Application No.:	14-12-XXX
Exhibit No.:	SCE-01
Witnesses:	Thomas J. Palmisano Robert D. Bledsoe Russell G. Worden Richard L. Park

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(U 338-E)

Testimony On The Nuclear Decommissioning Of SONGS 2 & 3

Before the

Public Utilities Commission of the State of California

Rosemead, California
December 10, 2014

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I.

POLICY

A. Summary of Request

In this Application, SCE respectfully requests that the Commission:

(1) Find that the updated $4.411 billion (100% share, 2014$) SONGS 2 & 3 decommissioning cost estimate (DCE) is reasonable;[1]

(2) Approve SCE's request to reduce its annual contributions to the SONGS 2 & 3 Nuclear Decommissioing Trust ("NDT") to $0.00 (zero) at this time, based upon the current estimate of decommissioning costs, current level of funding of the NDTs, projected escalation rates, and financial market conditions known at this time;

(3) Approve an advice letter process for authorizing disbursements from the SONGS 2 & 3 NDTs, reporting recorded SONGS 2 & 3 decommissioning costs and forecasted costs for future intervals, and reporting remaining NDT balances; and

(4) Authorize a process for the years between the Nuclear Decommissioning Cost Triennial Proceeding (NDCTP) applications that would allow SCE to file an application seeking a reasonableness review annually for the costs of decommissioning activities that were completed during the previous calendar year.[2]

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[1] The proposed decision for Application (A.) 12-12-013 (2012 NDCTP), which was issued several months after the DCE was prepared, contains a number of proposed requirements for this Application and proceeding. When the Commission issues a final decision, SCE will submit in separate exhibits, as required, additional information regarding the DCE and related decommissioning issues, in accordance with the procedural schedule set for this proceeding. One proposed requirement is for SCE to conduct a decommissioning workshop. SCE intends to conduct this workshop as soon as practicable. During the workshop SCE will explain the DCE and its accounting practices for tracking and recording decommissioning costs. SCE will also seek to develop, with workshop participants, the formats for presenting decommissioning costs and cost comparisons to enhance transparency and increase the amount of summary information available while preserving a brief and accessible document.

[2] SCE will submit an application and supporting testimony to support a reasonableness review of SONGS costs for 2014, in accordance with Decision (D.) 14-11-040 (SONGS OII Decision). The Utilities propose that following the 2014 reasonableness review, the Commission authorize SCE and SDG&E to submit annual applications for reasonableness reviews of costs for completed decommissioning work, and that SCE submit updated DCEs at three-year intervals via the NDCTP or as otherwise designated by the Commission. For years in which there is an NDCTP application, the Commission would conduct its annual reasonableness review in the NDCTP.

(5) Approve a SONGS Balancing Account for recording unanticipated SONGS 2 & 3 non-decommissioning costs.

B. Background

On June 7, 2013, SCE announced plans to permanently retire SONGS 2 & 3. On June 12, 2013, SCE submitted a Certification of Permanent Cessation of Power Operations to the U.S. Nuclear Regulatory Commission (NRC), certifying that SCE had permanently ceased power operations of SONGS 2 & 3, surrendering SCE's authority to operate the units. SCE submitted to the NRC a Certification of Permanent Removal of Fuel for Unit 3 on June 28, 2013, and for Unit 2 on July 23, 2013. As a result of these submittals, SCE now holds an NRC license that does not permit power operations but does authorize the possession of the SONGS facilities and licensed material. SCE no longer has authority under its NRC licenses to load fuel into the SONGS 2 & 3 nuclear reactors.

The permanent retirement of SONGS 2 & 3, approximately nine years before the NRC operating licenses would have expired in 2022, was an unforeseen event and was not anticipated in the decommissioning cost estimates previously submitted to and approved by the CPUC in NDCTPs prior to the plant retirement decision. Given the change of circumstances resulting from the early retirement of SONGS, SCE was unable to complete certain decommissioning planning activities that it would have completed in the years leading up to a planned retirement date.

Under the sequence of events that was previously contemplated, for example, SCE would have submitted a preliminary decommissioning cost estimate for review by NRC and approval by this Commission at least five years prior to a planned retirement date, as required under 10 C.F.R. § 50.75(f)(3). During the five years prior to a planned retirement, SCE would have continued to develop and refine the decommissioning cost estimates and plans. One year prior to a planned retirement, SCE also would have applied for Commission approval to use decommissioning funds to pay for decommissioning planning costs as provided in Section 2.01(7) of the Qualified and Non-Qualified Master Trust Agreements:

> One year prior to the time decommissioning of a Plant or Plants is estimated to begin, the Company shall apply for CPUC approval of the estimated cost and schedule for decommissioning each Plant or Plants. Upon approval of the cost and schedule for decommissioning each Plant or Plants, the CPUC shall authorize Interim Disbursements from the applicable Fund to pay Decommissioning Costs.

In addition, the timing contemplated by the Master Trust Agreements would have permitted SCE to seek NRC review of a site-specific decommissioning plan and a detailed cost estimate, and obtain disbursements from the NDTs for decommissioning-related planning expenses, as the units approached the expiration of the operating licenses. Given the unanticipated change of timing for SONGS decommissioning, it is no longer possible for SCE to seek NRC review of preliminary decommissioning plans or obtain interim disbursements from the NDTs prior to plant retirement.

To obtain access to the NDTs, on November 18, 2013, SCE submitted Tier 3 Advice Letter (AL) 2968-E requesting Commission approval for interim disbursements from the NDTs and other relief, in connection with SONGS 2&3 decommissioning activities and costs incurred from June 7, 2013 through December 31, 2013. SCE explained that it anticipated filing an application in 2014 that would seek Commission approval of a SONGS 2 & 3 site-specific, detailed radiological and non-radiological decommissioning and fuel management cost estimate. SCE also proposed an advice letter procedure, consistent with D.11-07-003, through which SCE would: (1) report on SONGS 2 & 3 decommissioning activities and recorded costs, and (2) seek disbursements from the NDTs for SONGS 2 & 3 decommissioning costs incurred in 2014 and future periods. SCE proposed that reasonableness reviews of SONGS decommissioning costs would continue to occur in the NDCTP or other proceeding designated by the Commission.

In accordance with federal regulations, SCE submitted the DCE, Post Shutdown Decommissioning Activities Report (PSDAR), and Irradiated Fuel Management Plan (IFMP) to the NRC on September, 23 2014. SCE anticipates that the NRC review of the DCE and PSDAR will be completed by December 2014, within approximately 90 days of these submittals, and the NRC review of the IFMP will be completed in the first half of 2015. In this Application, the Utilities are submitting the SONGS 2 & 3 site-specific DCE for the Commission's approval. The Utilities are

also submitting the PSDAR and the IFMP with this Application for the Commission's informational review.

C. SONGS Decommissioning Strategy

1. Decommissioning Core Principles

SONGS decommissioning will be a long and complex process requiring the balancing of many interests. SCE acknowledges that during SONGS decommissioning it is responsible:

- To meet all federal and state regulatory and legal requirements,
- To be a responsible steward for our customers' contributions to the Nuclear Decommissioning Trust, and
- To be a trusted partner to the communities surrounding San Onofre.

To meet this responsibility, SCE, along with the other SONGS decommissioning participants (SDG&E, Anaheim, and Riverside), has determined that the SONGS decommissioning process will be guided by the core principles and fundamental values of Safety, Stewardship, and Engagement.

2. Prompt DECON

NRC regulations provide for three basic decommissioning alternatives: DECON, SAFSTOR, and ENTOMB. SAFSTOR and ENTOMB involve placing the nuclear facility in a long-term, safe-storage configuration for future decommissioning. DECON is the only method in which decommissioning commences promptly following the permanent closure of the facility. SCE has selected DECON for several reasons:

- The nuclear industry now has substantial experience using proven technologies for all aspects of nuclear facility decommissioning (including SCE's experience decommissioning SONGS 1). Prompt DECON ensures access to a workforce and retired employees with legacy knowledge regarding the plant, which is important for completing decommissioning safely and efficiently.
- SCE can dispose of Class A Low Level Radioactive Waste (LLRW) at a licensed disposal facility under the pricing terms of an existing contract, providing cost

certainty for disposal of the predominant type of radioactive waste from SONGS. SCE also currently has access to a licensed disposal facility for Class B and C LLRW, for which current pricing information is known, also providing greater cost certainty. Prompt DECON provides greater assurance of access to these waste disposal facilities.

- Based upon the current estimate of SONGS decommissioning costs, current level of funding of the NDTs, projected escalation rates, and financial market conditions known at this time, the decommissioning participants have each accumulated sufficient funds to complete their respective shares of the decommissioning project. Prompt DECON is less expensive than SAFSTOR and mitigates the risk of inflation and market performance.

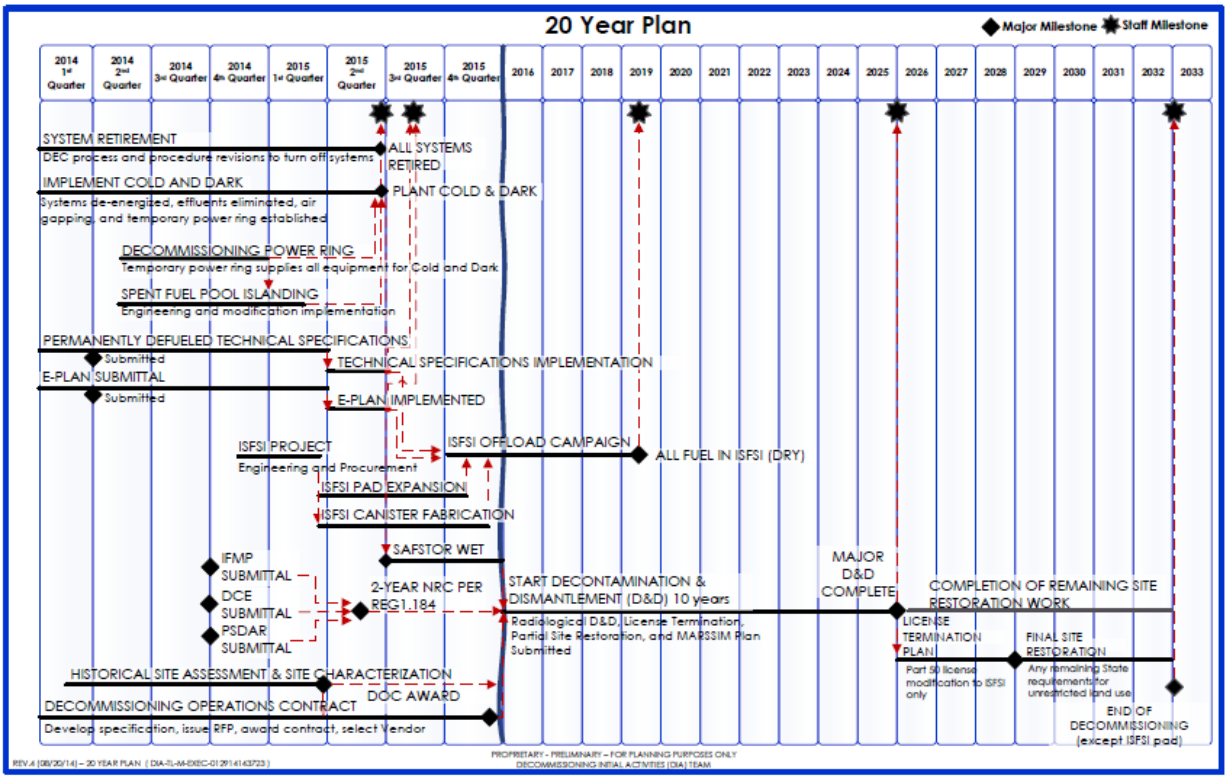
  It also is in the best interest of the decommissioning participants' customers and the state of California to complete decommissioning as soon as is reasonably practicable. Prompt DECON, for example: (1) will reduce CPUC and other state regulatory-oversight costs; (2) ease the burden of emergency preparedness management necessary by state and local entities; (3) allow public concerns regarding the decommissioning process to be addressed now rather than deferred to an unknown date; (4) ensures intergenerational equity such that the generation that benefitted from the operation of the plant is responsible for decommissioning; and (5) returns the land to other productive economic uses sooner than if decommissioning is delayed.

3. <u>Proposed Schedule</u>

As explained in greater detail further below, the SONGS 2 & 3 decommissioning project consists of three major components: (1) license termination; (2) spent fuel management, storage, transfer, and Independent Spent Fuel Storage Installation (ISFSI) decommissioning; and (3) site restoration. SCE plans to complete license termination, spent fuel management, and site restoration activities within 20 years for all plant areas except the ISFSI. It will not be possible, however, to complete all spent fuel transfer, ISFSI decommissioning, and site restoration activities

until after the U.S. Department of Energy (DOE) has removed the last spent fuel from the site. As explained further below, SCE currently assumes that the DOE will remove the last fuel in 2049, and that ISFSI Decommissioning and final site restoration activities will be completed in 2051. Figure I-1 below provides the decommissioning twenty-year plan:

Figure I-1
SONGS 2 & 3 Decommissioning
20 Year Plan



4. Decommissioning Plan

A brief summary of the SONGS 2 & 3 decommissioning plan is provided below:

a) System Abandonment

Shortly after SCE announced its decision to permanently retire SONGS 2 & 3 on June 7, 2013, SCE commenced decommissioning planning. After transferring all fuel that remained in the SONGS 2 reactor to the spent fuel pool, SCE reduced the SONGS staff size to minimize ongoing labor costs, and deployed many of the remaining employees to the process of de-activating and abandoning plant systems that did not support the safe storage of fuel in the spent fuel

pools to the extent permitted under the continuing applicable provisions of its NRC licenses and NRC regulations. This process is a key prerequisite to commencing decommissioning. As part of this effort, SCE performed extensive benchmarking with the two other nuclear units that were also recently permanently retired, Crystal River 3[3] and Kewaunee.[4] The system abandonment process is expected to continue throughout 2014.[5]

SCE performed the analyses leading to the de-activation and abandonment of these systems, and documented all changes under the SONGS configuration and control program. In addition, SCE evaluated the surveillance, preventive maintenance, and functional testing procedures for all plant systems, and eliminated those that were no longer required.

b) Decommissioning Planning and Regulatory Submittals

Concurrently with system abandonment activities, SCE also began re-evaluating the plant technical specifications, emergency plan (E-Plan), security plan, and other regulatory requirements associated with the NRC licenses for SONGS 2 & 3. The purpose of these efforts is to update these various NRC requirements as necessary, now that SONGS is a permanently defueled facility entering decommissioning. SCE has submitted license amendment requests with the NRC to approve permanently defueled technical specifications and an updated E-Plan for SONGS. The permanently defueled technical specifications are necessary for SCE to be able to complete system abandonment for certain nuclear safety systems. The updated E-Plan and changes to the security plan[6] are necessary for SCE to appropriately plan for the reduced risks associated with

[3] On October 22, 2012, Dominion Resources, Incorporated announced that it would permanently close the Kewaunee Power Station, a 556 MWe pressurized water reactor plant in Carlton, Wisconsin. The unit last operated on May 7, 2013.

[4] On February 5, 2013, Duke Energy Corporation announced that it would permanently close the Crystal River 3 Nuclear Power Plant, an 860 MWe pressurized water reactor plant in Crystal River, Florida. The unit last operated in September 2009.

