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TO: Commissioners and Interested Parties

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SUBJECT: Review of and Possible Commission Action on 2018 and 2019 Two-Year Work Program and Budget for the San Onofre Nuclear Generating Station (SONGS) Mitigation Independent Monitoring Program

SUMMARY OF STAFF RECOMMENDATION

The staff is recommending Commission approval of a two-year work program and \$6,261,250 two-year budget paid by Southern California Edison for the independent monitoring and technical oversight of the San Onofre Nuclear Generating Station (SONGS) mitigation projects. The mitigation projects and the permittee funded independent monitoring are required under Southern California Edison Company's coastal development permit (No. 6-81-330-A, formerly 183-73). The staff is also recommending Commission approval of a \$216,794 contingency fund to be used for the independent monitoring, in consultation with SCE, if needed.

The permit conditions originally were adopted by the Commission in 1991 to mitigate the adverse impacts of the operation of SONGS Units 2 and 3 on the marine environment. The conditions require SCE and its partners to: (1) create or substantially restore a minimum of 150 acres of southern California wetlands (Condition A), (2) install fish barrier devices to reduce the biomass of fish killed inside the power plant (Condition B), and (3) construct an artificial reef large enough to sustain 150 acres of medium to high density kelp bed community together with funding for a mariculture/marine fish hatchery (Condition C). The conditions also require SCE to provide the funds necessary for technical oversight and independent monitoring of the mitigation projects, to be carried out by independent contract scientists under the direction of the Executive Director (Condition D). Implementation of the mitigation projects is the responsibility of SCE whereas the Commission is responsible for overseeing the independent monitoring and technical

oversight. The independent monitoring and oversight also includes periodic public review of the performance of the mitigation projects.

The independent field monitoring program is carried out through a contract with the University of California, Santa Barbara. Under this contract monitoring data are collected by university contract biologists under the direction of three Principal Scientists that serve as project managers for the monitoring effort (collectively known as “contract scientists”). Southern California Edison also provides funds for a science advisory panel to provide independent scientific expertise to the Commission and to the Principal Scientists.

Work Program for 2018 and 2019

The two principal components of the mitigation project, the wetland and the reef, are progressing on slightly different timelines. The Commission approved the CDP for the San Dieguito wetland restoration project on October 12, 2005 (CDP #6-04-88). Construction began in August 2006 and was completed in fall 2011 with inlet dredging. During the 2016-2017 work period, the contract scientists implemented the fifth and sixth year of independent performance monitoring to evaluate whether the wetland restoration met the standards set forth in the SONGS permit. In 2018 and 2019, independent performance monitoring will continue.

After construction and monitoring of an experimental reef, the Commission approved the coastal development permit and final reef mitigation plan on February 6, 2008 (CDP #E-07-010). Construction of the artificial reef was completed in September 2008, and on January 27, 2009, the Executive Director determined that the constructed reef met the Final Design Plan specifications in the SONGS permit. During the 2016-2017 work periods, contract scientists implemented the eighth and ninth years of independent performance monitoring to evaluate whether the mitigation reef met the standards set forth in the SONGS permit. Reef tasks for the 2018 and 2019 work period will continue with the tenth and eleventh year of post-construction performance monitoring. As discussed below, the reef has failed to meet performance standards for the last nine years, and in response, the Executive Director of the Commission required SCE to remediate the reef. A permit implementing the required remediation is anticipated to be before the Commission in the next year, and could necessitate revisions to the 2018-2019 work program.

Budget for 2018 and 2019

The proposed budget for calendar years 2018 and 2019 covers the independent monitoring and technical oversight program costs for the independent contract scientists, science advisory panel, consultants, administrative support, and operating expense. The proposed independent scientific staff is the minimum needed to meet the goals specified by the permit under Condition D and to complete the tasks identified in the 2018-2019 work program. The proposed funding totals \$6,261,250 for the two years. Coastal Commission staff also is proposing pre-approved contingency funds in the amount of \$216,794 specifically for potential additional costs for: (1) the Scientific Advisory Panel, (2) early office lease termination, (3) unexpected repair and/or replacement of field vehicles and outboard engines, and (4) tasks associated with the review of SCE’s proposed reef remediation project. 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.

SCE has indicated its satisfaction with the proposed Commission oversight and independent monitoring work plan and budget for the wetland and reef mitigation program for 2018-2019. Staff recommends that the Commission approve the 2018-2019 work program and budget for the independent monitoring and technical oversight of the San Onofre Nuclear Generating Station (SONGS) mitigation projects.

The Coastal Commission staff and the contract scientists will provide an in-depth report on the status of the SONGS Mitigation Program for the Commission at the November 2017 meeting.

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EXHIBITS

EXHIBIT 1: Wetland Restoration Project Location

EXHIBIT 2: San Dieguito Wetland Restoration Plan

EXHIBIT 3: Mitigation Reef Project Location Map

EXHIBIT 4: Mitigation Reef

EXHIBIT 5: Letter of Support from SCE

I. MOTION AND RESOLUTION

Motion:

I hereby move that the Commission approve the 2018 and 2019 two-year SONGS Work Program and Budget and contingency fund as recommended by the staff.

The staff recommends a “yes” vote on the foregoing motion, which will result in the adoption by the Commission of the following resolution:

The Commission hereby determines that the 2018 and 2019 two-year SONGS Work Program and Budget and contingency fund that is set forth in the staff recommendation, dated October 20, 2017, carries out the intent of Condition D of Permit 6-81-330-A (formerly 183-73) by requiring the permittee to provide reasonable and necessary funding for the independent contract scientists’ technical oversight and independent monitoring responsibilities pursuant to the mitigation and lost resource compensation conditions (A through C).

II. FINDINGS AND DECLARATIONS

A. 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 to reduce the biomass of fish killed inside 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 scientific staff technical oversight and independent monitoring of the mitigation projects (Condition D). Monitoring, management and remediation, if needed, are required to be conducted over a period of time equivalent to 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. Operation of Units 2 and 3 began in 1983 and 1984, respectively.

Both reactors were shut down in January 2012 due to excessive wear in the cooling tubes of the steam generators, and permanently retired in June 2013. Although Units 2 and 3 have been permanently shut down, SONGS still circulates ocean water within the plant to cool the spent fuel, and thus continues to discharge cooling water. Thus the number of years of mitigation credit that the SONGS mitigation project must obtain to fulfill the requirements of the SONGS CDP is a minimum of 30 years.

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 that supports 28 tons of reef associated fish (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 kelp bed and 28 ton fish standing stock requirements. 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.

B. 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 under contract to provide scientific expertise to the Commission, contract staff scientists to manage and operate the monitoring program and administrative support personnel to manage administrative tasks. 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 university contract staff biologists 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. This implementation structure will continue during the two-year period of the 2018 and 2019 work program.

C. STATUS OF MITIGATION PROGRAM

1. Status of Wetland Restoration Mitigation

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. On October 12, 2005, the Commission approved the Final Restoration Plan and CDP #6-04-88, for the San Dieguito Wetland Restoration Project (See [Exhibits 1 and 2](#) and Appendix A for a complete list of specific condition compliance dates). Construction of the wetland restoration project at San Dieguito ([Exhibit 2](#)) commenced in August 2006 and was completed on September 29, 2011, with the completion of the inlet opening.

Wetland Vegetation. Following excavation and grading, portions of the restoration project were planted with salt marsh vegetation. 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 Commission staff, contract scientists, and SCE regarding the failure of these plantings and the patchiness of natural plant establishment lead to the construction of tidal networks and re-grading of some areas of W2/W3 in November 2010 to better convey tidal waters throughout these modules. Plant establishment improved in areas adjacent to the tidal creeks, but remained sparse at higher elevations that received infrequent tidal inundation. Further discussions between Commission staff, contract scientists, and SCE lead to the re-grading of W2/W3 in March 2014 to lower tidal elevations with more slope to improve the drainage of tidal waters. Natural recruitment of pickleweed was observed in the re-graded areas in spring 2015 and 2016 and has continued to expand since then. Based on observations of an increase in vegetation cover in spring 2017, we expect the continued development of salt marsh vegetation over the next few years.

Pacific cordgrass, a native low marsh plant, provides habitat for the endangered Light-footed clapper rail (recently re-named the Ridgway's Rail) and other bird species. Cordgrass (1200

individuals) was planted in November 2008 and April 2009 with a larger planting (19,450 individuals) in November 2011. Cordgrass was sparsely distributed during the first two years following planting. However, the acreage of cordgrass has subsequently increased to cover approximately 5 acres of restored habitat along the margins of the restored basin (W1) and throughout lower elevation areas of modules W4/W16. These results are encouraging and suggest that cordgrass will become well established in low marsh habitat throughout the wetland.

Wetland Acreage and Topography. The SONGS permit required independent monitoring by Commission contract scientists to ensure that the restoration work was conducted according to approved plans. To accomplish this task, CCC contract scientists 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 monitored construction activities through attendance at briefings, discussions with SCE and its consultants, and field inspections of work in progress to ensure the wetland was constructed according to the approved Final Plan. These inspections included verifying module boundaries and elevations, planned habitat areas, and the appropriate tidal regime. CCC contract scientist surveys indicated that SCE has met the acreage requirement of 150 acres of tidally influenced habitat in 2013 through 2016.

CCC contract scientists also monitored 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 administered these changes through condition compliance, where appropriate, and through permit amendments as needed.

