phase 2 analysis will further address legislative changes that may be required to maximize bonding capacity and efficiency. The Phase 2 analysis will also refine existing scenarios to address comments received from the industry forum, the Salton Sea Authority Board and its members and constituents, and to make adjustments for the timing of alternatives for lakeside infrastructure construction and phasing.

Specific steps to be included in a second phase of analysis would include the following:

- Work with the Authority to identify Seaside Improvement costs
- Further analysis of the IFD allocation and preparation of the fiscal impact analysis
- IFD bonding assumptions (e.g. interest rate and debt service coverage)
- Development scenarios, including timing of absorption
- Implementation steps for IFD
- Extend development scenario to 75 years

8.5 Environmental Issues Documentation

An Environmental Issues Report should be prepared. The report would be prepared as a technical document to identify the environmental issues associated with the selected Salton Sea management concept. The environmental effects, both adverse and beneficial, of the various components of the plan would be identified. As an example, these would include the effects of dredging, stockpiling, and placing of lake-bottom sedimentary materials associated with the Perimeter Lake, as well as issues associated with the SSRREI and other management components. The report should be prepared for ease of incorporation into the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) that is expected to be prepared for the overall Salton Sea Management Program.

8.6 Demonstration Project

A demonstration project is proposed to allow testing, data collection and observation of the main elements of the Perimeter Lake concept, especially the long-term behavior of placing fill in the sea and the dewatering behavior of the dredge spoils. The causeway may be left in the sea after the demonstration project and could be used as a fishing platform, boat ramp, or docking facility in the future as the lake levels recede. A figure of the conceptual causeway is shown schematically in Figure 22. Potential locations could include an area near the State Park, Yacht Club, or one of the Imperial County shoreline communities such as Salton City. The location could also be selected so that the structure could ultimately be converted into a causeway dividing two cells in the Perimeter Lake.

The project would generally consist of the following steps and items:

1. Subsurface exploration – Borings and sand cone penetrometer tests of the subsurface conditions under the demonstration project alignment.

2. Installation of foundation improvement geotextile over portions of the demonstration project alignment using anchors and micro piles. (estimate up to 100,000 sf of geotextile)

3. Building a causeway approximately 1,000 feet long using imported granular fill on top of the geotextile. The causeway would likely be constructed on the east side or north shore of the lake, to be closer to the existing quarries. The causeway would have a 50-foot crest with 1 vertical to 3 horizontal slopes. It would start on land at an elevation of -230' and terminate in the sea at a depth of -245'. The crest would be maintained at a -230' elevation. (estimate up to 25,000 cy of fill)

4. Install vertical sheet pile (vinyl of RFG) at the deep end of the causeway to test different methods of pile driving and materials. It is estimated that up to 1,000 lineal feet of sheet pile (35-60' deep) would be installed. The sheet pile could be installed in the location of the ultimate levee alignment. Test pad areas could be used to study alternative sheet pile configurations.

5. After the causeway and sheet pile are constructed, a large dredge mounted on a crane will be mobilized at the deep end of the causeway. This dredge would then excavate the sediments at the end of the causeway down to -260'. The dredges sediment (spoils) would be stockpiled in an adjacent area in the water such that it would from the water approximately 15-20 feet. This will allow for future testing and observation. (Estimate up to 5,000 cy excavated)

6. Test pads would be created stemming perpendicular from the demonstration causeway. These test pad areas would be used to test various scenarios in various depths of water and would be monitored as the sea level retreats.

Some of the goals of the demonstration project would be to observe and gauge the engineering response, constructability, performance, longevity, and durability of the Perimeter Lake levee construction methods and design concepts.

1. Drivability and loading using various sheet pile materials and installation methods.

2. Dredge production rates using various bucket sizes and reach lengths.

3. Shrinkage and bulking rate of material above and below water.

4. Angle of repose of stockpiled excavated and stacked dredge material above and below water.

5. Effects of geotextile in deep and shallow water.

6. Coffer dam constructability and seepage rates at various levels of head.

7. Drying and dewatering behavior of dredged native material and time required to allow for reworking with traditional earth moving equipment.

8. Settlement over time of various stockpile heights above and below water level with and without geotextile reinforcement.

9. Settlement of causeway with and without geotextile.

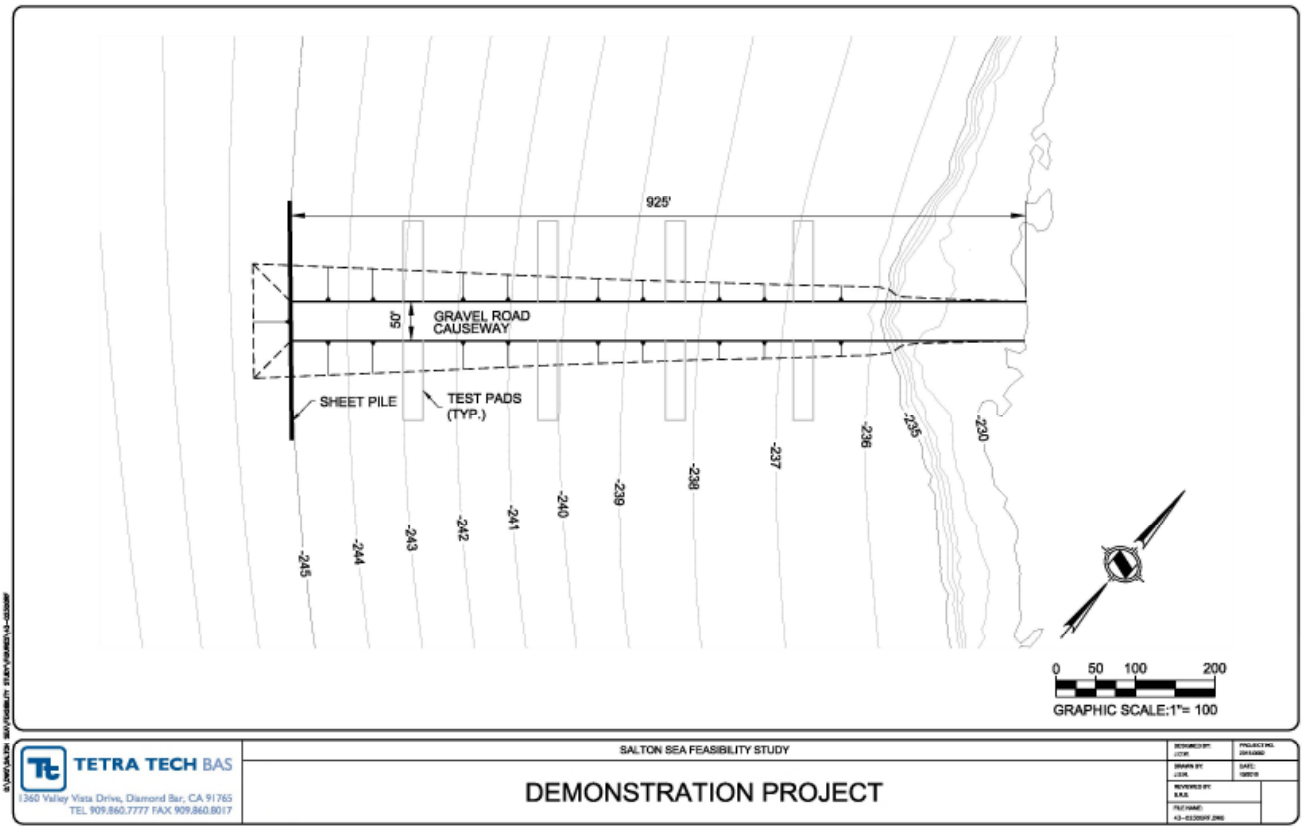

Figure 22: Schematic representation of causeway for potential demonstration project.

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Exhibit A2

,to:

Design-Build Proposal

Salton Sea Desert Shores Habitat Restoration Project

Prepared For: The Salton Sea Authority

July 1, 2022

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S O

July 1, 2022

G. Patrick O'Dowd
Executive Director/General Manager
Salton Sea Authority
82995 Hwy 111, Suite 200
Indio, CA 92201

RE: Proposal to Provide Design-Build Services for the Desert Shores Habitat Restoration Project

Dear Patrick,

The Salton Sea Authority (SSA) requires an experienced firm with expert staff and capability to successfully provide design-build services for the Salton Sea Desert Shores Habitat Restoration Project (Desert Shores Project). To complete the project on-schedule, the SSA needs a contractor with experience working with SSA member agencies and familiar with the project requirements, constraints, and potential obstacles, to develop a cost-efficient design that is constructable, permittable, maintainable, and acceptable to the community, and can be constructed within the approved budget.

Tetra Tech, Inc. (Tetra Tech) has assembled a team of leading experts, engineers, and construction professionals familiar with the project area to deliver this project effectively and efficiently. Tetra Tech has been ranked #1 in Water for 18 years and #1 in Environmental Science by Engineering News-Record (ENR) through the hard work, dedication, and passion of its employees that are Leading with Science®. In addition, we have a Remediation and Field Services Division, that I head up, that is experienced constructing projects in the Salton Basin that are like the Desert Shores Project. Our Program Manager, Javier Weckmann and Construction Manager, Art Gunter, both have experience in the Salton Basin with projects that have included installing wells and constructing embankments, the two key components of the Desert Shores Project.

Our familiarity with the project site and experience preparing and assisting with grant applications provides the team with intimate knowledge of critical issues the SSA may face over the course of this project. The team's background knowledge of the site and conditions, and our experience with the stakeholders will reduced need for a learning curve, minimize the challenges the SSA may face, and allow us to efficiently meet the demands of the SSA's time frame for the project.

Tetra Tech has a proven track record of analyzing, designing, and permitting large regional infrastructure projects that affect multiple stakeholders. Drawing on this record, we have assembled a team of in-house experts to address the critical issues at Desert Shores, and communicate with the SSA, its stakeholders, and the public to successfully manage and deliver a project that meets or exceeds the goals set forth by the SSA.

The attached proposal will provide you with a firm understanding of our qualifications, experience, and approach. If you have any questions, please contact me at bill.brownlie@tetratech.com or (626) 429-0995.

Respectfully submitted,

William R. Brownlie, PhD, PE
Chief Engineer

Contents

1. Introduction

Tetra Tech has assembled an exceptionally well qualified team with many years of relevant experience to successfully complete the design for the Desert Shores Habitat Restoration Project. Tetra Tech proposes to complete the project on a three-phase design-build approach. Tetra Tech proposes the following three phases:

- Phase 1: Preliminary Design Package. Gather and analyze project data, design all project facilities, and prepare a set of 60% designs plans and specifications.
- Phase 2: Permitting and Right-of-Way. Complete all required permitting.
- Phase 3: Final Design and Construction. Construct and commission the project.

We will draw on our specific knowledge and experience from the past 24 years working with the Salton Sea Authority (SSA) and its member agencies, as well as our experience analyzing and designing water resource projects including levees and embankments design, multi-benefit stormwater treatment (water quality improvements, recreation, and wetlands creation), ecosystem restoration and marina improvements throughout California and nationwide. Starting in 1998, with our first contract with the SSA, Tetra Tech has provided engineering support as a direct contactor for 19 straight years and more recently has continued to support the Authority on several projects through our Salton Sea contract with the California Department of Water Resources (DWR).

Because of our long experience in the area on many relevant projects, the Tetra Tech team has the foresight to recognize issues and provide solutions in advance to mitigate project delays and additional costs. As such, our team members will remain available throughout the duration of the project to ensure the project objectives and goals are met. Our familiarity with the personnel and protocol of the agencies involved with this project gives us the ability to efficiently assist the SSA with minimum “ramp up” time. As a result, the SSA and its stakeholders can be confident that your project will be successfully completed in a timely and professional manner.

Project Understanding

Desert Shores is located on the western shore of the Salton Sea, in the northwest corner of Imperial County at an elevation of -197’ below sea level. Inlets were created at Desert Shores when channels or “fingers” were built into the Salton Sea. Because the Salton Sea has been experiencing decreased water levels, the channels’ access to the Sea has been blocked. Desert Shores’ channels have been separated from the Salton Sea by a stretch of dry playa, and the remaining water is foul and colored red by halophilic bacteria.

The primary goals of the Project are the following:

- Restore water to the 30 acres of historic, aquatic habitat suitable for piscivorous or other bird species.
- Prevent dust emissions from this part of the exposed lakebed, provide access to the Sea for continued monitoring.
- Provide a potential water source for future projects on lands adjacent to Desert Shores where no water is currently available.

The proposed restorations to the Project will also contribute to satisfying the following objectives:

- Protect and increase the economic benefits arising from healthy watersheds, fishery resources and instream flow.
- Protect and restore aquatic, wetland, and migratory bird ecosystems, including fish and wildlife corridors and the acquisition of water rights for instream flow.
- Fulfill the obligations of the State of California in complying with the terms of multiparty settlement agreements related to water resources.
- Remove barriers to fish passage.
- Collaborate with federal agencies in the protection of fish native to California and wetlands in the Central Valley of California.
- Protect and restore rural and urban watershed health to improve watershed storage capacity, forest health, protection of life and property, storm water resource management and greenhouse gas reduction.
- Assist in the recovery of endangered, threatened, or migratory species by improving watershed health, instream flows, fish passage, coastal or inland wetland restoration, or other means, such as implementation of a natural community conservation plan and habitat conservation plan.

Tetra Tech is fully committed in its role to deliver a completed project on an agreed-upon schedule. We further commit to deliver a project that not only meets SSA objectives and commitments, but also provides an opportunity to stimulate the local economy and provide recreational opportunities to the community.

2. Approach and Scope of Work

As previously discussed, Tetra Tech proposes to complete the project on a three-phase design-build approach. Each phase is discussed below.

Phase 1 Preliminary Design Package

Upon Notice to Proceed, Tetra Tech will begin by scheduling and attending a kickoff meeting to review and agree upon the scope. At SSA discretion, stakeholders may be invited.