[5] The distributed costs associated with the System Abandonment process are identified in the ES/CBI Decommissioning Cost Estimate as Decon Period 2 Activity 2.21 – Drain and De-Energize Non-Essential Systems. Labor costs and other indirect costs allocated to System Abandonment activities will be included in the Decon Period 2 undistributed costs.

[6] Following shutdown of SONGS 2 & 3, SCE evaluated and modified certain aspects of the security plan pursuant to 10 CFR 50.54(p). [Recommend obtaining confirmation from Ross Quam/John Brabec.]

a decommissioning plant. The updated E-Plan and changes to the security plan also will allow SCE to reduce the number of emergency response organization and security-related positions at SONGS and to reduce the associated costs commensurate with the reduced risk level at SONGS. While SCE made certain staffing reductions at SONGS following the plant retirement announcement, there will be additional staffing level changes once the NRC has approved SCE's license amendment requests (LARs) for SONGS permanently defueled technical specifications and E-Plan (and other associated emergency preparedness submissions), as well as planned security-related submissions.

In addition, SCE commenced developing its plan to decommission the units. A fundamental component of this plan was to develop three interrelated planning documents required by the NRC. These included: (1) a site-specific DCE pursuant to 10 C.F.R. § 50.82(a)(8)(iii) & (iv); (2) a PSDAR pursuant to 10 C.F.R. § 50.82(a)(4)(i); and (3) an IFMP pursuant to 10 C.F.R. § 50.54(bb). The site-specific DCE, PSDAR, and IFMP are included as Appendix A to this submittal.

The site-specific DCE differs from DCEs previously submitted in prior NDCTPs. Those DCEs were used primarily to determine the appropriate amount of ratepayer contributions needed for the decommissioning trust pursuant to Public Utilities Code §§ 8321-30. In contrast, this site-specific DCE was developed for the purpose of being used as the basis for an executable decommissioning plan and schedule, and included the evaluation of various alternative sequences and schedules for the decommissioning work to achieve the decommissioning core principles and fundamental values of safety, stewardship, and engagement. It includes the costs to complete all aspects of the SONGS 2 & 3 decommissioning project, including:[7] (1) radiological decommissioning to the extent required to terminate the plant's NRC licenses pursuant to 10 C.F.R. § 50.75(c); (2) post-shutdown spent fuel management until acceptance by DOE pursuant to 10

[7] To support the development of the site-specific DCE, SCE developed a preliminary Historical Site Assessment and Site Characterization to accurately identify the locations, types, and quantities of radioactive contamination throughout the site, to help facilitate the site decontamination and license termination efforts that will be completed in the decommissioning process.

C.F.R. § 50.54(bb); (3) ISFSI decommissioning pursuant to 10 C.F.R. § 72.30; and (4) demolition of uncontaminated structures and site restoration pursuant to easement and lease contracts with the U.S. Department of the Navy and the California State Lands Commission. Consistent with SCE's priorities during plant operations, the DCE was developed to reflect the fact that industrial, radiological, and nuclear safety will continue to be SCE's highest priorities throughout the SONGS 2 & 3 decommissioning project.

The PSDAR contains a description of the planned decommissioning activities and overall schedule. In addition, the PSDAR explains the environmental impacts associated with site-specific decommissioning activities, including whether those impacts will be bounded by appropriate previously issued environmental impact statements. The PSDAR also contains the DCE, including the projected costs for managing irradiated fuel and for final site restoration.

The IFMP explains how SCE intends to manage and provide funding for the management of all irradiated fuel generated at SONGS 2 & 3 until title to and possession of the fuel are transferred to the DOE for its ultimate disposal in a permanent repository.

SCE submitted the DCE, PSDAR, and IFMP to the NRC on September 23, 2014. After a public meeting and 90-day review and public comment period, SCE will have fulfilled all federal requirements to access the decommissioning trust funds.[8]

[8] The distributed costs associated with the Decommissioning Planning and Regulatory Submittals process are identified in the ES/CBI Decommissioning Cost Estimate as Decon Period 2 Activities 2.01 – Develop Certified Fuel Handler Program; 2.02 – Prepare Post-Shutdown QA Plan; 2.03 Prepare Post-Shutdown Security Plan; 2.04 – Prepare Post-Shutdown Fire Protection Plan; 2.05 – Prepare Defueled Radiation Protection Manual; 2.06 – Prepare Preliminary Defueled Technical Specifications; 2.07 – Prepare Defueled Safety Analysis Report (DSAR); 2.08 – Implement Technical Specification Modifications; 2.09 – Prepare Post-Shutdown Emergency Preparedness Plan; 2.10 – NRC Review of Emergency Preparedness Plan; 2.11 – Prepare Post-Shutdown Decommissioning Activities Report (PSDAR); 2.12 – NRC Review of Post-Shutdown Decommissioning Activities Report (PSDAR); 2.13 – Respond to NRC Questions on PSDAR; 2.14 – Prepare Decommissioning Cost Estimate (DCE); 2.15 – NRC Review of Decommissioning Cost Estimate; and 2.17 – Perform Historic Site Assessment and Site Characterization. Labor costs and other indirect costs allocated to Decommissioning Planning and Regulatory Submittals process activities will be included in the Decon Period 2 undistributed costs.

c) Implement Cold & Dark

"Cold & Dark" generally consists of establishing a temporary power ring, which is a temporary source of electrical power for all required power plant electrical loads, and then de-energizing the permanently installed power sources to prepare for dismantling as described below. SCE plans to install the temporary power ring for SONGS 2 & 3 by mid-year 2015. SCE plans to complete several additional "Cold & Dark" related projects that will help prepare the site for decontamination and dismantling activities, including: (1) Temporary Power Ring, (2) Spent Fuel Pool Islanding, (3) Effluent Pathway Modifications, (4) Auxiliary, Radwaste, and Fuel Handling Buildings HVAC Modifications, (5) Fire Protection Systems Modifications, and (6) Telecommunications Systems Modifications. SCE also plans to complete these "Cold & Dark" related projects by mid-year 2015.[9]

(1) Temporary Power Ring

When SCE de-activated and abandoned many SONGS 2 & 3 plant systems that are no longer required to support spent fuel storage, SCE de-pressurized them and de-energized their original electrical power sources. Nevertheless, industry experience from other decommissioning projects has shown that, on rare occasions, systems that were believed to be de-energized were discovered to have remained energized. In addition, plant systems that are required to remain in operation to support spent fuel storage remain energized. To ensure the safety of decommissioning workers by preventing accidental contact with energized electrical conductors while dismantling the plant, SCE plans to de-energize all permanently installed (original) plant

[9] The distributed costs associated with the SONGS Cold & Dark project activities are identified in the ES/CBI Decommissioning Cost Estimate as Decon Period 2 Activity 2.18 – Planning and Design for Cold and Dark; 2.19 – Implement Cold and Dark (Repower Site); 2.20 – Install 12kV Service Line to Power Temporary Power Ring; 2.23 Design Spent Fuel Pool Support System Modifications; 2.24 – Design Control Room Relocation; 2.25 – Design Spent Fuel Security Modification Systems; 2.26 and 2.27 – Install Spent Fuel Pool System Modifications – Units 2 & 3; 2.28 – Spent Fuel Pool System Modification Training; 2.29 – Implement Control Room Modifications; 2.30 – Implement Spent Fuel Pool Security Modifications; 2.31 – Transition Project Modifications. Labor costs and other indirect costs allocated to the SONGS Cold & Dark project activities will be included in the Decon Period 2 undistributed costs.

electrical power sources, and to provide power only to the plant systems that continue to be used via a conspicuously identified (bright orange) temporary power ring.

(2) Spent Fuel Pool Islanding

The SONGS 2 & 3 nuclear steam cycle generated a tremendous amount of thermal energy. The portion of the thermal energy that was not converted to electricity via the turbine-generators and used for other applications in the plant was transferred to the ultimate heat sink for the plant, the Pacific Ocean, via major plant systems designed for that purpose, including the circulating water system and the saltwater cooling system. The spent fuel stored in the SONGS 2 & 3 spent fuel pools also generated thermal energy, which was discharged through those major plant cooling systems.

Now that SONGS 2 & 3 have been permanently retired, the primary source of thermal energy that requires cooling is the spent fuel in the spent fuel pools. Because the spent fuel generates substantially less thermal energy than the energy generated during plant operations, the full cooling capacity designed for plant operations is no longer needed. Therefore, SCE plans to install stand-alone cooling systems for the SONGS 2 & 3 spent fuel pools. The installation of these stand-alone cooling systems will transition the pools into "spent fuel pool islands" and allow SCE to de-activate their original plant cooling systems, and thereby isolate the pools from the Pacific Ocean. SCE plans to complete the Spent Fuel Pool Islanding project by mid-year 2015. The completion of this project will eliminate the need and cost to continue to operate and maintain the original plant cooling systems, and allow them to be decommissioned.

(3) Effluent Pathways Modifications

The permanent cessation of SONGS 2 & 3 operations, the closure of the SONGS Mesa facilities, the implementation of Spent Fuel Pool Islanding, and the permanent disabling of many other sources of effluent waste streams will result in reduced volumes of effluents discharged from the SONGS plant site. As a result, the existing saltwater cooling pumps will be replaced with smaller saltwater pumps that will be sized appropriately for the reduced effluent volumes that will be discharged through the existing offshore conduits, under SONGS' National

Pollutant Discharge Elimination System permit. In addition, portable submersible sump pumps, collection tanks, and processing skids will be used to dispose of effluents captured in potentially radioactive sumps and non-radioactive sumps.

(4) Auxiliary, Radwaste, and Fuel Handling Buildings HVAC Modifications

Certain areas within the Radwaste Building and the Units 2 & 3 Fuel Handling Buildings contain radioactive contamination that was unavoidably generated throughout the operating lives of SONGS 2 & 3. To ensure positive control of these materials, and to provide ventilation, heating, and cooling for Auxiliary, Radwaste, and Fuel Handling building habitability, SCE will install modifications to the HVAC systems in those buildings.

(5) Fire Protection Systems Modifications

To facilitate plant dismantling, the existing SONGS 2 & 3 fire detection systems will be permanently removed from service. New fire detection systems, with central alarm station monitoring, will be installed in required areas. Similarly, the existing SONGS 2 & 3 fire water storage tanks, pumps, piping network, and suppression systems will be retired. Fire water will be provided by the municipal water supply, and pumper trucks operated by an off-site fire brigade will be used to supply pressure. A portable fire water booster pump will protect a limited number of structures, and stand-alone fire suppression systems will be installed to protect certain plant areas. Centrally located fire hydrants and fire hose stations will be installed to protect the balance of the site.

(6) Telecommunication Systems Modifications

SCE will replace existing plant telephone system, plant paging system, plant radio system, satellite radio system, and telecommunications uninterruptible power supply with new systems, maximizing the use of wireless technologies. Only essential systems (e.g., security) will be hard-wired.

d) Transfer Fuel Assemblies to Dry Storage by Mid-Year 2019

In prior decommissioning cost estimates, SCE forecasted that up to twelve years would be required post-shutdown before the last fuel assemblies could be transferred into dry storage in the ISFSI to allow for sufficient post-operation thermal cooling of the fuel assemblies. The calculation of twelve years was based on the then-current NRC-licensed heat load capacities for the Transnuclear 24-PTH dry storage canisters that were used to store SONGS 1, 2, and 3 fuel during the 2003-2012 period.

SCE is currently working with a dry fuel storage vendor to obtain an updated canister design that is expected to be licensed by the NRC to safely accommodate significantly greater heat loads. In addition, although SONGS 2 & 3 were permanently retired on June 2013, the last fuel assemblies in the SONGS 2 & 3 reactors have been cooling since January, 2012 when they were last operated in the nuclear reactors. Consequently, SCE now projects that it will be able to transfer all fuel assemblies into dry storage within approximately seven-and-one-half years of their last operation, by mid-year 2019, assuming all required permits and approvals are obtained on a timely basis. The reduction in the cooling time required before the remaining fuel assemblies can be transferred from the SONGS 2 & 3 pools to dry storage should help enable SCE to decommission the spent fuel pools and surrounding structures much earlier in the decommissioning schedule, and should enable SCE to reduce the overall decontamination and dismantling schedule from twelve years to ten years.[10]

[10] The distributed costs associated with the Transfer of Spent Fuel Assemblies into Dry Storage by Mid-Year 2019 are identified in the ES/CBI Decommissioning Cost Estimate as SNF Period 2 Activity 8.01 – Security Shut Down Strategy; 8.02 – Decay Heat Analysis; 8.03 – Zirconium Fire / Shine Analysis; 8.05 – NRC Review of Irradiated Fuel Management Plan; 8.07 – ISFSI Pad Study; 8.08 – Design ISFSI Expansion; 8.09 – Construct ISFSI Expansion; 8.10 and 8.11 – Purchase and Fabrication of Spent Fuel Canisters and AHSMs – Units 2 & 3; and 8.12 and 8.13 – Deliver and Load Spent Fuel Canisters and Transfer to ISFSI – Units 2 & 3. Labor costs and other indirect costs allocated to System Abandonment activities will be included in the SNF Period 2 undistributed costs.

e) U.S. Department of Energy (DOE) Starts Accepting Fuel from Commercial Nuclear Industry in 2024

In SCE's 2009 SONGS 2 & 3 decommissioning cost estimate, which was adopted by the Commission in D.10-07-047, SCE projected that DOE would commence accepting fuel from domestic commercial nuclear power plants in 2020, and that they would begin accepting fuel at the take rate published in the DOE's July 2004 Acceptance Priority Ranking & Annual Capacity Report (DOE/RW-0567).[11] DOE has not provided any new, definitive, or binding information regarding the opening of a permanent deep geologic repository, or a schedule for commencing to accept spent fuel.[12]

In the absence of any new information from DOE, and given that four years transpired since their decommissioning estimates were updated in 2008, SCE and PG&E agreed to assume for purposes of their 2012 decommissioning cost estimates that DOE would start accepting fuel four years later in 2024. In light of the ongoing uncertainty regarding the timing of DOE's performance, SCE continues to assume that DOE will open its repository and commence accepting fuel from U.S. commercial nuclear facilities in 2024 for purposes of the 2014 SONGS 2 & 3 Decommissioning Cost Estimate. Based on that assumption, SCE projects that the DOE will remove the last fuel from the SONGS ISFSI in 2049.[13] It would be wholly speculative to make any other assumption at this time, and the assumption made here is reasonable for purposes of estimating decommissioning costs at this time. SCE acknowledges that it will be important to update this assumption in future decommissioning cost estimates as additional information becomes available.

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[11] See A.09-04-009, Exhibit SCE-2, p. 6, line 16 and Footnote 17.

[12] In January 2010, the Blue Ribbon Commission on America's Nuclear Future (BRC) was established as directed by President Barack Obama's Memorandum for the Secretary of Energy to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle and to recommend a new plan. On January 26, 2012, the BRC issued its final report. The BRC's Report contained many recommendations for a new national plan for spent fuel management, but it did not contain any definitive details or dates regarding the availability of a national spent fuel repository.

[13] SCE's spent fuel forecast was developed based on the U.S. Department of Energy (DOE) Acceptance Priority Ranking & Annual Capacity Report, dated July 2004.

