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2010 ANNUAL STATUS REPORT

SAN ONOFRE NUCLEAR GENERATING STATION (SONGS) MITIGATION PROGRAM

(Status Report Only/No Commission Action Required)

Following is a status report for 2010 for the mitigation projects required in Southern California Edison Company's (SCE) coastal development permit for the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 (permit no. 6-81-330, formerly 183-73). The last annual status report was provided as part of the 2010 and 2011 work program and budget adopted by the Commission in November 2009.

The Commission originally adopted the SONGS permit conditions in 1991 to mitigate the adverse impacts of the power plant on the marine environment. The 1991 conditions (Condition D) also require SCE to provide the funds necessary for Commission technical oversight and independent monitoring of the mitigation projects, to be carried out by independent contract scientists under the direction of the Executive Director.

Implementation of the mitigation projects is the responsibility of SCE whereas the Commission is responsible for implementing its independent monitoring and technical oversight function. The Commission's monitoring and oversight also includes periodic public review of the performance of the mitigation projects.

SONGS Permit Background

In 1974, the California Coastal Zone Conservation Commission issued a permit (No. 6-81-330-A, formerly 183-73) to Southern California Edison Company for Units 2 and 3 of the San Onofre Nuclear Generating Station (SONGS). A condition of the permit required study of the impacts of the operation of Units 2 and 3 on the marine environment offshore from San Onofre, and mitigation of any adverse impacts. As a result of the impact studies, in 1991 the Coastal Commission added new conditions to mitigate the adverse impacts of the power plant on the

marine environment which require the permittee to: (1) create or substantially restore at least 150 acres of southern California wetlands (Condition A), (2) install fish barrier devices at the power plant (Condition B), and (3) construct a 300-acre kelp reef (Condition C). The conditions specify both physical and biological performance standards for the wetland restoration and kelp reef, and require continuing monitoring of the effectiveness of the fish barriers. The 1991 conditions also require SCE to provide the funds necessary for Commission contract staff technical oversight and independent monitoring of the mitigation projects (Condition D). Monitoring, management and remediation, if needed, are required to be conducted over the "full operating life" of SONGS, defined as past and future years of operation of SONGS Units 2 and 3, including the decommissioning period to the extent that there are continuing discharges. In 1993, the Commission added a requirement for the permittee to partially fund construction of an experimental white sea bass hatchery. Due to its experimental nature, the Commission did not assign mitigation credit to the hatchery requirement.

After extensive review of new kelp impact studies, in April 1997 the Commission approved amended conditions which: (1) reaffirm the Commission's prior decision that San Dieguito is the site that best meets the permit's standards and objectives for wetland restoration, (2) allow up to 35 acres credit for enhancement of wetland habitat at San Dieguito Lagoon by keeping the river mouth permanently open, and (3) revise the kelp mitigation requirements in Condition C. Specifically, the revised Condition C requires construction of an artificial reef large enough to sustain 150 acres of medium to high density kelp bed community (which could result in a reef larger than 150 acres) together with funding for a mariculture/marine fish hatchery as compensation for the loss of 179 acres of medium to high density kelp bed community resulting from the operation of SONGS Units 2 and 3. The artificial reef is to consist of an experimental reef of at least 16.8 acres and a larger mitigation reef to meet the 150-acre requirement. The purpose of the experimental reef is to determine which combinations of substrate type and substrate coverage will most likely achieve the performance standards specified in the permit. The design of the mitigation reef will be contingent on the results of the experimental reef.

The Commission also found in April 1997 that there is continuing importance for the independent monitoring and technical oversight required in Condition D to ensure full mitigation under the permit.

Commission Oversight and Independent Monitoring

Condition D of the permit establishes the administrative structure to fund the independent monitoring and technical oversight of the mitigation projects. It specifically: (1) enables the Commission to retain contract scientists and technical staff to assist the Commission in carrying out its oversight and monitoring functions, (2) provides for a scientific advisory panel to advise the Commission on the design, implementation, monitoring, and remediation of the mitigation projects, (3) assigns financial responsibility for the Commission's oversight and monitoring functions to the permittee and sets forth associated administrative guidelines, and (4) provides for periodic public review of the performance of the mitigation projects.

Condition D requires SCE to fund the Commission's oversight of the mitigation and independent monitoring functions identified in and required by Conditions A through C. The permittee is required to provide "reasonable and necessary costs" for the Commission to retain personnel with appropriate scientific or technical training and skills, as well as reasonable funding for

necessary support personnel, equipment, overhead, consultants, the retention of contractors needed to conduct identified studies, and to defray the costs of members of any scientific advisory panel convened by the Executive Director to provide advice on the design, implementation, monitoring and remediation of the mitigation projects.

Pursuant to this condition, the Commission has operated under approved work programs and budgets since 1993. The funds for the oversight and monitoring program are managed by an independent accounting firm. The Commission retains a science advisory panel and a small technical oversight team (two scientist positions and administrative support) under contract to provide the necessary scientific expertise to the Commission and to serve as project managers for the monitoring program. Field assistants also are retained under contract to conduct the monitoring. In addition, independent consultants and contractors are called upon when specific expertise or assistance is needed for specific tasks. The Commission's permanent staff also spends a portion of their time on this program, but except for direct travel reimbursements, their costs are paid by the Commission and are not included in the monitoring program budget.

In approving the work programs and budgets for the monitoring and oversight program, the Commission has authorized an implementation structure through a contract with the University of California, Santa Barbara that utilizes the existing contract scientists as project managers at no additional cost, with data collection done by contract field assistants under their direction. The Commission found, based on a comparison of estimated costs from UCSB, other universities, and private consultants, that this implementation structure is the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the permit.

Wetland Restoration Mitigation

Mitigation Requirement

Condition A of the permit requires the permittee to create or substantially restore a minimum of 150 acres of wetlands to mitigate for the reduction in the standing stocks of nearshore fishes caused by the operation of SONGS Units 2 and 3. In April 1997, the Commission revised Condition A to allow the permittee to meet its 150-acre requirement by receiving up to 35 acres enhancement credit for the permittee's permanent, continuous tidal maintenance at San Dieguito Lagoon.

Wetland Restoration Planning and Environmental Review

In June 1992, following an evaluation of eight sites, the Commission approved SCE's selected restoration site, the San Dieguito River Valley. In April 1997, the Commission reaffirmed its prior decision that San Dieguito River Valley is the restoration site that meets the minimum standards and best meets the objectives set forth in Condition A.

In November 1997, the Commission approved SCE's preliminary wetland restoration plan as largely conforming with the minimum standards and objectives stated in the permit. The CEQA/NEPA environmental review incorporated the mitigation project into the overall San Dieguito River Valley Regional Open Space Park project. The lead agencies for the CEQA/

NEPA environmental review were the San Dieguito River Valley Regional Open Space Park Joint Powers Authority (JPA) and the U.S. Fish and Wildlife Service, respectively.

Following the review period on the January 2000 Draft EIR/EIS, the JPA certified the Final EIR/EIS on September 15, 2000, after public hearing. The EIR/EIS designated the Mixed Habitat plan as the environmentally preferred alternative.