The preliminary design phase will include the following key tasks:

- Data Gathering: Initial project data collection, site reconnaissance visit(s), and data evaluation.
- Property or Right-of-Way Acquisition Support
- Aerial Topography and Bathymetry Surveys
- Utility Requirement Research
- Geotechnical Analysis of the Inlet
- Hydraulics and Hydrology Analysis and Drainage Design
- Conceptual Embankment Design
- Biological and Cultural Investigations
- Well Siting Investigation
- Preparation of 60% Design Plans and Specifications

Following preparation of the 60% design, Tetra Tech will present the plans to the SSA Board of Board of Directors at their April 2023 Board Meeting and submit them for review and approval by the SSA. Upon incorporation of SSA comments, Tetra Tech will update the plans and specifications, begin work on Phase 2, and submit a definitive cost plan for Phase 3 construction.

The two most critical design elements will be the well design and embankment design. Each is discussed in some detail below.

Well Design and Permitting

Tetra Tech's well design engineer will complete the following tasks:

- Obtain and review available data to assist the project, including water quality data in the vicinity, well completion reports, geophysical logs, geologic reports, and local regulatory agency requirements.
- Develop preliminary well design drawings based on the findings.
- Identify expected pumping capacity and water quality.
- Identify permits required for well drilling.
- Prepare methods and procedures for well drilling, construction, development, and testing.
- Develop sequence of drilling operations.
- Define expected depth of well casing and screened intervals.
- Prepare preliminary list of well construction materials including well casings, well screen, filter pack, gravel feed tube, well seal, etc.
- Discuss site logistics and requirements for well drilling including utility locations, drilling setup, noise abatement, working hours, dust control, site access, and drilling waste management.
- Establish temporary drilling equipment layout in coordination with site logistics, engineering, and future site development plans.
- Prepare an engineer's cost estimate and project schedule.
- Prepare a final design report that includes the above information.

At the conclusion of these tasks, Tetra Tech will prepare and submit water well permit applications to Imperial County Public Health Department. The county also requires approval from the Imperial County Planning and Development Services Department and the Imperial County Public Works Department. Tetra Tech will prepare necessary documents and provide permitting support.

Embankment Design

Tetra Tech will prepare an embankment design that is expected to measure approximately 150 feet wide by 5 to 6 feet high, by 12 feet wide at the crest. The embankment is expected to be constructed with a compacted clay core, and rip rap scour protection. A broad crested concrete weir spillway will be constructed on top of the embankment.

Based on 2D HEC-RAS model results provided by CVWD, the 100-Year design storm event for the spillway is 1,540 cfs. Tetra Tech will conduct a hydraulic analysis of the spillway and design it to include a factor of safety so that it can pass a storm of at least 2,000 cfs.

Technical Specifications and Contractor Bidding

In preparation for construction, Tetra Tech will prepare technical specifications for drilling contractor bids to construct, develop, and test the wells. Tetra Tech will then conduct contractor bidding from local drilling firms, evaluate bids, and select a contractor. A similar process will be followed for selecting an earthwork contractor.

Phase 2 Permitting and Right-of-Way

Once the SSA has approved the 60% design plans, Tetra Tech will prepare and submit permitting and right-of-way documents for the full range of required documents, including environmental, well permits, and grading and berm construction permits. Tetra Tech will then work with the permitting agencies to ensure all permits are ultimately approved.

Phase 3 Final Design and Construction

During Phase 3, Tetra Tech will finalize the design plans and specifications and begin preparing bidding documents for selection of contractors, to:

- Install Wells
- Install Piping and Electrical Connections
- Install Embankment Fill and Spillway

Tetra Tech will conduct the bidding process, and in cooperation with the SSA, select the drilling, earthwork and other contractors, providing work for local businesses. Throughout the process, Tetra Tech will manage the construction process, provide construction oversight, provide construction quality control (CQC), and conduct safety training and provide health and safety management.

Project Management

Tetra Tech's Program Manager, Javier Weckmann, PE, GLC will be responsible for the overall success of the program and will have many responsibilities including, but are not limited to:

- Facilitating frequent and consistent communications with the SSA and Stakeholders
- Implementing the overall delivery plan
- Managing overall scope, schedule, and budget
- Implementing the Quality Assurance/Quality Control (QA/QC) and health and safety programs
- Overseeing project controls staff for timely project management reports

As the Project Manager for Tetra Tech, Javier has the authority to commit firm resources. Javier is both a licensed California Professional Civil Engineer and holds California Construction Contractor's license. His experience on many large multi-discipline projects has ingrained in him the importance of focusing on the long-term goals of every project, while leaving "no stone unturned".

Javier will also be responsible for the technical management of the project. He will be responsible for the internal team coordination, management, preparing and reviewing design deliverables, and directing design support service disciplines and specialty subcontractors. He will assist in presenting the technical work at meetings and documenting action items and decisions.

Strict Quality Control Saves Time and Budget, Now and into the Future

Quality is achieved through efforts of skilled professionals who will effectively apply their judgement and experience and follow a deliberate QA/QC program. Tetra Tech has well established procedures for quality management that will be utilized as the project standard. This includes an independent advisory team of senior professionals, and a QA/QC Manager as part of the to make sure that procedures are followed. Conformance with the SSA's design standards will be included in the QA/ QC reviews.

Quality Assurance Process

Tetra Tech has standard institutional project delivery and quality management procedures and controls that are employed for all projects. Our Quality Management Program is modeled after ISO 9000 guidance documents. The Tetra Tech team will use the corporate program as the basis for our Quality Management Program for this project. The Quality Management Program is designed to be transparent, complete, auditable, and measurable to allow for continuous quality. For the overall contract, Tetra Tech will maintain a current Quality Control Plan which will be provided to the SSA if requested.

Proactive Open Communications Enhances Collaboration and Expedites Progress

Designing to budget will be a major emphasis for our Project Manager and team. This includes both design budget/costs and construction costs. Our Project Management Team will develop level-of-effort and cost estimates by task, determine the labor mix to perform the task, and track costs to meet design budgets.

Controlling scope creep, which can affect both budget and schedule, will also be a major emphasis of our project team. Controlling scope creep is almost always tied to making - and not changing - design decisions made during the project planning phase unless there are overriding reasons. After the preferred project layout is approved, Javier will implement a formal procedure to assess suggested design changes that evaluates all aspects of the change, including number of facilities impacted, design and construction costs, schedule, benefits, options to avoid the change, and the change justification.

Schedule

Tetra Tech has prepared a milestone schedule in Microsoft Project containing major tasks and subtasks. The Tetra Tech team is committed to following this schedule to achieve the key milestone dates of completing the Phase1 design by Aril 2023 and completing construction by December 2023. While we are committed to meeting these milestones, during the kickoff meeting we will discuss early-start items, including having water supply and embankment design in parallel to maximize efficiency and take time off the schedule.

The schedule provided in Section 6 will be used to manage the project and will be set as the project baseline schedule. Upon award, additional detail will be added for lower-level subtasks. Other items to be added in consultation with the SSA and involved agencies. Any deviations from the schedule will be discussed and documented. If delays occur, our Project Manager will work with the project team and SSA to identify possible methods of maintaining the critical path of the project schedule.

3. Cost Estimate

Tetra Tech has thoroughly investigated the project scope and concluded that the project can be completed for the budget available in the project grant. We propose to complete Phase 1 and Phase 2 on a Time and Materials basis with a Cost Not to Exceed a budget of approximately $250,000. If authorized by SSA, Tetra Tech will develop a detailed cost proposal, labor rate table, and draft contract to establish the Final Cost Not to Exceed for Phases 1 and 2. At the conclusion of Phase 1, Tetra Tech will prepare a Firm-Fixed Price Cost Proposal for Phase 3 for review and approval by the SSA.

Tetra Tech has surveyed contractors in the area and developed the indicative construction cost estimate shown in Table 3.1 below, which indicates that the construction can be completed for approximately $970,000. This would bring the total cost of the project, including design and construction, within the grant amount of $1,250,000.

Table 3.1
Salton Sea Program Desert Shores Project
Indicative Construction Cost Estimate for Phase 3

Earthen Berm, Spillway, Wells, and Water Conveyance

Project Management		$	30,155
Site Specific H&S Plan		$	13,458
Waste Management & Dust Control Plans		$	13,062
Wells, Electrical & Control		$	552,789
Earthen Berm, Spillway & Water Conveyance Pipeline		$	245,209
Completion Report		$	14,594
Sub Total		**$**	**869,267**
Contingency and Unpriced Items	12%	$	104,312
Total		**$**	**973,579**

Assumptions:

5 month planning, 1 month in the field, for a total 6 month POP.

2 - 300' wells, budget cost provided by well driller of $250,000 - $500,000 including pumps. $375,000 included in estimate.

Embankment / Dam to measure appr. 150' x 12' x 6'. Constructed with a compacted clay core, and rip rap scour protection.

Concrete spillway to be constructed on top of the embankment / dam.

Electrical service to be provided for each well pump, assume commercial power adjacent to each pump. Level control will be provided.

4. Team Qualifications

Tetra Tech offers the SSA a team of local experts backed by national experience who can skillfully design and construct the Desert Shores Project. The project team includes recognized experts in biological and lake habitat design, flood control and stormwater management measures, hydrologic and hydraulic modeling, and CEQA/NEPA coordination, well design and installation, embankment and spillway design, and construction of all required project components. A list of our key staff and their roles is provided in Table 4.1, below. Brief resumes of our key staff are provided on the following page.

Proposed Key Personnel

Table 4.1. Our Key Personnel Team is Highly Experienced in Completing Similar Projects at the Salton Sea.

Staff Member	Role
Javier Weckmann, PE	Program Manager
Aric Torreyson, PE	Hydraulic Design
Rafael Holcombe, PE, QSD	Design Support
Mary McKinnon	Environmental, CEQA/NEPA Support, Permitting
Stephanie Pacheco	Environmental, CEQA/NEPA Support, Permitting
Ondrea Hummel, CERP*	Environmental Planner, Environmental and Habitat Support
Doug Bell, PE, GE	Geotechnical Engineering
Don Lee, PH, CHG	Well Design/Pipeline Alignment/Water Supply
David Pizzi, PE, CFM	Hydrologic and Hydraulic Modeling/Drainage
Dan Helt, PE, PLS	Survey and Right-of-Way
Arthur Gunter, PG	Construction Manager
William Brownlie, PhD, PE	Technical Oversight

Resumes

The Tetra Tech team is experienced in providing scope-specific services. We assembled our team based on each individual's extensive expertise in assigned fields, as well as their long-standing history of successful project delivery. Resumes for all proposed key personnel are shown below.

Javier Weckmann PE, GLC

Role: Principal in Charge

EDUCATION

ME Coastal/Oceanographic Engineering, University of Florida (1979)

BSE Civil Engineering, Loyola Marymount University (1978)

REGISTRATION/CERTIFICATION

Professional Engineer, Civil:
CA License No. 33678
WA License No. 22013

YEARS OF EXPERIENCE

41 Years | 38 Years at Tetra Tech

Mr. Weckmann has 41 years of experience in civil and environmental planning and engineering. He has conducted the feasibility studies, engineering, design, and planning for numerous large civil design and remedial implementation projects. His responsibilities have included: levee and embankment design and construction, dredging analyses and design, erosion assessments, landfill design, groundwater pump and treat systems, surface runoff control channels, and contaminated soil excavation, treatment, and disposal. Mr. Weckmann has 23 years of experience designing and constructing projects at the Salton Sea.

Relevant Project Experience

- Salton Sea Management Program Technical Support for the CNRA, California DWR, and Department of Fish and Wildlife (DFW), Riverside County, CA
- Salton Sea Restoration Funding and Feasibility Action Plan for the Salton Sea Authority, Riverside County, CA
- Salton Sea Wetland Design Project, Salton Sea Authority/California DWR, Riverside County, CA

Aric Torreyson PE

Role: Hydraulic Design

EDUCATION

BS Civil Engineering, California State Polytechnic University, Pomona (2000)

REGISTRATION/CERTIFICATION

Professional Engineer, Civil:
CA License No. 66068

YEARS OF EXPERIENCE

21 Years | 13 Years at Tetra Tech

Mr. Torreyson has over 21 years of diverse engineering experience in public works construction, environmental engineering, and infrastructure assessment. He is the current Program Manager for the Los Angeles District IDIQ contract. He has successfully completed numerous multi-discipline public works and recreational improvement projects, smoothly integrating many different disciplines to achieve project goals. Mr. Torreyson has extensive and relevant experience in stormwater design and development of Best Management Practices, and has successfully implemented sustainable design elements, including complete streets, water harvesting, landscaping, and wetland design

Relevant Project Experience

- Eastern Coachella Stormwater Master Plan, Coachella Valley Water District, Coachella, CA
- East Garden Grove-Wintersburg Channel, Orange County, Huntington Beach, CA
- International Boundary and Water Commission (IBWC) Design IDIQ, IBWC, AZ,NM, TX
- Tres Rios Ecosystem Restoration Recreation Improvements, City of Phoenix, AZ
- Santa Fe Drive Corridor Bike & Pedestrian Improvements, City of Encinitas, CA

Rafael Holcombe PE

Role: Design Support

EDUCATION

BS Civil Engineering, The Ohio State University (1998)

REGISTRATION/CERTIFICATION

Professional Engineer, Civil:
CA, License No. C67956
OH, License No. PE.76489

Qualified Stormwater Developer (QSD), California Stormwater Quality Association, License No. 22485

YEARS OF EXPERIENCE

23 Years | 21 Years at Tetra Tech

Mr. Holcombe is a project manager with experience in design, engineering analysis, preparation of construction documents, and construction administration of multi-disciplinary waterfront developments, including dredging, marinas, revetments, wave attenuators, piers, retaining walls, parks and special project. He is also responsible for compliance with all environmental concerns including endangered species monitoring, turbidity monitoring, and contaminated materials remediation.