Monitoring Plan and Adaptive Management

Condition A of the SONGS permit requires that monitoring of the wetland restoration be done for a period of time equivalent to 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, contract scientists retained by the Executive Director developed the Monitoring Plan to guide the monitoring work and are overseeing 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 and was considered and approved by the Commission on October 12, 2005. The Monitoring Plan was most recently updated in July 2017.

The Monitoring Plan for the SONGS Wetland Mitigation Program closely adheres to the monitoring requirements of the SONGS permit and 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 performance standards that are being used to measure the success of the wetland restoration project fall into two broad categories. Absolute standards are evaluated only in San Dieguito Lagoon and pertain to topography, tidal prism, habitat areas, reproductive success of salt marsh plants, and exotic species. Relative standards require that the value of the variable of interest be similar to that measured in reference wetlands in the region. The relative standards pertain to water quality (i.e., oxygen concentration), biological communities (i.e., fish, invertebrates, and birds), salt marsh vegetation, *Spartina* canopy

architecture, and food chain support functions. The successful achievement of the relative performance standards will be measured in comparison to three reference wetlands, which are specified in the SONGS permit to be: (1) relatively undisturbed, (2) natural tidal wetlands, and (3) within the Southern California 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.

The SONGS permit requires SCE to develop and implement a plan for managing the inlet in perpetuity to ensure uninterrupted tidal flushing of the restored wetland. This plan, initially submitted to CCC staff on March 30, 2006, revised and finally accepted by the Executive Director on January 27, 2011, provides conditions that would indicate the need for additional maintenance dredging at the inlet. Commission contract scientists are measuring water elevation, tidal exchange, salinity, and dissolved oxygen concentration in the wetland during their evaluation of the water quality performance standard. These variables change dramatically with a reduction in tidal flushing and provide a useful trigger for inlet maintenance. Monitoring by CCC contract scientists have found no evidence of reduced tidal flushing or degradation of water quality. However, monitoring by SCE contractors found increasing movement of beach sand into the inlet and as a result, dredging of the inlet was conducted in November of 2015.

Wetland Performance Monitoring

Construction of the wetland habitats in San Dieguito Lagoon was completed in 2011 and annual post-construction monitoring to evaluate whether the restoration meets the performance criteria identified in Condition A began in January 2012. The success of the San Dieguito Wetlands in meeting the mitigation requirement for a given year is based on its ability to meet the physical and biological performance standards contained in the SONGS Permit. In 2013 through 2016, the San Dieguito Wetlands Restoration Project satisfied four of the five absolute standards, which pertained to topography, tidal prism, plant reproductive success, and exotic species. The project has yet to meet the habitat areas standard. This standard requires that habitat areas in the Restoration be within 10% of the areas provided in the Final Plan. The restoration met a higher proportion (0.87) of the relative standards than the proportion met in the lowest performing reference wetland (0.73) in both 2015 and 2016. The relative standards that were met in both years pertained to water quality, the densities and species richness of fish and birds and macro-invertebrates in main channel habitat, invertebrate species richness in tidal creek habitat, *Spartina* canopy architecture, and food chain support. The relative standards that were not met in both years pertained to the cover of salt marsh vegetation and the densities of macro-invertebrates in tidal creek habitat. There is an additional permit requirement that the standards for Biological Communities must be met within four years of construction of the wetland. These standards were met in 2015 and 2016, thus satisfying this permit requirement.

As of 2016, the San Dieguito Wetlands Restoration has not earned any mitigation credit for resources lost due to SONGS operations because it has not yet met the habitat areas standard. The slow development of vegetation in modules W2/3 is responsible for the failure of the

restored wetland to meet both the habitat areas standard and the vegetation standard. SCE is aware of the problem and is implementing a planting program to increase vegetation cover to bring the project into compliance with the requirements of the SONGS permit. The reason for the slow development of macro-invertebrates is unknown at present, but more time may be required for macro-invertebrates to become established. Conditions in the San Dieguito Wetland that will warrant close observation during 2018 and 2019 include development of salt marsh vegetation cover and macro-invertebrate density in tidal creeks. Results from monitoring in 2015 and 2016 were presented at an annual public review workshop held on May 9, 2016 and May 8, 2017 in the City of Del Mar and are posted on UCSB's SONGS mitigation monitoring website (http://marinemitigation.msi.ucsb.edu/documents/annual_review_workshops/wetland/index.html).

2. Status of Kelp Reef Mitigation

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 with a standing stock of reef fish that is at least 28 US tons. The purpose of the experimental reef was to determine which combinations of substrate type and substrate coverage would most likely achieve the performance standards specified in the permit.

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. SCE completed construction of the experimental reef on September 30, 1999. Five years of post-construction monitoring of the experimental reef 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 high tendency to meet many of 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 had 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.

The Commission approved CDP #E-07-010 for the Phase 2 mitigation reef on February 12, 2008 (See [Exhibits 3 and 4](#), and Appendix B for a complete list of specific condition compliance dates). 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. Construction of the Phase 2 mitigation reef began on June 9, 2008 and was completed on September 11, 2008.

Monitoring Plan

The SONGS permit requires the Wheeler North Reef to be monitored, managed, and, if necessary, remediated upon the completion of its construction. The purpose of the mitigation monitoring program, conducted by independent contract scientists working for the CCC, is to: (1) determine whether the performance standards established for the mitigation reef are met, (2)

determine, if necessary, the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. The SONGS coastal development permit requires the CCC's contract scientists to develop a monitoring plan for the reef mitigation project that describes the sampling methodology, analytical techniques and methods for measuring performance of the mitigation reef relative to the performance standards identified in the SONGS coastal development permit. UCSB scientists working under contract for the CCC submitted a monitoring plan for the SONGS' reef mitigation project to the CCC on September 27, 2007. The monitoring plan contains: (1) a description of the process used to evaluate condition compliance, including a list of the performance standards by which the Wheeler North Reef will be judged and the general approach that will be used to judge the overall success of the mitigation project, (2) descriptions of the specific sampling methods and analyses used to evaluate each of the performance standards, (3) an explanation of how project data will be managed and archived for future use, and (4) a description of how the results from the monitoring program will be disseminated to the CCC, the applicant, and all other interested parties. The Monitoring Plan for the SONGS' Reef Mitigation Project is a dynamic document that is modified as needed to ensure and maintain rigorous monitoring and evaluation of Condition C in the most cost-effective manner possible. The reef monitoring plan, most recently updated in April 2017 to include general modifications to how the performance standards are evaluated, is available at:

http://marinemitigation.msi.ucsb.edu/documents/artificial_reef/ucsb_%20mm_reports/mitigation_phase/monitoring_plan4reef-mitigation_project_rev_apr2017.pdf).

Reef Performance Monitoring

Concurrent monitoring of physical and biological attributes of the Wheeler North Reef and two reference reefs (San Mateo and Barn) is conducted annually to evaluate whether the Wheeler North Reef meets the performance criteria identified in Condition C. To date, Commission contract scientists have completed annual quantitative underwater surveys of all three reefs for 2009 -2017. Results from the 2016 surveys were reported at the annual public review workshops held in Dana Point, CA in April 2017 and are available at:

http://marinemitigation.msi.ucsb.edu/documents/annual_review_workshops/artificial_reef/index.html.

Monitoring results obtained thus far have been mixed, with Wheeler North Reef consistently meeting many of its objectives, but failing to meet others. Notably, the biological community on the Wheeler North Reef has consistently met as many or more of the relative performance standards pertaining to the kelp forest community as the reference reefs. However, the success of the Wheeler North Reef is also assessed on its ability to meet all four absolute performance standards as well as a similar number of relative performance standards as the two reference reefs. In 2016 the Wheeler North Reef failed to meet the absolute performance standard requiring to sustain 150 acres of adult giant kelp, though it consistently met this standard from 2010 - 2015. The failure of the Wheeler North Reef to meet the standard for giant kelp in 2016 is believed to have resulted from a sustained period of anomalously warm water that adversely affected the growth and survivorship of giant kelp throughout southern California.

Of greater concern is the failure of the Wheeler North Reef to meet the absolute standard that requires it to support a fish standing stock of at least 28 tons. Since monitoring commenced in 2009, Wheeler North Reef has failed to meet this requirement and thus, has not earned any mitigation credit for compensating the kelp forest resources lost due to SONGS operations. Results of analyses using longer-term data collected from the reference sites and the

experimental modules during the Phase 1 and Phase 2 periods of the project indicate that the present size and configuration of the Wheeler North Reef is not sufficient to consistently support 28 tons of kelp bed fish. On May 24, 2016, the Commission's Executive Director informed SCE that to comply with the requirements of CDP 6-81-330-A, SCE would be required to remediate Wheeler North Reef by building new reef acreage that meets minimum size, relief and cover requirements (described in detail in the letter). Over the past year and a half, Commission staff, the contract scientists and the SAP have worked with SCE to develop a remediation project that is sufficient to consistently meet all the requirements of the SONGS permit. Currently, SCE has developed a project description and is working with the SLC to ensure that CEQA requirements are satisfied. Commission staff anticipates that remediation of Wheeler North Reef will come before the Commission in spring or summer of 2018.

More complete information on the results of monitoring the performance of the Wheeler North Reef can be found in the annual reports on kelp reef mitigation available at: http://marinemitigation.msi.ucsb.edu/documents/artificial_reef/index.html.

3. Status of 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 can 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 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. (See staff report entitled *Executive Director's Determination that Fish Behavioral Barriers Tested at SONGS are Ineffective*, dated September 22, 2000.)