5. Utilize Decommissioning Operations Contractor

Early in the decommissioning planning process, SCE considered a number of strategies for completing major SONGS 2 & 3 decommissioning activities including: (1) self-managing the project using existing plant staff, supplemented with specialists as required; or (2) engaging a third-party decommissioning operations contractor (DOC) to manage the project, with oversight by SCE and the other SONGS decommissioning participants. After considering each of these alternatives, including assessing the skill-sets and experience of remaining SONGS plant workers; benchmarking other past and present nuclear decommissioning projects; and obtaining input from industry experts as well as the SONGS decommissioning participants (SDG&E, Anaheim, and Riverside), SCE determined that an independent third-party DOC should be used for SONGS decommissioning.

a) Engaging a DOC Offers Several Advantages

Prior to this decision, SCE engaged CH2M Hill to evaluate other decommissioning projects since 1990 to assess the viability of utilizing a DOC for SONGS decommissioning. CH2M Hill observed that most of the commercial nuclear power station decommissioning projects that have been completed since that time were managed by the utilities that operated the stations. This reflected the utilities' view that decommissioning and fuel transfer activities were similar to those required to operate and maintain a nuclear power station. Although the utilities who selected this self-management decommissioning model completed the projects, many experienced significant schedule delays and associated cost increases compared to the initial decommissioning estimates. SCE seeks to avoid these pitfalls here and seeks to improve decommissioning performance, including minimizing schedule and cost risks. Given the complexity and difficulty of major, radiological decommissioning activities, SCE believes the schedule and cost risks inherent in a major decommissioning project such as SONGS decommissioning are better addressed by an experienced contractor who has performed similarly scaled projects. Under this model, the DOC will be contractually responsible for completing major,

time- and cost- critical decommissioning activities at SONGS necessary for license termination, as specified in the DOC contract.

Engaging an experienced decommissioning contractor or DOC provides the following potential advantages:

- **Enhanced Oversight** – Engaging a DOC will allow SCE to deal directly with one decommissioning contractor responsible for all major decommissioning activities, rather than multiple contractors responsible for various, potentially overlapping aspects of decommissioning. This should streamline decommissioning activities and provide greater schedule and cost control. In addition, engaging a DOC – rather than self-performing some tasks – provides the advantage of allowing SCE, as the lead NRC license holder, to focus on exercising oversight and ensuring compliance with NRC regulations and other state and federal environmental requirements.
- **Cost Control** – The DOC contract will provide a fixed price, with any scope and cost changes being subject to the terms and conditions of the DOC contract. When completing decommissioning activities under a fixed-priced DOC contract, the DOC will have a strong commitment to adhering to the planned decommissioning schedule, as it will share the economic risks of schedule and cost overruns. This potentially offers greater assurance of controlling decommissioning costs for the benefit of customers, who will receive refunds of any unspent decommissioning funds.
- **Greater Expertise** –The use of a DOC will utilize an organization whose core business and competencies are focused on cost-effectively implementing and managing large industrial projects similar in scope to decommissioning. The DOC will be able to use its staff for various decommissioning activities and take advantage of the economies of scale provided by its internal organization and capabilities. Engaging a DOC will avoid the need for SCE to hire new employees and retrain remaining site personnel, which will save time and costs.
- **Advantages available from lessons learned –** In addition, SCE and the selected DOC will be able to optimize SONGS decommissioning by applying lessons learned from prior DOC contracts.

b) DOC Procurement Process

To optimize the DOC decommissioning model for SONGS, SCE engaged CH2M Hill to develop a "SONGS DOC Strategic Assessment Plan" (DOC Assessment Plan) that: (1) identified the major issues for SCE to address in connection with procuring a DOC for SONGS; and (2) developed preliminary plans for SCE to initiate a DOC procurement process. In particular, the DOC Assessment Plan identified lessons learned from other facilities that had utilized a DOC so that those lessons learned could be applied for SONGS decommissioning. Toward that end, SCE has incorporated the DOC Assessment Plan into its planning strategy for procuring the DOC for SONGS decommissioning. SCE expects the DOC procurement process, which commenced in 3Q 2014, to result in a DOC contract in time to allow the DOC to start major decommissioning work activities in early 2016.

SCE is managing the DOC procurement process as a project to ensure the DOC contract meets SCE's planned scope, schedule, budget, and quality expectations for decommissioning. SCE will conduct a fair, transparent, and rigorous procurement process to ensure that SCE selects and engages a DOC with the technical and commercial capability to complete SONGS decommissioning in accordance with the SONGS decommissioning plans and DCE. The project will apply rigor to the process and ultimately create a framework to support contract administration and oversight. SCE will engage the DOC bidders early and throughout the procurement process to build a spirit of cooperation and good will. Indeed, early and frequent engagement with bidders addresses a key lesson learned from prior DOCs, and is an important step to lay the groundwork for an effective and enduring relationship between SCE and the successful DOC bidder.

SCE will manage the project in three phases and utilize project controls to ensure transparency and fairness. The planning strategy and project phases explained below incorporate lessons learned from other DOCs to optimize the DOC for SONGS decommissioning. During this process, SCE will also continue to engage with the Community Engagement Panel and

regulatory stakeholders, so that they can provide timely feedback on the DOC approach and procurement process.

(1) Phase 1 – Develop DOC Solicitation Documents and Identify Qualified Bidders

(a) Request for Information

SCE will select the DOC from bidders based on their interest and capabilities in completing SONGS decommissioning. In late September, 2014, SCE identified a list of potential bidders to provide for a competitive bidding process and issued a Request for Information (RFI) package to them in order to obtain preliminary information that would enable SCE to verify and qualify bidders based on their technical and commercial qualifications. The RFI questionnaire, among other things, requested information regarding the bidders' safety records, financial condition, commercial experience, and large decommissioning and fuel handling experience. The questionnaire also required bidders to declare their teaming arrangements (i.e., whether they were teaming with other bidders) and to file a single response for the team. SCE will evaluate the responses to RFIs received and develop a list of pre-qualified bidders (i.e., identify the candidates who will be qualified to bid on a Request for Proposal (RFP), as discussed below).

(b) Request for Proposals

After completing the RFI phase and identifying the group of pre-qualified bidders, SCE will finalize and issue an RFP to them. SCE is in the process of preparing draft DOC terms and conditions, technical specification, and instructions to bidders for the RFP, and plans to issue the RFP in early 2015. As part of the RFP process, SCE will require the bidders to participate in the RFP on site as they prepare their respective bids. SCE will provide secure and private space for the bidders at SONGS, and ensure that each bidder has the same level of access to all pertinent plant and site information necessary to prepare their bids. Requiring this onsite presence will apply another lesson learned from recent DOC efforts. That is, by establishing a site presence as they develop their formal bids, bidders will have a better understanding of plant/site conditions and issues, which will greatly enhance their ability to submit comprehensive, well-

informed bids. In addition, this will ultimately support SCE and the successful bidder develop a DOC contract of proper scope and avoid pitfalls later in the decommissioning process.

(2) Phase 2 – Solicit and Evaluate DOC Bids

After SCE finalizes and issues the RFP materials, SCE will conduct at least two meetings/workshops with the bidders during the RFP response period. During the first meeting, SCE will present the RFP documents, explain SCE's expectations, and answer initial questions. The second meeting will focus on preliminary technical and commercial approaches. SCE will continue to provide support to the bidders throughout the process. As noted above, this will create a spirit of cooperation and good will, and, as observed in lessons learned from other DOCs, is an important element of the process necessary to develop an effective relationship between SCE and the successful DOC bidder, and ultimately, successful DOC operations.

SCE presently plans to require the DOC bidders to submit their final bids in 2Q 2015. SCE will then complete technical and commercial evaluations of the RFP response received from the bidders, and down-select one or more bids to proceed to final contract negotiations. To complete the evaluations, SCE will establish a cross-functional team of technical and commercial specialists, consisting of procurement representatives, engineers, cost-estimators, and other functions, who will complete separate evaluations. SCE also intends to obtain an independent peer review of the down-selection process.

(3) Phase 3 – Negotiate a DOC Contract

SCE will negotiate with the down-selected bidder(s) regarding the terms and conditions of the DOC contract. The DOC contract, including the terms and conditions, technical specifications, and non-technical requirements, will provide the scope of the decommissioning activities to be completed by the DOC. To optimize DOC performance, other key terms will provide among other things: (1) performance standards to ensure state and federal health, safety, and environmental requirements are met; and (2) a defined project schedule for certain activities to ensure the decommissioning project is completed efficiently.

(4) Project Controls

During the phases of the procurement process, SCE also will implement a number of project controls to assure the integrity of the DOC selection. These will include training the SCE team members overseeing the DOC procurement process on business conduct requirements, roles, and responsibilities. In addition, SCE will require team members responsible for evaluating, negotiating and selecting the DOC to sign procurement-specific conflict-of-interest agreements and non-disclosure agreements. SCE will conduct compliance reviews to ensure these steps are being followed. As with other procedural steps SCE is establishing, these project controls implement lessons learned from other DOCs, and will better assure a fair, transparent, and rigorous procurement process, and ultimately a well-developed DOC contract capable of being implemented.

II.

SONGS 2 & 3 DECOMMISSIONING COST ESTIMATE

A. Summary of Cost Estimate

1. Methodology and Description

SCE and the SONGS participants[14] began accumulating funds for the eventual decommissioning of SONGS Units 2 & 3 early in the units' operating lives. Because the units were licensed to operate for several decades,[15] decommissioning fund accumulations were based on conceptual cost estimates.[16] These conceptual decommissioning cost estimates were developed by third-party vendors using proprietary estimating algorithms consistent with recognized industry guidelines such as AIF/NESP-036, "Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates" and the DOE Decommissioning Handbook.[17] These estimates

[14] San Diego Gas & Electric Company and the City of Riverside own 20% and 1.79% shares of SONGS 2 & 3, respectively. On December 29, 2006, SCE acquired the City of Anaheim's ownership share of SONGS 2 & 3. Under the Anaheim Settlement Agreement adopted by the Commission in D.06-11-025, however, the City of Anaheim retained a pro-rata share of the SONGS 2 & 3 decommissioning obligation as shown approximately in the table below:

Decommissioning Obligation		
	SONGS 2	SONGS 3
SCE	75.7363%	75.7475%
SDG&E	20.0000%	20.0000%
Anaheim	2.4737%	2.4625%
Riverside	1.7900%	1.7900%
	100.00%	100.00%

[15] On March 9, 2000, the U.S. Nuclear Regulatory Commission issued Amendment No. 166 to Facility Operating License No. NPF-10 and Amendment No. 157 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station (SONGS) Units 2 and 3, respectively. These amendments revised the expiration dates of the SONGS Unit 2 and Unit 3 operating licenses from October 18, 2013, to February 16, 2022 and November 15, 2022, respectively.

[16] In this context, "conceptual" means that the decommissioning cost estimates were developed based on Unit Cost Factors coupled with the Critical Path Method, using the best-available current information, for projects that were not expected to commence until several years or decades into the future. These "conceptual" cost estimates were not intended to be executable decommissioning project plans or schedules.

[17] See Decommissioning Cost Estimate for SONGS 2 & 3 Prepared for SCE by ABZ Incorporated, dated December 14, 2012, page 5. Since 2001, SCE utilized ABZ, Incorporated to develop the

(*Continued*)

were updated periodically to reflect changes in regulations, technology, and economics; additions and deletions to the nuclear facilities; updated site radiological assumptions; lessons-learned from other nuclear decommissioning projects; and other related information necessary to complete accurate cost estimates.

On July 22, 2013, after SCE announced its decision to permanently retire SONGS 2 & 3, SCE notified the Commission that it intended to prepare a new decommissioning cost estimate for SONGS 2 & 3 after the development of a site-specific decommissioning plan.[18] SCE informed the Commission that this new estimate would be included in the PSDAR that SCE is required to submit to the NRC.[19]

After a thorough and objective competitive bidding process, SCE engaged the consortium of Energy*Solutions* and Chicago Bridge & Iron Company (ES/CBI) to develop the new decommissioning cost estimate for SONGS 2 & 3. ES/CBI is uniquely qualified to accurately estimate SONGS 2 & 3 decommissioning costs because it has completed five nuclear decommissioning projects within the past decade, and is actively involved in decommissioning twenty-three reactors throughout the world. In addition, Energy*Solutions* is the owner of the Zion Decommissioning Project, and is currently decommissioning the Zion Nuclear Power Station (Zion) that was formerly owned and operated by the Commonwealth Edison Company in Illinois.[20]

The ES/CBI decommissioning cost estimate for SONGS 2 & 3 (ES/CBI DCE or DCE) was developed using a slightly different approach than the conceptual decommissioning cost estimates SCE has submitted in prior NDCTPs for funding purposes. The previous estimates were developed as conceptual estimates, primarily for use in the periodic determination of appropriate

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Continued from the previous page
decommissioning cost estimates for SONGS 2 & 3. Prior to 2001, SCE utilized TLG Services, Incorporated to develop the decommissioning cost estimates for SONGS 1, 2, & 3.

[18] A.12-12-013, Exhibit SCE-06, p. 1.

[19] Id.

[20] Commonwealth Edison Company is a subsidiary of Exelon Corporation.

trust fund contribution levels. The ES/CBI DCE was also developed using Unit Cost Factors and the Critical Path Methodology consistent with AIF/NESP-036, "Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," and was prepared in accordance with NRC Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors." In contrast to previous cost estimates, however, the ES/CBI DCE was designed to provide an executable project schedule and initial budget for execution of all SONGS 2 & 3 decommissioning activities. The ES/CBI DCE reflects the best efforts of both SCE and ES/CBI to provide the most accurate information currently available regarding SONGS 2 & 3 decommissioning costs, and reflects both SCE's experiences in decommissioning SONGS 1 and ES' current experience at the Zion Decommissioning Project and other decommissioning projects.

It is important to note, however, that the ES/CBI DCE is not an engineered estimate for each decommissioning activity. In addition, this estimate is necessarily based on assumptions regarding certain project costs that remain unknowable at this time, such as the timing and rate of the removal of the spent fuel from the SONGS site by DOE. Accordingly, SCE will continue to update the DCE as decommissioning proceeds, the detailed plans for specific decommissioning activities are engineered, and specialty contractor pricing is identified as contracts are executed.

2. NRC Decommissioning Cost Categories

The scope of the SONGS 2 & 3 decommissioning project is driven by federal regulations for: (1) radiological decontamination/license termination; (2) spent fuel management and storage, and ISFSI decommissioning; and (3) site restoration, which also is driven by the terms of the easement/lease contracts for the SONGS facility. Because federal regulations require that the funds accumulated for these categories be separately identified, SCE will briefly summarize the nature of the costs for these categories in the sections below. The ES/CBI DCE and all previous SONGS decommissioning cost estimates, include the costs for each of these three categories.

a) NRC Radiological Decommissioning/License Termination Costs

Under 10 C.F.R. § 50.75(c), SCE is required to reduce the residual radioactivity at the SONGS site to a level that permits release of the property for unrestricted use and

termination of the SONGS 2 & 3 NRC licenses. NRC radiological decommissioning/license termination costs include the costs to perform all activities required to decontaminate the site and terminate the licenses. This includes all costs directly or indirectly related to the decontamination, dismantling, demolition, packaging, surveying, transportation, disposal, and documentation of all plant systems, equipment, structures, foundations, soils, and other materials that will be disposed of at a licensed low-level radioactive waste or exempt waste disposal or reprocessing facility. This also includes all costs related to the pre-demolition historical site assessment and radiological characterization of the site; and the post-demolition soil and groundwater sampling, comprehensive ground records development, final site status surveys, and NRC license termination activities.