Lawsuits challenging the adequacy of the Final EIR/EIS were filed by the Del Mar Sandy Lane Association and Citizens United to Save the Beach. On July 27, 2001, the San Diego Superior Court ruled that the EIR/EIS did not comply with CEQA and remanded the EIR/EIS back to the JPA for revisions. However, on August 4, 2003, the California Court of Appeals overturned the Superior Court's ruling and upheld the adequacy of the EIR/EIS.

Following the conclusion of the litigation, the USFWS issued its final Record of Decision on the Final EIR/EIS on November 28, 2003.

Steps in Implementing Wetland Restoration

Upon completion of the wetland restoration project design and engineering plans, SCE and JPA submitted their Coastal Development Permit Application (#6-04-88) in August 2004 to receive authority to carry out the restoration project. The Commission's contract scientists and staff reviewed the application and associated documents, requesting additional information where necessary. On October 12, 2005, the Commission approved the Final Restoration Plan and CDP #6-04-88, as conditioned, for the San Dieguito Wetland Restoration Project. (See Exhibits 1 and 2.)

In approving the preliminary restoration plan in 1997, the Commission acknowledged and accepted that a small amount of existing wetland could be lost in implementing the overall wetland restoration project at San Dieguito. The Commission had determined that if the Final Plan involves any loss of wetlands, then such loss would be mitigated and an amendment to the SONGS permit would be considered to allow the restoration project to go forward in compliance with the SONGS permit conditions. Thus, on October 12, 2005, the Commission also approved an amendment to SONGS CDP #6-81-330-A4 to revise Standard 1.3.h of Condition A to allow the minimal loss of existing wetlands as "specifically authorized by the Coastal Commission in Coastal Development Permit No. 6-04-88 for the San Dieguito Wetland Restoration Project Final Restoration Plan."

At the same time, the long-standing obligation of the 22nd Agricultural District to provide for Least Tern nesting habitat as a requirement of its Coastal Development Permit No. 6-84-525 was resolved with the inclusion of four new nesting sites in the Final Restoration Plan. On October 12, 2005, the Commission approved an amendment to CDP #6-84-525 to require the provision, maintenance and monitoring of the new Least Tern nesting habitat to be constructed as part of the San Dieguito Wetland Restoration Project.

Wetland Restoration Condition Compliance

Following the Commission's approval of CDP #6-04-88, SCE and JPA began preparing the final plans in compliance with the special conditions in CDP #6-04-88 that must be met prior to issuance of the permit, prior to commencement of construction, during construction, at the completion of construction, and on an on-going basis. Materials submitted in compliance with

the special conditions were reviewed by the Executive Director and found to fulfill the requirements of certain of those conditions, as follows:

- On August 22, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to issuance of the permit and issued CDP #6-04-88.
- On September 13, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction; however, the Notice of Acceptance excluded authority to construct certain plan elements that require compliance with additional site-specific conditions (i.e., least tern nesting habitat, public trails, freshwater runoff treatment ponds, inlet dredging, use of North Beach staging area and beach restoration activities, river bend revetment, a disposal site, and a mitigation site).
- On October 2, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of segments 1 through 3 of the Coast-to-Crest public trail (from Jimmy Durante Boulevard along the northern edge of the river to I-5).
- On November 20, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction on disposal site DS32.
- On November 29, 2006, Commission staff issued the Notice of Acceptance for condition compliance on a revised design and alignment for the temporary construction haul road under Interstate Highway 5.
- On January 29, 2007, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the Least Tern nesting sites.
- On February 20, 2007, Commission staff issued the Notice of Acceptance for condition compliance on a revised construction haul road route to Disposal Site 36.
- On November 21, 2007, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the Freshwater Runoff Treatment Ponds and Segments 4 though 8 of the Coast to Crest Trail.
- On June 3, 2010, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the North Beach access improvements.
- On September 15, 2010, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the riverbank revetment.
- On November 30, 2010, Commission staff issued the Notice of Acceptance for condition compliance required for the 29th Street South Beach access improvements.

In March 2009 the Executive Director provided to SCE the selection of experts to be named to the Coastal Processes Technical Panel to assist with the Beach Monitoring Program required under Special Condition #25. SCE has confirmed their service on the panel. SCE expects to submit a summary report of beach surveys to the panel in early January 2011 for review prior to inlet dredging, currently scheduled for February 2011. SCE also is monitoring the sites designated in the SONGS permit and will summarize historical and recent data for these sites.

Wetland CDP Amendments

The following permit amendments have been submitted:

1. On August 24, 2006, the Commission issued an immaterial amendment to modify the language of special condition #4 with regard to the timing of submittal of final plans for berm and slope protection. Originally, the condition required such plans be submitted "prior to issuance of the coastal development permit." This immaterial amendment changed the timing of the submittal to "prior to commencement of construction of the revetment located on the south side of the river east of Jimmy Durante Boulevard."
2. On July 10, 2007, the Commission approved an amendment to include in the wetland restoration project the removal of the berm north/northeast of the Grand Avenue Bridge.
3. On August 20, 2007, SCE withdrew an amendment request to build a temporary river crossing.
4. On August 14, 2007, SCE submitted an amendment request to address several changes in the Final Restoration Plan, including changes to restoration module W45, exclusion of the riverbank revetment, and an alternative South Beach access plan. This amendment was revised in September 2009, and on June 9, 2010, the Commission approved an amendment to replace restoration module W45 with module W16, modify the timing of construction of public beach accessways, and modify the riverbend revetment requirements in Special Condition #4.
5. On October 25, 2007, the Commission issued an immaterial amendment to modify special condition #8 regarding the mitigation plan for impacts from construction of the trail and wetland treatment ponds.
6. On February 28, 2008, the Commission issued an immaterial amendment to modify the trail crossing under Interstate 5 from open bottom box culverts to bridges.
7. On October 13, 2009, the Commission issued an immaterial amendment to modify segment 8 of the Coast to Crest trail to designate a pedestrian-only path along an existing erosion-control stability bench on the slope of disposal site 32. The pedestrian-only segment would be in addition to and would connect with segment 8 to form a loop trail.
8. On November 19, 2010, the Commission issued an immaterial amendment to modify designated mitigation sites for creation of coastal sage scrub as required by Special Condition #8 regarding trail and treatment ponds.

Wetland Restoration Construction and Remaining Construction Issues

Construction of the wetland restoration project at San Dieguito (Exhibit 2) commenced in August 2006 and is expected to be completed by the end of summer 2011. Construction activities began with the delivery of rock and gravel material for use in constructing the haul roads and berms, the installation of fencing to delineate project boundaries and sensitive habitat, and BMP (best management practice) fencing to contain soils within the project area during rainfall events. Construction proceeded with the installation of haul roads to transport dredge materials to disposal sites, the importation, screening, and stockpiling of rock and sandy clay to create berms and permanent access roads, and the clearing and grubbing of vegetation and debris from project areas to the south of the San Dieguito River and west and east of Interstate 5. Upland topsoil was

stripped from the disposal sites and stockpiled, and wetland base soil was removed from excavation areas and stockpiled. Construction of the large subtidal and intertidal basin (44 acres) in Area 2A (Module W1) west of Interstate 5 commenced in December 2006 and was completed with opening to tidal exchange on January 23, 2008.