The contract scientists and staff review the annual data and analyses on the fish chase procedure at SONGS against two key standards discussed in the staff report:

- (1) The **Fish Return Standard**: This standard is a measure of the effectiveness of the Fish Chase procedure used during heat treatments. This procedure can lead to a reduction in impingement by causing fish that would be impinged to be returned to the ocean by means of the fish return system. The standard is that the return should be at least 10% of the overall impingement biomass for the year.
- (2) The **Mortality Standard**: There should not be higher than normal mortality. Higher than normal mortality is defined as: (1) a sequence of three or more heat treatments where the mortality rate exceeds 50%, (2) more than 50% of heat treatments in a given year have more than a 50% mortality rate, or (3) mortality rate for the year exceeds 50%.

Between 2000 and 2011, the fish chase Procedure effectiveness relative to impingement (Fish Return Standard) was 10% or greater in only 7 of the 12 years, and the Mortality was met in only 5 of those years (2000-2011). There were only 4 years in which both standards were met.

In January 2012, normal operations of SONGS Units 2 and 3 were shut down, one unit due to routine maintenance, the other due to the discovery of a leak inside its steam generator. With the units shutdown and thus, not generating heat, SCE was unable to implement the fish chase procedure. However, shutting down SONGS Units 2 and 3 led to a significant decrease in both the intake flow rate (~96%) and velocity (~94%). In 2013, this reduction translated into reductions in the total abundance (~69%) and biomass (~94%) of fish impinged at SONGS that were significantly larger than the 10% reduction required by the Fish Return Standard in the Executive Director's 2000 determination.

With SCE's June 2013 announcement that SONGS would be permanently decommissioned, the reduction in intake volume and velocity reported in 2013 is expected to be a permanent project feature, until such time as SONGS is fully decommissioned and seawater is no longer needed. Thus, as long as these intake reductions remain in place, the abundance and biomass of fish impinged by SONGS is expected to continue to be significantly lower than the long-term average measured between 1983 and 2011. Based on this information, Commission staff notified SCE in a letter dated March 27, 2015 that with the shutdown of Units 2 and 3 and the resulting decreases in intake flow and velocity and fish impingement, SCE had met the intent and requirements of Special Condition B and the Executive Director's determination regarding behavioral barriers at SONGS. As long as the reductions in intake flows are maintained, SCE is no longer required to conduct heat treatments or monitor and report on the efficacy of the Fish Chase Procedure. However, if the total intake flow increases above a monthly average of 50 MGD and/or the instantaneous flow velocity increases above 0.5 feet per second¹, SCE is required to consult with Commission staff to determine if impingement monitoring and reporting should resume.

4. Status of 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 Wildlife's (formerly, Dept. Fish & Game)

¹ These thresholds align with thresholds developed by the State Water Resources Control Board under the 2014 Once-Through Cooling Water Policy that allow an existing power plant to demonstrate compliance with the policy under Track 1, indicating that flow reductions in place are sufficient and additional monitoring is not required.

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 seabass fish hatchery and an evaluation program to determine if the hatchery is effective at increasing the stock of white seabass. 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 Wildlife's continuing fish hatchery program.

California Department of Fish and Wildlife 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 California Department of Fish and Wildlife. 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 seabass 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 Wildlife 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 Wildlife, Coastal Commission, and OREHP's Scientific Advisory Panel.

Review of the hatchery program is conducted by permanent Coastal Commission staff thus, there are no tasks funded through the SONGS work program.

D. WORK PROGRAM: 2018 AND 2019

Condition D requires the permittee to fund scientific and support staff retained by the Commission to oversee the site assessments, project design and implementation, and monitoring activities for the mitigation projects.

Implementation Structure

Scientific expertise is provided to the Commission by a small technical oversight team hired under contract and paid by an independent accounting firm with non-State SCE funds. The technical oversight team members include three Principal Scientists from UC Santa Barbara: Stephen Schroeter, Ph.D., marine ecologist, Mark Page, Ph.D., wetlands ecologist (half time), and Daniel Reed, Ph.D., kelp forest ecologist (half-time). A part-time senior administrator (Lane Yee) completes the technical oversight team. In addition, a science advisory panel advises the Commission on the design, implementation, monitoring, and remediation of the mitigation projects. Current science advisory panel members include Richard Ambrose, Ph.D., Professor, UCLA, Peter Raimondi, Ph.D., Professor, UC Santa Cruz, and Russell Schmitt, Ph.D., Professor, UC Santa Barbara.

To meet the goals specified in the permit under Condition D and to complete the tasks identified in the 2018-2019 work program, the technical oversight team is aided by contract biologists who are responsible for collecting and assembling the monitoring data. The technical oversight team is also assisted on occasion by independent consultants and subcontractors when expertise for specific tasks is needed or when additional field assistance is needed for monitoring 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 SONGS budget.

The staff implements the Commission's technical oversight and independent monitoring program through a contract with the University of California, Santa Barbara. UCSB has an international reputation for excellence in ecology and marine biology and is well equipped to support extramural contracts and grants in these areas. The UCSB contract uses the existing Principal Scientists as project managers for both the wetland restoration and reef mitigation oversight and independent monitoring, with data collection done by the university contract staff biologists under their direction. The Principal Scientists are responsible for supervising the contract staff biologists, subcontractors and consultants, authorizing purchases, interacting with UC administrative staff on issues pertaining to personnel, budget, and UC policies (e.g., boating and diving safety regulations) relevant to the project, and interacting with CCC staff assigned to the mitigation efforts. Monitoring of these projects is being adaptively managed in order to streamline effort and minimize costs without compromising the integrity of the data and their value in decision making with regards to the performance of the mitigation projects. Continuous interaction between the Principal Scientists and contract staff biologists is crucial to fulfilling the monitoring tasks for both the wetland restoration and mitigation reef.

Before starting the five-year experimental reef monitoring program in 1999, Coastal Commission staff conducted a cost comparison among UCSB, other universities, and private consultants and concluded that use of a qualified university would save SCE a substantial sum over use of private consultants. Based on 1995 real cost data from private consultants for work that included the same physical and biological variables used in the SONGS reef monitoring program, costs for private consultants were nearly three times higher than the cost of implementing the monitoring program through UCSB.

The Commission concurred with staff at the start of the monitoring program and continues to find that implementing the field monitoring programs through a contract with UCSB, funded through non-State SCE funds, is the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the SONGS permit.

Staffing Levels for Wetland Performance Monitoring

Staff has determined the staffing levels for the wetland monitoring tasks based on a consideration of the effort (time) involved to complete each task, location of the task (field sites, laboratory), the number of contract biologists required to complete each task in a timely and efficient manner, the frequency with which each task will be performed, and the expertise required to complete the task. Much of the information used to determine staffing level was developed during pre-restoration monitoring at San Dieguito Lagoon and the reference wetlands (Tijuana Estuary, Mugu Lagoon, Carpinteria Salt Marsh) and during pre-construction and construction monitoring.

The Principal Scientists will continue to be assisted in performance monitoring in 2018-2019 by five full time university contract wetland biologists and one database programmer/systems analyst working 30% time on the wetland project and based at the SONGS Mitigation Program office in Carlsbad. One full time wetland biologist based at the SONGS Mitigation Program office will work with the database programmer to develop the web based wetland database,

which involves the preparation of data entry schemes, quality assurance and quality control procedures, and the training of other project personnel in the use of the database. This biologist will also assist the Principal Scientists with the supervision of project staff, and with the scheduling of monitoring activities. Two other full time wetland biologists/database assistants at the SONGS Mitigation Program office have primary responsibilities to: (1) work with the wetland project database programmer/systems analyst to prepare data entry schemes, and quality assurance and quality control procedures for the wetland data, (2) enter data, (3) assemble field sampling protocols, metadata, and create database user guides, and (4) conduct monitoring activities at the San Dieguito Lagoon restoration and at Tijuana Estuary, one of the reference wetlands.

The Principal Scientists will also be assisted in performance monitoring in 2018-2019 by two full time wetland biologists based at UCSB with primary responsibility for the monitoring tasks at the northernmost reference wetlands (Mugu Lagoon, Carpinteria Salt Marsh), including organizing the field sampling team and leading the field and laboratory work (assessing water quality, cover of saltmarsh vegetation and algal mats, sampling of fish and invertebrates, processing of invertebrate samples). These contract staff biologists are also responsible for organizing and entering data into the project's wetland database, quality control and quality assurance of the data, and consulting with the project's database programmer/systems analyst based in Carlsbad, as well as other tasks as needed.

Temporary employees are used to provide cost-effective assistance with the labor-intensive sampling surveys of fish and macro-invertebrates in the restored and reference wetlands. These are lower level field assistants, some may be university students, who provide logistical support with transporting gear in the wetlands, deploying and retrieving nets during sampling, collecting invertebrate samples, and recording data. Based on monitoring completed to date the Principal Scientists have determined that a total of seven temporary field assistants are the optimal number needed to sample fish and invertebrates in each wetland. Since the San Dieguito restored wetland will be sampled concurrently during the summer with the three reference wetlands, Tijuana Estuary, Mugu Lagoon and Carpinteria Salt Marsh, the three permanent wetland contract biologists based at Carlsbad will be assisted by three temporary field assistants during the intensive summer sampling. The two permanent wetland contract biologists at UCSB will be assisted by four temporary field assistants at the two northern reference wetlands.

In addition to being skilled in invertebrate, fish and plant taxonomy, the use of environmental data loggers, global positioning systems, and data collection methods, wetland contract staff biologists have other skills, similar to those of biologists employed on the reef project, that are required to complete the monitoring requirements of the mitigation project. These skills include data entry, database development, quality control and quality assurance as well as expertise in the use of statistical software, equipment maintenance, fabrication of sampling devices, and expertise in information technology.