As explained above, SCE plans to perform nearly all such activities during the ten-year decontamination and dismantling (D&D) schedule, beginning in 2016. At the end of this period, SCE anticipates that it would be able to terminate the NRC licenses applicable to the SONGS 2 & 3 sites, but that an NRC license will remain in effect for the ISFSI until after all spent fuel is removed from the site and SCE completes the decommissioning of the ISFSI, currently forecasted in 2051. The cost to terminate the NRC license for the ISFSI would be paid from ISFSI Decommissioning funds, as explained below.

b) NRC Spent Fuel Management, Storage, and Transfer Costs, and ISFSI Decommissioning Costs

Under 10 C.F.R. § 50.54(bb), SCE is required to submit to the NRC its program by which it intends to manage and provide funding for the management of all nuclear fuel that was used in SONGS 2 & 3 operations at the SONGS site until it is removed by the DOE. After fuel is permanently removed from the nuclear reactor, it is stored in on-site deep water pools for several years before it cools sufficiently to be placed in dry storage canisters and transferred to the SONGS ISFSI. SCE currently stores fuel from SONGS 2 & 3 in each unit's spent fuel pool and in the ISFSI. SCE plans to transfer all fuel currently in wet storage to the ISFSI by mid-2019.

After all fuel is transferred to the ISFSI, SCE will secure and monitor it continuously until the DOE removes it from the SONGS site to its permanent repository. SCE

currently projects that the DOE will commence accepting spent fuel from U.S. commercial nuclear facilities in 2024. Based on that assumption, SCE projects that the DOE will remove the last fuel from the SONGS ISFSI in 2049.

Under 10 C.F.R. § 72.30, SCE is required to reduce the residual radioactivity at the ISFSI site to a level that permits release of the property for unrestricted use and termination of the NRC license for the ISFSI. SCE, therefore, currently projects that it will decontaminate and decommission the ISFSI, and terminate its NRC license, by 2051. SCE recognizes, however, that due to the DOE's lack of progress in siting and constructing its repository, this schedule is likely to be extended in future updates to the SONGS 2 & 3 decommissioning cost estimate.

c) Non-Radiological Decommissioning/Site Restoration Costs

SCE does not own the onshore or offshore land upon which the SONGS facility is located. SCE, therefore, is required to fulfill additional, non-NRC-related requirements that arise from the SONGS site easements and leases in order to complete its decommissioning obligations for the SONGS site.

The onshore SONGS site is situated on government-owned land pursuant to an easement granted by the U.S. Department of the Navy (Navy). Under the current easement, SCE may be required to remove all improvements. Although the easement is the subject of current discussions between SCE and the Navy, to date, the Navy has not committed to an approach that deviates from the original terms of the easement. SCE is currently negotiating with the Navy on this issue. Until the current terms of the easement are modified, however, the DCE necessarily includes the costs to remove all improvements from the site, including above and below ground structures. SCE anticipates that it will complete nearly all of the above-described Site Restoration activities during the twenty-year D&D schedule, beginning in 2016, and that it will terminate the Navy easement, except as required for the ISFSI, near the end of that schedule. SCE projects that it will complete the final Site Restoration activities and terminate the portion of the Navy easement that remains for the ISFSI site in 2051.

The offshore site for SONGS 2 & 3, upon which its offshore circulating water conduits are located, is subject to an easement lease granted by the California State Lands Commission (CSLC). This separate easement lease currently requires that SCE excavate and remove these conduits in their entirety. SCE also seeks to amend this easement, and has entered into discussions with the CSLC for that purpose. Until the current terms of this easement are modified, however, the DCE necessarily includes the costs to excavate, remove, and dispose of these conduits in their entirety.

B. Reconciliation of ES/CBI Cost Estimate to July 2013 ABZ Study

In December 2012, as part of the NDCTP, SCE submitted a decommissioning cost estimate for SONGS 2 & 3 of $4,119 million (100% level, 2011 dollars).[21] That estimate, developed by ABZ Incorporated (ABZ) prior to the permanent closure of SONGS 2 & 3, assumed that SONGS 2 & 3 would continue to operate until their NRC operating licenses expired in 2022. Subsequently, on July 22, 2013, after SCE announced the permanent retirement of SONGS 2 & 3, SCE submitted a revised SONGS 2 & 3 decommissioning cost estimate, also developed by ABZ, of $4,132 million (100% level, 2011 dollars).[22] SCE explained that there was not sufficient time to reflect all of the implications of the retirement decision in the July 2013 revised ABZ estimate.[23] The revised ABZ estimate, therefore, necessarily retained most of the same assumptions and cost factors as the December 2012 estimate.[24] The July 2013 ABZ Study (ABZ Study), however, reflected the following new assumptions compared to the December 2012 estimate:

- SONGS 2 & 3 will not generate additional spent fuel after January 2012,
- SONGS 2 & 3 would permanently cease operations and be placed in a SAFSTOR configuration by the end of 2014, and

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[21] A.12-12-013, Exhibit SCE-2, p. 2.

[22] A.12-12-013, Exhibit SCE-06, p. 4.

[23] Id., p. 1.

[24] Id., p 3.

- SONGS 2 & 3 decommissioning would commence in mid-year 2015.[25]

At that time, SCE also notified the Commission that it intended to prepare a new decommissioning cost estimate for SONGS 2 & 3 following the development of a site-specific decommissioning plan.[26]

With this Application, SCE is submitting a new site-specific SONGS 2 & 3 DCE, developed by ES/CBI. As discussed above, the ES/CBI DCE was designed to provide an executable schedule and initial budget for execution of all SONGS 2 & 3 decommissioning activities. Nevertheless, this DCE is based on many of the same assumptions as the ABZ Study, including the following:

- DOE will commence accepting fuel from the industry in 2024 and will remove the last fuel from the SONGS ISFSI in 2049,
- All onshore substructures and offshore conduits are removed,
- A 25% contingency factor is applied to all estimated decommissioning costs, and
- Decommissioning costs recorded between June 7, 2013 and December 31, 2013 are included, with no added contingency dollars.

As a result of the newly available information regarding the licensed characteristics of a different type of spent fuel dry storage canister that SCE intends to use for most of the fuel assemblies that currently remain in the SONGS 2 & 3 spent fuel pools, the new decommissioning cost estimate developed by ES/CBI used the following new assumptions:

- All fuel assemblies will be removed from the SONGS 2 & 3 spent fuel pools by mid-2019 (instead of December 2023), and
- SONGS 2 & 3 active decontamination and dismantling will be completed in 10 years instead of 12 years.

In addition, the ES/CBI DCE assumed that:

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[25] Id.

[26] Id., p. 1.

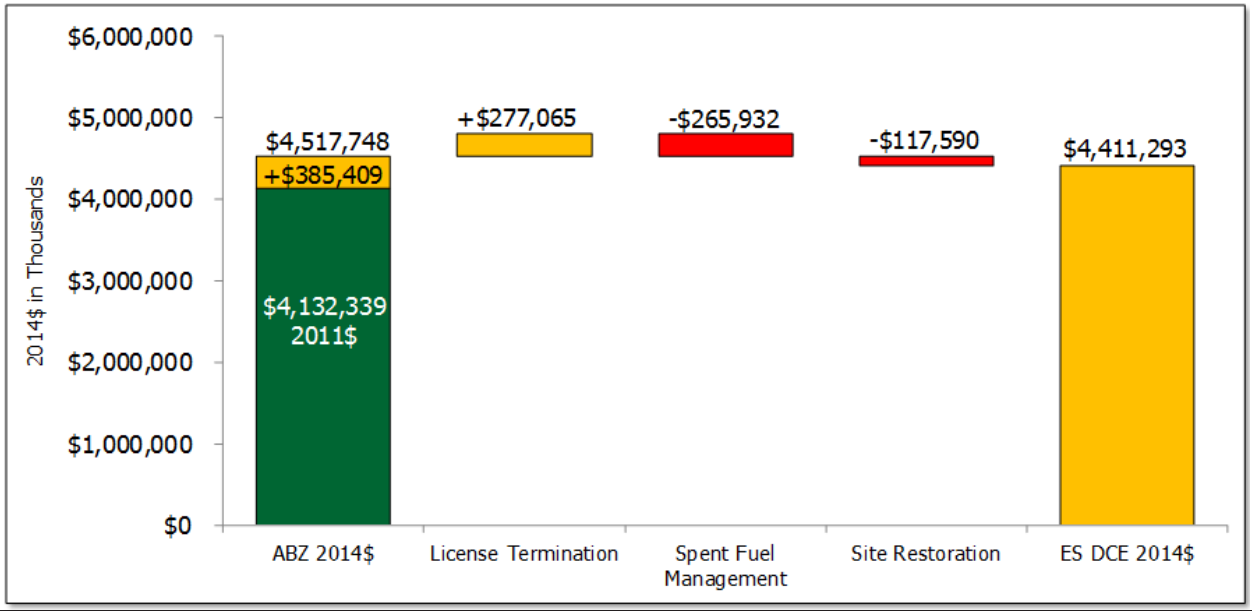
- The SONGS 2 & 3 spent fuel pool islands will be installed by June 2015 (instead of 2017 for SONGS 3 and 2018 for SONGS 2), and
- SONGS 2 & 3 decommissioning (active decontamination and dismantling) will commence in January 2016 (instead of July 2015).

The ES/CBI DCE estimates the cost to decommission SONGS 2 & 3 at $4,411 million (100% level, 2014 dollars). The estimated cost in the ABZ Study, was $4,132 million (100% level, 2011 dollars), and $4,518 million when escalated to 2014 dollars, as shown in Figure X-2 below. Thus, the ES/CBI DCE is approximately $107 million (100% level, 2014 dollars) or 1.9 percent lower than the ABZ Study.

1. Reconciliation by NRC Cost Categories

Figure II-2 below illustrates the differences in the estimated costs in each of the NRC Decommissioning Cost Categories changed between the ABZ Study and the ES/CBI DCE. Two things should be noted regarding this reconciliation. First, the ABZ Study was a conceptual estimate developed for fund accumulation purposes only, whereas as discussed above, the ES/CBI Study was designed to provide an executable Work Breakdown Structure, schedule, and initial budget for execution of all SONGS 2 & 3 decommissioning activities. Second, the federal regulations do not prescribe detailed criteria for allocating all decommissioning costs among these three categories. The allocations in the ABZ Study and the ES/CBI DCE were made by the respective cost estimating vendors using their reasonable professional judgment. They did not use identical criteria. Therefore, the reconciliation below is provided for informational purposes only, and does not represent a line-by-line reconciliation, which is not possible for the reasons explained above. It is also important to note that for the same reasons, the various explanations provided are intended to explain only the most significant variances in each category and not every difference that may exist.

Figure II-2
Reconciliation of ES/CBI Study to July 2013 ABZ Study by NRC Decommissioning Cost Categories
(100% level, millions of 2014 dollars)



a) Radiological Decommissioning/License Termination Costs

In the ES/CBI DCE, Radiological Decommissioning/License Termination costs are roughly $277 million (100% level, 2014$) higher than the ABZ Study. This increase is driven by several factors. First, the ES/CBI Study includes costs for a number of activities that were not included in the ABZ Study, including Community Outreach, Decommissioning Advisor, and Property Taxes (which are explained in greater detail below).[27] Second, the ES/CBI DCE includes higher cost levels for a number of activities (e.g., development of the Historical Site Assessment, Primary System Chemical Cleaning, and Site Repower) than were projected in the ABZ Study. Third, the ES/CBI DCE assumed a higher level of LLRW disposal costs, partially offset by reduced labor costs, because it assumed that a larger volume of material would be disposed of as LLRW compared with the ABZ Study. These Radiological Decommissioning Cost increases were partially

[27] Attachment 1 to the ES/CBI DCE shows additional SDG&E internal costs, which are discussed in detail in Exhibit SDG&E-XX.

offset by reduced Large Component Removal costs, based on a detailed analysis that factored in Energy*Solutions*' recent experience removing and disposing of the large components at the Zion plant.

b) Spent Fuel Management Costs

Spent Fuel Management costs decreased by $266 million (100% level, 2014$) in the ES/CBI DCE relative to the ABZ Study because the ES/CBI DCE assumes that SCE will implement the spent fuel pool islanding by mid-year 2015, and complete the transfer of all remaining fuel from the pools to the ISFSI by mid-year 2019. Advancing these activities by several years in the decommissioning schedule will result in substantial staffing cost savings.

c) Non-Radiological Decommissioning/Site Restoration Costs

In the ES/CBI DCE, Non-Radiological Decommissioning/Site Restoration costs decreased by $118 million (100% level, 2014$) relative to the ABZ Study. This is because, in the absence of prescriptive NRC criteria defining which costs fall within each of these categories, the costs for several activities were shifted from this category in the ABZ Study to the Radiological Decommissioning/License Termination cost category in the ES/CBI DCE. Among these shifted costs are many of the costs to excavate and dispose of the substructures below minus 3-feet. The cost decreases in this category are partially offset by the shifting of all employee severance costs to this category; increased costs for sheet piling and shoring required to dewater, excavate, demolish, and dispose of the circulating water system box culvert; and new costs associated with the construction of a temporary seaway to facilitate the box culvert demolition.

2. Reconciliation by Major Decommissioning Activity Costs

The following reconciliation summarizes the differences between the ES/CBI DCE and the ABZ Study by major decommissioning activity costs:

Table II-1
Reconciliation of ES/CBI Study to July 2013 ABZ Study by Major Decommissioning Activity Costs
(100% level, millions of 2014 dollars)

	July 2013 ABZ Study	$4,518
1	Staffing Costs	($330)
2	Craft Labor/Non Labor Costs	$97
3	Waste Disposal Costs	$92
4	Property Taxes	$59
5	NRC Fees	$29
6	Community Outreach Costs	$27
7	Contingency	($84)
8	Miscellaneous Costs	$3
	ES/CBI Study	$4,411

a) Staffing Costs

The ABZ Study assumed that SCE personnel would manage and oversee the active decommissioning activities throughout a 12-year project schedule. The ES/CBI DCE assumed that the SONGS 2 & 3 decommissioning project would be completed in a ten-year project schedule managed by a third-party Decommissioning Operations Contractor (DOC), with appropriate oversight by SCE personnel. The ten-year project schedule reflected earlier reductions in decommissioning staffing resulting from the transfer of all spent fuel to the ISFSI by 2019 instead of 2024 as assumed in the ABZ Study. The ES/CBI DCE also used SCE labor rates for non-craft functions. These labor rates, however, increased at a lower rate between 2011 and 2014 than the prevailing escalation rate. The combined effect of reduced labor rates and a shorter decommissioning schedule resulted in reduced Staffing costs. This reduction was partially offset, however, by the need for a higher level of Security staffing than was assumed in the ABZ Study and

the costs for the DGC and A&E consultant, which were not anticipated in the ABZ Study. The ES/CBI DCE reflects a net Staffing cost decrease of $330 million (100% level, 2014 dollars).

b) Craft Labor/Non Labor Costs

The Staffing cost decrease in the ES/CBI DCE is partially offset by an increase of $97 million (100% level, 2014 dollars) in Craft Labor/Non Labor costs relative to the ABZ Study. The ES/CBI DCE is based on a new analysis of the level of effort that would be required to remove and dispose of the substructures and foundations that are below 3 feet below grade that is more detailed than the analysis upon which the ABZ Study was based. The ES/CBI analysis has identified the need for additional sheet piling and shoring over a larger area than previously contemplated, and assumes that it will be necessary to construct a temporary seaway into the ocean in order to de-water, excavate, and demolish the circulating water systems' intake and outfall box culvert structures.

c) Waste Disposal Costs

Radioactive waste disposal costs were estimated in the ABZ Study based on material take-off calculations from plant drawings, and informed by SONGS radiological survey records, and lessons learned from the SONGS 1 Decommissioning Project and other industry sources. The ABZ Study also used LLRW disposal costs based on a joint SCE-PG&E Study developed in 2008. Radioactive waste disposal costs in the ES/CBI DCE, however, were developed by Energy*Solutions*, the owner of the disposal facility in Clive, Utah, to which nearly all of the Class A LLRW from SONGS 2 & 3 will be shipped. The costs were based on the existing "Life of Plant" contract for disposal of Class A LLRW between Energy*Solutions* and SCE. In addition, the ES/CBI DCE calculated disposal costs for Class B and C LLRW, Greater Than Class C (GTCC) waste, mixed waste, and clean waste based on current pricing at existing disposal facilities, and based on its current, first-hand experience in the decommissioning of the Zion Nuclear Power Station.

