APPENDIX B
SALTON SEA STRATEGIC SCIENCE PLAN EXECUTIVE SUMMARY

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SECTION I—INTRODUCTION

The Salton Sea is an ecosystem in peril. Its prehistory consists of a series of intermittent lakes dependent on infrequent flooding of the Colorado River, while the modern Salton Sea originated from the desire to harness the flow of the Colorado River for irrigation. What began as an accident of this attempt is now a permanent inland sea supported by wastewater and agricultural drainage rather than Colorado River flood flows. However, environmental degradation is challenging the ability of the Sea to sustain the biological components that society has learned to value as characteristics of this waterbody. Increasing salinity and increasing frequency and magnitude of wildlife losses indicate the Sea is under severe environmental stress. The Salton Sea Restoration Project originated to reverse this degradation, to stabilize fluctuating water levels, and to provide a permanent waterbody that sustains values of the human society that uses it. The project foundation is provided by Public Law (PL) 102-575, passed by Congress in 1992. PL 102-575 directs the Secretary of the Interior to "conduct a research project for the development of a method or combination of methods to reduce and control salinity, provide endangered species habitat, enhance fisheries, and protect human recreational values . . . in the area of the Salton Sea." That PL was followed by the Salton Sea Reclamation Act of 1998 (PL 105-372), which directs the Secretary of the Interior to "complete all studies, including, but not limited to environmental and other reviews, of the feasibility and benefit-cost of various options that permit the continued use of the Salton Sea."

Section I of this document provides background and historical information relevant to the Salton Sea Restoration Project (SSRP). Section II highlights the activities and accomplishments of the Science Subcommittee. Section III is the conceptual framework for a continuing Salton Sea Science effort that is pragmatically focused on and linked to the SSRP. Section IV contains supplemental information referred to within the other sections.

SECTION II—SCIENCE SUBCOMMITTEE

The Salton Sea Science Subcommittee (SSC) was incorporated within the Salton Sea Restoration Project in December 1997 to guide the science effort needed to support restoration. The primary purpose of the SSC is to provide a sound scientific foundation on which management judgments can be based in considering alternatives for achieving project goals. Achieving this endpoint has been accomplished by evaluating data, identifying data gaps, and awarding contracts for focused scientific investigations. Using the principles of competition and peer review, eight reconnaissance projects and four studies of fish and avian mortality were funded in 1998 and 1999 through the Salton Sea Authority (SSA) by a research grant provided the SSA by the US Environmental Protection Agency. By September 1999, two projects had been completed and eight synthesis documents had been written to provide input to the planning documents. These investigations are providing the most comprehensive scientific evaluations of the Salton Sea ever available. An additional eight issue-specific documents were prepared by SSC members to meet urgent needs of the planning process. Findings often differ from popular perceptions and conventional wisdom about the Sea, based on earlier investigations and more fragmented scientific efforts. As a result, speculation and unknowns are being replaced by practical knowledge. The SSC also provided presentations at scientific, agency, and environmental community forums and developed a strategic science plan (SSP) to guide the long-term integration of science within the SSRP.

SECTION III—FUTURE SCIENCE ACTIVITIES

The SSP provides recommendations for the development, function, and oversight of a pragmatic science effort to support long-term management actions for restoring the Salton Sea. Development of this segment of the SSP was assisted by input resulting from an SSC request for a US Geological Survey "Tiger Team" to carry out an intense evaluation of needs. A strong scientific program specifically oriented at guiding management actions will provide a sound basis for management decisions, evaluation of progress toward achieving SSRP goals, and conceptual models for effective selection among alternatives to address specific SSRP actions.

The basic objective for the SSP is to provide a framework for a continued scientific effort in support of the restoration project that replaces the interim activities of the Science Subcommittee. This objective will be met by accomplishing the following goals:

- Establish a dedicated science office to serve as an interface with restoration efforts;
- Provide timely, objective scientific evaluation and technical assistance to management;
- Establish a long-term database program for supporting investigations and management actions; and
- Establish a steady and reliable funding base for supporting SSRP science needs.

Components of the Science Program

Environmental baselines need to be established to evaluate change from restoration efforts. Monitoring is performed to evaluate the success of restoration actions and to collect long-term data from which quantitative models can be validated. Conceptual models are used to guide the development of quantitative models by identifying processes and ecosystem functions thought to be important. Quantitative modeling then generates hypotheses about these processes and ecosystem functions that focused investigations can explore. Focused investigations fill in key information gaps, support monitoring by identifying important measures that were not initially recognized, and also help in validating quantitative models. These components interact to provide management with a solid base to assess functional system changes being achieved and the outcome of management actions relative to the SSRP goals.

Technical assistance provides the glue linking the science program to restoration management. A dedicated technical assistance component is included within this SSP to provide a focal point for management requests and to develop processes to support those requests in a timely manner.