The contract scientists seek to minimize the time between sample collection, sample processing, and the analysis of collected data, so that the monitoring results can be completed and reported in a timely manner. Full-time wetland contract scientists are highly qualified scientists capable of performing all the technical and scientific aspects of the monitoring program.

In conclusion, the staffing levels identified in the work plan for the wetland project in 2018 and 2019 have been carefully thought out using information obtained from prior monitoring, and

vetted through the Science Advisory Panel and Coastal Commission staff, as the minimum level needed to meet the monitoring requirements for the wetland mitigation as specified in the SONGS permit.

Staffing Levels for Reef Performance Monitoring

A team of marine biologists employed by UCSB assists the Principal Scientists in monitoring the performance of the Wheeler North Reef. Staff has determined that the staffing levels of 8 university-certified scientific divers are required for the reef monitoring tasks. This determination is based on a number of considerations. First, university and industry accepted standards require that diving be done in pairs. Because most kelp forest organisms show substantial seasonal variation in recruitment, growth and overall abundance, data need to be collected at the mitigation reef and the two reference reefs contemporaneously during a relatively short season (June through October) each year. This, coupled with the often-marginal diving conditions typical of the project site prevents using fewer divers over a longer period of time. Second, safe diving practices limit the amount of time divers are able to spend underwater on a given day and the number of days diving in any given week. Third, full time university-trained research divers can more cost-effectively accommodate the inevitable unforeseen contingencies caused by weather or logistical constraints that arise during the course of the monitoring work than can part time employees. Fourth, completion of the field work requires a substantial level of expertise and training. UCSB's project staff biologists are trained in identifying over 200 species of benthic algae and invertebrates and some 45 species of kelp forest fishes, which is needed to properly evaluate the performance standards for the artificial reef.

Extensive use of part-time biologists would require either highly paid experts or would entail significant (and costly) training of less qualified individuals. Moreover, the logistics of deploying part-time scientific divers in an environment where field conditions for diving are often marginal and vary unpredictably is inefficient and can result in a less than satisfactory completion of assigned tasks (as was borne out during the 1999-2001 work programs in which private consultants were used for some of the tasks).

Lastly, in addition to being experts in scientific diving and data collection, UCSB's research divers are trained in a number of other tasks necessary for completing the monitoring requirements of the mitigation projects. These tasks include: data management (data entry, quality control and quality assurance) and processing using statistical and database software, equipment maintenance, fabrication of sampling devices, small marine boat operations and maintenance, and expertise in information technology. If ocean conditions are not conducive for diving, then project contract staff are assigned other project-related tasks.

The Principal Scientists employ additional temporary field assistants during the summer, the period of the most intense sampling surveys. These are lower level field biologists who are qualified to dive and drive the boats, which is especially critical during the fish surveys as the diving teams complete multiple short dives without having to anchor the boat at each location.

Based on the above considerations, the Principal Scientists have determined that eight diver biologists working full time during the six-month field seasons of each year are needed to complete the reef monitoring activities. During the non-field season, five biologists working full time will be responsible for database development and management, data analysis and reporting, computer network administration and support, equipment repair and maintenance, planning and

preparation for the annual workshop required by the SONGS permit, and other assorted tasks needed to maintain a functional working environment.

In sum, the staffing identified in the 2018-2019 work plan is predicated on meeting the monitoring requirements specified in the SONGS permit and is based on the considerable experience from the 5-year experimental reef monitoring and completion of the first nine years of performance monitoring of the mitigation reef. The currently proposed work program represents a carefully thought out minimum staffing model to accomplish the performance monitoring tasks for the next two years.

Consultation with Permittee

Pursuant to the permit conditions, the staff has consulted with SCE on the proposed work program and budget for 2018 and 2019. SCE indicated its satisfaction with the proposed Commission oversight and independent monitoring work plan and budget for the wetland and reef mitigation program for 2018-2019. SCE's letter of support is attached ([Exhibit 5](#)).

1. Wetlands Tasks

The SONGS permit requires independent monitoring by Commission contract scientists to determine whether the physical and biological performance standards of Condition A are met. To accomplish this task, the Principal Scientists will continue to interact closely with SCE and others involved with implementation of the Final Plan.

The following wetland tasks will be completed during the 2018-2019 work period.

1.1 Monitoring of the Restored Wetland

The SONGS permit requires the Commission's independent contract scientists to design and conduct monitoring of the restored wetland to: (1) evaluate compliance of the wetland with the physical and biological performance standards set forth in Condition A, (2) determine, if necessary, the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. The primary monitoring activities planned for 2018-19 entail collecting data that will be used to evaluate the performance of the restored wetland. The particular monitoring activities needed to accomplish this task are specified in the Monitoring Plan for the SONGS Wetland Mitigation Program (http://marinemitigation.msi.ucsb.edu/documents/wetland/ucsb_mm_reports/wetland_mitigation_monitoring_plan_%20updated_february2017.pdf). Wetland construction was completed upon the opening of the inlet on September 29, 2011 and performance monitoring of the wetland began in January 2012.

1.1.1 Performance Monitoring

The following tasks will be undertaken by the Principal Scientists and contract wetland biologists:

- a. Conduct field surveys and use aerial photographs to assess the performance standards pertaining to topography and habitat areas.*

Observations by the Principal Scientists during construction monitoring indicate that noticeable sediment erosion and deposition can occur within a period of a few months.

Therefore, field observational surveys will be done monthly throughout the restored San Dieguito wetland to monitor for any sign of substantial erosion or sediment deposition that could impede tidal flow within the wetland. Additional surveys will be done following extreme weather events. Annual ground surveys using RTK GPS and low level aerial photographs taken in the spring will be used to determine whether the areas of wetland habitats (subtidal, intertidal mudflat, vegetated marsh) deviate more than 10% from areas specified in the Final Plan. Commission staff has defined 4.5' NGVD as the upper limit of tidally influenced habitat for the calculation of acreage credit for this restoration project. Because of this, the upper edge of the 4.5' contour is of special interest and will be checked annually to evaluate compliance with the acreage requirement and performance standard on habitat areas. Professional surveyors will be engaged as needed to assist in this evaluation.

- b. Conduct field sampling and use environmental data loggers to assess the performance standards pertaining to water quality and tidal prism.*

Because of its documented importance to wetland health, the concentration of dissolved oxygen will be used to evaluate water quality within the restored wetland.

Measurements of dissolved oxygen will be made using continuously recording environmental data loggers deployed in the restored and reference wetlands at sites that encompass average conditions. A reduction in the tidal prism of the restored wetland can have detrimental effects on water quality and alter the area of inundated habitat. Tidal prism will be calculated by integrating measurements of tidal flow taken near the inlet using a portable acoustic Doppler profiler/discharge measurement system over a range of predicted tides twice monthly.

- c. Survey fish, macroinvertebrates, and birds to assess the performance standards pertaining to biological communities and food chain support.*

During pre-restoration monitoring, the Principal Scientists developed and refined methods to sample fish and macroinvertebrates. These methods were published in the scientific literature and are being used to evaluate the performance standards pertaining to biological communities. Sampling fish in the restored and reference wetlands, in particular, is a labor intensive task that requires the employment of temporary field assistants to help with enclosure trap and seine sampling during the summer. The methods developed for fish sampling employ the minimum number of personnel for completing the task and a sampling design that balances the conflicting goals of adequate spatial and temporal sample replication to evaluate wetland performance with the time, cost and impacts of sampling in the restored and reference wetlands. The performance standard pertaining to food chain support will be evaluated by measuring bird feeding activity during the same period that bird densities are measured, and using bird species that are present in both restored and reference wetlands. Bird specialists will be retained to assist the Principal Scientists to determine the abundance and number of species of birds and assess bird feeding activity.

- d. *Use aerial photographs and ground surveys to assess the performance standards pertaining to the cover of wetland vegetation and open space and the coverage of algal mats.*

The use of low-level multi-spectral aerial photography provides a means of obtaining a whole wetland estimate of the cover of vegetation, bare space and macroalgae in the restored and reference wetlands. Multi-spectral photographs also allow the identification of plant species assemblages throughout the wetlands, which is useful in locating the presence of exotic species. Aerial photographs will be taken in the restored and reference wetlands in late spring to early summer, which is the period of maximum growth of marsh plants and algae. Ground surveys for the presence of unusually thick algal mats, which typically indicates poor tidal flushing or excessive nutrient enrichment, will also be made during routine water quality monitoring.

- e. *Assess the performance standard pertaining to *Spartina* canopy architecture.*

This task will be accomplished through the measurement of the height of cordgrass (*Spartina foliosa*) stems in sampling quadrats located in stands of cordgrass. Sampling of cordgrass will be done in late spring to early summer concurrently with the monitoring of wetland vegetation.

- f. *Sample seeds of salt marsh plants to evaluate the performance standard pertaining to the reproductive success of these plants.*

The reproductive success of salt marsh plants will be evaluated by measuring seed set in seven plant species in the restored wetland. Sampling will be done annually in late summer-fall when seed set is expected to be greatest.

- g. *Examine monitoring data and conduct a survey to assess the performance standard pertaining to exotic species.*

Monitoring data collected for fish, invertebrates, birds, and plants will be used to evaluate this standard. In addition, a special survey of exotic species that covers as much of the restored wetland as possible will be conducted once a year during the summer to adaptively manage for exotic species. This special survey will focus on plants and visible invertebrates and incorporate a diver survey of the subtidal portion of the main basin (W1, [Exhibit 2](#)).