There are many offsetting waste disposal cost increases and decreases between the ABZ Study and the ES/CBI DCE. The differences in the waste disposal costs between

the two studies, however, largely can be explained by two primary differences: large component disposal costs and containment concrete disposal costs.

The estimated cost to decontaminate, remove, package, transport, and dispose of the SONGS 2 & 3 large components (i.e., reactor pressure vessels and heads, steam generators, and pressurizers) in the ABZ Study was developed based on SCE's experience with the SONGS 1 large components approximately one decade ago. Energy*Solutions*, however, is currently in the process of dealing with large components at Zion, which are similar in size and radiological characteristics to the SONGS 2 & 3 large components. In addition, because the spent fuel racks and certain other components do not meet the disposal facility classification for oversized debris, Energy*Solutions* applied large component transportation and disposal to them. The ES/CBI DCE, therefore, assumed that the costs associated with the disposal of the SONGS 2 & 3 large components would align more closely with the disposal costs for the Zion large components. As a result, the ES/CBI DCE estimates that the cost to dispose of the SONGS 2 & 3 large components will be substantially greater than estimated in the ABZ Study.

In addition, the ABZ Study assumed that a substantial quantity of concrete in the containment structures would be scabbled[28] and shipped to a licensed LLRW disposal facility, and the remainder would be disposed of as clean material. In contrast, the ES/CBI DCE assumed that all concrete structures inside containment would be "ripped and shipped," that is, demolished without scabbling and all shipped to a licensed LLRW disposal facility. The "rip and ship" process reduced labor costs relative to the ABZ Study but increased LLRW disposal costs. Due primarily to the combined effect of these two differences, Waste Disposal costs increased by $92 million (100% level, 2014 dollars) relative to the ABZ Study.

[28] Scabbling is a process whereby the surface portion of a concrete structure that has been radioactively activated or that contains radioactive contamination is mechanically removed. The scabbled concrete is disposed of as low-level radioactive waste. The remaining structure may then be demolished and disposed of as clean (non-radioactive) waste.

d) Property Taxes

When SONGS 1 was permanently retired, property taxes on that unit ceased, although they continued to be collected for SONGS 2 & 3. An SCE analysis performed at the time that assumption was developed, more than a decade ago, also concluded that although the SONGS ISFSI was taxed during the operation of SONGS 2 & 3, it would be exempted after SONGS 2 & 3 were permanently closed. SCE did not re-visit that assumption in subsequent updates to the ABZ Study. For this reason, the ABZ Study did not include an allowance for property taxes.

Now that SONGS 2 & 3 are permanently retired, SCE is ascertaining whether or not SONGS will continue to be subject to property taxes. At this time, SCE has not resolved this issue. Based on the Energy*Solutions'* experience, the ES/CBI Study includes an allowance for property taxes of $1.5 million per year (100% level, 2014 dollars) for the duration of the SONGS 2 & 3 decommissioning project. This resulted in a $59 million (100% level, 2014 dollars) increase relative to the ABZ Study.

e) NRC Fees

Federal regulations mandate that the NRC recover most of its operating funds through fees assessed to licensees and applicants. The NRC charges three types of fees to SONGS and other licensees: (1) Annual Fees, (2) Inspection Fees (paid quarterly), and (3) Hourly Amendments and Operator Exam Expenses. Energy*Solutions* performed an updated review of the NRC fees that are expected to be incurred throughout the SONGS 2 & 3 decommissioning project, and determined that they will be approximately $29 million (100% level, 2014 dollars) higher than the level of NRC fees assumed in the ABZ Study.

f) Community Outreach Costs

Prior to the permanent closure of SONGS 2 & 3, SCE did not anticipate the level of community outreach that would be required to maintain proactive communications with the wide variety of stakeholders with interest in the SONGS 2 & 3 decommissioning project. The ABZ Study, therefore, did not include community outreach costs, or the cost of the SONGS

Decommissioning Community Engagement Panel. The ES/CBI DCE includes these costs, resulting in a $27 million (100% level, 2014 dollars) increase over the ABZ Study.

g) Contingency

Both ABZ and ES/CBI included a contingency factor of 25% to estimated SONGS 2 & 3 decommissioning costs in their respective studies. The ES/CBI DCE, however, includes approximately $280 million (100% level, 2014 dollars) of SONGS 2 & 3 decommissioning costs that were recorded in 2013 and early 2014, whereas the ABZ study does not contain recorded costs. These costs included post-shutdown transition costs, decommissioning planning costs, and separation payments to SCE employees whose jobs were terminated due to the closure of SONGS 2 & 3. Because SCE did not apply contingency to those recorded costs, and because the estimated costs in the ES/CBI DCE were slightly lower than the ABZ Study, the amount of contingency in the ES/CBI DCE was $84 million (100% level, 2014 dollars) less than the amount of contingency in the ABZ Study.

h) Miscellaneous Costs

Several other cost categories in the ES/CBI DCE increased or decreased relative to the ABZ Study. With regard to increases, several activities were identified in the ES/CBI analysis that were underestimated in or omitted from the ABZ Study. For example, the ABZ Study did not anticipate the use of a Decommissioning Advisor.[29] In addition, the ABZ Study did not include the premiums for general liability or nuclear property insurance.

With regard to decreases, several activities were assumed to be higher in the ABZ Study. For example, the ABZ Study assumed that SCE would continue to maintain the lease contract for the SONGS Mesa for fourteen years after the permanent closure of SONGS 2 & 3. The

[29] The SONGS Decommissioning Advisor (DA) is a large multi-national energy engineering firm with extensive experience and expertise in nuclear plant operations and decommissioning. SCE retained the DA to initially provide objective and impartial insight and support into SCE's decommissioning planning efforts. SCE may continue to utilize the DA to provide oversight over ongoing decommissioning activities. Acting in this capacity will not preclude the DA from submitting bids to perform decommissioning activities at SONGS. In such a case, however, the DA will be required to provide competing bidders with equal access all relevant information it may possess regarding such activities.

ES/CBI DCE includes a portion of Mesa lease costs through June 30, 2015 – just over two years after the permanent closure. There are also a number of assumed decreases and increases related to energy costs for various activities. The net impact of the increases and decreases of these Miscellaneous Costs was an increase of $3 million (100% level, 2014 dollars).

III.

APPROVAL AND REVIEW OF SONGS 2 & 3 DECOMMISSIONING COSTS

A. Advice Letter Process for Commission Approval of Interim Disbursements and Annual Reviews of Decommissioning Expenditures

In D.11-07-003, the Commission noted that prior to the commencement of the decommissioning of the Humboldt Bay Power Plant Unit 3 (HBPP 3) by Pacific Gas & Electric (PG&E), its only experience with decommissioning was the decommissioning of SONGS 1 by SCE. The Commission observed that its procedures for approvals of nuclear trust fund disbursements for PG&E and SCE were different due to a lack of direction from the Commission. The Commission, therefore, provided explicit direction to PG&E regarding the periodicity, type of information, and level of detail required for future nuclear trust fund disbursement advice letter filings for the decommissioning of HBPP 3.[30]

On November 18, 2013, SCE submitted Tier 3 Advice Letter 2968-E requesting Commission approval for interim disbursements from the NDTs and other relief, in connection with SONGS 2 & 3 decommissioning activities and costs incurred from June 7, 2013 through December 31, 2014. There, SCE proposed an advice letter procedure for SONGS 2 & 3 consistent with the Commission's direction to PG&E in D.11-07-003, through which: (1) SCE would seek approval of interim disbursements for SONGS 2 & 3 decommissioning costs incurred in 2014 and future periods until such time as the Commission approves this Application, and (2) the Commission would review SONGS 2 & 3 decommissioning activities and recorded costs. In accordance with the Commission's direction in D.11-07-003, and additional direction given by the Commission to PG&E in D.14-02-024, SCE proposes in this Application to submit advice letters at least once during each calendar year regarding SONGS 2 & 3 decommissioning containing the following information:

[30] D.11-07-003, Ordering Paragraph 2 and Attachment B.

1. Summary of Previous Advice Letter Approvals and Trust Withdrawals

SCE would provide a summary of all previous funding requests and trust withdrawals, summarized by major cost categories, correlated to the most recent Commission-adopted cost study, and including nominal dollar adjustment:

- List of activities for which trust funds were requested in past advice letters
- Amount previously requested for each activity
- Actual "to date" expenditures for each activity
- Total "to date" trust disbursements
- Comparison of any advances to actual expenditures
- Description of key decisions about the cost, scope, or timing of any activity for which a variance of plus or minus ten percent (+/- 10%) occurs[31]

This summary would facilitate Commission review of trust fund utilization relative to disbursement requests from project inception through the end of the period covered by the previous advice letter.

2. Major Cost Categories

In each advice letter, SCE will summarize the major cost categories for which trust withdrawals are requested, and for which previously requested funds were expended. These cost categories, summarized in Table III-2 below, are consistent with Table 6-1 of the ES/CBI DCE.

[31] See D.14-02-024, p. 51. At a minimum, the record shall include the nature of the decision, who made the decision, factors considered, and whether and what alternatives were considered.

Table III-2
SONGS 2 & 3 Decommissioning Major Cost Categories
(100% level, millions of 2014 dollars)

Period No.	Period Description	Start	End	Years	Total Cost
License Termination – 10 C.F.R. § 50.75(c)					
Decon Pd 1	Transition to Decommissioning	6/7/2013	12/31/2013	0.56	$52,315
Decon Pd 2	Decommissioning Planning and Site Modifications	1/1/2014	6/30/2015	1.49	$241,140
Decon Pd 3	Decommissioning Preparations and Reactor Internals Segmentation	6/30/2015	6/1/2019	3.92	$539,009
Decon Pd 4	Plant Systems and Large Component Removal	6/1/2019	9/24/2022	3.31	$804,504
Decon Pd 5	Building Decontamination	9/24/2022	7/13/2024	1.80	$429,106
Decon Pd 6	License Termination During Demolition	7/13/2024	12/24/2032	8.44	$46,171
Account Total				**19.52**	**$2,112,246**
Spent Fuel Management – 10 C.F.R. § 50.54(bb) and ISFSI Decommissioning – 10 C.F.R. § 72.30					
SNF Pd 1	Spent Fuel Transition	6/7/2013	12/31/2013	0.56	$129,997
SNF Pd 2	Spent Fuel Transfer to Dry Storage	1/1/2014	6/1/2019	5.41	$716,822
SNF Pd 3	Dry Storage During Decommissioning – Units 1, 2, and 3	6/1/2019	12/5/2031	12.51	$122,849
SNF Pd 4	Dry Storage Only – Units 1, 2, and 3	12/5/2031	12/31/2035	4.07	$58,765
SNF Pd 5	Dry Storage Only – Units 2 and 3	12/31/2035	12/31/2049	14.0	$214,653
SNF D&D Pd 1	ISFSI License Termination	12/31/2049	5/6/2050	0.34	$2,520
SNF D&D Pd 2	ISFSI Demolition	5/6/2050	9/8/2051	1.34	$30,590
Account Total				**38.23**	**$1,276,196**
Site Restoration					
SR Pd 1	Transition to Site Restoration	6/7/2013	6/30/2015	2.06	$130,489
SR Pd 2	Building Demolition During Decommissioning	6/30/2015	7/11/2017	2.03	$50,245
SR Pd 3	Subsurface Demolition Engineering and Permitting	10/1/2019	7/13/2024	4.78	$37,912
SR Pd 4	Building Demolition to 3 Feet Below Grade	7/13/2024	10/14/2028	4.25	$259,066
SR Pd 5	Subgrade Structure Removal Below – 3 Feet	10/14/2028	12/5/2031	3.14	$441,547
SR Pd 6	Final Site Restoration and Lease Termination	5/6/2050	12/15/2051	1.60	$103,545
Account Total				**17.86**	**$1,022,804**
Grand Total					**$4,411,246**

In addition, SCE will summarize the recorded costs for completed decommissioning activities in these categories in its periodic reasonableness review filings to facilitate the

Commission's reviews. SCE will also summarize the costs incurred for activities that were not completed during the period in these categories to facilitate the Commission's tracking of ongoing decommissioning costs.