In April 2007, the construction of wetland habitat commenced in other areas within the restoration site. This included modules on the east side of Interstate 5, both north (Area 3) and south (Area 2B) of the San Dieguito River that will be primarily high and middle salt marsh and exposed mud flat habitat. Tidal flushing to the restoration site was enhanced through a partial dredging of the inlet on May 7, 2008. Excavation and grading to create middle and high marsh was completed in Area 2A (Modules W2, W2A, W3) adjacent to the San Dieguito River. Excavation and grading, including the construction of tidal creek networks, was completed in Area 3 (Modules W4, W16) and these areas were opened to tidal exchange on December 3, 2008. Excavation and grading of Area 2B (Modules W5, W10) was also completed in December 2008. Material excavated from the construction site was deposited in upland disposal sites within the project area. Berms that will constrain storm runoff were completed along the boundary of the effective flow area of the San Dieguito River.

The disposal sites and berms were covered with topsoil and hydroseeded in December 2007 and October 2008 to control erosion. The results of the hydroseeding were mixed. Initially, neither hydroseed application was successful in producing native vegetation and the berm slopes and disposal sites became covered with weeds. However, a program of intensive hand weeding of the berm slopes during summer 2010 proved beneficial and much of Berm 8, bordering the south side of modules W4/W16 and portions of Berm 9 bordering the south side of W2/W3 are now covered in native plants (goldenbush, buckwheat, sand aster). SCE has committed to weeding and the application of hydroseed to bare areas as necessary in order to achieve the cover requirement of 85% native plants on berms and disposal sites after 2 years as required by the City of San Diego.

Following excavation and grading, portions of the restoration project are to be planted with salt marsh vegetation. This is anticipated to be accomplished in two phases. The first phase involved planting selected species in high marsh habitat. The second phase, to be accomplished following full inlet dredging, will involve planting cordgrass in the low marsh habitat of Area 2A. Planting of selected species (largely pickleweed) in high marsh habitat occurred in January/February 2009. The performance of these plantings varied among modules with the best survival and growth occurring in W4/W16, whereas plantings failed to survive in W2/W3. Some natural recruitment of pickleweed has occurred in all modules. Discussions between CCC staff and SCE regarding the failure of the plantings and patchiness in natural plant establishment in portions of W2/W3 have lead to the construction of tidal networks and grading in some areas to lower the elevation of the marsh plain to better convey tidal waters throughout these modules.

Four least tern nesting sites were constructed within the wetlands restoration area to fulfill mitigation requirements of the 22nd District Agricultural Association (DAA) under a previous Coastal Development Permit. The nesting sites are not a requirement of the SONGS Permit; however, in land use agreements among SCE, the 22nd DAA, and the JPA for the wetland restoration project, SCE agreed to construct the nesting sites for the 22nd DAA. (The 22nd DAA will be responsible for the maintenance and monitoring of the nesting sites.) There are still unresolved issues pertaining to the completion of construction of the nesting sites, including the coarseness of the surface material used in construction. The San Dieguito Lagoon Final

Restoration Plan requires the use of coarse sand to cap the nesting sites. However, coarse sand does not occur naturally in the area. SCE is applying for an amendment to change the permit to better reflect the grain size available under natural conditions. Final approval of nesting site construction is awaiting determination by U.S. Fish and Wildlife.

JPA components of the project include a portion of the Coast to Crest Trail adjacent to the restoration site and the construction of Treatment Ponds (TP41) designed to remove pollutants from surface runoff entering the restoration site. These components are not a requirement of the SONGS Permit. Construction of the trail is nearly complete. The potential to restore additional acreage within the San Dieguito restoration site as proposed by other parties required the JPA to identify an alternative mitigation site for impacts resulting from construction of the trails and treatment ponds. In August 2009, the JPA submitted a revised mitigation plan to address impacts of trail construction to seasonal marsh and to coastal sage scrub. This plan includes an alternative mitigation site as well as proposed changes in the re-vegetation plan for the Treatment Ponds and revisions to the coastal sage scrub mitigation site location. JPA submitted further revisions in August 2010 (Mitigation Plan dated April 23, 2010). Staff reviewed the submittal and requested additional information for the plan. Staff also attended a field meeting with JPA in late October 2010 to discuss revisions to the plan and the maintenance and performance of the treatment ponds to date. The JPA is currently revising the mitigation plan.

SCE hopes to begin inlet dredging for full tidal exchange in mid to late February 2011 and to complete dredging by the end of Spring 2011. An agreement has been reached between SCE and the North County Transit District (NCTD) that will allow dredging at the railroad bridge near the inlet. Dredging of the inlet presently awaits NCTD action to re-enforce the bridge. Agreement has been reached with NCTD for the installation of a new revetment designed to protect the southern rail bridge abutment. However, this revetment will require a commission federal consistency review that NCTD has yet to submit. Depending on the timing of the consistency review or other agreements with NCTD, it may be the end of December 2011 before inlet dredging is completed.

Special Condition 12 requires the provision of improved access ways from Camino Del Mar to the beach south of the river mouth. Construction of the north access improvement is completed and planting is in progress with completion scheduled for after the rainy season. The City of Del Mar has approved the 29th Street (south) access improvement and currently those plans are under review by Commission staff to ensure compliance with CDP conditions. Construction of the south access improvement is scheduled for completion by the end of December 2010.

Wetland Construction Monitoring

The SONGS permit requires independent monitoring by CCC contract scientists to ensure that the restoration work is conducted according to approved plans. To accomplish this task, CCC contract scientists have established good communication with SCE and its partners involved with implementation of the Final Plan and a frequent on-site presence at the restoration site. CCC contract scientists are monitoring construction activities through attendance at briefings, discussions with SCE and its consultants, and field inspections of work in progress to ensure the wetland is constructed according to the approved Final Plan. These inspections include verifying module boundaries and elevations, habitat areas, and the appropriate tidal regime. CCC contract scientists are also monitoring the impacts of unplanned construction activities. Unplanned construction changes have caused impacts to existing habitat through changes in the alignment of

a haul road, and unforeseen impacts of a disposal site and berm on wetland habitat. Staff administers these changes through condition compliance, where appropriate, and through permit amendments as needed. CCC contract scientists have worked cooperatively with SCE consultants in assessing the suitability of seasonal wetland habitat for mitigating the project's permanent impacts to seasonal wetland, and in resolving issues that will affect the ability of the wetland to meet the performance standards outlined in the SONGS permit. These issues include the unplanned continuous inundation of proposed intertidal habitat and the poor performance of vegetation in some portions of the wetland. SCE and its construction team have been very responsive to the requirements of the permit.

Monitoring Plan and Adaptive Management

Condition A of the SONGS permit requires that monitoring of the wetland restoration be done over the full operating life of SONGS Units 2 and 3. This monitoring will be done to measure compliance of the mitigation project with the performance standards specified in the SONGS permit. In accordance with Condition D (Administrative Structure) of the permit, scientists retained by the Executive Director shall develop the Monitoring Plan to guide the monitoring work and will oversee the monitoring studies outlined in the Plan. The SONGS permit provides a description of the performance standards and monitoring required for the wetland mitigation project.

A Draft Monitoring Plan for the SONGS Wetland Mitigation Program was reviewed by State and Federal agencies and SCE in May 2005. A revised Monitoring Plan was part of the coastal development permit (No. 6-04-88) for the wetland restoration project considered and approved by the Commission on October 12, 2005.