1.1.2 Monitoring of transition habitat as mitigation for construction impacts

- a. *Conduct surveys to determine if the acreage of transition habitat may be used to mitigate for impacts to seasonal salt marsh caused by construction*

Areas between elevations of greater than 4.5' to 5.0' NGVD are defined in the Final Restoration Plan (SCE 2005) as a transitional habitat between tidal wetlands and non-tidal or seasonal wetland habitats. In accordance with CDP 6-04-088, data on native vegetation type and cover will be collected in transitional habitat areas annually and

compared to reference site data to determine if transitional habitat acreage can be used to offset impacts to seasonal salt marsh that occurred during wetland construction.

1.2 Wetland Data Management, Analyses and Reporting

a. Enter, organize, and manage data collected during the monitoring studies.

Data management and quality assurance are critically important tasks that require a substantial amount of effort by the team of contract scientists. All monitoring data for the wetland and reef mitigation projects are entered and stored in electronic databases. The SONGS reef mitigation monitoring project's data entry procedures have been designed to facilitate rapid data entry while continuing to ensure the quality and integrity of the data as they are transformed from physical to electronic form. The project employs a highly redundant, multi-server system to ensure maximum data integrity, preservation, and access. The system consists of a central data server, and multiple mirror and backup servers located at UCSB's Carlsbad office, and at the Marine Science Institute on UCSB's main campus in Santa Barbara, CA. The operation, maintenance, and security of this system require a dedicated system administrator in Carlsbad who works closely with the scientific staff on the project and with system administrators on UCSB's main campus.

b. Analyze monitoring data and use them to determine whether the restored wetland is in compliance with the performance standards specified in the SONGS permit. Conduct analyses to determine reasons for any failures to meet the performance standards.

c. Prepare annual reports for the Commission (with a copy to SCE) on the performance of the wetland restoration project and the accumulation of mitigation credit.

d. Respond to requests from SCE and other parties for data and analyses.

e. Maintain a public website with current information on the monitoring of the wetland restoration project.

The Principal Scientists have developed a public website that provides information on the history, current status, and other relevant information pertaining to the monitoring of the SONGS reef and wetland mitigation projects (<http://marinemitigation.msi.ucsb.edu/>). The website serves as a repository for progress reports, workshop proceedings and other project related documents and thus helps facilitate the transfer of information between the contract scientists and the Commission, SCE, other agencies and the general public.

f. Present monitoring results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission and post results on the project's public website.

1.3 Wetland Management, Oversight, and Administration

- a. *Direct the wetland monitoring studies described in the work plan. This involves planning these activities, managing personnel, and engaging consultants as needed to carry them out.*

The Principal Scientists manage a team of university contract research assistants (i.e., wetland biologists trained in data management and analyses) who are responsible for conducting the rigorous field work and extensive data management. They will also participate in field work in the restored and reference wetlands as needed to assist in data collection, resolve issues that arise in the monitoring, and conduct site visits to inspect routine and unexpected changes in the physical and biological properties of the restored and reference wetlands.

- b. *Resolve any issues pertaining to logistics and data analyses that arise.*
- c. *Work with University of California administrative staff on project issues pertaining to contracts, payroll, purchasing and personnel.*
- d. *Maintain database software, hardware, and network services. Troubleshoot and remedy any problems that arise. Consult with computer consultants as needed to maintain reliability and security of network and desktop operations.*
- e. *Meet with the Science Advisory Panel (SAP) and Coastal Commission Staff to discuss the planning, status and findings of the monitoring studies. Consult with the SAP and Commission staff, members of other resource agencies, and the permittee and its contractors on the planning and permitting of any needed remediation and adaptive management.*
- f. *Perform assorted tasks to maintain a functional working environment.*
- g. *Prepare 2020-2021 Work Plan.*

2. Reef Tasks

The permit requires the Commission's contract scientists to monitor the mitigation reef to determine whether: (1) the performance standards of Condition C are met, (2) if necessary, determine the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. Thus the primary monitoring activities planned for 2018 and 2019 entail collecting data that will be used to evaluate the performance of the mitigation reef. The particular monitoring activities needed to accomplish this task are specified in the Monitoring Plan for the SONGS Reef Mitigation Project (http://marinemitigation.msi.ucsb.edu/documents/artificial_reef/ucsb_%20mm_reports/mitigation_phase/monitoring_plan4reef-mitigation_project_rev_apr2017.pdf) . Data management, analysis and reporting, network administration, equipment repair and maintenance, planning and preparation for the annual workshop required by the SONGS permit, and other assorted tasks needed to

maintain a functional working environment are the primary staff activities during the non-field season.

As described in Section C.2, the Commission's Executive Director has required SCE to remediate Wheeler North Reef in accordance with the requirements of CDP 6-81-330-A. Planning for remediation is ongoing, but a specific timeline for permitting and construction is uncertain. If the project progresses quickly, it may become necessary to revise this Work Program and budget to reflect necessary changes to the mitigation monitoring program that address remediation. If revisions become necessary before the end of the two year period, Commission staff will bring a revised Work Program and budget to the Commission for approval.

The following tasks pertaining to the mitigation reef will be completed during the 2018-2019 work period.

2.1 Performance Monitoring of the Wheeler North Reef

- a. *Conduct diver surveys of the Wheeler North Reef and the two reference reefs in late spring through summer of 2018 and 2019 to assess the performance standards pertaining to substrate coverage, kelp density and the benthic community of algae and invertebrates.*

Extensive analyses of data collected during the experimental phase of the reef mitigation project showed that a minimum of 82 sampling stations at the two reference reefs was needed to adequately assess whether the Wheeler North Reef was performing similarly to them with respect to the performance standards identified in Condition C. A slightly higher number of sampling stations (92) are needed to sufficiently characterize the physical and biological characteristics of the 176 acre Wheeler North Reef in order to compare it to the reference reefs. Each sampling station requires a team of 2 to 3 divers who can sample at most 2 stations per day.

- b. *Conduct diver surveys of the Wheeler North Reef and the two reference reefs in summer and autumn 2018 and 2019 to assess the performance standards pertaining to the standing stock, density, species richness, and recruitment of kelp bed fishes.*

Unlike kelp and benthic invertebrates, fish are highly mobile visual predators and their abundances as estimated by divers typically vary dramatically in space and time. Diver sampling of mobile fishes is also complicated by the fact that it requires greater underwater visibility than does the sampling of sessile bottom-dwelling algae and invertebrates. Consequently, it is not always possible to collect data on fish during the diver surveys of the kelp forest community (described in 2.1.a above). Past experience has shown that the combination of these factors requires additional fish surveys be done in summer and autumn to obtain sufficient data to properly evaluate the performance standards for fish standing stock, density, species richness, and recruitment.

- c. *Collect fish specimens during the spawning seasons (May-October) of 2018 and 2019 for use in evaluating the performance standards for fish production, fish reproductive rates, and benthic food chain support.*

Unlike the performance standards pertaining to the abundance and number of species of algae, invertebrates and fish, which can be assessed visually by divers, those pertaining to fish production, reproductive rates and food chain support require fish to be collected for processing and analyses in the laboratory. Five key indicator species were selected to evaluate these standards to minimize impacts to the fish assemblages. Data collected during previous work plans determined that 75-150 individuals of each species collected from each reef are needed to properly evaluate these standards. These collections will have little impact on fish populations as they represent < 1% of the standing stock of these species on each of the reference reefs and ~ 0.5% of the standing stock requirement for the Wheeler North Reef. The Principal Scientists will be assisted by subcontractors from California State University, Northridge (CSUN) with expertise in fish production and reproduction.

- d. *Process samples used to evaluate the performance standards for fish production, fish reproductive rates, and benthic food chain support.*

Collected specimens must be carefully processed in the laboratory shortly after collection to obtain viable samples for evaluating the performance standards pertaining to fish production, reproductive rates and benthic food chain support. The Principal Scientists will be assisted by subcontractors from CSUN with expertise in fish production and reproduction.

- e. *Analyze prepared samples for fish growth, fecundity, and gut fullness.*

Estimates of fish growth will be used to evaluate the fish production standard. These estimates will be obtained using standard methods of analyzing annular rings in fish ear bones (otoliths). Histological analyses of female gonads will be used to evaluate the performance standard pertaining to reproductive rates, and data on gut fullness in two species that feed on the bottom will be used to assess the performance standard pertaining to benthic food chain support. The Principal Scientists will be assisted by subcontractors from CSUN with expertise in fish production and reproduction.

- f. *Develop methods for estimating standing biomass of giant sea bass*

The giant sea bass (*Stereolepis gigas*), a top kelp forest predator, was historically common in southern California but was so rare in the 1970's -2000 due to overfishing that it was not observed during the impact assessment phase of the SONGS project. Its abundance has increased following its protection from fishing and it is now commonly seen on Wheeler North Reef and well as the reference reefs. Their large size (up to 600 pounds), low density, large home ranges and attraction to divers leads to inaccurate and highly variable estimates of standing stock using current methods. Techniques of mark and recapture for estimating population size of giant sea bass that rely on identifying

individuals based on unique markings will be developed to improve estimates of their standing stock on Wheeler North Reef.

- g. *Monitor recruitment, growth, and survivorship of the sea fan *Muricea* in long-term plots on the experimental modules.*

The sea fan *Muricea* has been known to colonize artificial reefs in high densities to the exclusion of other reef biota, including giant kelp. Data collected from permanently located sampling plots on 21 rock modules of the experimental reef since summer 2000 have provided valuable information on patterns of *Muricea* colonization, growth and survivorship. Project scientists will continue to monitor these plots in 2018 and 2019 for additional colonization by *Muricea*, and to determine whether there is evidence for density dependent changes in *Muricea* growth and survivorship that might minimize (or at least stabilize) the potential adverse effects of *Muricea* on giant kelp and other components of the benthic community.