Relevant Project Experience

- Torres Martinez Wetlands Project, Salton Sea Authority, Salton Sea, CA
- Bayshore Swim Dock Replacement, City of Long Beach Public Works, Long Beach, CA
- Davies Launch Ramp Improvements, City of Long Beach Public Works, Long Beach, CA
- Stormwater Design Review of Pier A West, Port of Long Beach, Los Angeles, CA .
- Naples Seawall Replacement Project, Long Beach Public Works, Long Beach, CA

Mary McKinnon

Role: Environmental, CEQA/NEPA Support, Permitting

EDUCATION

BS Environmental Earth Science, Stanford University (1983)

YEARS OF EXPERIENCE

32 Years

Ms. McKinnon is a Principal Environmental Analyst and Project Manager with over 32 years of experience in the performance of environmental impact assessments. Her experience has focused primarily on writing and managing the preparation of Initial Studies (ISs), Environmental Assessments (EAs), and Environmental Impact Reports/Statements (EIRs/EISs) for a variety of projects subject to review under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). She is currently providing on-going support to DWR for projects around the Salton Sea, including preparing permitting and environmental clearance documents required for vegetation enhancement and dust suppression projects, including Streambed Alteration Agreements for CDFW, and several CEQA Addendums.

Relevant Project Experience

- Salton Sea Management Program (SSMP) Support, Salton Sea, CA
- IS/MND for Carbon Canyon Channel Flood Control Improvement Project, Chino Hills, CA

EIRs and Biological Resources Permitting for Remedial Action Plans, Confidential Aerospace Client, Beaumont, Riverside County, CA

Stephanie Pacheco

Role: Environmental, CEQA/NEPA Support, Permitting

EDUCATION

MS Soil Science, University of California (1989)

BS Environmental Resources in Agriculture, Arizona State University, (1985)

REGISTRATION/CERTIFICATION

Jurisdictional Delineation of Wetlands Certificate, University of California, Berkeley

YEARS OF EXPERIENCE

32 Years

Ms. Pacheco is an Environmental Permitting Specialist with more than 32 years of experience serving as both a project manager and resource specialist for large and small natural resource projects in the southwestern United States. She has successfully negotiated permits for both commercial entities, governmental agencies and non-governmental sovereign nations to satisfy Section 404 and 401 of the Clean Water Act plus California Department of Fish and Game Code (CDFG) 1600 for projects impacting waters subject to regulatory authority. Ms. Pacheco has successfully negotiated Lake and Streambed Alteration Agreements in compliance with CDFG Code for projects in Los Angeles, San Bernardino, and Riverside Counties.

Relevant Project Experience

- Salton Sea Management Program, Aquatic Habitat and Dust Suppression, Riverside County, CA
- Waste Discharge Requirement for the Clubhouse, Tule Wash and West Bombay Beach Vegetation Enhancement Project, Salton Sea Dust Suppression Action Plan
- Water Quality Certification and Streambed Alteration Agreement, San Manuel Band of Mission Indians, San Bernardino County, CA

Ondrea Hummel CERP

Role: Environmental Planner, Environmental and Habitat Support

EDUCATION

MS Biological Sciences, Florida Institute of Technology (1994)

BA Biology, Keuka College (1992)

REGISTRATION/CERTIFICATION

Certified Ecological Restoration Practitioner (#0054)

YEARS OF EXPERIENCE

27 Years | 6 Years at Tetra Tech

Ms. Hummel has been active in the field of riverine, riparian and wetland ecosystem restoration efforts in the southwest for the past 27 years. She has expertise in ecological restoration project planning, habitat and wildlife inventory including threatened and endangered species, vegetation mapping, noxious weed and invasive species inventory and management planning, environmental documentation (NEPA, CWA, ESA, FWCA), monitoring plan development and implementation, mitigation plan development and implementation, environmental oversight during construction, post construction project monitoring, project management and has written numerous planning documents, environmental assessments, environmental impact statements, categorical exclusions and biological assessments.

Relevant Project Experience

- Dust Suppression and Vegetation Enhancement Planning and Design, Salton Sea, CA
- Middle Rio Grande Endangered Species Collaborative Program Assessment and Monitoring, USACE Albuquerque District, Rio Grande, NM
- San Acacia Diversion Dam Fish Passage Environmental Compliance, Bureau of Reclamation
- Buena Vista Solar Project, NextEra Energy Resources, LLC, Otero County, NM
- Cimarron Watershed Alliance (CWA) Trout Restoration Project Compliance, CWA

Doug Bell PE, GE

Role: Geotechnical Engineering

EDUCATION

BS Civil Engineering, The Ohio State University (1998)

REGISTRATION/CERTIFICATION

Professional Engineer, Civil:
CA, License No. C40516

Geotechnical Engineer:
CA, License No. GE2140

YEARS OF EXPERIENCE

30 Years

Mr. Bell has been involved with the geotechnical engineering of numerous projects involving heavy civil construction, commercial and industrial development, roadways, bridges, water reservoirs, pipelines, and hydraulic structures. His work has included detailed settlement analysis, development of recommendations for shallow and deep foundation systems, slope stability analysis, and evaluation of lateral earth pressures for shoring and permanent wall structures. His work has also included forensic study of foundation distress of residential, commercial, and industrial buildings.

Relevant Project Experience

- Lake Gregory Dam Rehabilitation, San Bernardino County Special Districts, Crestline, CA
- East Garden Grove-Wintersburg Channel Improvements, Orange County Flood Control District Huntington Beach, CA
- Whitewater River FEMA Levee Certification, Riverside County Flood Control and Watershed Conservation District, Whitewater River West Bank, CA
- International Boundary and Water Commission (IBWC) Design IDIQ, IBWC, AZ, NM, TX

Don Lee PH, CHG

Role: Well Design/Pipeline Alignment/Water Supply

EDUCATION

BS Geology, University of Alberta (1988)

REGISTRATION/CERTIFICATION

Professional Geologist:
CA License No. 7406

Certified Hydrogeologist:
CA License No. 810

YEARS OF EXPERIENCE

32 Years

Mr. Lee is a California certified hydrogeologist with 30 years of experience in hydrogeological assessments, basin evaluations, water well siting, design, permitting assistance, and construction.

Relevant Project Experience

- Water Well Rehabilitation and Aquifer Testing, Salton Sea Authority and Torres-Martinez Reservation, Mecca, CA
- Well Siting, Preliminary Well Design Report, and Construction of over 30 Wells, Private and Municipal Clients, Inland Empire

David Pizzi PE, CFM

Role: Hydrologic and Hydraulic Modeling/Drainage

EDUCATION

MS Civil Engineering (hydraulics), Colorado State University (2002)

BS Civil Engineering (water resources), University of Maryland (2000)

REGISTRATION/CERTIFICATION

Professional Engineer, Civil:
CO License No. 0046807
NM License No. 21452

Certified Floodplain Manager,
License No. US-15-08635 (2015)

YEARS OF EXPERIENCE

18 Years | 17 Years at Tetra Tech

Mr. Pizzi manages and leads technical analyses for a range of engineering and planning projects dependent on hydraulics, erosion and sedimentation, fluvial geomorphology, and hydrology. He has a broad base of experience working for both private and government clients in a variety of climatic and geologic settings throughout the US, including limited international experience. His primary expertise is evaluating how changes in the delivery of water and sediment from contributing watersheds impact the hydraulic, geomorphic, and ecologic conditions of rivers and reservoirs.

Relevant Project Experience

- Oasis Area Drainage Study, Coachella Valley Water District, Riverside County, CA
- San Joaquin River Sediment Transport Measurements, California Department of Water Resources, Fresno and Madera Counties, CA
- Geomorphology Monitoring Plan Development for the Upper American River Project, Sacramento Municipal Utility District, El Dorado and Sacramento Counties, CA

Dan Helt PE, PLS

Role: Survey and Right-of-Way

EDUCATION

BS, Civil Engineering, California Polytechnic University, San Luis Obispo (2003)

REGISTRATION/CERTIFICATION

Professional Engineer, Civil:
CA, License No. C69347

Mr. Helt is experienced in both civil engineering and land surveying aspects of construction and land development projects. He has designed and prepared both small and large federal, municipal, commercial, and residential grading and drainage plans, as well as utility plans and project associated public improvement plans. He has prepared and reviewed specifications, calculations, and other basis of design documents. Mr. Helt has performed field boundary and topographic surveys, as well as construction staking, certification, and monitoring, and ALTA/ACSM surveys.

Professional Land Surveyor:
CA, License No. 8925

YEARS OF EXPERIENCE

18 Years

Relevant Project Experience

- Map Checking Services, City of Pismo Beach, Pismo Beach, CA
- Records research and Mapping Services, Naval Facilities Engineering Command (NAVFAC) SW, Long Beach, CA.
- Adventure Park Stormwater Capture Project, Los Angeles County Public Works, Whittier, CA

Arthur Gunter PG

Role: Construction Manager

EDUCATION

BS, Geology, San Diego State University, 2002

REGISTRATION/CERTIFICATION

Professional Geologist, CA, Number 9091

Qualified SWPPP Developer, Certification No. G9091

Qualified SWPPP Practitioner, Certification No. 25859

YEARS OF EXPERIENCE

18 Years

Art Gunter is a Construction Manager in our Remediation and Field Services Division that specializes in environmental construction projects that typically involve earthwork and well installation. He has managed various environmental projects, including land reclamation and remediation and restoration (excavations), dry-cleaner facility assessments and remediation, clarifier and hydraulic lift removal assessments, burn ash land fill assessments, mining real estate transaction screens, insurance claims investigations, storm water compliance, and construction oversight of subsurface utilities. Additionally, Art has been responsible for staff health and safety training, supervision, planning, bidding, permitting, scheduling, budget analysis, site access agreements, and reporting on project activities.

Relevant Project Experience

- Remediation and land reclamation for Naval Facilities Engineering Command, El Cento, CA
- Well installation at multiple sites in California for the US Navy
- Emergency response services

William Brownlie PHD, PE

Role: Technical Oversight

EDUCATION

PhD Civil Engineering, Hydraulics and Hydrology, Caltech (1981)

MS Civil Engineering, Hydraulics and Water Resources, SUNY, Buffalo (1976)

BS Civil Engineering, SUNY, Buffalo, (1975)

REGISTRATION/CERTIFICATION

Professional Engineer, Civil:
CA License No. 36192
11 Other states and Puerto Rico

YEARS OF EXPERIENCE

40 Years | 40 Years at Tetra Tech

Dr. Brownlie has extensive experience in water resources engineering and program management for a wide range of civil and environmental engineering projects, including more than 60 projects related to Salton Sea restoration. For the past 24 years, Dr. Brownlie has managed a diverse range of engineering and environmental programs at the Salton Sea in southern California. These programs have involved civil and environmental engineering design, analysis of restoration measures, dust mitigation design, hydraulic and hydrologic analyses, environmental impact documentation, and environmental planning. Dr. Brownlie is based in Tetra Tech's corporate office in Pasadena, CA but lives near Ontario Airport and is readily available for morning meetings near the Salton Sea.

Relevant Project Experience

- Engineering Support Services for Salton Sea Restoration, Salton Sea Authority, California DWR, and US Bureau of Reclamation, Riverside County, CA
- Salton Sea Management Program (SSMP) Technical Support, CNRA, California DWR, and Department of Fish and Wildlife, Riverside County, CA
- Salton Sea Funding and Feasibility Review, Salton Sea Authority, California DWR, Riverside County, CA

5. Past Performance

Tetra Tech has assembled a team of experts that have a long history with a variety of projects at the Salton Sea and elsewhere that provide our staff with a range of experiences and perspectives related to the design-build at Desert Shores. This section includes examples of scope-specific experience. We have included a summary of the team's project experience (Table 5.1, *below*), followed by project descriptions with a key client contact person with their current phone number.

Table 5.1. Tetra Tech Has Project Experience in All Scope Areas That Will Be Required at Desert Shores.

CLIENT/OWNER	PROJECT	SURVEY	RIGHT OF WAY SUPPORT	PROJECT ACQUISITION SUPPORT	UTILITY RESEARCH	POTHOLING	HYDROLOGIC AND HYDRAULIC MODELING/ DRAINAGE	PIPELINE ALIGNMENT STUDY/ WATER SUPPLY	GEOTECHNICAL ENGINEERING	STRUCTURAL ENGINEERING	RECREATION OPPORTUNITIES	NEPA/CEQA SUPPORT	BIOLOGICAL AND LAKE HABITAT DESIGN	GRANT FUNDS
Riverside County	Embankment Design for the North Lake						✓	✓	✓	✓	✓		✓	
Salton Sea Authority	Salton Sea Restoration Funding and Feasibility Action Plan	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Salton Sea Authority	Development of a Preferred Salton Sea Restoration Plan	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	
Salton Sea Authority	Salton Sea Tribal Wetland Design Project – Torres Martinez	✓			✓		✓	✓	✓	✓		✓	✓	✓
California DWR	Technical Support for the Salton Sea Management Program	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	
USACE	Robles Diversion Dam Modification	✓	✓	✓	✓		✓	✓	✓	✓			✓	
Orange County Public Works	East Garden Grove-Wintersburg Channel Levee Design-Build		✓		✓	✓	✓	✓	✓	✓	✓			
Coachella Valley Water District	Eastern Coachella Valley Storm Water Master Plan			✓	✓		✓	✓				✓		
International Boundary and Water Commission	International Boundary and Water Commission IDIQ	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Ventura County Public Works	Levee Support - Ventura County Public Works Agency - Watershed Protection	✓	✓		✓		✓		✓	✓	✓	✓		✓
City of Encinitas	Santa Fe Drive Corridor Bike & Pedestrian Improvements	✓	✓		✓	✓	✓		✓		✓	✓		✓
USACE	Tule River Spillway Enlargement (Schafer Dam) Success Lake Project	✓		✓	✓		✓	✓	✓	✓	✓			

5.1 Project Descriptions

Embankment Design for the North Lake

CLIENT/DATES

County of Riverside (2011- 2017)

LOCATION

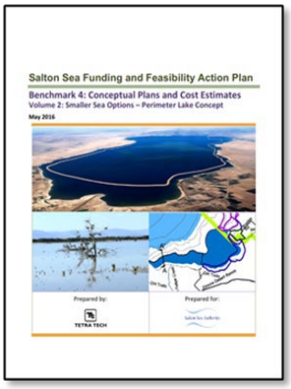
Riverside, CA

CONTACT

Brian Nestande
(951) 955-1110
bnestande@rivco.org

Tetra Tech was hired by Riverside County to develop the original concept for a North Lake that would align with the Perimeter Lake, a Salton Sea restoration concept that was developed by Tetra Tech for the Salton Sea Authority under a grant from the California Natural Resources Agency.