The Monitoring Plan for the SONGS Wetland Mitigation Program closely adheres to the monitoring requirements of the SONGS permit. The performance standards that will be used to measure the success of the wetland restoration project fall into two categories. The first category includes long-term physical standards relating to topography (erosion, sedimentation), water quality (e.g., oxygen concentration), tidal prism, and habitat areas. The second category includes biological performance standards relating to biological communities (e.g., fish, invertebrates, and birds), marsh vegetation, *Spartina* canopy architecture, reproductive success of marsh plants, food chain support functions, and exotic species. The Monitoring Plan includes a description of each performance standard and the methods that will be used to determine whether the various performance standards have been met. The successful achievement of the performance standards will in some cases be measured relative to three reference wetlands, which are specified in the permit to be: (1) relatively undisturbed, (2) natural tidal wetlands, and (3) within the Southern Bight. The wetlands that best met these three criteria and that were selected as reference sites are Tijuana River Estuary, Mugu Lagoon, and Carpinteria Salt Marsh.

Management issues relevant to the SONGS wetland mitigation requirement are also discussed in the Monitoring Plan. These issues include inlet maintenance, excessive changes in topography, and exotic species. Although the Commission's contract scientists are not responsible for managing the wetland restoration, their monitoring will measure several parameters that can be used in adaptive management to ensure the success of the restoration project.

SCE has a permit requirement and a plan for managing the inlet in perpetuity to ensure uninterrupted tidal flushing of the restored wetland. This plan provides conditions that would

indicate the need for additional maintenance dredging at the inlet. Commission contract scientists will measure water elevation, salinity, and dissolved oxygen concentration during water quality monitoring in the wetland. These variables change dramatically with a reduction in tidal flushing and provide a useful trigger for inlet maintenance. Topographic degradation of the wetland and berms is likely to occur over time as a result of sedimentation and scour. If aerial photographs or topographic surveys taken as part of post-restoration monitoring indicate that major topographic degradation has occurred, then the appropriate corrective action (e.g., dredging) will be taken to reconfigure the wetland to its "as designed" condition. Exotic species may invade restored habitats. If invasive exotic species are found in the restored wetland during post-restoration monitoring, and these species could adversely affect the success of the restoration, experts working in this field will be consulted and a program to control the spread of these species will be developed.

Kelp Reef Mitigation

Mitigation Requirement

Condition C of the permit requires construction of an artificial reef that consists of an experimental reef and a larger mitigation reef. The experimental reef must be a minimum of 16.8 acres and the mitigation reef must be of sufficient size to sustain 150 acres of medium to high density kelp bed community. The purpose of the experimental reef is to determine which combinations of substrate type and substrate coverage will most likely achieve the performance standards specified in the permit. The design of the mitigation reef will be contingent on the results of the experimental reef.

In April 1997, the Commission added the requirement for a payment of $3.6 million to the State's Ocean Resource Enhancement and Hatchery Program (OREHP) to fund a mariculture / marine fish hatchery to provide compensation for resources not replaced by the artificial mitigation reef. The Commission had earlier required, in 1993, SCE to contribute $1.2 million toward construction of an experimental white sea bass fish hatchery. SCE has fully satisfied these requirements; thus, there are no fish hatchery tasks conducted by Commission contract scientists or funded through the Commission's monitoring and oversight program. Permanent Commission staff provides oversight of the Department of Fish and Games' continuing fish hatchery program.

Planning and Construction of Experimental Reef

Following the Commission's approval of the SONGS permit amendments in April 1997, the permittee submitted a preliminary conceptual plan for the experimental reef in June 1997, which was approved by the Executive Director and forwarded to state and federal agencies for review. As lead agency, the State Lands Commission (SLC) determined that under the requirements of CEQA a Programmatic Environmental Impact Report (PEIR) should be prepared to evaluate both the experimental reef and the subsequent full mitigation reef. SLC began the environmental review process in March 1998, and certified the final PEIR and issued the offshore lease for the experimental reef on June 14, 1999.

The Coastal Commission approved the coastal development permit for the experimental reef on July 15, 1999. The final plan approved by the Coastal Commission was for an experimental

artificial reef located off San Clemente, California that tested eight different reef designs that varied in substrate composition (quarry rock or recycled concrete), substrate coverage (low, medium, and high), and presence of transplanted kelp. All eight reef designs were represented as individual 40 m x 40 m modules that were replicated in seven areas (i.e., blocks) for a total of 56 artificial reef modules totaling 22.4 acres. The Army Corps of Engineers issued its permit on August 13, 1999, and SCE completed construction of the experimental reef on September 30, 1999.

Monitoring of Experimental Reef

The contract scientists produced a proposed monitoring plan for the experimental reef that was reviewed by SCE, various resource agencies and other technical specialists, and also was included in the draft PEIR for general public review. The Commission approved the proposed monitoring plan for the experimental reef on July 15, 1999.

Five years of post-construction monitoring were completed in December 2004. Results from the five-year experimental phase of the artificial reef mitigation project were quite promising in that all six artificial reef designs and all seven locations (i.e., blocks) tested showed a near equally high tendency to meet the performance standards established for the mitigation reef. It was concluded from these findings that a low relief concrete rubble or quarry rock reef constructed off the coast of San Clemente, California has a good chance of providing adequate in-kind compensation for the loss of kelp forest biota caused by the operation of SONGS Units 2 and 3.

A final report on all the findings and recommendations gleaned from the experimental phase of the artificial reef project was prepared by contract scientists and submitted to the Executive Director of the Commission on August 1, 2005. These findings and recommendations formed the basis of the Executive Director's determination that: (1) the mitigation reef shall be built of quarry rock or rubble concrete having dimensions and specific gravities that are within the range of the rock and concrete boulders used to construct the SONGS experimental artificial reef, and (2) the percent of the bottom covered by quarry rock or rubble concrete on the mitigation reef should average at least 42%, but no more than 86% (the range of low to high coverage on the experimental reef modules as surveyed by the contract scientists). The Commission concurred with the Executive Director's determination for the type and percent cover of hard substrate on October 12, 2005.

Mitigation Reef Planning and Permitting

On August 8, 2006, the Commission concurred with the Executive Director's determination that SCE's preliminary Phase 2 mitigation reef plan met the requirements of the SONGS permit. The plan called for the addition of 127.6 acres of reef construction to the existing 22.4 acres built in September 1999 for the Phase 1 experimental reef. The project area is located offshore of San Clemente, California, on an 862-acre parcel leased from the California State Lands Commission. The preliminary design created a low-profile, single-layer reef constructed of quarried boulders and distributed in quantities similar to those of the lowest substrate coverage used for the experimental reef project. The design consisted of 11 polygons that varied in area from 2.4 to 37.5 acres. The reef design achieved the following: (1) locates the final construction site in close proximity to the San Mateo Kelp Bed, (2) avoids hard substrate areas, (3) maintains the integrity

of the experimental reef modules, (4) provides for navigation channels, and (5) avoids areas of historical kelp growth as well as areas of special interest to local fisheries.

On October 3, 2007, SCE submitted its Final Plan and a preliminary CDP application for the mitigation reef. The Commission approved CDP #E-07-010 on February 12, 2008. (See Exhibits 3 and 4.)