- h. *Monitor reef fish density and sizes in long-term plots on the experimental modules.*

Time series data on fish density and size in permanently located sampling plots on 21 rock modules of the experimental reef have been collected by divers since summer 2000. The longer time period of these data encompasses a much wider range of oceanic conditions than those experienced by the Phase 2 mitigation reef, and thus provides important insight into the expectations of the more recently constructed Phase 2 reef. Specifically, these data have provided valuable information on the extent to which fish biomass varies from year to year and in relation to the percent cover of rock covering the bottom. Project scientists will continue to monitor the density and sizes of fish in these plots in 2018 and 2019 for use in analyses aimed at determining the configurations (i.e. rock coverage) and footprint area needed for the Wheeler North Reef to consistently meet the performance standards.

2.2 Reef Data Management, Analyses and Reporting

- a. *Enter, organize, and manage data collected during the monitoring studies.*

Data management and quality assurance are critically important tasks that require a substantial amount of effort by the team of contract scientists. All monitoring data for the wetland and reef mitigation projects are entered and stored in electronic databases. The SONGS reef mitigation monitoring project's data entry procedures have been designed to facilitate rapid data entry while continuing to ensure the quality and integrity of the data as they are transformed from physical to electronic form. The project employs a highly redundant, multi-server system to ensure maximum data integrity, preservation, and access. The system consists of a central data server, and multiple mirror and backup servers located at UCSB's Carlsbad office, and at the Marine Science Institute on UCSB's main campus in Santa Barbara, CA. The operation, maintenance, and security of this system require a dedicated system

administrator in Carlsbad who works closely with the scientific staff on the project and with system administrators on UCSB's main campus.

- b. Analyze monitoring data and use them to determine whether the mitigation reef is in compliance with the biological and physical performance standards specified in the SONGS permit. Conduct analyses to determine reasons for any failures to meet the performance standards.*
- c. Prepare annual reports for the Commission (with a copy to SCE) on the performance of the mitigation reef project and post annual reports on the project's public website.*
- d. Respond to requests from SCE and other parties for data and analyses.*
- e. Maintain public website with current information on the monitoring of the reef mitigation project.*

The Principal Scientists have developed a public website that provides information on the history, current status, and other relevant information pertaining to the monitoring of the SONGS reef and wetland mitigation projects (<http://marinemitigation.msi.ucsb.edu/>). The website serves as a repository for annual reports, workshop proceedings and other project related documents, and thus helps facilitate the transfer of information between the contract scientists and the Commission, SCE, other agencies and the general public.

- f. Present monitoring results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission and post results on the project's public website.*

2.3 Analyses and Planning for Reef Remediation

- a. Refine analyses as needed to ensure that the area of additional reef planned for remediation is sufficient to ensure that the Wheeler North Reef consistently meets the performance standards for fish standing stock and giant kelp.*
- b. Meet with members of the Science Advisory Panel, Coastal Commission staff, SCE and other appropriate agencies to discuss reef remediation planning and permitting.*

2.4 Reef Project Management, Oversight, Administration, and Daily Operation

- a. Direct the field and analytical studies described in the 2018-2019 Work Plan.*

The Principal Scientists manage a team of university research assistants (i.e., marine biologists trained in scientific diving and data management and analyses) who are responsible for conducting the rigorous field work and extensive data management. They also dive periodically at the artificial reef and nearby reference reefs as needed to resolve issues that arise in the monitoring, and conduct site visits to inspect routine and unexpected changes in the physical and biological properties of the artificial reef and natural reference reefs.

- b. *Perform assorted tasks to maintain University of California research diver certification (e.g. pass physical exams, attend classes in CPR, First-Aid, Nitrox, O₂ administration, complete dive logs, service scuba equipment, etc.).*
- c. *Maintain boats, vehicles and other equipment in proper working condition.*
- d. *Work with University of California administrative staff on project issues pertaining to contracts, payroll, purchasing and personnel.*
- e. *Maintain database software, hardware, and network services. Troubleshoot and remedy any problems that arise. Consult with computer consultants as needed to maintain reliability and security of network and desktop operations.*
- f. *Consult with members of the Science Advisory Panel, Coastal Commission staff, other resource agencies, and the permittee and its contractors on the status, planning and findings of the reef monitoring studies and inform them of any unexpected changes or concerns that might arise.*
- g. *Perform assorted tasks to maintain a functional working environment.*
- h. *Prepare 2020-2021 Work Plan.*

E. BUDGET: 2018 AND 2019

Condition D of the permit 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. The Commission has operated under approved work programs and budgets since 1993. The non-State SCE funds for the oversight and monitoring program are managed by an independent accounting firm.

The budgets for the Commission's monitoring and oversight program are "zero-based budgets," that is, each budget period begins anew, based on the proposed activities, with no funds from the previous budget carried forward to the new budget period. The total budget to implement the work program is intended as a "not-to-exceed" amount. The permittee provides funds periodically throughout the budget period rather than as a lump sum to minimize the advance outlay of cash. Any funds not expended at the end of the budget period are returned to the permittee.

History of Expenditures for Independent Monitoring

The Commission began its oversight and independent monitoring program in November 1991 following adoption in July 1991 of the SONGS mitigation requirements. This start-up period was funded directly by SCE and covered the work necessary to establish the implementing structure and the initial administration of the program. The next year the Commission operated under an

interim work program and budget, during which time the first contract scientists were hired and the Scientific Advisory Panel convened to begin working with SCE on project planning. The Commission approved annual work programs and budgets for calendar years 1994 through 1997, and then, in accordance with the provisions of the permit, adopted two-year work programs and budgets beginning with the 1998-1999 period. These work programs have included planning, environmental analyses, permit compliance issues, five years of experimental reef monitoring, construction monitoring and the first seven years of performance monitoring of the Phase 2 mitigation reef, pre-restoration and construction monitoring for the wetland project, development of performance monitoring plans, and six years of performance monitoring at the wetland. The status section of this report (see Section C) summarizes the accomplishments of the Commission's program.

The budgets and expenditures for the SONGS oversight and monitoring program since its inception are summarized below. As a normal practice, the Commission requires an independent financial audit of the independent monitoring expenditures for each budget period. To date, those audits have disclosed no discrepancies or deficiencies in the financial systems.

Period	Total Budget	Actual Expenditures
Nov 1991-Dec 1992	\$ 57,654	\$ 57,654
Oct 1992-Dec 1993	610,646	334,632
1994	1,173,105	387,096
1995	849,084	467,888
1996	440,139	397,631
1997	423,035	379,571
1998-1999	1,039,072	970,118
2000-2001	2,293,162	2,151,820
2002-2003	2,423,045	2,174,706
2004-2005	2,338,957	2,256,543
2006-2007	2,266,141	2,162,750
2008-2009	3,055,170	2,776,632
2010-2011	3,953,014	3,559,266
2012-2013	4,738,886	4,634,500
2014-2015	5,214,283	4,984,228
2016-2017	5,844,930	5,497,717 (projected)
26-YEAR TOTAL	\$36,719,786	\$33,178,420

The oversight and independent monitoring program has consistently come in under budget, and in some years substantially so. The early work programs and budgets were marked by considerable uncertainty in the timing of the planning process for the two major projects (wetland restoration and experimental kelp reef) as well as significant discussions with SCE regarding the Commission staff's interpretation of the permit conditions. In more recent years, the staff has been able to better predict the funding necessary to carry out the program. As performance monitoring for the mitigation projects is implemented, the staff, in consultation with SCE, has made its best predictions for the required tasks, timing, and funding necessary to support those tasks in the 2018 and 2019 work program and budget.

Proposed Budget for 2018 and 2019

The proposed budget for calendar years 2018 and 2019 covers the monitoring and oversight program costs for the Commission's contract scientists, contract field biologists and subcontractors to monitor the wetlands and mitigation reef, science advisory panel, consultants, contract administrative support, and operating expense during the two-year budget period. All of the current and proposed contract program staff, except for the part-time administrator, are hired under contract with the University of California, Santa Barbara, while subcontractors are retained through separate contracts and paid by an independent accounting firm with non-State SCE funds. Costs associated with the implementation of the SONGS permit and attributable to permanent Coastal Commission staff work are not paid by the permittee and thus are not included in this budget.

The funding proposed to cover the monitoring and oversight program costs during the two-year budget period (calendar years 2018 and 2019) is \$6,261,250 as shown below. This budget is based on the minimum scientific staff required to accomplish the goals of the SONGS permit and carry out the proposed tasks (see discussion above). The wetland project will continue with its sixth and seventh year of performance monitoring in 2018-2019. The tenth and eleventh years of performance monitoring will be the primary work for the reef. Personnel rates are set by U.C. Systemwide Administration. Narrative budget notes explaining each budget category are contained in Appendix A.