The SSRP has need for data and information management. The projected long-term efforts of the project will be best served by formal agreement between the project and external programs for managing scientific data and information that clearly define the roles, responsibilities, and contributions of each entity. Key considerations regarding SSRP scientific data and information management are that these components are part of the integrated scientific effort rather than a separate scientific program. This is important because formatted input and availability of scientific data can be required only for investigations funded by the project. It would require a substantial investment in equipment, personnel, and facility costs to establish an internal database function within the science program.

The Science Office

Restoration of the Salton Sea is a lengthy process that will require scientific support and investigations for many years. Continuity of the science effort, effectiveness of the science undertaken in support of the SSRP, and efficiency of operations in serving management needs will be best served by a funded and staffed Science Office. This office should be established as an independent organization along with the management offices for the SSRP.

The functions of the Science Office are as follows:

- Science leadership and coordination;
- Science oversight and responsibility for SSRP science activities;
- Administration of science funding;
- Science contract awards and negotiations;
- Science outreach activities;

- Development and delivery of scientific products;
- Collaboration and coordination with the SSRP management agencies;
- Networking with external agencies and organizations for data sharing and other SSRP science needs; and
- Accountability and reporting for the science program.

The basic roles for the Science Office are that of science planning, coordination, evaluation, and contract awards and administration. The Science Office should not be involved in the internal conduct or supervision of individual scientific investigations. It is the foundation for the science program and is accountable for the quality and productivity of science efforts funded as part of the restoration project. The Science Office has two standing committees to help set priorities and to address various issues. The External Advisory Committee of stakeholders in the Salton Sea helps coordinate scientific investigations at the Sea, setting priorities and resolving science issues. The Science Advisory Committee, whose members are selected because of their technical expertise, meets as small focus groups to address specific technical issues, to assist in establishing science priorities, to serve as peer reviewers, and to provide requested scientific evaluations.

Field Station

The Salton Sea Restoration Project science activities would be greatly enhanced by a common use on-site field station. The primary purposes of this facility would be to increase cost efficiency by sharing equipment and to facilitate coordination and dialogue among scientific studies. This would be a working facility for investigators who should be isolated from external disturbances, such as tour groups and unscheduled visits by the public, media, and others. The site should provide stability for the life of the project and should not be subject to transient occupancy due to other needs for the site by the landowner. The field station could be administered by one of four entities: the private sector, as an interagency cooperative agreement for shared government facilities, as sole responsibility of a government agency, or by the Salton Sea Science Office.

Funding the Science Program

The science program has no directed purpose without the SSRP; therefore, funding for the science effort should be part of total federal appropriations for the SSRP. Base funds provided the Science Office as an annual appropriation should be augmented by contributions from the state of California, grants for specific activities, and cooperative agency science activities that are funded through agency budget processes. Base funding should be tied to Congressional authorization for the Salton Sea Restoration Project because the purpose for the science program is to provide a sound scientific foundation for management decisions and actions associated with the restoration effort. Science requires time to gather information needed by management; therefore, funding for science should not be delayed if there is a delay between SSRP authorization and appropriations for construction.

Federal funding for the Science Office will need to be provided through some federal agency as base resources to assure annual operating funds to sustain the science effort. Funding the major components of the science effort should be approached in a manner consistent with the objectives of the following components:

- Modeling and Focused Investigations—base funds, contributed funds from outside sources, and grants obtained for specific areas of inquiry.
- Monitoring—routine activities should be provided by cooperative state/federal agency programs, using their internal budget processes and existing program expertise. Nongovernment agencies also may contribute to a coordinated monitoring effort. Specialized monitoring associated with pilot and demonstration projects will require SSRP funding.
- Technical Assistance—funding to be provided by the Science Office and charged against SSRP and other management offices requesting assistance. The nature of the assistance should dictate what costs would not be borne by the Science Office.
- Data and Information Management—combined funding by the Science Office, external grants, fees for services provided, and cost-sharing arrangements with stakeholder agencies and organizations.

The Role of Review Processes in Restoration Science

External peer review is a fundamental component of quality science programs and should be an uncompromised standard for Salton Sea science. Peer review processes should be incorporated within all science activities: competitive science awards, database evaluations, data and documents released for use of the public, and collaborative science, such as monitoring.

Transition from Science Subcommittee to a Workable Science Program

Several actions are needed to assure continuity of science support for the SSRP. These include, but are not limited to, maintaining the current executive director of the SSC to oversee the transition, appointing a permanent Science Office executive director, establishing the External Advisory and Technical Advisory Committees, holding a modeling workshop to develop a conceptual model of the Sea, and producing a publication on the "State of the Salton Sea," which summarizes current knowledge from studies directed by the SSC. Most critical to continuing the science support for restoration are obtaining temporary funding for science operations until the SSRP is authorized and obtaining commitments from stakeholder agencies for continuing oversight on current Salton Sea science investigations.