Riverside County contracted with Tetra Tech to perform a conceptual design and cost analysis of various alternatives of North Lake concepts for the Salton Sea Perimeter Lake within Riverside County. Tetra Tech had previously developed the Perimeter Lake as part of a finance and feasibility action plan for restoration of the Salton Sea. Three locations for developing lakes within Riverside County were identified: (1) West of the White Water River Delta; (2) The Western Shoreline from Kings Road to 84th Avenue; and (3) The Eastern Shoreline from Garfield St. to Mecca Breach in the State Park Recreation Area. In all, seven alternatives were developed, with some in a six-foot deep lake version and others with deeper water and a raised berm height. Several presentations were made to Riverside County and comments were incorporated in the final report.



Salton Sea Restoration Funding and Feasibility Action Plan

CLIENT/DATES

Salton Sea Authority
(2014- 2016)

LOCATION

Riverside County, CA

CONTACT

Phil Rosentrater
(760) 863-2695

The project involves feasibility planning and design for restoration to ensure that the Salton Sea becomes a sustainable ecosystem, a renewed recreational destination, and can be developed economically for geothermal energy. Tetra Tech's current work at the Salton Sea includes water quality modeling and conceptual design studies. The scope of work included preparation the following Benchmark Reports:

1. Comprehensive Work Plan
2. Review and Update Existing Condition Data Including Hydrology: Included evaluations of salinity and other water quality issues and modeling using SALSA and Modified SSAM
3. Review of Past Alternatives With Respect to Existing Conditions: Evaluations of past alternatives, modeling using SALSA and Modified SSAM
4. Conceptual Plans and Cost Estimates: These are the primary documents that involved design criteria and design plans

   • Vol. 1: Import/Export Options: Evaluations of water import and export alternates including Sea-to-Sea Analysis, using the Modified SSAM and a Salt Balance Spreadsheet developed by Dr. Brownlie

   • Vol. 2: Perimeter Lake Design Report: Planning and engineering design for the Salton Sea Perimeter Lake including a geotechnical feasibility study for seismic and seepage modeling and design of berms, engineering design criteria and plans, blending of freshwater and saline flows to produce habitat water of desired salinity, incorporation of dust control features, construction sequencing scenarios, and detailed feasibility level construction cost analysis. Evaluated by CA DOE and found to not have any fatal flaws.
5. Infrastructure Financing Feasibility: Including a financial model and feasibility analysis for an Enhanced Infrastructure Financing District
6. Financing and Funding Options from Renewable Energy Development: Evaluation of funding options from renewable energy sources conducted by US DOE National Renewable Energy Laboratory (NREL) as a subcontractor to Tetra Tech
7. Final Report and Presentation of Findings: Final presentation report and PowerPoint presentation of results at numerous workshops.

Development of a Preferred Salton Sea Restoration Plan

CLIENT/DATES

Salton Sea Authority
(1994- 2016)

LOCATION

Riverside County, CA

CONTACT

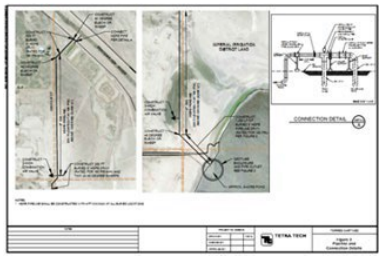
Phil Rosentrater
(760) 863-2695

Tetra Tech provided engineering, scientific, and management support functions including preparation of engineering plans, a preferred project report, and presentation materials. Project included the original scope and 27 additional task orders.

Preferred Project Report. Tetra Tech conducted engineering studies to evaluate the feasibility of various alternatives and developed the Salton Sea Authority's preferred restoration alternative which was documented the Preferred Project Report. Design studies included geotechnical investigations of underwater sediments by drilling and cone penetrometer investigations from a jack-up barge. This work served as the basis for design of in-Sea embankments that are part of the project. Other technical aspects of the project include conceptual designs and cost assessments for two water treatment plants and a pumping plant. Public Involvement/Workshops. Tetra Tech provided proactive outreach support that included fact sheets, news releases, advertising, web support, a public involvement plan, and facilitation of multiple workshops.

Tetra Tech developed a water quality and hydrodynamic model to represent the Salton Sea using the Environmental Fluid Dynamics Code, a public domain model developed and supported by Tetra Tech that has been applied to more than 60 estuaries, lakes, and rivers. Using available data on weather conditions, current flow, temperature, and water quality, the model has been calibrated for the current configuration of the Salton Sea. Besides hydrodynamics and water temperatures, the following water quality parameters are being modeled: phosphorus, nitrogen, selenium, salinity, chlorophyll a, dissolved oxygen depletion and sulfide generation.

Environmental Assessments and Initial Studies. Tetra Tech has prepared several Environmental Assessments in compliance with NEPA and Initial Studies and Mitigated Negative Declarations in compliance with CEQA for various project components.



Salton Sea Tribal Wetland Project – Torres Martinez

CLIENT/DATES

Salton Sea Authority
2013-2016

LOCATION

Riverside County, CA

CONTACT

Phil Rosentrater
(760) 863-2695

Tetra Tech provided environmental, design, and construction services to rehabilitate the Torres Martinez Wetlands at the north end of the Salton Sea. The project was funded by a grant from the California DWR FAP.

Tetra Tech prepared design plans and specifications and an initial bid package that was required to be completed in a compressed four week time period over the Dec-Jan 2013/2014 holiday period. Tetra Tech worked closely with the customer, met all deadlines, and completed the project under budget allowing the customer to reprogram the remaining budget for other tasks.

Subsequently, because of restrictions on funds available for construction, Tetra Tech was asked to prepare revised plans and develop bid packages for individual components. Amec FW updated the environmental documents to be consistent with the new plans. A new water source has now been installed and the ponds have been rehabilitated. A final bid package was prepared for installation of solar panels to provide a renewable energy source to power the pump for a continuous source of water for the ponds.

Tetra Tech worked closely with the Salton Sea Authority in the issuance of the bid packages, scoring of construction proposals and selection of contractors.

Technical Support for the Salton Sea Management Program

The Salton Sea is a large, shallow, hypersaline, terminal lake in Imperial and Riverside County with serious environmental concerns on account of decreasing inflows. Two major effects of these are increasing salinity and loss of lake volume, and dust emissions from exposed lakebed. Improving air quality and creating habitat at the Salton Sea are key priorities for Governor Gavin Newsom and the California Natural Resources Agency. To address these impacts, the Department of Water Resources is focused on 30,000 acres of discrete habitat and dust suppression projects around the perimeter of the Sea over 2018-2028 (Salton Sea Management Program, SSMP). Tetra Tech has been a key participant in this program since 2017 and has performed

CLIENT/DATES

California DWR
(2017-Ongoing)

LOCATION

Riverside County, CA

CONTACT

Vivien Maisonneuve
(916) 873-6796
vivien.maisonneuve@water.ca.gov

the following major tasks: development of Program Management Plan for the SSMP (2020-Present); development of Phase 1: 10-Year Plan (2018-Present) for the SSMP (2018); development of Dust Suppression Action Plan (2020-Present); preparation of Annual Report for the SSMP (2020); engineering support for habitat pond design concepts including design, cost estimation, and geotechnical field data collection (2017-Present); field support for pre-construction surveys and monitoring during construction (biological, cultural, and paleontological resources) (2020); support preparing compliance documents for individual dust suppression projects (2019-Present); support for technical review of design-bid-build contracts for $200 million Species Conservation Habitat Project; air quality planning, monitoring, and modeling; and stakeholder outreach across the Salton Sea region.

Robles Diversion Dam Modification

The Robles Diversion Dam is owned by the USBR and operated by the Casitas Municipal Water District. The contract was performed under the USACE Los Angeles District and is part of an overall mitigation plan for the Matilija Dam removal.

Robles operates under a regulated diversion schedule, affected by the highly variable river flows, large sediment loads, downstream water rights, and minimum flows to maintain fish passage. The design modifications to Robles consist of the addition of a high-flow bypass spillway with Tainter gates, a stilling basin, and a high-flow fishway/ladder. To assist in the operability of the diversion dam, the existing embankment will be raised and an armored rock ramp spillway will be provided for the embankment. and a downstream channel bed to protect the diversion dam from scour damage.

Tetra Tech was the designer on this project and was responsible for civil design, structural design, geotechnical, mechanical and electrical design, construction documents, CAD using MicroStation, SpecsIntact specifications, and a comprehensive design documentation report.

Tetra Tech worked closely with the federal and local agencies, facilitating meetings of the USBR, USACE, Ventura County, the Casitas Municipal Water District, and the resource agencies for the purpose of evaluating the existing gates and dam and resolving issues related to the dam spillway capacity, the fish bypass design, the stilling basin design and permitting, including modifying design criteria for the Tainter gates analysis. The plans and specifications and the final design report for this $21 million project were completed in 2013. All work was performed within the initial project budget and satisfaction with Tetra Tech's services can be seen in the additional project awards with USACE.

CLIENT/DATES

USACE (2010- 2013)

LOCATION

Ventura, CA

CONTACT

Doug Chitwood
(213) 452-3587
Douglas.E.Chitwood@usace.army.mil

East Garden Grove-Wintersburg Channel Levee Design-Build

The East Garden Grove-Wintersburg Channel project is located in the City of Huntington Beach and approximately 1 mile long with improvements on both sides of the leveed channel. The levee section protects the adjacent neighborhoods and was originally designed to convey a 10-year storm event. The channel capacity does not meet the current design criteria of providing 100-year flood protection. This project is currently being implemented as part of a Progressive Design-Build contract led by the Design-Build Entity (D-BE) of JF Shea (contractor) and Tetra Tech (designer) and consists of a series of design elements necessary for the channel reach to convey the discharge from a 100-year storm, address levee erosion concerns, meet regulatory agencies requirements, and mitigate a potential levee failure due to a storm event, extreme tidal events, tsunami, and/or an earthquake.

Tech prepared a river hydraulic and groundwater analyses, performed geotechnical and structural engineering design, and developed construction documents for implementation of the following elements: Steel Sheet Piles (SSPs) installed via the press-in method on each side of the channel; a second row of SSPs installed on the land side on each embankment to further fortify the channel levees; deep soil cement mix columns are constructed between the two rows of SSPs; channel widening by removing the resultant trapezoidal soil wedge; storm drain and pump station utility penetration through the SSP to provide landside drainage overflow into the channel;

CLIENT/DATES

Orange County Public Works
(2019-2022)

LOCATION

Huntington Beach, CA

CONTACT

Melissa Pasa, MS, PMP
(714) 647-3977
melissa.pasa@ocpw.ocgov.com

Eastern Coachella Valley Storm Water Master Plan

As part of the Eastern Coachella Valley Storm Water Master Plan, Tetra Tech as a subconsultant to Webb & Asso., prepared detailed master plan for nine (9) alluvial fan floodplains from the Santa Rosa Mountains for the Oasis area and alternatives analysis for 11.6 miles of the Coachella Valley Stormwater Channel from 52nd Street to the Salton Sea.

The detailed alternatives analysis for 11.6 miles of the Coachella Valley Storm Water Channel identifying key physical processes governing the channel conditions and hydraulics, its state of equilibrium and developing alternatives that are cost effective and sustainable (i.e., low maintenance). A field review of the entire channel reach was performed to obtain and document additional site information, such as bank erosion, low flow channel migration, debris and sediment accumulation, current bridge scour, channel access, and unidentified utility crossings. The analysis includes a detailed hydraulic/sediment models (HEC-RAS/HEC6T) and review of the numerous constrictions such as HWY 111/UPRR Bridge, the Thermal Drop structure, existing gate structures, and R/W limits.

CLIENT/DATES

Coachella Valley Water District
ECVSWMP (2014-2016)
Oasis LOMR (2017-2018)

LOCATION

Riverside, CA

CONTACT

Dan Charlton, PE
(760) 398-2661
DCharlton@cvwd.org

Additionally, for the Oasis area, the analysis included a calibrated hydrologic run off modeling based upon Bulletin 17B and RCFC&WCD Hydrology, alluvial fan delineation including geomorphologic mapping per Guidance for Alluvial Fan Flooding Analyses and Mapping (FEMA, 2002), FLO-2D modeling, FEMA FIS and FAN model updates, debris/sediment delivery analysis, and hydraulic analysis for the proposed regional master plan systems utilizing the HEC-RAS program. The study area encompasses nine (9) major canyons and the associated alluvial fans tributary of the Santa Rosa Mountains, including the Martinez Canyon. The drainage areas of each canyon range from 1.7 sq. mi to 45.7 sq. mi. at the apex of each fan. Tetra Tech also analyzed the sediment transport capacities of the fan and channels to size the proposed master plan systems and properly account for future maintenance cost in the alternatives analysis. Debris and retention basin's locations were reviewed and optimized in the development of a comprehensive regional master plan for the Oasis area. The proposed systems and plan will assist Coachella Valley Water District with future development, fee assessment and prioritization of improvements.

Upon completion and approval of the OASIS area HAZARD Mapping, Tetra Tech in coordination with CVWD prepared a LOMR application to update the FEMA FIRM panel. The LOMR application was prepared for 5 Unnamed Canyons, Alamo Canyon, Barton Canyon, Martinez Canyon, Sheep Canyon, Travertine Palms Wash Canyon and covered panels 06025C0025C, 06025C0050C, 06065C2925G, 06065C2950G, 06065C3500G*, and 06065C3525G* All work was performed within the initial project budget and satisfaction with Tetra Tech's services can be seen in the additional project awards with CVWD such as the North Indio CLOMR.