3. Anticipated Disbursements

SCE will also provide a list of work to be performed in each major cost category during the period to be covered by that advice letter, the estimated disbursement amounts required to cover the cost:

- List of activities for which trust funds are requested during the period
- Estimated amount to be spent for each activity during the period
- Correlation of the activities and costs to the most recent cost study, including nominal dollar adjustment
- Explanation for any differences (amount and timing) from the most recent cost study estimate

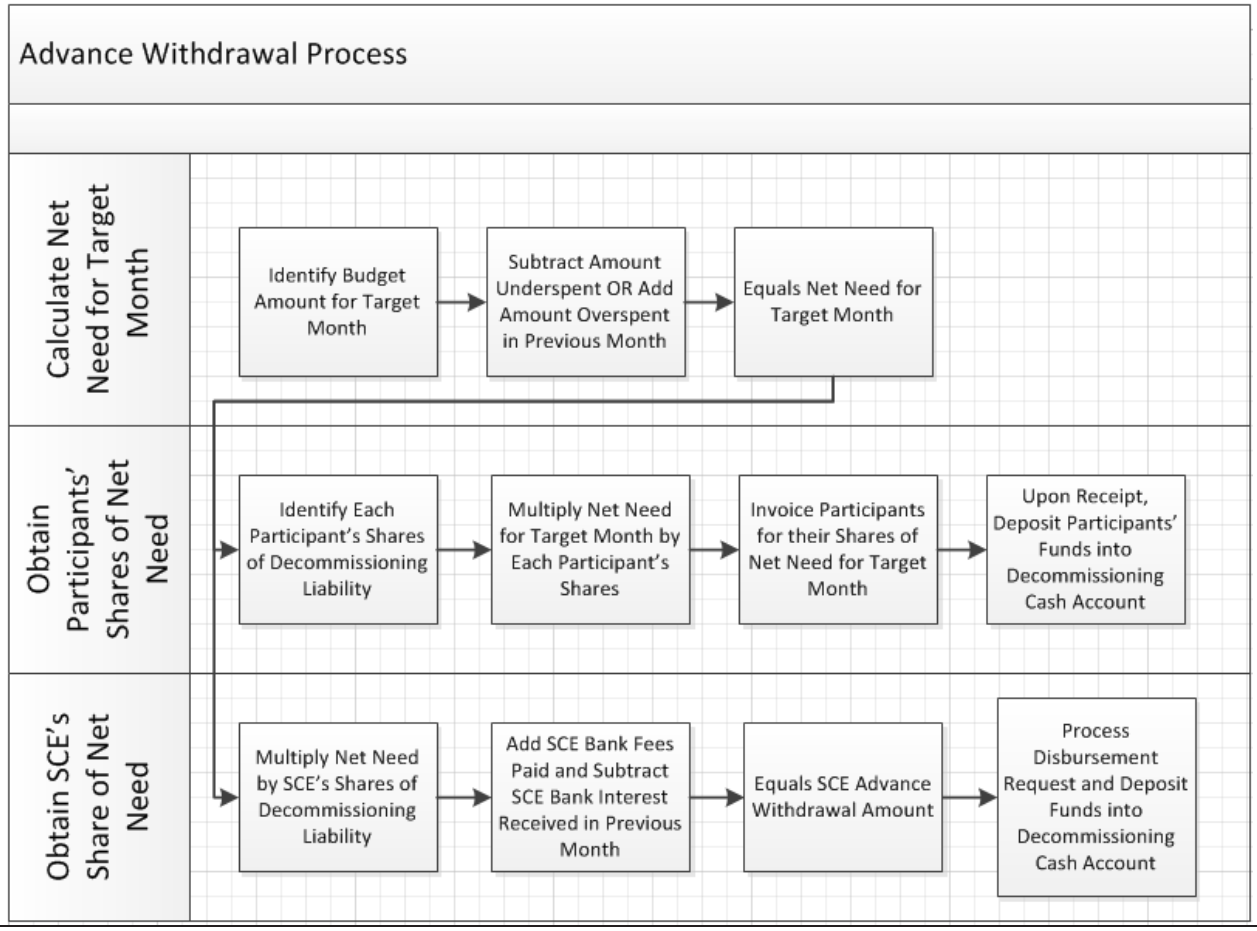
4. Comparison Charts

SCE also will provide a graph that tracks the forecasted and actual decommissioning expenditures from project inception through the end of the period covered by the previous advice letter, and a forecast of future project expenditures.

5. Advance Withdrawal Process

Under Section 2.01(5) of the SCE Qualified and Nonqualified Nuclear Decommissioning Master Trust Agreements (MTAs), SCE may request advance withdrawals from the trusts up to one month before expected payments for decommissioning costs are made. Amounts withdrawn shall be deposited in an interest-bearing account, and interest earned shall be used to pay for decommissioning costs. SCE plans to seek Commission approval of periodic advance withdrawals consistent with its MTAs in accordance with the following process, which is illustrated in Figure III-3 below:

Figure III-3
Advance Withdrawal Process



- Calculate Net Need for Target Month (TM)
  - ° Calculate Gross Need for Target Month (Budgeted Costs)
  - ° Perform True-Up for Previous Month (PM)
    - → Net Need (PM) less Actual Spend (PM) = Unencumbered Funds (PM)
  - ° Net Need (TM) = Gross Need (TM) less Unencumbered Funds (PM)
- Calculate Participant Shares of Net Need for Target Month
- SCE will invoice the Participants for their respective shares of the Net Need (TM) and deposit their funds received into SONGS Decommissioning Cash Account for payment of decommissioning costs.
- Calculate SCE Advance Funding Request for Target Month

→ SCE AFR (TM) = SCE Share Net Need (TM) less SCE Interest received (PM) plus SCE Bank Fees incurred (PM)

- Obtain SCE Internal Approvals
- Issue Direction Letter to SCE Trust for SCE Advance Funding Request (TM)
- Receive funds from SCE Trust and deposit into SONGS Decommissioning Cash Account for payment of decommissioning costs.

B. Reasonableness Reviews of Costs for Completed Decommissioning Activities

The advice letter process described above would facilitate ongoing Commission oversight of SONGS 2 & 3 decommissioning expenditures relative to the project budget and schedule on a chronological basis. It would not, however, take the place of Commission's established process for performing reasonableness reviews of decommissioning expenditures.

SCE proposes in this Application that the Commission authorize SCE to file an application seeking an annual reasonableness review of the costs for decommissioning activities that were completed during the previous calendar year. This process, if approved, will allow for a more frequent review cycle than provided in the NDCTP, so that the Commission can review costs sooner and SCE can minimize the amount of spending at risk, pending a Commission reasonableness review. SCE further proposes that the Commission would continue to perform reasonableness reviews in the NDCTP for the costs of decommissioning activities that were completed during the calendar year that was completed before each new NDCTP is initiated.

1. Reasonableness Review Standard

In D.10-07-047, page 45, the Commission reaffirmed its standard of reasonableness review for decommissioning expenditures other than those incurred during Phase I of the SONGS 1 decommissioning project:

> [W]e define reasonableness for decommissioning expenditures consistent with prior Commission findings; i.e., that the reasonableness of a particular management action depends on what the utility knew or should have known at the time the managerial decision was made.

SCE anticipates that the Commission will apply this standard in its reasonableness reviews of completed SONGS 2 & 3 decommissioning project activities, and to the periodic updates to the SONGS 2 & 3 decommissioning cost estimates, as discussed below.

2. Reasonableness Reviews of Completed Work

In D.03-10-015, the Commission adopted the following criteria for determining the completion of decommissioning work:

- A *decontamination and dismantling* activity is complete if: (1) the activity has been completed in its entirety, or (2) the activity has eliminated a specifically identifiable decommissioning liability. Decommissioning liability is eliminated when material is removed from the SONGS [1] site.
- *For ISFSI design, licensing, and construction work*, completed work satisfied a defined regulatory activity or construction milestone.[32]

All subsequent Commission reasonableness reviews for nuclear decommissioning costs (SONGS 1 and Humboldt Bay 3) have been based on completed decommissioning activities consistent with the above criteria. SCE anticipates that the Commission will apply the same criteria for completed work on the SONGS 2 & 3 decommissioning project. As discussed above, to facilitate the Commission's reasonableness reviews, SCE will submit the costs for completed decommissioning activities summarized by the major cost categories shown in Table X-2.

3. SCE Will Refresh "To Go" Decommissioning Cost Estimate Triennially in NDCTPs

Under California Public Utilities Code section 8326, SCE is required to periodically revise the decommissioning cost estimate to include:

- A description of changes in regulation, technology, and economics affecting the estimate of costs
- A description of additions and deletions to the nuclear facilities, and

[32] See A.02-03-039, Exhibit SCE-1, p. 13.

- Upon request of the Commission, other information required by the Nuclear Regulatory Commission regarding decommissioning costs

To comply with this requirement, SCE would provide in the NDCTP or other proceeding authorized by the Commission periodic updates to the decommissioning cost estimate that would provide the estimated cost and schedule for all decommissioning activities that had not yet been completed at the time of the submittal. Previously completed decommissioning activities would no longer be included in the updates, and activities completed during the most recent triennial period would be subject to Commission reasonableness review, unless the Commission reviewed such costs in another authorized proceeding. In the event there are material changes in an updated decommissioning cost estimate, (e.g., the updated cost estimate for an activity is based on contract pricing versus prior estimated cost), SCE would bear the burden of proof to demonstrate the reasonableness of such changes.

4. SCE Will Submit Updated SONGS 2 & 3 Decommissioning Cost Estimate for Remaining Costs in the Next NDCTP

SCE currently anticipates that SONGS 2 & 3 physical decontamination and dismantling activities will commence in January 2016. SCE also anticipates that it will submit its application and testimony for the next NDCTP during early 2016. By that time, it is likely that SCE will have entered into contracts for the retention of a DOC and for some of the initial major decommissioning activities, such as: (1) the primary systems decontamination project, (2) the reactor vessels internals segmentation project, and (3) the transfer of all remaining fuel assemblies, control element assemblies (CEAs), and other highly radioactive materials from the spent fuel pools to the ISFSI. The latter project will include the expansion of the ISFSI pad, security, and lighting systems; the fabrication and delivery of the remaining fuel storage modules and canisters, and the loading, sealing, transportation, and installation of the canisters into the ISFSI.

The SONGS 2 & 3 DCE that is being submitted with this Application includes estimated costs for these initial decommissioning activities. Because the next NDCTP will establish the basis upon which the Commission will perform its reasonableness review, an updated SONGS 2

& 3 decommissioning cost estimate will be submitted in the next NDCTP that will include all contract pricing that is available at the time of the submittal.

5. Proposal for Annual Reasonableness Review Standard for SONGS 2 & 3 Decommissioning Costs

Assuming the Commission authorizes SCE to submit updated decommissioning cost estimates for remaining costs and annual reasonableness review applications for completed decommissioning activities, SCE requests that the Commission consider a slightly modified standard for annual reasonableness reviews. Such a standard would simultaneously impose greater rigor upon SCE to accurately estimate the costs of decommissioning work that is scheduled to be completed during each calendar year, and facilitate the reasonableness reviews by the Commission.

In each annual update to the decommissioning cost estimate for remaining costs, SCE would provide a summary level forecast of the costs for each decommissioning activity that is scheduled to be completed during the following calendar year, separated into its corresponding decommissioning cost category and period, as shown in Table III-2 above. SCE would further summarize the estimated costs for work to be completed in each category and period by distributed and undistributed costs. This would provide significantly improved granularity for the Commission to use as a basis for the reasonableness reviews of all such estimated costs. In exchange, SCE requests that if the costs recorded for completed activities in a particular cost category and period during the corresponding calendar year are bounded by the estimated costs for those activities, SCE's expenditures for those activities would be presumed reasonable. Any entity claiming that SCE acted unreasonably would, therefore, bear the burden of proving SCE acted unreasonably. SCE would be responsible for proving that material variances from the recently approved decommissioning cost estimate for remaining costs are reasonable.

6. Reasonableness Review of Costs for Decommissioning Activities Completed in 2014

Ordering Paragraph No. 4 of the final decision (D.14-11-040) approving the settlement for the San Onofre Order Instituting Investigation (OII), states:

> Within sixty (60) days of the effective date of the decision, Southern California Edison Company and San Diego Gas & Electric Company shall each file an application to recover costs for 2014 operations and maintenance and non-operations and maintenance expenses at the San Onofre Nuclear Generating Station, whether requesting recovery in general rates or the decommissioning trust.

SCE anticipates filing this application in late January 2015, subject to the effective date of the decision. However, because the accounting of all costs recorded in 2014 is unlikely to have been finalized in January 2015, SCE will request permission to submit late-filed exhibits providing the final 2014 recorded cost information, in accordance with the procedural schedule ultimately adopted by the Commission for that application.

IV.

OTHER DECOMMISSIONING ISSUES

A. Efforts to Negotiate Site Restoration Requirements

As discussed above, SONGS is situated on an easement granted by the U. S. Navy. This easement currently provides that the Navy can require SCE to remove all improvements in their entirety upon termination of the easement. Most other U.S. nuclear facilities are located on privately-owned land. At these facilities, after site decontamination is completed, any remaining structures and foundations below 3-feet underground are typically abandoned in place, resulting in the avoidance of significant decommissioning costs.

The SONGS 2 & 3 offshore circulating water conduits are subject to an easement lease granted by the California State Lands Commission (CSLC). This easement lease currently requires that SCE excavate and remove these conduits. In 2005, however, the CSLC agreed to amend a similar easement for the SONGS 1 offshore conduits to allow for the partial removal (of vertical structures) and abandonment in place of conduits.

As stewards of its customers' decommissioning funds for SONGS 2 & 3, SCE desires to fulfill the decommissioning obligation in a cost-effective, environmentally responsible manner. SCE, therefore, desires to amend the Navy and CSLC easements to allow for end states for the onshore and offshore SONGS 2 & 3 sites that meet both these objectives.

1. U.S. Navy Site Easement – Onshore Site

In D.10-07-047, Ordering Paragraph No. 10, the Commission issued the following order:

> Within one year of the date of this decision, the Commission's Executive Director, on behalf of the entire California Public Utilities Commission, shall make a formal written request along with Southern California Edison Company and San Diego Gas & Electric Company, to the United States Department of the Navy to clarify the applicable site restoration and remediation standards that will be required to terminate the San Onofre Nuclear Generating Station site lease, and shall meet and confer with the United States Department of the Navy to attempt execution of an amended site lease contract that explicitly reflects such clarified standards, prior to the development of the San Onofre Nuclear Generating Station cost estimates for the next Nuclear Decommissioning Cost Triennial Proceeding. Southern California Edison Company and San Diego Gas & Electric Company shall report to the Commission any responsive information received by either utility in their next Nuclear Decommissioning Cost Triennial Proceeding application.

On July 1, 2011, Mr. Paul Clanon, Executive Director of the California Public Utilities Commission, submitted a formal written request to Mr. Christopher Haskett, Manager, Navy Facilities Engineering Command Southwest (NAVFAC), on behalf of SCE and SDG&E, to request "clarification…regarding the applicable site restoration and remediation standards that will be required to terminate SCE/SDG&E' Grant of Easement (Easement) for the SONGS site…" and to request "an amendment of the Easement to reflect agreed upon modified standards." This formal request initiated discussions between NAVFAC and the Utilities (SCE and SDG&E) regarding the requested clarifications. The Navy indicated during initial discussions that they would consider the concept of an amendment, and they invited SCE to submit proposed language.

In light of the changed circumstances arising from the permanent retirement of SONGS 2 & 3 on June 7, 2013, the SONGS participants have re-engaged NAVFAC and Camp Pendleton representatives regarding possible modifications to the site easement. SCE has submitted language for the Navy's consideration, and discussions regarding an amendment remain ongoing. Until such an amendment to the easement is executed, however, it would be premature to assume that any of the easement's terms will be changed, or to modify the scope of the SONGS 2 & 3 DCE based on a desired or assumed, but still speculative, outcome. The ES/CBI DCE, therefore, includes the estimated costs to remove all improvements as currently required in the site easement.

2. <u>California State Lands Commission Easement – Offshore Conduits</u>

Prior to the construction of SONGS 1 and SONGS 2 & 3, respectively, the CSLC granted easements under which SCE and SDG&E were authorized to use offshore lands for the

circulating water conduits required to connect the nuclear generating units to their ultimate heat sink, the Pacific Ocean.[33] Both easements required the complete excavation and removal of these conduits after the permanent closure of the plants as a condition of termination of the easements.