Reef Condition Compliance

Following the Commission's approval of the mitigation reef construction permit (CDP #E-07-010), SCE began preparing the final design plan in compliance with the special conditions in CDP #E-07-010. Materials submitted in compliance with the special conditions were reviewed by the Executive Director and found to fulfill the requirements of certain of those conditions, as follows:

- On March 25, 2008, Commission staff accepted the additional GIS data and files requested for the experimental reef modules and the phase 2 mitigation reef polygons.
- On April 14, 2008, Commission staff issued the Notice of Acceptance for condition compliance required prior to issuance of the permit and issued CDP #E-07-010.
- On May 16, 2008, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction.
- On August 22, 2008, Commission staff issued the Notice of Acceptance for condition compliance requiring an initial construction audit.
- On January 27, 2009, Commission staff issued the Notice of Acceptance for condition compliance requiring a final construction report. Acreage from the experimental reef modules (22.4 acres) and "as-built" primary reef polygons (130.3 acres) shown on Exhibit 4 meet the SONGS permit and SCE *Final Design Plan* specifications required by CDP #E-07-010.

To date, SCE has submitted Kelp Wrack and Rock Hazard Monitoring reports required under Special Condition #12 for the periods October 2008-March 2009, April 2009-September 2009, and October 2009-March 2010. No rock that could be attributed to the artificial reef has been seen on the beaches, and the amount of kelp wrack found remains within the normal range expected by the City of San Clemente.

Reef Construction and Construction Monitoring

Construction of the Phase 2 mitigation reef began on June 9, 2008 and was completed on September 11, 2008. The Phase 2 reef was designed as 18 polygons ranging in area from 1.35 to 38.88 acres for a total reef area of 153 acres. Approximately 126,000 tons of boulder-size quarry material was used to construct the reef. Quarry boulders obtained from the Pebbly Beach and Empire quarries on Catalina Island and the La Piedra quarry in Ensenada, Mexico were the exclusive construction material. Boulder dimensions averaged 2.3 ft in length, 1.8 ft in width, and 1.4 feet in height. The boulders were hauled to the construction site by barge and precisely cast upon the seafloor within the described boundaries of each polygon in roughly a single-layer. The variation of boulder deposition per polygon ranged from 743 to 987 tons per acre with an average of 829 tons per acre.

The siting of each polygon within the lease site was based on avoiding the historical distributions of giant kelp as determined from aerial surveys and the existing distribution of hard substrate (which included natural rock and the Phase 1 modules) as determined from multibeam and sub-bottom profiling sonar surveys. The distribution of hard substrate detected by the acoustical surveys was verified by dive surveys. Additionally, the dive surveys evaluated the biological diversity of the lease area. The design also considered the historical, physical, and biological data collected during previous studies in the area and the results of experimental reef monitoring between 1999 and 2004.

The Phase 2 reef construction achieved the following desired objectives: (1) all polygons were built in close proximity to the San Mateo Kelp Bed; (2) all polygons avoided existing hard substrate areas that had historical presence of kelp; (3) the integrity of the Phase 1 Experimental Reef modules was maintained; (4) navigation channels were provided in response to concerns raised by fisherman; and (5) all constructed reef polygons avoided areas of historical kelp growth, existing areas of hard substrate, and areas of special interest to local fisheries.

The SONGS permit (CDP No. 6-81-330) requires that the coverage of quarry rock in the Phase 2 reef be between 42% and 86%. Commission contract scientists were charged with measuring the percentage of the seafloor covered by quarry rock in each polygon. They accomplished this by noting the type of bottom substrate beneath 20 points uniformly distributed in replicate 1m x 1m quadrats. Divers placed quadrats along ninety-two 50-meter long transects oriented east to west at locations that will be repeatedly monitored to determine consistency with all physical and biological performance standards. Five quadrats spaced 10 meters apart were sampled on each transect, beginning at 5 meters and alternating from the north to the south sides of the transect. Additional higher resolution sampling conducted by Commission contract scientists in two of the 18 polygons demonstrated that the estimates of boulder coverage obtained from divers sampling the permanent transects were both accurate and precise.

The 92 permanent transects were distributed among the Phase 2 polygons and Phase 1 modules in proportion to their fractional area of the total acreage of the Phase 1 and 2 reefs combined. Fractional areas of the polygons were calculated using the polygon areas obtained from SCE's multibeam sonar surveys. In this way, the sampling effort of boulder percent coverage was scaled to the areas of the different sized polygons. Survey results showed that percent cover of the sea floor covered by quarry boulders ranged from 33.7% to 65.5% on the 18 polygons with an overall average of 40.8% for the entire 153 acre Phase 2 reef, which was below the required range of 42% to 86%. However, the combined area of the Phase 1 and Phase 2 reefs totaled 174.4 acres, which exceeds the minimum 150-acre requirement in the SONGS CDP. Therefore, when the portions of the Phase 2 reef that did not meet the hard substrate coverage requirement (polygon 5 and the north-western section of polygon 7) were excluded from being counted toward the overall acreage requirement, the Phase 2 reef totaled 130.3 acres with a mean rock coverage of 42.3%. The combined total of the 130.3 acres of the Phase 2 reef and the 22.4 acre Phase 1 experimental reef (which collectively is officially known as the Wheeler North Reef) met the minimum requirements for area (150 acres) and coverage (42%).

Reef Performance Monitoring

Concurrent monitoring of physical and biological attributes of the Wheeler North Reef and two reference reefs (San Mateo and Barn) is being done annually to evaluate whether the Wheeler North Reef meets the performance criteria identified in Condition C. To date CCC contract

scientists have completed quantitative underwater surveys of all three reefs for 2009 and 2010. Results from the 2009 survey, reported at the annual public review workshop in April 2010, were very encouraging in that the Wheeler North Reef showed great promise in its ability to support kelp forest biota. Giant kelp, understory algae, sessile invertebrates and reef fish all colonized the Wheeler North Reef during the first year following its construction. Because not all performance standards were met in 2009, the year will not count toward the overall requirement for the reef, but it is important to note that 9 of the 14 performance standards were met after only 1 year. Among the most notable findings revealed by the 2009 monitoring data were: (1) hard substrate on the Wheeler North Reef, which is essential for supporting reef biota, was quite stable and there were no signs of it sinking or being exported to the beach, (2) an abundant and diverse fish assemblage on the Wheeler North Reef, which exhibited reproduction and growth that was similar to or greater than that found on natural reefs, and (3) no evidence that invasive or other undesirable species were adversely affecting the important functions of the reef.

The five performance standards that were not met by the Wheeler North Reef in 2009 pertained to the abundance of adult giant kelp, the abundance and diversity of the benthic community of algae and invertebrates, and the standing stock of kelp bed fish. Given the ecology of the kelp forest community it is not surprising that the Wheeler North Reef did not meet these standards in the first year. Spring is the period of peak colonization for giant kelp and spring 2009 was the first opportunity for it to colonize in high abundance. High densities of juvenile giant kelp were recorded in the 2009 survey, however this kelp did not have sufficient time to grow to adult size prior to being counted, which contributed to the Wheeler North Reef not yet meeting this standard.

The Wheeler North Reef was also did not meet three performance standards that pertain to the abundance and diversity of the benthic community of algae and invertebrates. The failure of the Wheeler North Reef to meet these standards was due to its lower abundance and diversity of invertebrates relative to the natural reference reefs. Populations of reef invertebrates generally take longer to become established than those of macroalgae and the relatively low abundance and diversity of invertebrates on the Wheeler North Reef after only one year is not unusual; in fact, a similar pattern was observed on the Phase 1 experimental reef.