International Boundary and Water Commission IDIQ

Tetra Tech was awarded an Indefinite Delivery/Indefinite Quantity (IDIQ) Contract with the US International Boundary and Water Commission (USIBWC) in September 2009. USIBWC received $220M in American Recovery and Reinvestment Act (ARRA) funding primarily for the rehabilitation of levees along the entire Rio Grande Valley in Texas and New Mexico. The results of Tetra Tech efforts were the embodiment of what ARRA was intending to do: laid off or unemployed personnel were provided jobs; personnel with diminishing workload sustained before potential layoff, and additional hours for employed and for Fiscal Year 2011 backlog.

CLIENT/DATES

IBWC (2009-2012)

LOCATION

AZ, NM, and TX

CONTACT

Delfina C. Lechuga
(915) 831-4120
Delfina.lechuga@ibwc.gov

Due to a flood in September 2008, various reaches along the Rio Grande Levee System in Texas and New Mexico sustained substantial damage that included levee breaks, overtopping, piping/sand boils, underseepage, and severe surface erosion. Tetra Tech provided levee remediation design for approximately 100 miles of levees under contract to the U.S. International Boundary and Water Commission. Tetra Tech tasks included site surveys, design memoranda, plans and specifications, cost estimates, bidding services, engineering during construction, and construction management services.

Tetra Tech also provided Construction Management responsible from project startup, quality assurance inspections, materials testing review, review of submittals, monthly report and documentation, coordination for resolution of request for information and design changes, and final inspection documentation. Task requirements of for design and construction were: increasing top-of-levee elevations, maintaining minimum side slope, and top width, per design; rehabilitation of the existing pipeline/culvert structures and appurtenances.

CLIENT/DATES

Ventura County Public Works (2015-Ongoing)

LOCATION

Ventura County, CA

CONTACT

Kirk Norman
(805) 654-2017
kirk.norman@ventura.org

Levee Support - Ventura County Public Works Agency - Watershed Protection

Over the past 8 years, Tetra Tech provided Grant, FEMA certification, Final Design, Alternatives/Feasibility studies, Civil, Geotechnical & Structural Engineering, Hydrology & Hydraulics, and Sediment Transport analysis for multiple levee systems across the SSA. Beginning in 2008, Tetra Tech lead the FEMA Certification for nine levee/floodwalls and prepare documents for their certification process based on FEMA's regulatory requirements as identified in Title 44 of the Code of Federal Regulations, Section 65.10 (44 CFR 65.10). Other projects include:

Ventura County DWR Grant Support- (2015- Present) Tetra Tech assisted the SSA in preparing levee assistance grant packages with more than $3.5 million in assistance granted. Services included cost engineering, economic, and project management expertise and services to support development of four grant applications. Grant applications were completed for the CC-2, SCR-1, VR-1 and VR-2 levee systems. For each levee system Tetra Tech developed project scopes, budget estimates, and schedules that demonstrated the SSA had plans to move forward with future phases on each of the levee systems. Detailed coordination with the SSA ensured all funding, scheduling, and scoping elements were sufficient within these documents. Tetra Tech also developed benefit-cost ratios for the two levee systems that were submitted under the LLCR guidelines. An economic report detailing the development of the benefit-cost ratios was included in the grant package submittals. ArcGIS was utilized to develop maps to support the information in the grant submittals.

VR-1 Final Design - (2017- ongoing)- The Ventura River Levee (VR-1) is a 2.65-mile-long levee system located in the city of San Buenaventura in Ventura County, California. This levee was originally designed and constructed by the United States Army Corps of Engineers in 1948, and is currently owned and maintained by the Ventura County Watershed Protection District (District). Based on Tetra Tech's review of existing VR-1 levee, historical data sets, and observations obtained during field investigations conducted in early 2009, the District was unable to certify VR-1 as fully-complying with all of the provisions found in 44 CFR 65.10. Based on the identified deficiencies, Tetra Tech has provided support to the District in this project in two phases. The first phase included preparing engineering and technical evaluations to support the design of alternatives to rehabilitate the levees. The evaluation and alternatives analysis was used to select a preferred alternative. In the second (current) phase, Tetra Tech has continued to provide the technical analyses and evaluations to support the final design and construction of the levee system. Tetra Tech's technical studies on this project have consisted of Data Collection, Topographic Mapping, Hydrologic Evaluation, Hydraulic Analysis, Scour Analysis, Alternatives Analysis. Geotechnical Investigation and Analysis, Economics, and Risk and Uncertainty Analysis.

VR-2 Levee Feasibility Study- (2017-Ongoing) The 1.1 mile segment of levee was determined to not meet Title 44 CFR 65.10 requirements. A deficiencies report was prepared identifying issues with deficient or missing embankment protection, steep levee prism slopes, and vegetation maintenance and inspection access. Tetra Tech conducted a design engineering feasibility study and geotechnical analysis to identify deficiencies and develop feasible alternative solutions in order to certify the VR-2 Levee. The technical studies consist of Data Collection, Topographic Mapping, Hydrologic Evaluation, Hydraulic Analysis, Scour Analysis, Geotechnical Assessment, Economics, Alternatives Analysis; and the preparation of Feasibility-Level Design Drawings, Cost Estimates and a Project Report.

Live Oak Acres and Meiners Oaks Levees Feasibility Study- (2019- 2021) VCPWA-WP contracted with Tetra Tech to develop an alternatives analysis, Intermediate Design Plans (or 65% plans) (as defined by the CDFW) for the selected alternatives, and cost estimates for both the Meiners Oaks Levee System (1.2 mi) and Live Oak Acres Levee System (0.8 mi) to meet CDFW Grant Application Requirements. Tetra Tech performed technical analyses, but also coordinated with other technical consultants and various stakeholders.

CLIENT/DATES

City of Encinitas
(2020-2021)

LOCATION

San Diego County, CA

CONTACT

Matt Widelski
(760) 663-2862
Mwidelski@encinitasca.gov

Santa Fe Drive Corridor Bike & Pedestrian Improvements

Tetra Tech is assisting the City of Encinitas' vision to implement a safe, efficient, and multi-beneficial transportation corridor project. The North Coast Corridor project is currently performing pedestrian and bicycle improvements to the Interstate 5 bridge crossing at Santa Fe Drive. To tie into these pedestrian and bicycle lane improvements, the City of Encinitas was awarded with grant funding from the State ATP and the Federal HSIP to perform pedestrian and bicycle improvements along Santa Fe Drive between Gardena Road to the west and El Camino Real to the east.

Santa Fe Drive is mostly a two-lane collector road facilitating limited active transportation. Pedestrians and/or cyclists share the roadway with motor vehicles as only a portion has sidewalk and curb and gutter. The proposed project will improve the sidewalks, curb, gutter, and curb ramps on both sides for an approximate 1.25-mile long segment. The project will include pavement widening to install protected bikeways lanes in each direction, protected intersections, along with the necessary striping and signage. Traffic calming measures, landscaping, and other walkability elements, designed to improve safety along the corridor, will be implemented. Additionally, LID techniques will be implemented to efficiently manage stormwater on-site. Given the current right-of-way constraints, to meet the City's project vision, it is anticipated that property acquisition will be necessary for the eastern portion of the project extents between Crest Drive and El Camino Real (north side). It is anticipated that the rest of the corridor alignment can be designed to utilize existing right-of-way extents and will not require acquisition of additional parcels.

CLIENT/DATES

USACE
(2019-Ongoing)

LOCATION

Tulare County, CA

CONTACT

Mostafa, PE
(916) 557-7539
Mostafa.M.Mostafa@usace.army.mil

Tule River Spillway Enlargement (Schafer Dam) Success Lake Project Phase 1 and 2

Success Lake and Schafer Dam is a multi-purpose facility built on the Tule River 5 miles East and upstream of the City of Porterville, Tulare County, California. Schafer Dam was designed and built by the U.S. Army Corps of Engineers (USACE) for flood control and storage of irrigation water. Construction of the zoned earth-filled dam and rock cut spillway were completed in 1961. It spans 3,490 feet across the Tule River and is approximately 142 feet high. When at gross pool elevation 655.11 feet NAVD88 (652.5 feet NGVD29), the lake holds 82,300-acre feet of water with a surface area of 2,450 acres. The maximum length of the lake at this elevation is 3.5 miles with approximately 30 miles of shoreline. The dam provides flood damage reduction benefits to the City of Porterville (pop: 52,000) and to other communities downstream of the dam. In addition, the dam helps protect several hundred thousand acres of valuable farmland west of the dam, including the Tulare Lakebed, from damaging winter and spring floods.

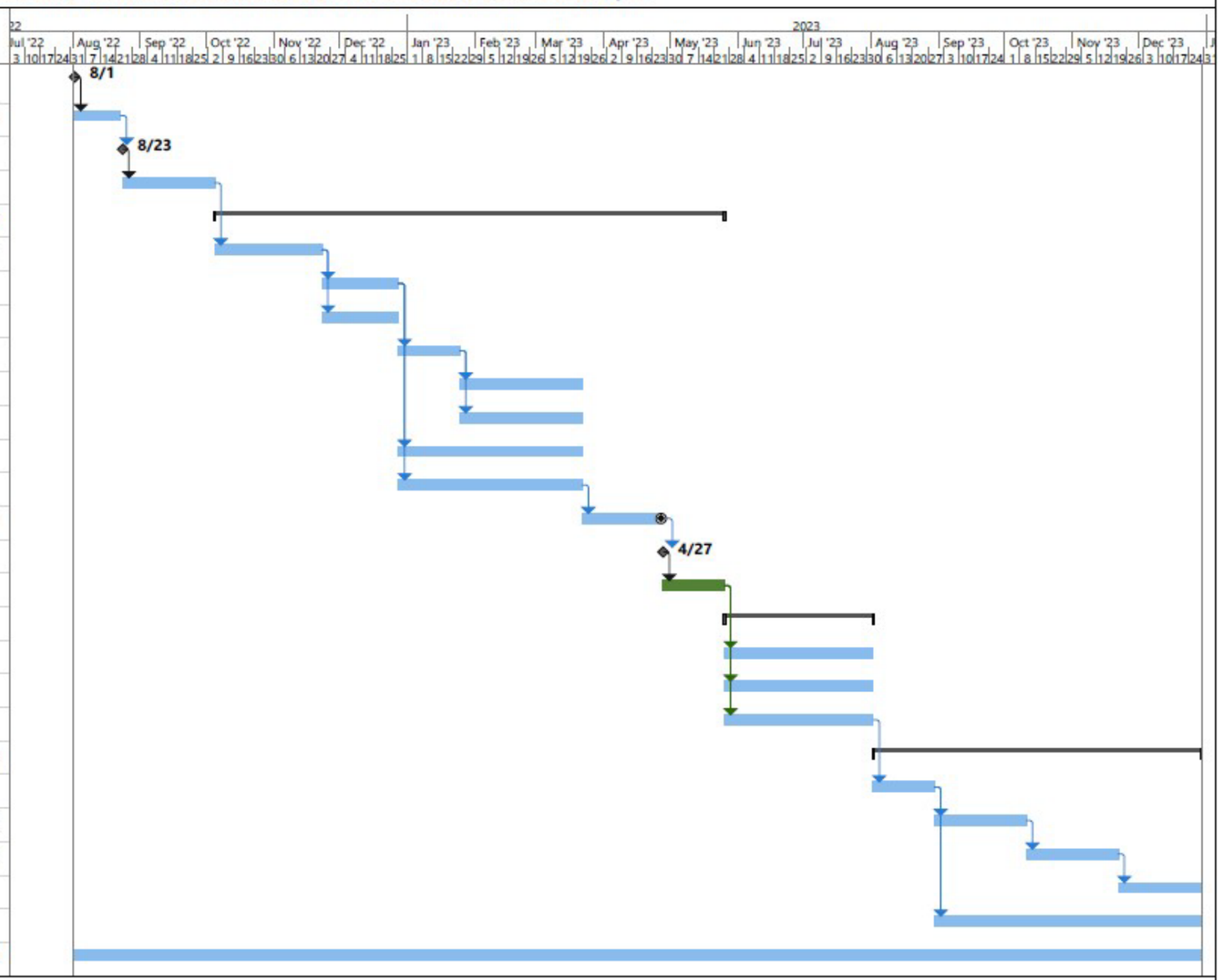
Phase 1: Will consist of widening the spillway right abutment and realigning the Avenue 146 to be above the spillway. The roadway was design in accordance with Caltrans design and specifications. Phase 1 has been constructed to cover widening of the right abutment spillway and the realignment of Avenue 146 road. This road is blasted within the right abutment slope and provides continued vehicle access up and around the Phase 2 construction.

Phase 2: Includes the ultimate design to widen the spillway's left abutment and excavation of the remaining spillway configuration, including an ogee weir, to achieve the design pool elevation condition. The ultimate condition is based on the latest spillway physical model to be completed by Utah State University. The structural and hydraulic designs of the spillway will be conducted by USACE and provided as part of the Phase 2 design. Several Success Lake appurtenance facilities that will be affected by the spillway improvements and will need to be flood proofed or relocated to higher grounds. This includes the slope protection along State Highway 190 bridge abutments to account for the increased storage capacity of the dam. The Phase 2 construction is anticipated to begin construction in March 2022 and will be completed in July 2023.