The Utilities permanently closed SONGS 1 in 1992 and placed the unit in a SAFSTOR configuration shortly thereafter. Several years later, in 2004, while decommissioning SONGS 1, the Utilities applied to the CSLC for authorization to excavate and remove the SONGS 1 conduits. In response to the Utilities' application, the CSLC initiated an environmental review, which identified that the environmentally preferable alternative would be to abandon the conduits in place buried beneath the seafloor, and allow them to infill with seafloor material after removing all structures that protruded from the tops of the conduits through the seafloor. Based on that environmental review, CSLC granted an amendment to the easement for the SONGS 1 conduits to allow the Utilities to decommission them in that manner, resulting in a reduced work scope and cost.

The SONGS 2 & 3 offshore conduits are larger than the SONGS 1 conduits, and have more vertical structures. Based on the current easement for the SONGS 2 & 3 conduits, w hich requires the SONGS Participants to excavate and remove them, the estimated decommissioning cost is approximately $95 million (100% share, 2014 dollars). SCE plans to seek an amendment to the easement regarding the decommissioning of the SONGS 2 & 3 conduits. Therefore, the SONGS Participants do not yet know whether the CSLC will prescribe an amendment to this easement similar to the amendment granted to the easement for the SONGS 1 conduits, or if so, how other alternatives would impact work scope and cost.

[33] SCE and SDG&E owned 80% and 20% shares of SONGS 1, respectively.

Appendix A

Appendix A-1

Decommissioning Cost Estimate (DCE)

SOUTHERN CALIFORNIA EDISON®
An *EDISON INTERNATIONAL*® Company

Thomas J. Palmisano
Vice President & Chief Nuclear Officer

10 CFR 50.82(a)(4)(i)

September 23, 2014

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington D.C. 20555-0001

Subject: **Docket Nos. 50-361 and 50-362,**
San Onofre Nuclear Generating Station, Units 2 and 3
Site Specific Decommissioning Cost Estimate

References:

1. Letter from P. T. Dietrich (SCE) to the U.S. Nuclear Regulatory Commission dated June 12, 2013; Subject: Certification of Permanent Cessation of Power Operations San Onofre Nuclear Generating Station, Units 2 and 3

2. Letter from Thomas J. Palmisano (SCE) to the U.S. Nuclear Regulatory Commission dated February 13, 2014; Subject: Access to Nuclear Decommissioning Trust Funds, San Onofre Nuclear Station, Units 2 and 3

3. Letter from Richard C. Brabec (SCE) to the U.S. Nuclear Regulatory Commission dated March 12, 2014; Subject: Access to Decommissioning Trust Funds, San Onofre Nuclear Generating Station Units 2 and 3

4. Letter from Richard C. Brabec (SCE) to the U.S. Nuclear Regulatory Commission dated March 31, 2014; Subject: 10 CFR 50.75(f)(1) Decommissioning Funding Status Report, San Onofre Nuclear Generating Station Units 2 and 3

Dear Sir or Madam:

On June 12, 2013, in accordance with 10 CFR 50.82(a)(1)(i), Southern California Edison (SCE) submitted a letter to the U.S. Nuclear Regulatory Commission (NRC) (Reference 1) certifying the permanent cessation of operations at San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. In accordance with 10 CFR 50.54(bb) and 10 CFR 50.82(a)(4)(i), SCE is required to submit an Irradiated Fuel Management Plan (IFMP), Site Specific Decommissioning Cost Estimate (DCE) and Post-Shutdown Decommissioning Activities Report (PSDAR) within two years of permanent cessation of operations.

The SONGS, Units 2 and 3 DCE is attached. The SONGS, Units 2 and 3 IFMP and PSDAR are being concurrently submitted under separate cover letters. The DCE provides more current estimates of annual cash flow than were previously provided in the Nuclear Decommissioning Trust Fund Exemption Request (References 2 and 3) and annual funding assurance update (Reference 4). Future filings with the California Public Utilities Commission will be based on the SONGS, Units 2 and 3 DCE and subsequent revisions.

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The descriptions of decommissioning activities and phases in the DCE are consistent with those described in the PSDAR. Both the DCE and PSDAR represent SCE's current plans and are subject to change as the project progresses. Much of the third-party contracting activities associated with decommissioning are underway but have not been finalized. As contracts are finalized and SCE progresses through the actual work of the decommissioning project, various risks will be realized or avoided and contingencies adjusted, accordingly.

Changes to significant details will be included in subsequent revisions to the DCE as required by 10 CFR 50.54(bb). Financial assurance information will be provided on an annual basis as required by 10 CFR 50.75(f)(1).

This letter does not contain any new commitments.

If there are any questions or if additional information is needed, please contact me or Ms. Andrea Sterdis at (949) 368-9985.

Sincerely,

Enclosure: San Onofre Nuclear Generating Station Units 2 and 3 Site Specific Decommissioning Cost Estimate

cc: M. L. Dapas, Regional Administrator, NRC Region IV
T. J. Wengert, NRC Project Manager, San Onofre Units 2 and 3 Decommissioning
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2014 Decommissioning Cost Analysis of the San Onofre Nuclear Generating Station Units 2 & 3

Project No. 164001 **Rev 1**

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☐ New Report
☐ Title Change
☒ Report Revision
☐ Report Rewrite

Effective Date Sept 5, 2014

SONGS UNIT-2 AND UNIT-3
DECOMMISSIONING COST ESTIMATE
DESCRIPTION OF REVISION

MAJOR REVISION _____ MINOR REVISION__X_____

REVISION NUMBER – 1 EFFECTIVE DATE - 9/5/2014

The revisions contained in this MINOR REVISION to the SONGS Unit-2 and Unit-3 Decommissioning Cost Estimate are minor in nature and do not revise or otherwise impact the content or results of the cost estimate.

ITEM-1

A new Appendix-F is added to the DCE at the request of San Diego Gas & Electric Company (SDG&E) in order to provide information regarding its internal decommissioning costs which it expects to incur and to fund on its own behalf in addition to its 20% share of the Decommissioning Cost Estimate.

ITEM-2

The APPENDICES section of the DCE Table of Contents is revised to include the new APPENDIX-F SDG&E SONGS Decommissioning Costs (100%)

ITEM-3

Within the narrative section of the DCE the various appearances of the term “utility staff” have been revised to include a parenthetic statement “(Licensee)” to clarify that the utility staff means the NRC Licensee.

ITEM-4

On Table 6-1 “Cost and Schedule Summary” the title block for SPENT FUEL is revised to include “(72.30)” since this section also contains cost elements associated with ISFSI decommissioning.

ITEM-5

Added new SDG&E footnote for Table 1-1 referring to Appendix F

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ACRONYMS AND ABBREVIATIONS

AHSM	Advanced Horizontal Storage Modules
AIF	Atomic Industrial Forum
ALARA	As Low As Reasonably Achievable
ARO	Asset Retirement Obligation
CFR	Code of Federal Regulations
CPM	Critical Path Method
DAW	Dry Active Waste
DGC	Decommissioning General Contractor
DOE	U.S. Department of Energy
DSC	Dry Shielded Canister
ESS	Essential System
FEMA	Federal Emergency Management Agency
FSS	Final Status Survey
FTE	Full Time Equivalent
GSA	U.S. General Services Administration
GTCC	Greater Than Class C
HP	Health Physics
ISFSI	Independent Spent Fuel Storage Installation
LLRW	Low-Level Radioactive Waste
LLW	Low Level Waste
LLWPA	Low-Level Waste Policy Act
LOP	Life-of-Plant
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MPC	Multi-Purpose Canister
MWt	Megawatt thermal
NON	Non-Essential System
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
ORISE	Oak Ridge Institute for Science and Education
PCB	Polychlorinated Biphenyl
PGE	Pacific Gas & Electric
PSDAR	Post-Shutdown Decommissioning Activities Report
PWR	Pressurized Water Reactor
RIF	Reduction In Force
SCE	Southern California Edison
SONGS	San Onofre Nuclear Generating Station
STRUCT	Structure
TCEQ	Texas Commission on Environmental Quality
WBS	Work Breakdown Structure
WCS	Waste Control Specialists LLC
UCF	Unit Cost Factor

1.0 EXECUTIVE SUMMARY

This report presents the 2014 Decommissioning Cost Estimate (DCE) Study of the San Onofre Nuclear Generating Station (SONGS) Units 2 & 3, hereinafter referred to as the 2014 Cost Study. The San Onofre Nuclear Generating Station is operated by the Southern California Edison Company (SCE).

On June 7, 2013, SCE announced its intention to permanently cease power generation operations and shut down SONGS Units 2 & 3. Units 2 & 3 had not produced power since January 9, 2012 and January 31, 2012, respectively. SCE now has the responsibility to decommission the site. In January 2014 SCE contracted with Energy*Solutions* to evaluate decommissioning alternatives and assist in the development of a detailed project schedule and DCE to support the preparation and submittal of a Post Shutdown Decommissioning Activities Report (PSDAR) in accordance with 10 CFR 50.82(a)(4)(i), which requires that a PSDAR be submitted within two years following the permanent cessation of operations.

This study has been performed to furnish an estimate of the costs for: (1) decommissioning SONGS Units 2 & 3 to the extent required to terminate the plant's operating license pursuant to 10 CFR 50.75(c); (2) post-shutdown management of spent fuel until acceptance by the U.S. Department of Energy (DOE) pursuant to 10 CFR 50.54(bb); (3) demolition of uncontaminated structures and restoration of the site in accordance with the United States Department of Navy Grant of Easement (Ref. No. 14); and the California State Lands Commission Easement Lease (Ref. No. 15); and (4) Independent Spent Fuel Storage Installation (ISFSI) decommissioning pursuant to 10 CFR 72.30. This study includes SCE's actual costs incurred in the transitional periods following cessation of permanent operations on June 7, 2013 until December 31, 2013. Costs presented herein commencing on January 1, 2014 are estimated.

SCE's December 2012 testimony to the CPUC provided the basis for the current spent fuel management costs. SCE is continuing to review available information from the DOE to determine if the DOE start date assumption of 2024 requires updating. The DCE will be revised accordingly as new information becomes available.

Accordingly, the costs and schedules for all activities are segregated for regulatory purposes as follows: costs for "License Termination" (10 CFR 50.75(c)); costs for "Spent Fuel Management" (10 CFR 50.54(bb)); costs for "Site Restoration" (clean removal and site restoration) final site conditions; and costs for "ISFSI Decommissioning" (10 CFR 72.30). Energy*Solutions* has established a Work Breakdown Structure (WBS) and cost accounting system to differentiate between these project accounts.

This study analyzes the following technical approach to decommissioning as defined by SCE:

- DECON methodology.
- Permanent cessation of operations on June 7, 2013.
- Termination of spent fuel pool operation six years after permanent shutdown.
- Spent fuel will be stored in Multi-Purpose Canisters (MPCs) at an on-site Independent Spent Fuel Storage Installation (ISFSI).

- A dry transfer facility will not be necessary for transfer of SNF canisters for transport.
- DOE begins accepting spent fuel from the industry in 2024 and completes the removal of all SONGS spent fuel by 2049.
- Decommissioning will be performed by a Decommissioning General Contractor (DGC) with oversight by the SONGS participants.
- Incorporation of Life-of-Plant (LOP) Disposal Rates for Class A Low-Level Radioactive Waste (LLRW).
- Incorporation of disposal rates for Class B and C LLRW based on recent quotes for disposal at the Waste Control Specialists LLC (WCS) site in Andrews County, Texas.

The cost estimate results are provided in Table 1-1. Table 1-1 gives License Termination costs (which correspond to 10 CFR 50.75 (c) requirements); Spent Fuel Management costs (which correspond to 10 CFR 50.54 (bb) requirements); and Site Restoration costs (which correspond to activities such as clean building demolition and site grading and end-state preparation as required under the Site Easement).

Table 1-1
Decommissioning Cost Summary[12]
(2014 Dollars in Thousands)

Cost Account	Unit 2	Unit 3	Total
License Termination 50.75(c)	$1,034,230	$1,078,016	**$2,112,246**
Spent Fuel Management 50.54(bb)	$623,209	$652,987	**$1,276,196**
Site Restoration	$423,297	$599,507	**$1,022,804**
Totals	**$2,080,735**	**$2,330,511**	**$4,411,246**

The estimate is based on site-specific plant systems and buildings inventories. These inventories, and Energy*Solutions*' proprietary Unit Cost Factors (UCFs), were used to generate required manhours, activity schedule hours and costs, and waste volume, weight, and classification. Based on the activity schedule hours and a decommissioning activities analysis, a Critical Path Method (CPM) analysis was performed to determine the decommissioning schedules. These schedules reflect the effects of sequenced activity-dependent or distributed decommissioning elements such as planning and preparations, major component removal, building decontamination, and spent fuel shipping. The schedules are divided into project phases (periods) and presented, as noted previously, by cost account "License Termination," "Spent Fuel Management," or "Site Restoration." The summary is shown in Figure 1-1, and may also be found in Section 6.0 of this report.

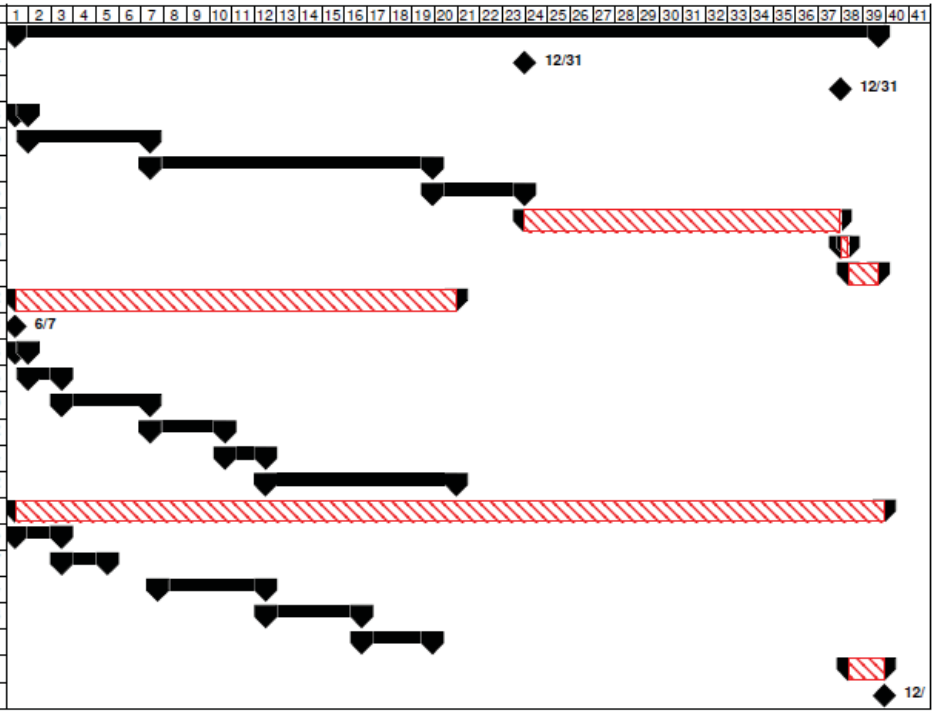
[1] In addition, the Decommissioning Cost Summary in Table 1-1 does not include separate internal costs that San Diego Gas & Electric Company (SDG&E) has indicated that it expects to incur. SDG&E provides information regarding these costs in Appendix F

[2] Rows and columns may not add correctly due to rounding.