The permit requires the Wheeler North Reef to support 28 tons of reef fish, which was the estimated reduction in the standing stock of reef fish attributed to SONGS operations. While the density, diversity, reproduction and growth of reef fish on the Wheeler North Reef were equal to or greater than that of the two reference reefs, the Wheeler North Reef fell short of the 28 ton target. While the 28 ton standard for fish standing stock is not measured against the reference reefs it is worth noting that fish observed on Wheeler North Reef were on average smaller than fish on the two reference reefs. This smaller size reflected a greater proportion of smaller species on the Wheeler North Reef as well as younger ages of the same species, which might be expected given the recent construction of Wheeler North Reef

Data collected during 2010 are in the process of being entered into the project's database where they will undergo formal procedures for quality assurance and control before being analyzed and compared to the performance standards. Results from the 2010 monitoring will be presented at the annual public review workshop scheduled for spring 2011.

Fish Behavioral Mitigation

Mitigation Requirement

Condition B of the SONGS permit requires SCE to install and maintain behavioral barrier devices at SONGS Units 2 and 3 to reduce fish impingement losses.

Fish Behavioral Mitigation Compliance

The impact studies for the operation of SONGS Units 2 and 3 conducted between 1983 and 1991 found that annual losses of juvenile and adult fish in the cooling water systems under normal operations averaged about 20 metric tons. Although the SONGS permit does not specify any criteria for evaluating the effectiveness of these devices, the Commission accepted the studies' recommendation that "the techniques" (behavioral barrier devices) "be tested on an experimental basis, and implemented if they reduce impingement by at least 2 metric tons (MT) per year", which is equivalent to at least 10% of the average loss due to impingement (Section IV– Proposed Findings and Declarations in the SONGS 1991 permit). None of the experiments showed evidence that these devices would reduce fish impingement losses as required by Condition B. At the same time, SCE continued its modified heat cleaning treatments of the cooling water intake systems of Units 2 and 3 (called the Fish Chase procedure), which result in a considerable reduction in fish impingement.

In October 2000, the Commission reviewed the results of the experiments and concluded that no further testing of alternative behavioral barriers should be required at that time, provided that (1) SCE continues to adhere to the operating, monitoring, and reporting procedures for the modified heat cleaning treatments and (2) SCE makes every effort to test and install, if feasible, future technologies or techniques for fish protection if such techniques become accepted industry standards or are required by the Commission in other power plant regulatory actions.

The contract scientists and staff review the annual data and analyses on the fish chase procedure at SONGS. The reports indicate that the fish chase procedure generally has been consistent with the Commission's requirements. Since 2000, the Fish Chase Procedure effectiveness relative to impingement has been 10% or greater in 7 of ten years (2000-2009). However, it is of concern that since 2004, the effectiveness has been below 10% in 3 of 6 years.

The effectiveness of the fish chase procedure was below 10% in 2004 and 2005 and only returned to levels greater than 10% following a short term change on sampling in 2006-2007. As SCE concluded, the accuracy of the impingement assessment increased over 2006-2007 because of increased frequency of sampling during that period. Staff was concerned that a return to the former quarterly sampling would lead to inaccuracies in future assessments of the effectiveness of the Fish Chase Procedure and the need to consider new approaches to behavioral barriers. The staff's review of results from 2009 (4.13% effectiveness) suggest that that current sampling effort (decreased from 2006-2007) may be inadequate, or that the effectiveness of the fish chase procedure will often be below the target of 10%. Staff notes that SCE's application for renewal of its permit from the regional water quality control board is currently under consideration and includes a provision to reinstitute semi-monthly sampling.

Based on these results the Executive Director will be requesting an update from SCE concerning: (1) any changes that are either envisioned or required to reduce entrainment and impingement

based on changes to federal and state law regulating once-through cooling and (2) new assessment of the adequacy of the current sampling program. In addition, CCC contract scientists and scientific advisory panel will review the current industry standard for "technologies or techniques for fish protection" with respect to decreasing impingement and entrainment.

Given the potential for less accurate assessments coupled with the continuing requirement of the Executive Director's determination for Condition B compliance that SCE make every effort to test and install technologies or techniques for fish protection that become accepted industry standards, staff would like to see SCE take a proactive role in developing new technologies at SONGS that will meet the stricter standards currently proposed by the federal government.

Although the contract scientists' oversight pertains to fish losses, the staff notes that the State's 316(b) Policy under the regional water quality board, which requires that power plants install large exclusion bars or other barriers to marine mammals within one year, went into effect October 1, 2010. SCE, in conjunction with Hubbs/Sea World Research Institute, is studying the feasibility of exclusion and/or behavioral barrier devices.