SONGS PROGRAM BUDGET 2018

	2018 Wetland	2018 Reef	2018 Admin/Mgt	2018 Total
SALARIES				
Core Program Staff				
Principal Scientist (0.5 PY)	10,322	92,899		103,221
Principal Scientist (1.0 PY)	76,659	76,659		153,318
Principal Scientist (0.5 PY)	59,405	6,601		66,006
Sr. Administrator (0.15 PY)			19,502	19,502
Field Biologists				
Computer & Network Technologist IV (1.0 PY)	37,066	86,468		123,552
Staff Research Associate IV (1.0 PY)		79,572		79,572
Staff Research Associate IV (1.0 PY)	72,240			72,240
Staff Research Associate II (1.0 PY)	57,024			57,024
Staff Research Associate II (1.0 PY)	51,903			51,903
Staff Research Associate II (1.0 PY)	51,903			51,903
Staff Research Associate II (1.0 PY)		51,903		51,903
Staff Research Associate II (1.0 PY)		51,903		51,903
Staff Research Associate I (1.0 PY)		51,903		51,903
Staff Research Associate I (1.0 PY)	44,925			44,925
Lab Assistant III (3 @ 6 mos, 1.5 PY)		65,295		65,295
Lab Assistant I (4 @ 4 mos; 1.33 PY)	58,468			58,468
Lab Assistant I (3 @ 6 mos; 1.5 PY)	65,295			65,295
SUBTOTAL SALARIES	585,210	563,221	19,502	1,167,933
UCSB Indirect Cost @ 26% (excluding SrAdmin)	152,155	146,437		298,592
TOTAL SALARIES	737,365	709,658		1,466,525
BENEFITS				
Core Program Staff				
Principal Scientist	3,944	35,498		39,442
Principal Scientist	36,897	36,897		73,794
Principal Scientist	28,052	3,117		31,169
Field Biologists				
Computer & Network Technologist IV	5,710	51,386		57,096
Staff Research Associate IV		31,513		31,513
Staff Research Associate IV	33,341			33,341
Staff Research Associate II	26,677			26,677
Staff Research Associate II	25,599			25,599
Staff Research Associate II	46,200			46,200
Staff Research Associate II		39,769		39,769
Staff Research Associate II		34,330		34,330
Staff Research Associate I		25,879		25,879
Staff Research Associate I	23,856			23,856
Lab Assistant III (3)		5,485		5,485
Lab Assistant I (4)	4,911			4,911
Lab Assistant I (3)	5,485			5,485
SUBTOTAL BENEFITS	240,672	263,874		504,546
UCSB Indirect Cost @ 26%	62,575	68,607		131,182
TOTAL BENEFITS	303,247	332,481		635,728

2018 Budget continued.

	2018 Wetland	2018 Reef	2018 Admin/Mgt	2018 Total
SCIENTIFIC ADVISORY PANEL	58,684	58,684		117,367
CONSULTANTS AND CONTRACTORS				
Wetlands				
Task 1.1a&d – Aerial photo surveys	54,000			54,000
Task 1.1a&d - Wetland Engineering Habitat Delineation	26,650			26,650
Task 1.1c - Bird sampling	68,227			68,227
Reef				
Task 2.1c-d-e - Fish reproductive rates, food chain support, and fish reproduction		289,431		289,431
UCSB Indirect Cost @ 26% ²	20,969	6,500		27,469
TOTAL CONSULTANTS & CONTRACTORS	169,846	295,931		465,777
TRAVEL				
Reimbursement for permanent CCC staff	5,400	5,400		10,800
UCSB Principal Scientists, Field Biologists	20,650	17,350		38,000
UCSB indirect cost (excl. CCC staff)	5,369	4,511		9,880
TOTAL TRAVEL	31,419	27,261		58,680
OPERATING EXPENSE				
General expense (SF office)			32,000	32,000
General expense (UCSB contract, incl. indirect cost)	68,010	78,765		146,775
Facilities operations (Carlsbad office) & Marina storage/offsite facilities (UCSB contract)	57,680	61,153		118,833
Computer technical support, repair & maintenance			1,500	1,500
Review workshop			1,700	1,700
Administrative/financial processing services			12,000	12,000
TOTAL OPERATING EXPENSE	125,690	139,918	47,200	312,808
EQUIPMENT				
Two 250 hp outboard engines (UCSB)		31,600		31,600
TOTAL EQUIPMENT		31,600		31,600
TOTAL EXPENSE 2018	1,426,250	1,595,534	66,702	3,088,485

² Indirect costs are applied to all contracts held by UCSB. The contract for Task 2.1 c-d-e is charged 26% only on the first \$25,000 of the 2-yr contract. The contract under Task 1.1c for \$68,227 is not held by UCSB and does not incur this overhead charge.

SONGS PROGRAM BUDGET 2019

	2019 Wetland	2019 Reef	2019 Admin/Mgt	2019 Total
SALARIES				
Core Program Staff				
Principal Scientist (0.5 PY)	10,685	96,166		106,851
Principal Scientist (1.0 PY)	81,417	81,417		162,834
Principal Scientist (0.5 PY)	60,593	6,733		67,326
Senior Administrator (0.15 PY)			20,496	20,496
Field Biologists				
Computer & Network Technologist IV (1.0 PY)	38,176	89,078		127,254
Staff Research Associate IV (1.0 PY)		81,960		76,487
Staff Research Associate IV (1.0 PY)	74,406			74,406
Staff Research Associate II (1.0 PY)	58,734			58,734
Staff Research Associate II (1.0 PY)	53,463			53,463
Staff Research Associate II (1.0 PY)	53,463			53,463
Staff Research Associate II (1.0 PY)		53,463		53,463
Staff Research Associate II (1.0 PY)		53,463		53,463
Staff Research Associate I (1.0 PY)		53,463		53,463
Staff Research Associate I (1.0 PY)	46,269			46,269
Lab Assistant III (3 @ 6 mos, 1.5 PY)		67,248		67,248
Lab Assistant I (4 @ 4 mos; 1.33 PY)	60,216			60,216
Lab Assistant I (3 @ 6 mos; 1.5 PY)	67,248			67,248
SUBTOTAL SALARIES	604,671	582,990	20,496	1,208,157
UCSB Indirect Cost @ 26% (excluding SrAdmin)	157,214	151,577		308,792
TOTAL SALARIES	761,885	734,568	20,496	1,516,949
BENEFITS				
Core Program Staff				
Principal Scientist	4,107	36,963		41,070
Principal Scientist	39,372	39,372		78,744
Principal Scientist	28,749	3,194		31,943
Field Biologists				
Computer & Network Technologist IV	5,909	53,183		59,092
Staff Research Associate IV		32,642		32,642
Staff Research Associate IV	34,507			34,507
Staff Research Associate II	27,609			27,609
Staff Research Associate II	26,488			26,488
Staff Research Associate II	47,708			47,708
Staff Research Associate II		41,084		41,084
Staff Research Associate II		35,481		35,481
Staff Research Associate I		26,778		26,778
Staff Research Associate I	24,673			24,673
Lab Assistant III (3)		5,649		5,649
Lab Assistant I (4)	5,058			5,058
Lab Assistant I (3)	5,649			5,649
SUBTOTAL BENEFITS	249,829	274,346		524,175
UCSB Indirect Cost @ 26%	64,956	71,330		136,286
TOTAL BENEFITS	314,784	345,676		660,461

2019 Budget continued.

	2019 Wetland	2019 Reef	2019 Admin/Mgt	2019 Total
SCIENTIFIC ADVISORY PANEL	61,741	61,741		123,483
CONSULTANTS AND CONTRACTORS				
Wetlands				
Task 1.1a&d-aerial photo surveys	54,000			54,000
Task 1.1a&d-Wetland Engineering Habitat Delineation	26,650			26,650
Task 1.1c-bird sampling	71,707			71,707
Reef				
Task 2.1c-d-e-fish reproductive rates, food chain support, and fish reproduction		291,331		291,331
UCSB Indirect Cost @ 26% ³	20,969	0		20,969
TOTAL CONSULTANTS & CONTRACTORS	173,326	291,331		464,657
TRAVEL				
Reimbursement for permanent CCC staff	5,675	5,675		11,351
UCSB Principal Scientists & Field Biologists	21,703	18,235		39,938
UCSB indirect cost (excl. CCC staff)	5,643	4,741		10,384
TOTAL TRAVEL	33,021	28,651		61,673
OPERATING EXPENSE				
General expense (SF office)			33,632	33,632
General expense (UCSB contract, incl. indirect cost)	71,479	82,783		154,262
Facilities operations (Carlsbad office) & Marina storage/offsite facilities (UCSB contract)	59,856	63,507		123,363
Computer technical support, repair & maintenance			1,500	1,500
Review workshop			1,787	1,787
Audit			4,000	4,000
Administrative/financial processing services			12,000	12,000
TOTAL OPERATING EXPENSE	131,335	146,290	52,919	330,544
EQUIPMENT				
Replacement Tow Vehicle		15,000		15,000
TOTAL EQUIPMENT		15,000		15,000
TOTAL EXPENSE 2019	1,476,093	1,623,257	73,415	3,172,765

TWO-YEAR TOTAL EXPENSE FOR 2018 and 2019**\$6,261,250**

³ Indirect costs are applied to all contracts held by UCSB. The contract for Task 2.1 c-d-e is charged 26% only on the first \$25,000 of the 2-yr contract. The contract under Task 1.1c for \$71,707 is not held by UCSB and does not incur this overhead charge.

F. PRE-APPROVED CONTINGENCY FUND FOR 2018 AND 2019

Staff is proposing pre-approved contingency funds in the amount of \$216,794, specifically for potential additional costs for: (1) the Scientific Advisory Panel, (2) early office lease termination, (3) unexpected repair and/or replacement of field vehicles, and (4) tasks associated with the review of SCE's proposed reef remediation project. Staff proposes these pre-approved contingency funds as a way of reducing the overall budget, but still providing the necessary Commission authorization for certain specified activities that may become necessary during the two-year work period. Staff has used this approach since the 2002-2003 work program. To date, staff has not had to authorize use of the contingency funds.