6. Project Schedule

Proposed Tetra Tech Schedule for Salton Sea Desert Shores Habitat Restoration Project

ID	Task Name	Start	Finish
1	**Notice to Proceed**	Mon 8/1/22	Mon 8/1/22
2	Schedule Kickoff Meeting	Tue 8/2/22	Mon 8/22/22
3	Attend Kickoff Meeting	Tue 8/23/22	Tue 8/23/22
4	Gather Data, Site Recon & Analysis	Wed 8/24/22	Tue 10/4/22
5	**Phase 1 Preliminary Design Package**	**Wed 10/5/22**	**Thu 5/25/23**
6	Property or ROW Acquisition Support	Wed 10/5/22	Tue 11/22/22
7	Conduct Aerial Topography/Bathymetry	Wed 11/23/22	Tue 12/27/22
8	Conduct Utility Research	Wed 11/23/22	Tue 12/27/22
9	Perform Geotechnical Analysis	Wed 12/28/22	Tue 1/24/23
10	Prepare H&H/Drainage Design	Wed 1/25/23	Tue 3/21/23
11	Conceptual Berm Design	Wed 1/25/23	Tue 3/21/23
12	Conduct Biological & Cultural Investigation	Wed 12/28/22	Tue 3/21/23
13	Well Siting Investigation	Wed 12/28/22	Tue 3/21/23
14	Prepare 60% Plans and Specifications	Wed 3/22/23	Wed 4/26/23
15	Presentation to the SSA Board	Thu 4/27/23	Thu 4/27/23
16	Review and Approval by SSA	Fri 4/28/23	Thu 5/25/23
17	**Phase 2 Permitting and Right-of-Way**	**Fri 5/26/23**	**Tue 8/1/23**
18	Environmental	Fri 5/26/23	Tue 8/1/23
19	Well Permits	Fri 5/26/23	Tue 8/1/23
20	Grading & Berm Construction Permits	Fri 5/26/23	Tue 8/1/23
21	**Phase 3 Final Design and Construction**	**Wed 8/2/23**	**Fri 12/29/23**
22	Finalize Plans and Specs	Wed 8/2/23	Tue 8/29/23
23	Install Wells	Wed 8/30/23	Tue 10/10/23
24	Install Piping and Electrical Connections	Wed 10/11/23	Tue 11/21/23
25	Install Embankment Fill and Spillway	Wed 11/22/23	Fri 12/29/23
26	Construction Oversight	Wed 8/30/23	Fri 12/29/23
27	**Project Management & Quality Control**	**Mon 8/1/22**	**Fri 12/29/23**



Desert Shores Project
Date: Wed 6/29/22

TETRA TECH

Reviews Task Milestone Summary

Salton Sea Authority Page 1 of 1 Tetra Tech, Inc.

Appendix C

RFQ/P SUBMISSION CHECKLIST

(Initial each line item to confirm submission of response and return with RFQ/P Submission)

Item	Included in Response *(initial each box)*
6.01 Statement of Qualifications	
6.02. Cover Letter	
6.03 Team Members & Firm Experience	
6.04 Project Work Plan & Schedule	
6.05 Fee Proposal	
6.06 Insurance Letter	
6.07 Corporate Information	
6.08 Contract Comments	
6.09 Appendices:	
• Appendix A – PROJECT DOCUMENTATION	
• *Appendix B – N/A*	
• Appendix C – RFQ/P SUBMISSION CHECKLIST	
• Appendix D – ADDENDA ACKNOWLEDGEMENT ***(only if applicable)***	
• Appendix E – PROFESSIONAL SERVICES AGREEMENT	
• Appendix F – INSURANCE REQUIREMENTS	
• *Appendix G – N/A*	
• Appendix H – EVALUATION SHEET	
• Appendix I – NON-DISCLOSURE AGREEMENT	

Appendix D

ADDENDA ACKNOWLEDGEMENT

(To be executed by Firm and submitted with RFQ/P Submission)

Addenda: Changes or corrections to the submission document will be issued via a numbered addendum. Firm must acknowledge receipt of all addenda. Not acknowledging all addenda may be reason for rejection of the submission. Record below the number(s) and date(s) of addenda received, if applicable.

Addendum # ---------- Date Received ----------

Addendum # ---------- Date Received ----------

Appendix E

PROFESSIONAL SERVICES AGREEMENT

PROFESSIONAL SERVICES AGREEMENT

This Professional Services Agreement (***"Agreement"***) is made and entered into as of October ___, 2024 (the ***"Effective Date"***) by and between **THE SALTON SEA AUTHORITY**, a California Joint Powers Agency (***"Authority"***, ***"Owner"***), and **[Consultant]**, a **[California Corporation]** (***"Consultant"***), with reference to the following facts and objectives:

AGREEMENT is made

Between the Owner:	**THE SALTON SEA AUTHORITY** 82500 Hwy 111, Suite 4 Indio, CA 92201
and the Consultant:	**[Consultant]** [Address Line 1] [Address Line 2]
Project:	**DESERT SHORES | Restoration Project** [Project Address 1] [Project Address 2]
Contract Sum:	**[Contract Sum]**

RECITALS

A. Owner is responsible for working in consultation and cooperation with the State of California to oversee the comprehensive restoration of the Salton Sea, including the Desert Shores | Restoration Project (***"Project"***).

B. Consultant is experienced in conducting Feasibility Studies, and providing Geotechnical, Geologic, and Hydrogeologic Services.

C. Subject to the terms and conditions of this Agreement, Owner desires to engage Consultant, and Consultant agrees to be engaged, to perform certain Services (as defined below) relating to the Project.

AGREEMENT

The parties agree as follows:

ARTICLE 1
CONSULTANT SERVICES

1.1. Scope of Services: Consultant shall perform and shall provide the services, advice, and assistance to Owner as described in **Exhibit 1** attached hereto (Desert Shores | Restoration Project Request for Qualifications / Proposals for Feasibility Study comprising Geotechnical, Geologic, and Hydrogeologic Services for the proposed restoration project in Imperial County, California, dated September 11, 2024) (the ***"RFQ/P"***, the ***"Scope of Work"***), which is incorporated herein by this reference; **Exhibit 1.1** attached hereto (Addendum 01 to the RFQ/P dated October 2, 2024), which is incorporated herein by this reference; and **Exhibit 2** attached hereto (the Consultant's Proposal dated [Date]), which is incorporated herein by this reference. The services described in the Scope of Work, together with any Additional Services (as defined below), shall sometimes be collectively referred to herein as the ***"Services"***.

1.2. Additional Services: Any services that are not specifically included within the Scope of Work or logically inferable therefrom shall be considered ***"Additional Services"***. In the event Owner requests that Consultant perform Additional Services, Consultant shall not undertake any Additional Services without the prior written authorization of the Owner's Representative identified in **Section 12.1**, in the form of a written change order or other written addendum or amendment to this Agreement that, at a minimum, (a) describes the Additional Services in detail in a form similar to the Scope of Work typified by **Exhibit 1**, and specifies the method of compensation and/or the stipulated fee to be paid for such Additional Services, and (b) satisfies the requirements of **Section 18.2**. In the event Owner authorizes Additional Services, all such Additional Services shall be subject to all of the terms and conditions of this Agreement, unless otherwise specifically agreed to in each applicable change order, addendum, or amendment in advance.

1.3. Location: Services shall be performed by Consultant at its offices, or at the Project location.

1.4. Personnel: All services hereunder shall be performed by highly experienced and skilled personnel in accordance with the highest applicable standards of care and professionalism consistent with a sophisticated Consultant experienced in providing similar services, including specific experience in groundwater well feasibility studies, well design projects, relevant geotechnical, geological, and hydrogeological work, groundwater monitoring and sampling, groundwater resource assessments and investigations, similar municipal water projects and regulatory compliance, and/or similar experience that is specific to your proposed approach for projects of a similar magnitude and complexity as the Consultant services required for the Project. Consultant shall be responsible for the professional quality, timeliness, coordination, and completeness of services. All of Consultant's personnel assigned to perform services shall be approved by Owner in writing prior to their performance of the services. Consultant shall use only personnel required for the performance of the services who are qualified by education, training and experience to perform the tasks assigned to them. Consultant agrees to replace all of its employees whose work is considered by Owner to be unsatisfactory or contrary to the requirements of the

services to be performed hereunder or for any other reason. The Owner shall not supervise nor control Consultant's services.

1.5. Subconsultants: Owner hereby approves of the use of only those Subconsultants, if any, named in Consultant's Scope of Work. Consultant shall not subcontract any portion of the services to be performed under this Agreement without providing Owner with prior written notice of the identity of such subcontractor and/or subconsultant. Any subcontractor and/or subconsultant retained by Consultant and any subcontract entered into by Consultant shall be made subject to the terms and conditions of this Agreement. Consultant shall be fully responsible to Owner for the actions of persons and firms performing subcontract work as subconsultants or subcontractors (collectively, ***"Subconsultants"***) to Consultant. Consultant shall require each Subconsultant to indemnify Owner on the same terms as set forth in **Section 11.1** herein, in a separate written document executed by each Subconsultant and delivered to Owner prior to commencement of any subcontracted services. Consultant shall require each Subconsultant to carry and maintain, at its sole cost and expense, insurance policies as set forth in **Article 10** of this Agreement

1.6. Subconsultants: Consultant shall be responsible for the results of the work and/or the services performed by Consultant's personnel and all Subconsultants.

1.7. Warranty: Consultant represents and covenants that all advice, programs, plans, specifications, recommendations, reports, or other services rendered hereunder shall be of high quality and shall comply fully with all Applicable Laws (as defined in **Section 11.1** below) applicable to Owner, the Project and the subject matter hereof.

Consultant further agrees to immediately advise Owner of any proposed law, regulation, or other requirement identified during the term of the Agreement and that Consultant believes will, if adopted, likely require or warrant modification of or change to any advice, program, plan, specification, recommendation, report or other services previously made, or to be made, during the course of this Agreement.

ARTICLE 2
COMPENSATION

2.1. Fixed Rates: Owner shall pay Consultant on a Time & Material Basis at the fixed rates set forth in **Exhibit 2** attached hereto, which is incorporated herein by this reference, for services satisfactorily performed by Consultant in accordance with this Agreement. Subconsultants shall be paid at a fee of **1.0** times the amount billed to the Consultant unless otherwise identified in **Exhibit 2**. Consultant and Owner agree that the Maximum Fee set forth in **Section 2.2** shall not be exceeded without prior written approval by Owner and an amendment to this Agreement that satisfies the requirements of **Section 18.2**.

2.2. Maximum Cost for Consultant Fee: In no event shall Owner be obligated to pay more than a maximum of [Contract Sum] (***"Maximum Fee"***) for services satisfactorily performed by Consultant and/or its Subconsultants in accordance with this Agreement and as described in the Scope of Work.

2.3. Reimbursable Expenses: The expenses described in this **Section 2.3** shall constitute the only expenses of Consultant which Owner shall reimburse to Consultant, unless Owner otherwise agrees in writing (collectively, ***"Reimbursable Expenses"***).

Owner shall reimburse Consultant for reasonable travel expenses paid or incurred by Consultant in connection with travel beyond a 50-mile radius from the Project, other than travel to and from Consultant's offices. Owner will reimburse Consultant for costs of long-distance communication and reproduction services as may be required in the performance of this Agreement and for other expenses approved in writing in advance by Owner.

The maximum amount of Consultant's Reimbursable Expenses pre-authorized by this Agreement is _____ Dollars ($_____). (***"Maximum Expenses"***).

2.4. Total Commitment Amount: The total amount contemplated and authorized under this Agreement is the sum of the Maximum Fee and the Maximum Expenses set forth in **Sections 2.2** and **2.3** (i.e., a total of _____ Dollars ($_____)).

ARTICLE 3
OBLIGATIONS OF OWNER

3.1. Obligations of Owner: To the extent deemed necessary by Owner and Consultant during the period of the Agreement, and while Consultant is performing services hereunder, Owner shall cooperate with the Consultant, and permit reasonable access to pertinent information and locations, and provide necessary scheduling, technical information and electronic data files, as required to permit Consultant to efficiently perform the services required under this Agreement.

ARTICLE 4
PERIOD OF PERFORMANCE

4.1. Term: The term of this Agreement (the ***"Term"***) shall commence on the Effective Date and shall terminate upon Consultant's completion of the Services, unless terminated sooner as provided herein, and subject to the survival of certain provisions as specified herein.

4.2. Schedule: Consultant shall submit for approval by Owner a project schedule for the performance of services of Consultant under this Agreement.

4.3. Termination: Owner may, upon written notice to Consultant, terminate all or a portion of the Services covered by this Agreement, at any time with or without cause, provided however, in the event of a termination without cause, Owner shall endeavor to provide ten (10) days' prior written notice.

Either Consultant or Owner may terminate this Agreement for cause in the event of a material breach by the other party by giving the other party at least thirty (30) calendar days' prior written notice of its intent to terminate unless the breaching party has cured the

breach within the thirty (30) day notice period to the reasonable satisfaction of the non-breaching party.

Consequences of Expiration and/or Termination; Survival. In the event Owner terminates this Agreement for any reason, Owner shall be liable to Consultant only for payment in accordance with the payment provisions of this Agreement and only for services performed prior to the effective date of the termination and all work in progress at the time of such termination that is delivered to Owner. Within ten (10) calendar days after any termination or expiration, Consultant shall deliver to Owner all work product completed or in progress up to the date of the termination or expiration for which payment has been or will be made and the parties shall cooperate to ensure an efficient and timely transfer of responsibilities. Also, the following shall survive any termination or expiration of the Agreement: (a) those rights and obligations that have accrued as of the date of expiration or termination; (b) those rights and obligations that expressly survive termination or expiration; (c) those rights and obligations under **Sections 4.3** (Termination), **Article 7** (Data), **Article 10** (Insurance Requirements), **Article 11** (Indemnification), **Article 14** (Dispute Resolution), and **Article 17** (Confidentiality), and (d); and any other provision that reasonably would be expected to survive termination shall survive termination or expiration of this Agreement. In the event that Consultant terminates under this Agreement as permitted herein, Owner may, at its sole discretion, require that Consultant complete services in progress and such completed services will be subject to approval by Owner before payment therefore is made, said approval not to be unreasonably withheld.

ARTICLE 5
PAYMENT

5.1. Consultant shall submit invoices for Services and Reimbursable Expenses on a monthly basis on or before the fifteenth (15^{th}) day of each month. Each invoice shall contain the amount of fee for the period covered by the invoice; the amounts expended or incurred as Reimbursable Expenses; a summary of the total amount of previous invoices; the current invoice amount; and the unbilled balance of this Agreement and any approved Amendments. In addition, the Consultant shall, on a monthly basis, review its progress on the Project and confirm that such progress is in proportion to its Maximum Fees incurred to date.

5.2. Upon submission by Consultant of a valid and fully supported invoice for Consultant's services, and upon the approval by Owner, and Owner's Project Manager (Gafcon PM-CM LLC, ***"Gafcon"***), Owner will pay Consultant for the amount requested in its current invoice within thirty (30) days from receipt of the fully supported invoice.