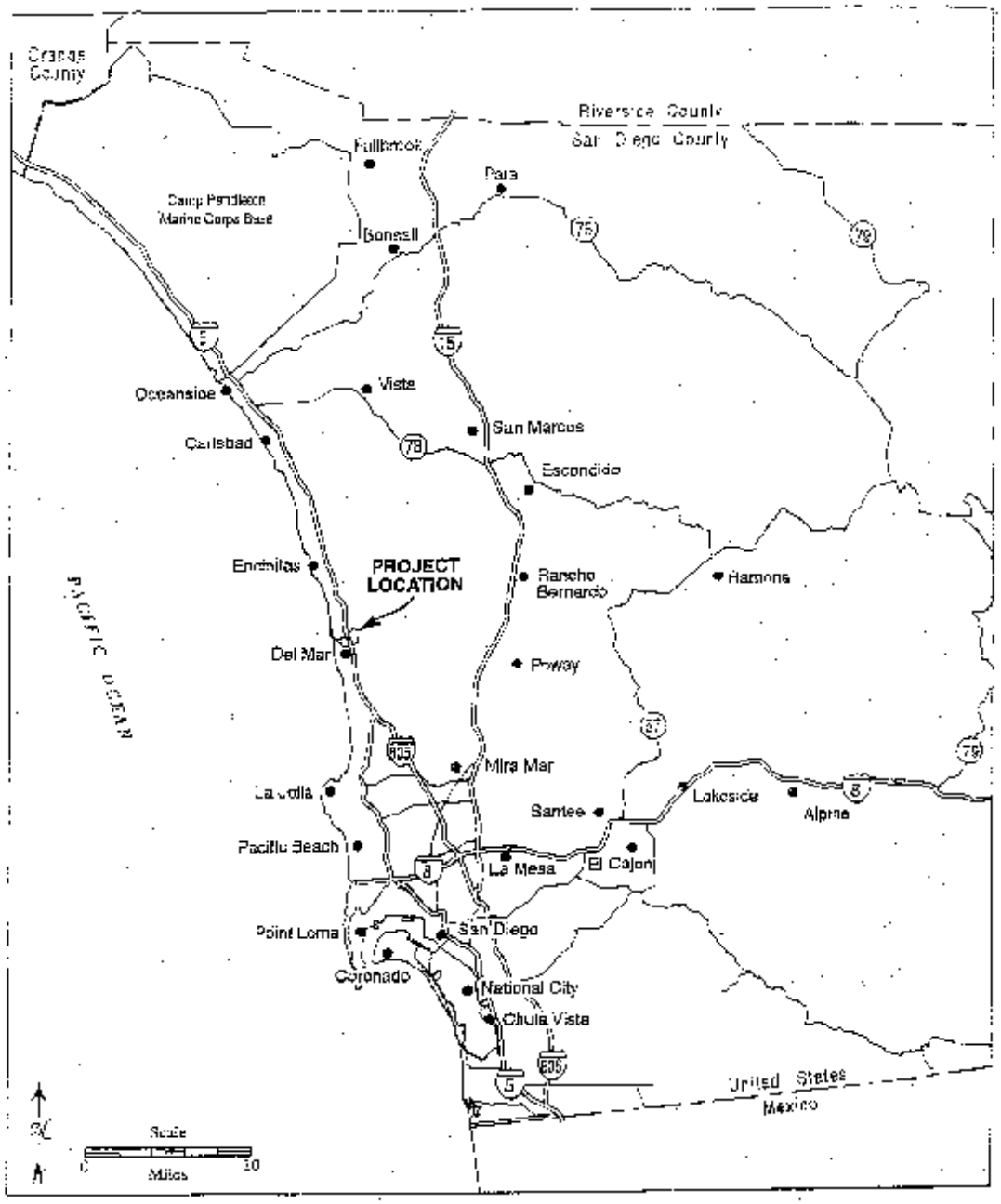
Hatchery Program

Permit Requirement

In two separate permit actions in 1993 and 1997, the Coastal Commission required the permittee to contribute to the California Department of Fish and Game's Ocean Resources Enhancement and Hatchery Program (OREHP) for a total required mitigation fee of $4.8 million to be used toward the construction of an experimental white sea bass fish hatchery and an evaluation program to determine if the hatchery is effective at increasing the stock of white sea bass. SCE has fulfilled all of its obligations for funding the fish hatchery requirements of the SONGS permit. Permanent Commission staff provides oversight of the Department of Fish and Game's continuing fish hatchery program.

Department of Fish and Game Hatchery Program

The marine fish hatchery program is operated by Hubbs Sea World Research Institute and the State of California through the Ocean Resources Enhancement and Hatchery Program (OREHP), which is administered by the Department of Fish and Game (DFG). Although the SONGS' mitigation funds were exhausted at the end of the 2004-2005 fiscal year, the OREHP program is ongoing and funded primarily through the sale of recreational fishing licenses in southern California. White sea bass are spawned at a hatchery in Carlsbad operated by the Hubbs-Sea World Research Institute and then tagged and transferred to grow-out facilities operated jointly by the California Department of Fish and Game and volunteer fishermen. After the fish attain a minimum length, they are released. The OREHP is currently authorized to release up to 350,000 fish annually, based on the active broodstock population at the hatchery. The OREHP operates under the terms and conditions of numerous state, local, and federal permits and authorizations. These include a Memorandum of Agreement among the California Department of Fish and Game, Coastal Commission, and OREHP's Scientific Advisory Panel.