A contingency amount is proposed for the Scientific Advisory Panel as that effort may increase over past years' expenditures for advice to the Commission on the performance monitoring for the wetland restoration and mitigation reef projects, as well as potential compliance issues with the performance standards contained in the SONGS permit. Although the permit authorizes the Scientific Advisory Panel to be funded up to \$100,000 *per year*, plus annual adjustments due to increases in the consumer price index applicable to California⁴, staff proposes less total funding for the Scientific Advisory Panel for the two budget years (\$117,367 for 2018 plus \$123,483 for 2019, for a two-year total of \$240,850) based on current rates of expenditure. However, the overall budget does not provide any cushion for any increased effort that may be required; thus, the staff proposes a two-year pre-approved contingency fund amount of \$163,750 to be earmarked for the Scientific Advisory Panel to allow the timely response to changing circumstances. This amount is derived from the total authorized amount for the two years as adjusted (\$404,600, see footnote) less the budgeted amount (\$240,850).

In addition, staff proposes funds for early lease termination for the Carlsbad office. The need for early lease termination is unlikely; however, should circumstances arise that necessitate canceling the lease, the contingency fund amount of \$38,044 would be available to satisfy the lease obligations. Similarly, the contingency fund includes \$15,000 for unexpected repairs of high mileage field vehicles.

Any expenditure from the pre-approved contingency fund would be made in consultation with SCE. If a dispute arises, the staff would bring the issue to the Commission for resolution.

⁴ Based on the average percent change in the Consumer Price Index-All Urban Consumers for the San Francisco and San Diego areas from the original 1991 permit to mid-year 2013, the adjusted amount for 2018 is \$197,270. A 5.1% escalator is used for estimating adjustments for 2019, resulting in an adjusted amount for 2019 of \$207,330. Thus, the total adjusted amount authorized for the two budget years 2018 and 2019 is \$404,600.

Appendix A

Detailed list of condition compliance dates for the wetland

- 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 through 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.
- On January 27, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for the inlet channel excavation and dredging.
- On April 6, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for dredge disposal.

- On August 10, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for Least Tern nesting sites and beach nourishment/dredge disposal.
- On August 29, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for the North Beach Staging Area plan.
- On December 20, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for the JPA Mitigation Program for Trail and Treatment Pond Impacts. The potential to restore additional acreage within the San Dieguito restoration site as proposed by other parties had delayed a portion of the JPA's mitigation program and required consideration of alternative mitigation sites. A material amendment was approved in September 2011 to address these changes (see Amendment 10).
- On January 26, 2012, Commission staff issued the Notice of Acceptance for condition compliance required for final construction information for Least Tern Nesting Sites.
- On September 26, 2014, Commission staff issued a Notice of Acceptance for the San Dieguito Lagoon October 2014 maintenance dredging plans. Dredging of the inlet has been delayed until winter 2015.
- SCE continues to submit quarterly beach survey reports in accordance with Special Condition 25 of CDP #6-04-88 reports posted at <http://www.coastalenvironments.com/presentations>, see section on City of Del Mar beach profile reports). This condition requires SCE to implement a beach monitoring program, consisting of beach profiles and inlet channel cross-sections, data analysis and reporting. The purpose of this program is to guide and direct placement of dredged beach quality sand and to identify unanticipated changes to the shoreline condition. To date the monitoring has not reached any triggers and review by the Coastal Processes Technical Panel, as required under the permit, has raised no issues of concern.

Detailed List of Wetland CDP Amendments

The following permit amendments have been approved:

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 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.

4. 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.
5. 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.
6. 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.
7. 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.
8. On July 20, 2011, the Commission issued an immaterial amendment to modify the timing restriction on the staging area at North Beach to allow staging of construction equipment associated with dredging activities to begin immediately after Labor Day.
9. On September 21, 2011, the Commission issued a material amendment to: (1) add the Mesa Loop Trail to the project, and (2) modify Special Condition #8 to allow integration of 2.736 acres tidal or seasonal salt marsh mitigation into the SANDAG proposed restoration, with a back-up plan for restoration of 2.736 acres of seasonal high marsh adjacent to El Camino Real on JPA property.
10. On September 12, 2012, the Commission issued an immaterial amendment to modify the permanent access roads within the lagoon system by: (1) eliminating a maintenance access point from the end of Race Track Drive, (2) converting an internal construction road from temporary to permanent, and (3) converting access to the maintenance road system from El Camino from temporary to permanent.

Appendix B: Detailed list of condition compliance dates for the reef

- 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.
- On May 9, 2013, Commission staff issued a Notice of Acceptance for condition compliance requiring Kelp Wrack and Rock Hazard Monitoring under Special Condition #12.
- On May 24, 2016, the Commission’s Executive Director informed SCE that to comply with the requirements of CDP 6-81-330-A, SCE would be required to remediate Wheeler North Reef by building new reef acreage that meets minimum size, relief and cover requirements (described in detail in the letter).

Appendix C: Budget Notes

SALARIES. Includes salaries and wages for the contract program staff, which includes two scientist positions, administrative support, and field biologists. All of the current and proposed contract program staff except a part-time administrator are hired under contract with the University of California, Santa Barbara; costs include the University's indirect costs.⁵ The part-time administrator is hired under contract with Simpson & Simpson CPAs, the firm that provides financial services for the program. The costs for the Commission's permanent staff that spend a portion of their time on this program are not included here; they are paid by the Commission.

BENEFITS. Includes benefits and employer-paid payroll taxes for contract program staff. Includes the indirect costs for personnel hired under contract to UCSB.

SCIENTIFIC ADVISORY PANEL. The Scientific Advisory Panel is a panel of experts established by the Commission pursuant to the permit conditions to provide scientific and technical advice. Expenses cover members' time and travel and are authorized in the permit at \$100,000 per year adjusted annually in accordance with the consumer price index (CPI) applicable to California. CPI adjustments have been made in previous budgets. Based on previous years' expenditures, staff budgeted less than the authorized amount. However, staff proposes additional funds in a pre-approved contingency fund up to the adjusted yearly authorized amount to be expended as needed, in consultation with SCE.

CONSULTANTS AND CONTRACTORS. Includes estimated costs for consultants and contractors to provide the technical and expert advice identified in individual tasks of the work program to assist the contract scientists in completing the tasks. Estimated costs are based on previous experience with similar consultants, at rates ranging from \$50 to \$210 per hour.

TRAVEL. Covers travel for meetings with SCE, Commission staff, consultants and contractors, field monitoring work, attendance at agency and public workshops and meetings, site visits, and attendance at conferences related to wetland and kelp forest community restoration issues. Total travel costs are based on previous years' expenditures plus anticipated increases in airline fares. A 5.1% escalator is applied for 2019.

GENERAL EXPENSE (SF). Covers operating expense for contract program staff working out of the Commission's San Francisco office (part-time administrator). Annual costs are based on the Commission's operating expense per PY for general expense, printing, communications, postage, training and facilities operations.

GENERAL EXPENSE (UCSB CONTRACT). Covers annual costs for reef surveys (NITROX for SCUBA), miscellaneous office, laboratory and field supplies, annual boat operating expense, annual insurance, registration and license fees for boats and vehicles, annual dive physicals required of each diver, and on-campus communications services for contract staff located at UCSB. A 5.1% escalator is applied for 2019.

FACILITIES OPERATIONS (UCSB CONTRACT). Rented office space in Carlsbad houses one full time contract scientific staff and contract field biologists for the reef and wetland monitoring programs. Annual costs cover space rental, utilities, security, office services and supplies, and communications (including telephone, cell phone service, and DSL service). A 5.1% escalator is used for 2019 where anticipated increases are not yet known.

OFFSITE STORAGE/FACILITIES (UCSB CONTRACT). Covers costs for storage and launch fees for the reef dive boats. A 5.1% escalator is applied for 2019.

COMPUTER TECHNICAL SUPPORT. Covers costs for maintaining the computers used by contract program staff and field biologists, including regular maintenance, repairs, and technical support needed for troubleshooting problems.

REVIEW WORKSHOP. Covers costs for conducting an annual review workshop, excluding costs for consultants who may be requested to attend the workshop. The intent of the workshop is to review whether performance

⁵ The indirect cost rate of 26% of direct costs is the U.S. Department of Health and Human Services negotiated, pre-determined off-campus rate for research projects. For these costs, the project receives: office space at UCSB for two 0.5 PY contract scientists (even though the on-campus overhead rate is normally 46%), utilities, internet services, laboratory facilities and equipment, administrative services associated with payroll, employee benefits, liability insurance, dive and boat safety programs, and purchasing for both on-campus staff and staff located in the Carlsbad office, library services, UC subsidized pricing on goods and services, site licenses for software, and access to faculty and staff expertise on a wide variety of issues.

standards have been met, whether revisions to the standards are necessary, and whether remedial measures are required. A 5.1% escalator is applied for 2019.

AUDIT. Covers costs for an independent audit of the contract reimbursements and service fees for the Commission's oversight and monitoring program. Independent audits have been conducted since 1994; no deficiencies in the financial systems have been discovered. Costs are estimated for a 2-year audit.

ADMINISTRATIVE/FINANCIAL PROCESSING SERVICES. Covers the annual cost of administrative and financial processing services provided by Simpson & Simpson CPAs.

EQUIPMENT. Covers durable equipment for the reef and wetland monitoring programs, including replacement of two outboard engines for two dive boats and a replacement tow vehicle (used) used for the reef monitoring program.