5.3. Payments past due and unpaid under this Agreement shall bear interest from the date payment is due at the annual rate of 1.50%.

5.4. Invoices for Consultant services shall be submitted electronically using the email address pnajar@gafcon.com and addressed to the Owner as follows:

THE SALTON SEA AUTHORITY.
82500 Hwy 111, Suite 4
Indio, CA 92201

Owner reserves the right to change its Representative at any time and with written notice to Consultant.

ARTICLE 6
CODES AND REGULATIONS

6.1. All services performed under this Agreement shall conform to all Applicable Laws. Unless otherwise provided, the Applicable Laws referred to above shall be the latest edition or revision in effect as of the effective date of this Agreement. Nothing in this Agreement shall be construed as requiring or permitting services that are contrary to the above-referenced Applicable Laws.

ARTICLE 7
DATA

7.1. Ownership of Data: Ownership of documents, materials, and Technical Data produced by or for Consultant or any of its employees or Subconsultants in the course of performing the services hereunder, and all proprietary rights therein, shall vest in and shall be delivered, as required herein or otherwise upon request, to Owner. For the purposes hereof, the term ***"Technical Data"*** means technical writings, pictorial reproductions, drawings or other graphical representations, tape recordings, reports, designs, specifications, calculations, tables and documents of technical nature, whether copyrightable or copyrighted, that are made in the course of performing services under this Agreement. Consultant may use data prepared or produced under this Agreement if such data is otherwise publicly available or upon the specific approval of Owner.

7.2. Protection of Proprietary Material: Consultant agrees not to reveal to third parties any information not generally known concerning computer programs, Technical Data and/or technical information, which may be confidential or proprietary to Owner. Consultant further agrees to respect and safeguard in every way practicable the proprietary nature of computer programs, Technical Data and technical information, and to insure that any copies of such programs, data and/or information, in whole or in part, in Consultant's possession at termination of this Agreement, whether in human or machine-readable form, is/are destroyed or returned to Owner. Consultant further agrees not to copy, or cause to be copied, any such programs or related information except as may be required for the performance of services assigned to Consultant under this Agreement. Consultant also agrees to comply with Owner policies concerning privacy of information and computer files.

ARTICLE 8
ADVERTISING

8.1. Consultant agrees not to use the name of Owner or to quote the opinion of any of Owner's employees or representative in any advertising without obtaining the prior written consent of Owner.

ARTICLE 9
INDEPENDENT CONTRACTOR

9.1. Consultant shall be an independent contractor, and neither Consultant nor any employee of Consultant shall be, or be deemed to be, an employee, agent or representative of Owner.

ARTICLE 10
INSURANCE REQUIREMENTS

10.1. Consultant shall not commence services under this Agreement until it has obtained all of the insurance required under this Agreement as described below as evidenced by valid insurance certificates, and such insurance and certificates have been approved by Owner. The Consultant shall not allow any Subconsultant to commence services under a subcontract until the Subconsultant has obtained all required insurance policies, or until the Consultant has insured the Subconsultant under its own insurance policies.

Insurance required under this Agreement shall be:

(a) Commercial General Liability (bodily injury, property damage, personal injury) insurance, with a single limit of not less than $1,000,000 per Occurrence, or current limit carried, whichever is greater, and $2,000,000 in the Aggregate, or current limits carried, whichever is greater. Coverage shall include, without limitation, coverage for bodily injury, including death; contractual liability specifically covering the indemnity obligations stated in **Section 11.1** and elsewhere in the Agreement; independent professionals coverage; personal injury including coverage for suits brought by employees of Consultant; broad form property damage including completed operations; and completed operations insurance.

Commercial General Liability insurance shall include the following provisions, coverages, or endorsements:

> "The Salton Sea Authority, members of the Salton Sea Authority's Board, and the officers, agents, employees and volunteers of the Salton Sea Authority, individually and collectively, and Gafcon PM-CM LLC." shall be included as Additional Insureds.
>
> The Consultant's insurance shall be primary coverage, and any insurance or self-insurance carried by Owner or any other Indemnified Party shall be excess and noncontributory.
>
> Thirty (30) days' prior written notice of cancellation or material change in the insurance must be given to Owner.

Consultant and Consultant's insurance companies waive their rights to subrogation against the above named insureds.

(b) Worker's Compensation insurance and employer's liability insurance with limits not less than $1,000,000 covering all persons whom the Consultant may employ in carrying out the services hereunder. Worker's Compensation insurance must be in accordance with the Worker's Compensation laws of the State of California.

(c) Automobile Liability Insurance to cover, without limitation, claims based on automobile liability (bodily injury and property damage) including coverage for all owned, hired and non-owned automobiles with minimum limits of $1,000,000 Combined Single Limit.

Automobile Liability Insurance shall include the following provisions, coverages, or endorsements:

"The Salton Sea Authority, members of the Salton Sea Authority's Board, and the officers, agents, employees and volunteers of the Salton Sea Authority, individually and collectively, and Gafcon PM-CM LLC." shall be included as Additional Insureds.

The Consultant's insurance shall be primary coverage, and any insurance or self-insurance carried by Owner or any other Indemnified Party shall be excess and noncontributory.

Thirty (30) days' prior written notice of cancellation or material change in the insurance must be given to Owner.

Consultant and Consultant's insurance companies waive their rights to subrogation against the above named insureds.

(d) Professional Liability (Errors and Omissions) insurance, with a single limit of not less than $5,000,000 per Occurrence, or current limit carried, whichever is greater.

"The Salton Sea Authority, members of the Salton Sea Authority's Board, and the officers, agents, employees and volunteers of the Salton Sea Authority, individually and collectively, and Gafcon PM-CM LLC." shall be included as Additional Insureds.

The Consultant's insurance shall be primary coverage, and any insurance or self-insurance carried by Owner or any other Indemnified Party shall be excess and noncontributory.

Thirty (30) days' prior written notice of cancellation or material change in the insurance must be given to Owner.

Consultant and Consultant's insurance companies waive their rights to subrogation against the above named insureds.

10.2. Prior to the commencement of any services hereunder and thereafter as coverage expires and is renewed or new coverage obtained, Consultant shall provide Owner with a certificate or endorsement naming "The Salton Sea Authority, members of the Salton Sea Authority's Board, and the officers, agents, employees and volunteers of the Salton Sea Authority, individually and collectively, and Gafcon PM-CM LLC." as Additional Insureds with respect to that insurance policy.

10.3. The insurance arranged by the Consultant and all Subconsultant(s) shall include contractual liability endorsements insuring the indemnity clause of this Agreement set forth in **Article 11**, below.

Insurance shall be placed with insurance companies rated at least A-X by Best's Key Rating Guide. Consultant shall also carry such other insurance as Owner reasonably requests. Within two (2) days from the date hereof but in no event later than Consultant's commencement of services, Consultant shall file with Owner a valid, original "Certificate of Insurance" evidencing that all required insurance is in full force and effect. Consultant shall file with Owner valid, original Certificates of Insurance prior to Consultant's renewal of each coverage described in this Section. Consultant shall maintain current and valid Certificates of Insurance which shall be kept on file with Owner at all times during the term hereof and during the performance of Services pursuant to the Agreement. Owner shall not be obligated to process any invoices or applications for payment submitted by Consultant for services performed or Reimbursable Expenses unless Owner has valid, original Certificate(s) of Insurance for Consultant and all Subconsultants. Consultant shall not make any changes in or allow the required insurance coverages to lapse without first obtaining prior written approval from Owner.

All policies for insurance shall be in a form satisfactory to Owner and shall contain an endorsement providing that Owner must be given thirty (30) days' prior written notice of any cancellation, non-renewal or material change in the policy or coverage thereunder. Upon request Consultant shall furnish Owner with complete copies of the insurance policies required by this Section. The failure to secure and maintain or add by endorsement Owner or any Indemnified Party shall not act as a defense to the enforcement of the terms of the Agreement. Any such insurance policy shall apply separately to each insured against whom claim is made or suit is brought and shall contain no provision which excludes coverage of a claim made by one insured under the policy against another insured under the policy. Any insured loss shall be adjusted with Owner and made payable to Owner, subject to any applicable mortgagee clause.

ARTICLE 11
INDEMNIFICATION

11.1. Indemnity: Consultant agrees to indemnify and hold harmless Owner, and any of its constituent partners, officers, directors, shareholders, board members, attorneys, consultants, tenants, representatives, and all of their respective employees, officers,

directors, agents, successors and assigns (individually, an ***"Indemnified Party"***, and collectively, ***"Indemnified Parties"***) harmless from and against any and all liabilities, losses, demands, causes of action, judgments, liens, orders, costs, claims, damages, penalties or expenses (including, without limitation, reasonable attorneys' fees and witness fees) (collectively, ***"Claims"***) to the extent caused by (i) the willful misconduct or negligent acts, errors or omissions of Consultant, its Subconsultants and/or any of their respective agents, employees, officers, directors or representatives or anyone else for whom Consultant is legally liable in connection with the performance of Services under this Agreement; (ii) with respect to any Claims not arising from Consultant's or its Subconsultant's professional services, any Claims arising from the acts of Consultant or its Subconsultants in connection with this Agreement (e.g., claims for bodily injury or property damage covered by Commercial General Liability Insurance); and/or (iii) Consultant's or Subconsultant's failure to comply with all applicable codes, rules, laws, orders, directives, mandates, guidelines, requirements, ordinances and regulations of all local, state and federal governmental authorities with jurisdiction relating to the Project site or Consultant's performance of services for the Project (collectively, ***"Applicable Laws"***). Consultant's obligation to indemnify the Indemnified Parties under this **Section 11.1** shall apply regardless of any concurrent or contributory passive negligent act, error or omission of the party to be indemnified; provided, however, Consultant shall not be obligated to defend or indemnify an Indemnified Party to the extent such damages are the result of the sole or active negligence or willful misconduct of one or more of the Indemnified Parties. Owner agrees to promptly notify Consultant of any such Claim, and the Indemnified Parties shall allow Consultant to defend such Claim with counsel reasonably selected by Consultant and/or to settle such Claim on behalf of the applicable Indemnified Parties, with such Indemnified Parties' reasonable consent. Owner and any other applicable Indemnified Party shall provide reasonable assistance in such defense or settlement at the request and expense of Consultant. At its option, an Indemnified Party may reasonably participate in the defense of a Claim against the Consultant at such party's own expense.

11.2. Infringement: Consultant, at its sole cost and expense, shall defend, indemnify and hold harmless all Indemnified Parties from and against any and all Claims which may be made in connection with, or alleging, an infringement of a patent, copyright, trademark, service mark, trade secret, or other legally protected proprietary right by work product provided to Owner by Consultant in the form as such deliverable product was delivered; provided, however, that the foregoing indemnity shall not apply to the extent that such infringement is caused by a design provided by Owner for inclusion into such work product or by any modification thereto by or on behalf of Owner.

11.3. Survival: The provisions of **Article 11** shall survive the termination or expiration of this Agreement.

ARTICLE 12
COMMUNICATIONS

12.1. Communications between Consultant with Owner shall be through the following persons:

Owner:	Consultant:
THE SALTON SEA AUTHORITY G. Patrick O'Dowd, Executive Director 82500 Hwy 111, Suite 4 Indio, CA 92201 Phone: (760) 565-3100 Email: gpodowd@saltonsea.com	**[CONSULTANT]** [Name] [Address Line 1] [Address Line 2] Phone: [Phone 1] Email: [Email 1]

12.2. Notice: Any notice, demand, consent, approval or statement required or permitted to be given under this Agreement shall be in writing and shall be delivered (a) in person, (b) by deposit in the United States mail, first-class certified or registered mail, postage pre-paid, return receipt requested, (c) by private messenger or courier service (e.g., Federal Express, DHL, UPS), prepaid, or (d) via email. The notice, demand, consent, approval or statement shall be addressed as follows (or to such other address or individual as either party may specify from time to time by written notice in the manner provided in this section). Telephone numbers are provided for convenience only and shall not constitute effective notice.

If to Owner:	If to Consultant:
THE SALTON SEA AUTHORITY G. Patrick O'Dowd, Executive Director 82500 Hwy 111, Suite 4 Indio, CA 92201 Phone: (760) 565-3100 Email: gpodowd@saltonsea.com	**[CONSULTANT]** [Name] [Address Line 1] [Address Line 2] Phone: [Phone 1] Email: [Email 1]

ARTICLE 13
CONFLICT OF INTEREST

13.1. Consultant affirms that to the best of its knowledge, there exists no actual or potential conflict between Consultant's family, business or financial interest and the services under this Agreement, and in the event of change in either private interests or services under this Agreement, it will notify Owner in writing of any possible or actual conflict of interest which may arise as a result of such change.

ARTICLE 14
DISPUTE RESOLUTION

14.1. Any suit, action or legal proceeding (an ***"Action"***) arising out of or relating to this Agreement shall be filed and maintained in Los Angeles County Superior Court.

14.2. Prevailing Party: The prevailing party in any Action shall be entitled to recover from the other party all reasonable fees, costs and expenses incurred by the prevailing party in connection with such Action, including without limitation reasonable attorney fees and expenses, all of which shall be deemed to have accrued upon the commencement of such Action and shall be paid whether or not such Action is prosecuted to a final judgment or award. Any judgment or award entered in such Action shall contain a specific provision providing for the recovery of fees, costs and expenses, including without limitation reasonable attorney fees and expenses, incurred by the prevailing party. The ***"Prevailing Party"*** shall mean the party who recovered a greater relief in the Action or who prevails by dismissal, default or otherwise and not necessarily the party in whose favor a judgment or award is rendered, except if the parties enter into a settlement agreement that provides otherwise.

ARTICLE 15
ASSIGNMENT PROHIBITED

15.1. Except for subcontracting specifically approved in writing by Owner, Consultant shall neither assign its rights nor delegate its duties under this Agreement or any part hereof without the prior written consent of Owner, which consent shall not relieve Consultant from any of its obligations under this Agreement. This Agreement shall inure to the benefit of and be binding upon the successors and permitted assigns of the parties hereto.