San Dieguito Wetland Restoration Project Regional Location Map

EXHIBIT 1: Wetland Restoration Project Location

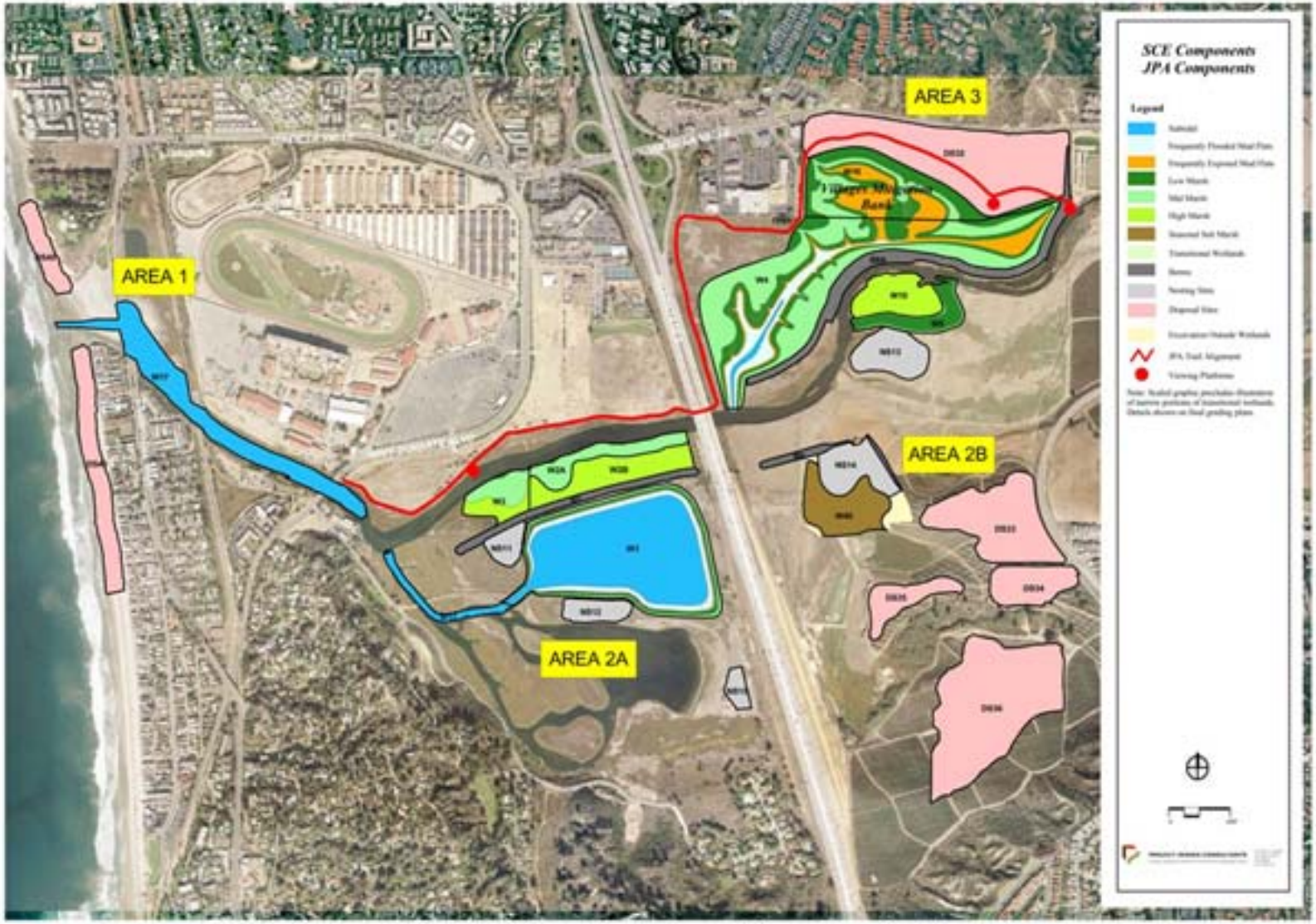


EXHIBIT 2: San Dieguito Wetland Restoration Plan

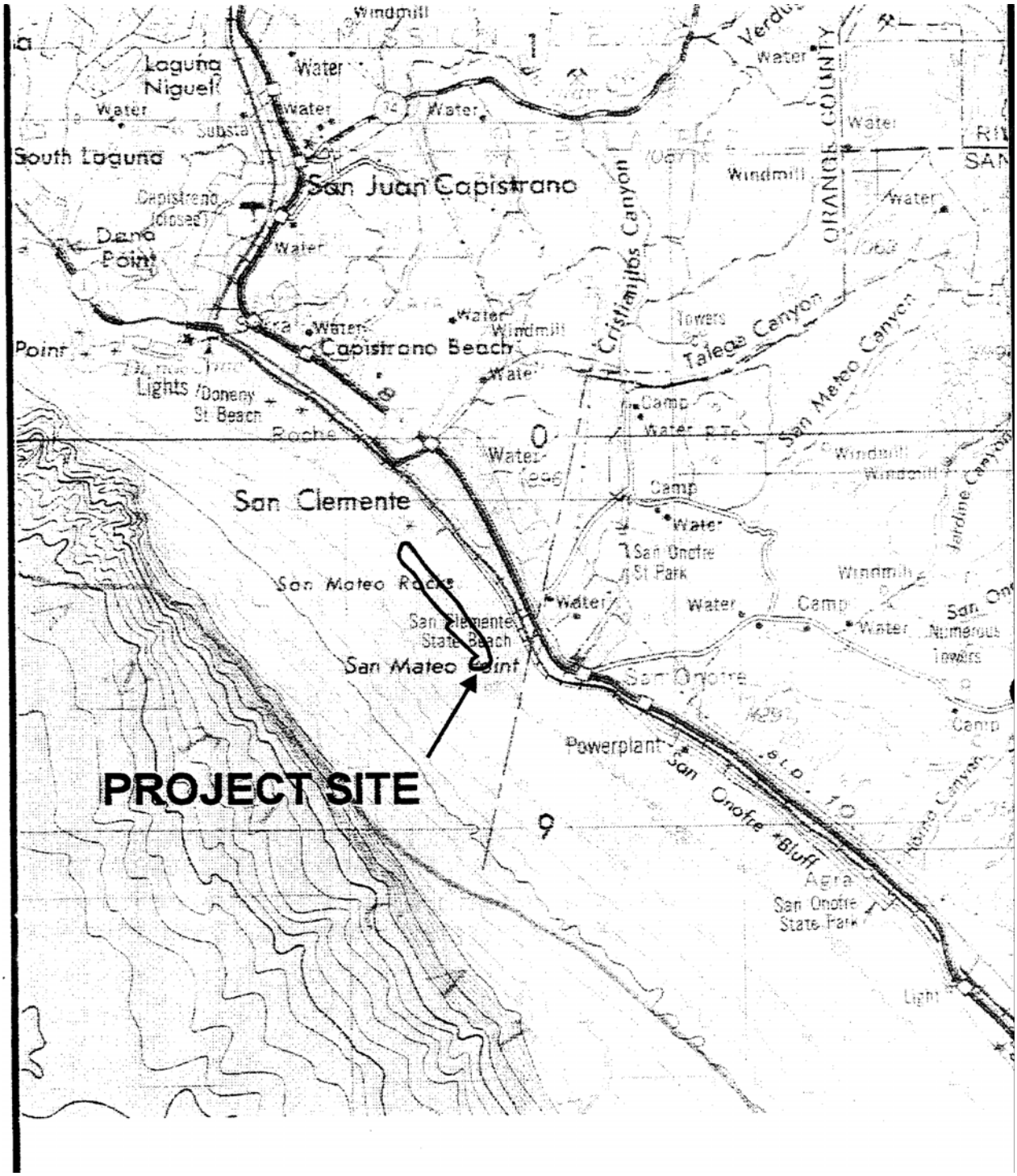
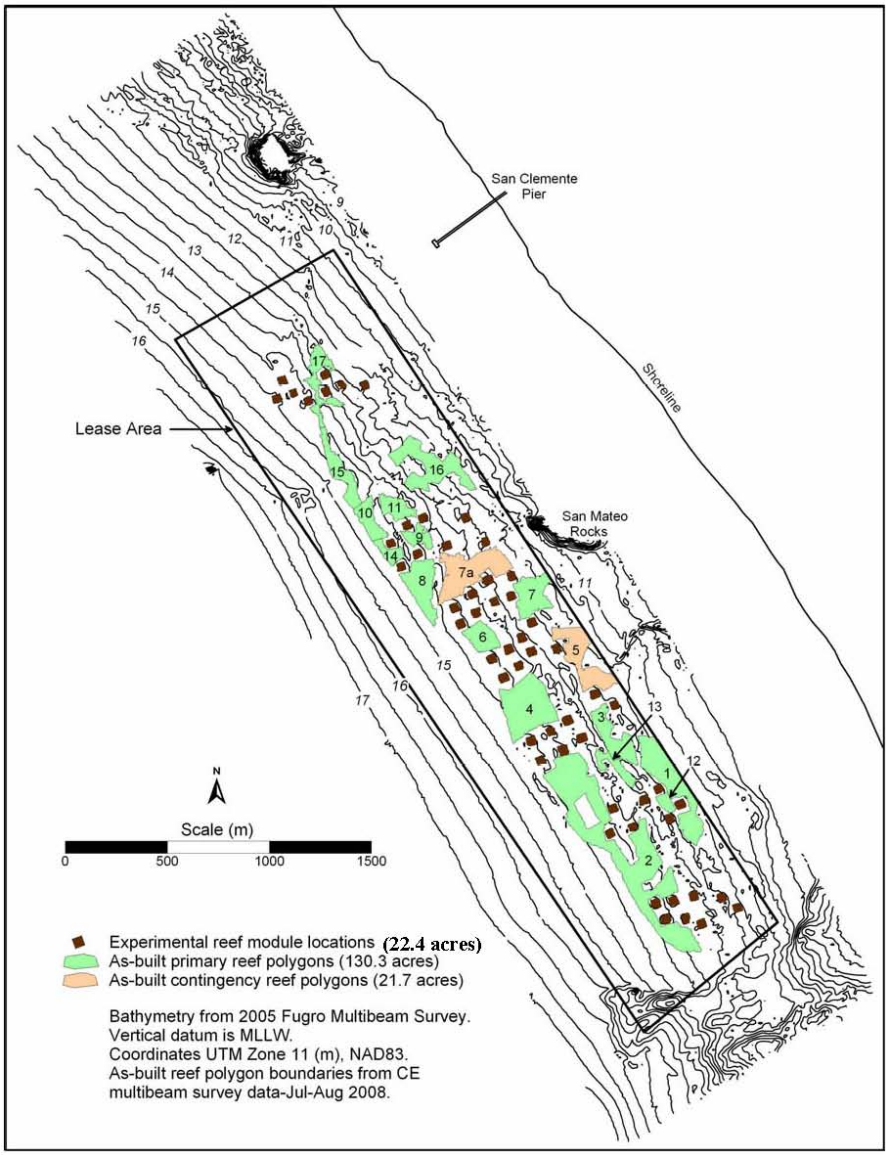


EXHIBIT 3: Mitigation Reef Project Location Map

EXHIBIT 4: Mitigation Reef



Phase 1 and 2 Mitigation Reef (WNR), consisting of the experimental modules (dark brown) and primary polygons (green) that combined equal 152.7 acres, approved by the CCC Executive Director as meeting the requirements of SONGS CDP #'s 6-81-330-A and E-07-010.