ARTICLE 16
LAW

16.1. This Agreement and all services hereunder shall be governed by, and construed in accordance with, the laws of the State of California.

ARTICLE 17
CONFIDENTIALITY

17.1. Confidential Information: As used in this Agreement, ***"Confidential Information"*** means any nonpublic information that a party (the ***"Disclosing Party"***) discloses or otherwise makes available to the other party (the ***"Receiving Party"***) that is used in the Disclosing Party's business and is: is of a confidential or proprietary nature, and either gives the Disclosing Party some competitive business advantage or the opportunity of obtaining such advantage, or the disclosure of which could be detrimental to the interests of the Disclosing Party; (ii) designated as Confidential Information by the Disclosing Party, or from all the relevant circumstances should reasonably be assumed by Receiving Party to be confidential or proprietary to the Disclosing Party; and (iii) not generally known by non-Disclosing Party personnel.

17.2. Exclusions: Information shall not be considered Confidential Information to the extent that such information is (i) publicly available, or becomes publicly available without restriction

and through no fault or action of the Receiving Party or its agents or contractors, (ii) rightfully received by the Receiving Party from a third party that is not itself under an obligation to keep such information confidential, (iii) already in the Receiving Party's possession and lawfully received from sources other than the Disclosing Party that are not themselves under an obligation to keep such information confidential, (iv) independently developed by the Receiving Party without use of or reference to the Confidential Information of the Disclosing Party, which can be supported by documentation prepared contemporaneously with such independent development, or (v) approved in writing for release or disclosure without restriction by the Disclosing Party.

17.3. Permitted Use and Disclosure: The Receiving Party shall exercise the same standard of care to protect such information as is used to protect its own Confidential Information. Receiving Party may use the Disclosing Party's Confidential Information only as necessary for its performance under this Agreement. Notwithstanding the foregoing, Receiving Party may disclose the Disclosing Party's Confidential Information (a) to the extent disclosure is required by law or court order, (b) with the prior written consent of the Disclosing Party, (c) to the Receiving Party's attorneys or accountants on a need to know basis for legal or accounting advice, and/or (d) in the event of a dispute between the parties relating to this Agreement, to a court or other adjudicative body with jurisdiction to resolve the dispute and/or enforce the terms of this Agreement.

17.4. Survival of Obligations: This confidentiality provision will remain in effect during the Term and for a period of three (3) years after the termination of the Agreement, except with respect to Confidential Information of the Disclosing Party that constitutes a trade secret under applicable law, in which case, such obligations of Receiving Party shall continue until such Confidential Information becomes publicly known or made generally available through no action or inaction of the Receiving Party

ARTICLE 18
CONTRACT DOCUMENTS & MISC. PROVISIONS

18.1. Integrated Agreement: This Agreement constitutes the entire agreement between the parties with respect to their subject matter, and supersedes any prior negotiations, agreements or understandings with respect to their subject matter.

18.2. Amendment. This Agreement shall not be amended, except in writing, signed by both parties and identified as an amendment, addendum, or Change Order to this Agreement, as the case may be.

18.3. Time is of the Essence: It is mutually agreed that time is of the essence for each and every portion of this Agreement and for any Services or other requirements of the Agreement, and, in the event of an extension of time under the Agreement is allowed for the completion of any services, the new time fixed by such extension shall be of the essence for this Agreement.

18.4. Waiver of Provisions: If at any time Owner or Consultant, as the case may be, shall have consented to any waiver, modification or alleged breach by the other party of any covenant, condition or provision of this Agreement, such consent must be in writing and the consenting party shall not thereafter be deemed to have consented to any further waiver, modification or alleged breach by the other party, whether new or continuing of the same or any other covenant, condition or provision of this Agreement.

18.5. Survival: All representations and covenants made or given by Consultant in this Agreement, together with any and all causes of action and other rights and remedies which Owner or Consultant may have as a result of breach of any term, condition, representation, or covenant of the other party pursuant to this Agreement, shall survive any expiration or termination of this Agreement.

18.6. Force Majeure: Neither Owner nor Consultant shall be liable for damages due to delay or failure to perform any obligation under this Agreement if and to the extent that such delay or failure results from circumstances beyond the control of the Owner or Consultant. In the event of such a force majeure event, the Consultant shall provide Owner with notice of such event within ten (10) days from its occurrence and the time for Consultant's performance shall be extended for the duration of the force majeure event as set forth in a change order or addendum pursuant to **Section 1.2** above.

18.7. Obligations to Third Parties: The execution and delivery of this Agreement shall not be deemed to confer any rights upon, nor obligate Owner, to any person or entity other than Consultant.

18.8. Owner's Approval Right: Owner shall have the right, in its sole discretion, to disapprove any portion of the Consultant's services that does not conform to the Scope of Work or to the description of any Additional Services contained in an addendum, amendment, or Change Order. Owner is in no way responsible for any defects in the services performed or Project documents prepared by Consultant that are submitted to, reviewed or approved by Owner.

18.9. Consultant's Duty to Complete Work: During all disputes, actions, claims or other matters arising out of or relating to this Agreement or the breach thereof, Consultant shall carry on its duties hereunder, provided Owner is not in default in its obligation to pay Consultant undisputed amounts pursuant to the provisions of this Agreement.

18.10. Liens: Consultant shall pay when due all claims for services or labor incurred at its instance or request in the performance of this Agreement. If, in the performance of Consultant's services, any mechanic's liens, stop notices, attachments, garnishments or suits are filed by Consultant's Subconsultants or parties for which Consultant is responsible (except when such lien or stop notice is caused by Owner's default in its obligation to pay Consultant pursuant to the provisions of this Agreement) against the Project, the site on which the Project is located, or any portion thereof, in connection with claims for services or labor incurred at the instance or request of Consultant in the performance of this Agreement, Consultant shall remove such lien when filed or within five (5) days after written demand by Owner, cause the effect of such lien, stop notice, attachment or suit to be removed from

the Project, the site or any portion thereof in a manner satisfactory to Owner. If Consultant fails to cause the removal of any lien, stop notice, attachment or suit in accordance with the foregoing, Owner is hereby authorized to take whatever actions it deems necessary to cause the lien, stop notice, attachment or suit, together with its effect upon said title, to be removed, discharged, satisfied, compromised or dismissed, and the cost thereof, including, without limitation, actual attorneys' fees incurred by Owner, shall become immediately due from Consultant to Owner. Consultant may contest any such lien, attachment or suit, provided it shall cause the effect to be removed from the Project or any part thereof.

18.11. Exhibits: All Exhibits attached hereto are incorporated into this Agreement and made a part hereof, in order of precedence:

(a) **Exhibit 1.1**: Addendum 01 to the RFQ/P dated October 2, 2024 (if applicable).

(b) **Exhibit 1**: Desert Shores | Restoration Project Request for Qualifications / Proposals for Feasibility Study comprising Geotechnical, Geologic, and Hydrogeologic Services for the proposed restoration project in Imperial County, California, dated September 11, 2024.

(c) **Exhibit 2**: The Consultant's Proposal dated _____.

18.12. General Interpretation: The terms of this Agreement have been negotiated by the parties hereto and the language used in this Agreement shall be deemed the language chosen by the parties to express their mutual intent. This Agreement shall be construed without regard to any presumption or rule requiring interpretation against the party causing such agreement or any portion thereof to be drafted, in favor of the party receiving a particular benefit under the Agreement. No rule of strict construction shall be applied against any person.

18.13. In the event any provision of this Agreement is found to be legally unenforceable, such unenforceability shall not prevent the enforcement of any other provision if the essential terms and conditions of this Agreement for each party remain valid, binding and enforceable.

18.14. Whenever used in this Agreement, as the context requires, the singular number includes the plural, and the plural number includes the singular.

18.15. Counterparts / Electronic Signature: This Agreement shall be binding and effective on the parties only when executed by both parties. For the convenience of the parties, this Agreement, and any amendment to this Agreement, may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall be deemed to be one and the same Agreement or amendment, as applicable. A signed copy of this Agreement or an amendment delivered by email or other means of electronic transmission shall be deemed to have the same legal effect as delivery of an original signed copy.

This Agreement was entered into as of the day and year first written above.

OWNER:	**CONSULTANT:**
THE SALTON SEA AUTHORITY	**[CONSULTANT]**
By: _____	By: _____
Name: G. Patrick O'Dowd	Name: _____
Title: Executive Director	Title: _____
Date: _____	Date: _____

Appendix F

INSURANCE REQUIREMENTS

(To be executed by Firm and submitted with RFQ/P Submission)

The selected Firm shall procure and maintain insurance, in the amounts specified in **Appendix E** (**ARTICLE 10, INSURANCE REQUIREMENTS**), for the duration of this contract.

Firm Name: _____

Signature: _____

Title: _____

Appendix H

EVALUATION SHEET

(For reference only)

CRITERIA FROM RFQ/P

Selection Qualifications	***Score***
Statement of Qualifications	-
Cover Letter	-
Team Members & Firm Experience	*30*
Project Work Plan & Schedule	*50*
Fee Proposal	*50*
Insurance Requirements	*P / F*
Corporate Information	-
Contract Comments	*-25 to 0*
Interview (*if required*)	*40*
Evaluation Determination	_____ *out of **170***

Appendix I

NON-DISCLOSURE AGREEMENT

This Agreement is made and entered into as of the last date signed below (the "***Effective Date***") by and between The Salton Sea Authority, a California Joint Powers Agency having its principal place of business at 82500 Hwy 111, Suite 4, Indio, CA 92201 ("***Organization***") and _____, a _____ corporation whose principal mailing address is _____ (the "***Second Party***").

WHEREAS The Salton Sea Authority and the Second Party (the "***Parties***") have an interest in participating in discussions wherein either Party might share information with the other that the disclosing Party considers to be proprietary and confidential to itself ("***Confidential Information***"); and

WHEREAS the Parties agree that Confidential Information of a Party might include, but not be limited to that Party's: (1) business plans, methods, and practices; (2) personnel, customers, and suppliers; (3) inventions, processes, methods, products, patent applications, and other proprietary rights; or (4) specifications, drawings, sketches, models, samples, tools, computer programs, technical information, or other related information;

NOW, THEREFORE, the Parties agree as follows:

1. Either Party may disclose Confidential Information to the other Party in confidence provided that the disclosing Party identifies such information as proprietary and confidential either by marking it, in the case of written materials, or, in the case of information that is disclosed orally or written materials that are not marked, by notifying the other Party of the proprietary and confidential nature of the information, such notification to be done orally, by email or written correspondence, or via other means of communication as might be appropriate.

2. When informed of the proprietary and confidential nature of Confidential Information that has been disclosed by the other Party, the receiving Party ("***Recipient***") shall, for a period of five (5) years from the date of disclosure, refrain from disclosing such Confidential Information to any contractor or other third party without prior, written approval from the disclosing Party and shall protect such Confidential Information from inadvertent disclosure to a third party using the same care and diligence that the Recipient uses to protect its own proprietary and confidential information, but in no case less than reasonable care. The Recipient shall ensure that each of its employees, officers, directors, or agents who has access to Confidential Information disclosed under this Agreement is informed of its proprietary and confidential nature and is required to abide by the terms of this Agreement. The Recipient of Confidential Information disclosed under this Agreement shall promptly notify the disclosing Party of any disclosure of such Confidential Information in violation of this Agreement or of any subpoena or other legal process requiring production or disclosure of said Confidential Information.

3. All Confidential Information disclosed under this Agreement shall be and remain the property of the disclosing Party and nothing contained in this Agreement shall be construed as granting or conferring any rights to such Confidential Information on the other Party. The Recipient shall honor any request from the disclosing Party to promptly return or destroy all copies of Confidential Information disclosed under this Agreement and all notes related to such Confidential Information. The Parties agree that the disclosing Party will suffer irreparable injury if its Confidential Information is made public, released to a third party, or otherwise disclosed in breach of this Agreement and that the disclosing Party shall be entitled to obtain injunctive relief against a threatened breach or continuation of any such breach and, in the event of such breach, an award of actual and exemplary damages from any court of competent jurisdiction.

4. The terms of this Agreement shall not be construed to limit either Party's right to develop independently or acquire products without use of the other Party's Confidential Information. The disclosing party acknowledges that the Recipient may currently or in the future be developing information internally, or receiving information from other parties, that is similar to the Confidential Information. Nothing in this Agreement will prohibit the Recipient from developing or having developed for it products, concepts, systems or techniques that are similar to or compete with the products, concepts, systems or techniques contemplated by or embodied in the Confidential Information provided that the Recipient does not violate any of its obligations under this Agreement in connection with such development.

5. Notwithstanding the above, the Parties agree that information shall not be deemed Confidential Information and the Recipient shall have no obligation to hold in confidence such information, where such information:
    a. Is already known to the Recipient, having been disclosed to the Recipient by a third party without such third party having an obligation of confidentiality to the disclosing Party; or
    b. Is or becomes publicly known through no wrongful act of the Recipient, its employees, officers, directors, or agents; or
    c. Is independently developed by the Recipient without reference to any Confidential Information disclosed hereunder; or
    d. Is approved for release (and only to the extent so approved) by the disclosing Party; or
    e. Is disclosed pursuant to the lawful requirement of a court or governmental agency or where required by operation of law.

6. Nothing in this Agreement shall be construed to constitute an agency, partnership, joint venture, or other similar relationship between the Parties.

7. Neither Party will, without prior approval of the other Party, make any public announcement of or otherwise disclose the existence or the terms of this Agreement.

8. This Agreement contains the entire agreement between the Parties and in no way creates an obligation for either Party to disclose information to the other Party or to enter into any other agreement.

9. This Agreement shall remain in effect for a period of five (5) years from the Effective Date unless otherwise terminated by either Party giving notice to the other of its desire to terminate this Agreement. The requirement to protect Confidential Information disclosed under this Agreement shall survive termination of this Agreement.

IN WITNESS WHEREOF:

SALTON SEA AUTHORITY	**COMPANY:** _____
By: _____	By: _____
Name: G. Patrick O'Dowd	Name:
Title: Executive Director	Title:
Date: _____	Date: _____