Figure 1-1
Summary Schedule

DECON with Dry Storage, 2013 Shutdown and DOE Acceptance in 2024

Task Name	Start	Finish
Post-Shutdown Spent Fuel Management	06/07/2013	09/08/2051
Spent Fuel Shipping Complete - Unit 1	12/31/2035	12/31/2035
Spent Fuel Shipping Complete - Units 2 & 3	12/31/2049	12/31/2049
SNF Pd 1 - Spent Fuel Management Transition	06/07/2013	12/31/2013
SNF Pd 2 - Spent Fuel Transfer to Dry Storage	1/1/2014	06/01/2019
SNF Pd 3 - Dry Storage During Decommissioning - Units 1, 2 and 3	06/01/2019	12/05/2031
SNF Pd 4 - Dry Storage Only - Units 1, 2 and 3	12/05/2031	12/31/2035
SNF Pd 5 - Dry Storage Only - Units 2 and 3	12/31/2035	12/31/2049
SNF D&D Pd 1 - ISFSI D&D Planning	12/31/2049	05/06/2050
SNF D&D Pd 2 - ISFSI D&D	05/06/2050	09/08/2051
Part 50 License Termination	06/07/2013	12/24/2032
Announcement of Cessation of Operations (June 7, 2013)	06/07/2013	06/07/2013
Decon Pd 1 - Transition to Decommissioning	06/07/2013	12/31/2013
Decon Pd 2 - Decommissioning Planning and Site Modifications	1/1/2014	06/30/2015
Decon Pd 3 - Decommissioning Preparations and Reactor Internals Segmentation	06/30/2015	06/01/2019
Decon Pd 4 - Plant Systems and Large Component Removal	06/01/2019	09/24/2022
Decon Pd 5 - Building Decontamination	09/24/2022	07/13/2024
Decon Pd 6 - License Termination During Demolition	07/13/2024	12/24/2032
Site Restoration	06/07/2013	12/15/2051
SR Pd 1 - Transition to Site Restoration	06/07/2013	06/30/2015
SR Pd 2 - Building Demolition During Decommissioning	06/30/2015	07/11/2017
SR Pd 3 - Subsurface Demolition Engineering and Permitting	10/01/2019	07/13/2024
SR Pd 4 - Building Demolition to 3 Feet Below Grade	07/13/2024	10/14/2028
SR Pd 5 - Subgrade Structure Removal Below -3 Feet	10/14/2028	12/05/2031
SR Pd 6 - Final Site Restoration and Lease Termination	05/06/2050	12/15/2051
Final Easement Termination	12/15/2051	12/15/2051



2.0 INTRODUCTION

2.1 Study Objective

This report presents the 2014 Decommissioning Cost Estimate Study of the San Onofre Nuclear Generating Station (SONGS) Units 2 & 3, hereinafter referred to as the 2014 Cost Study. The San Onofre Nuclear Generating Station is owned by the Southern California Edison Company (SCE), San Diego Gas & Electric Company, and the City of Riverside. A former owner, the City of Anaheim, also has liability for decommissioning. SCE has provided the following information regarding the liability by owner for SONGS decommissioning costs:

Cost Categories	Owners			
	SDG&E	Riverside	Anaheim	SCE
SONGS 1	20%	0%	0%	80%
SONGS 2	20%	1.79%	2.4737%	75.7363%
SONGS 3	20%	1.79%	2.4625%	75.7475%
Common Facilities (Units 2 & 3)	20%	1.79%	2.4681%	75.7419%
SONGS 1 Fuel	20%	0%	0%	80%
SONGS 2/3 Fuel	20%	1.79%	2.3398%	75.8702%
ISFSI Maintenance and D&D	20%	1.6066%	2.2686%	76.1248%
San Diego Switchyard	100%	0%	0%	0%
Edison Switchyard	0%	0%	0%	100%
Interconnection Facilities	50%	0%	0%	50%
Nuclear Fuel Cancellation Charges	20%	1.79%	0%	78.21%

This study has been performed to support the development of a site-specific PSDAR and furnish an estimate of the costs for (1) decommissioning SONGS Units 2 & 3 to the extent required to terminate the plant's operating license, (2) post-shutdown management of spent fuel until acceptance by the U.S. Department of Energy (DOE), (3) demolition of uncontaminated structures and restoration of the site in accordance with the U.S. Department of Navy Grant of Easement (Ref. No. 14), and the California State Lands Commission Easement Lease (Ref. No. 15), and (4) Independent Spent Fuel Storage Installation (ISFSI) decommissioning. This study also includes SCE's actual costs incurred in the transitional periods following cessation of permanent operations until December 31, 2013. Estimated costs begin on January 1, 2014.

The study methodology follows the basic approach originally presented in the Atomic Industrial Forum/National Environmental Studies Project Report AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Ref. No. 2). The report was prepared in accordance with Nuclear Regulatory Commission (NRC) Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," (Ref. No. 3). The estimate is based on compliance with current regulatory requirements and proven decommissioning technologies.

NRC requirements, set forth in Title 10 of the Code of Federal Regulations (CFR), differentiate between the post-shutdown costs associated with the decommissioning of the nuclear plant facility, those associated with storage of spent fuel on-site, and those associated with the decommissioning of the spent fuel storage facility. The Code of Federal Regulations, however, does not address the entire scope of the decommissioning liability for each nuclear facility. 10 CFR 50.75(c) requires funding by the licensee(s) of the facility for the decommissioning program, but specifically excludes the cost of removal and disposal of spent fuel and structures that do not require disposal as radioactive material. 10 CFR 50.75(c) also excludes the cost of site restoration activities that do not involve the removal of residual radioactivity necessary to terminate the NRC license(s). 10 CFR 50.54 (bb) requires funding by the licensee(s) "for the management of all irradiated fuel at the reactor upon expiration of the reactor operating license(s) until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository." 10 CFR 72.30 requires funding for decommissioning of the on-site spent fuel storage facility after the irradiated fuel is accepted by the DOE.

In addition to the NRC Decommissioning requirements described above, the Site Easements require the demolition and removal of all improvements installed on both the on-shore and off-shore sites, including all substructures regardless of depth, and site restoration to the satisfaction of the Grantors.

This study analyzes the following technical approach to decommissioning as defined by SCE and the co-owners:

- DECON methodology.
- Permanent cessation of operations and commencement of decommissioning planning on June 7, 2013.
- Termination of spent fuel pool operation within six years after permanent shutdown.
- Spent fuel will be stored in transportable Multi-Purpose Canisters (MPCs) at an on-site Independent Spent Fuel Storage Installation (ISFSI).
- A dry transfer facility will not be necessary for transfer of SNF canisters for transport.
- DOE begins accepting spent fuel from the industry in 2024 and completes the removal of all SONGS spent fuel by 2049.
- Decommissioning will be performed by a Decommissioning General Contractor (DGC) with oversight by the SONGS participants.

In addition, this study includes the following assumptions:

- Incorporation of Energy*Solutions*' Life-of-Plant (LOP) Disposal Rates for Class A Low-Level Radioactive Waste (LLRW), (Ref. No. 7).
- Incorporation of disposal rates for Class B and C LLRW based on recent quotes for disposal at the Waste Control Specialists LLC (WCS) site in Andrews County, Texas.

2.2 Regulatory Framework

Provisions of current laws and regulations affecting decommissioning, waste management, and spent fuel management are as follows:

1. NRC regulations require a license for on-site storage of spent fuel. Wet storage in a spent fuel pool is authorized by a facility's 10 CFR Part 50 license. On-site dry storage of spent fuel at an Independent Spent Fuel Storage Installation (ISFSI) is licensed by either: (a) the general license set forth in 10 CFR 72.210, which requires that a Part 50 license be in place; or (b) a site-specific ISFSI license issued pursuant to 10 CFR Part 72.

2. 10 CFR 50.75(c) requires funding by the licensee(s) of the facility for decommissioning.

3. 10 CFR 50.54 (bb) requires the licensee(s), within two years following permanent cessation of operation of the reactor or five years before expiration of the operating license(s), whichever occurs first, to submit written notification to the NRC for its review and preliminary approval of the program by which the licensee intends to manage and provide funding "for the management of all irradiated fuel at the reactor upon expiration of the reactor operating license until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository."

4. 10 CFR 961 (Ref. No. 4), Appendix E, requires spent fuel to be cooled for at least five years before it can be accepted by DOE as "standard spent fuel."

5. 10 CFR 72.30 requires funding by the licensee(s) for termination of the ISFSI license.

<u>Decommissioning Alternatives</u>

The three basic methods for decommissioning are DECON, SAFSTOR, and ENTOMB, which are summarized as follows:

1. DECON: The equipment, structures, and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license after cessation of operations.

2. SAFSTOR: The facility is placed in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to levels that permit license termination. NRC regulations require decommissioning to be completed within 60 years of cessation of operation.

3. ENTOMB: Radioactive structures, systems, and components are encased in a structurally long-lived substance, such as concrete. The entombed structure is appropriately maintained and monitored until radioactivity decays to a level that permits termination of the license. Since entombment will exceed the requirement

for decommissioning to be completed within 60 years of cessation of operation, NRC handles entombment requests on a case-by-case basis.

Post-Shutdown Spent Fuel Management Alternatives

The options for long-term post-shutdown spent fuel management currently available to power plant operators are (1) wet storage consisting of continued maintenance and operation of the spent fuel pool, and (2) dry storage consisting of transfer of spent fuel from the fuel pool to on-site dry storage modules after a cooling period or any combination of the two as is the present case at SONGS. Maintaining the spent fuel pool for an extended duration following cessation of operations prevents termination of the Part 50 license and typically has a higher annual maintenance and operating cost than the dry storage alternative. Transfer of spent fuel to an ISFSI requires additional expenditures for purchase and construction of the ISFSI and dismantlement and disposal of the ISFSI following completion of spent fuel transfer to DOE.

The spent fuel shipping schedules furnished by SCE for this study are based on projections that DOE will commence accepting spent fuel from domestic commercial nuclear power plants in 2024, and that the DOE will accept spent fuel at the rate published in DOE's July 2004 Acceptance Priority Ranking & Annual Capacity Report (DOE/RW-0567) (Ref. No. 12). These assumptions are in accordance with SCE testimony to the Public Utilities Commission of the State of California (Ref. No. 17). Additionally, SCE is reviewing available information from the DOE to determine if the DOE start date assumption requires updating. The DCE will be revised accordingly as new information becomes available.

3.0 STUDY METHODOLOGY

3.1 General Description

Energy*Solutions* maintains a proprietary decommissioning cost model based upon the fundamental technical approach established in AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," dated May 1986 (Ref. No. 2). The cost model has been updated frequently in accordance with regulatory requirements and industry experience. The cost model includes elements for estimating distributed and undistributed costs. Distributed costs are activity specific and include planning and preparation costs as well as costs for decontamination, packaging, disposal, and removal of major components and systems. For example, costs for the segmentation, packaging, and disposal of the reactor internals are distributed costs. Undistributed costs, sometimes referred to as collateral costs, are typically time dependent costs such as utility (Licensee) and decommissioning general contractor staff, property taxes, insurance, regulatory fees and permits, energy costs, and security staff.

The methodology for preparing cost estimates for a selected decommissioning alternative requires development of a site-specific detailed work activity sequence based upon the plant inventory. The activity sequence is used to define the labor, material, equipment, energy resources, and duration required for each activity. In the case of major components, individual work sequence activity analyses are performed based on the physical and radiological characteristics of the component, and the packaging, transportation, and disposal options available.

In the case of structures and small components and equipment such as piping, pumps, and tanks, the work durations and costs are calculated based on UCFs. UCFs are economic parameters developed to express costs per unit of work output, piece of equipment, or time. They are developed using decommissioning experience, information on the latest technology applicable to decommissioning, and engineering judgment. The total cost of a specific decommissioning activity can be determined by multiplying the total number of units associated with that activity by the UCF, expressed as $/unit, for that activity. For example, the estimated demolition cost of a non-contaminated concrete structure can be obtained by multiplying the volume of concrete in the structure by the UCF for non-contaminated reinforced concrete demolition, expressed in $/unit volume. Each UCF has associated with it a man-hours/unit and schedule-hours/unit. From these values, total man-hours and total schedule-hours can be estimated for a particular activity.

3.2 Schedule Analysis

After the work activity durations are calculated for all distributed activities, a critical path schedule analysis is performed using MS Project. The schedule accounts for constraints such as spent fuel cooling periods and regulatory reviews. The schedule is typically delineated into phases or time periods (hereinafter referred to as period or periods) that differentiate manpower requirements and undistributed costs.

In order to differentiate between License Termination, Spent Fuel, and Site Restoration elements of the entire decommissioning scope of work, Energy*Solutions* has established a Work Breakdown Structure (WBS) and cost accounting system to treat each element as a subproject.

Accordingly, the overall project schedule is divided into interrelated periods with major milestones defining the beginning and ending of each period. The major milestones also serve as the basis for integrating the periods of the three subprojects.

3.3 Decommissioning Staff

Energy*Solutions* has assumed that the SONGS Units 2 and 3 decommissioning project will be performed in an efficiently planned and executed manner using project personnel experienced in decommissioning. This DCE assumes that the decommissioning will be performed by a highly experienced and qualified DGC, with oversight and management of the decommissioning operations performed by the Licensee staff. It is also assumed that the Utility (Licensee) staff will be supplemented by a professional consulting engineering firm, particularly in the planning and preparation phase.

Energy*Solutions* analyzed the SONGS licensee staff and developed a site-specific staffing plan. The SCE existing salary structure was then used as the basis for calculating Utility (Licensee) staff labor costs. Energy*Solutions* used industry data to develop DGC salary costs.

Staffing levels, for both staffing plans and for each project period, are based on the Atomic Industrial Forum (AIF) guidelines and industry experience. The sizes of the staffs are varied in each period in accordance with the requirements of the work activities. Staffing has been organized into the following departments or functional groups:

- Decommissioning
- Engineering
- Maintenance and Work Control
- Operations
- Oversight and Nuclear Safety
- Radiation Protection and Chemistry
- Regulatory and Emergency Planning
- Safety and Human Performance
- Security Administration
- Security Guard Force
- Site Management and Administration
- Additional Staff for Spent Fuel Shipping
- DGC Staff

3.4 Waste Disposal

Waste management costs comprise a significant portion of the decommissioning cost estimate. Additionally, limited future access to disposal sites licensed for receipt of Class B and C wastes introduces a significant level of uncertainty with respect to the appropriateness of using existing rate structures to estimate disposal costs of these wastes. Energy*Solutions*' approach to estimating waste disposal costs is discussed in the following paragraphs.

Waste Classification

Regulations governing disposal of radioactive waste are stringent in order to ensure control of the waste and preclude adverse impact on public health and safety. At present, LLRW disposal

is controlled by 10 CFR 61, which went into effect in December 1983. This regulation stipulates the criteria for the establishment and operation of shallow-land LLRW burial facilities. Embodied within this new regulation are criteria and classifications for packaging LLRW such that it is acceptable for burial at licensed LLRW disposal sites.

For each waste classification, 10 CFR 61 stipulates specific criteria for physical and chemical properties that the LLRW must meet in order to be accepted at a licensed disposal site. The LLRW disposal criteria of 10 CFR 61 require that LLRW generators determine the proportional amount of a number of specific radioactive isotopes present in each container of disposable LLRW. This requirement for isotopic analysis of each container of disposable LLRW is met by employing a combination of analytical techniques such as computerized analyses based upon scaling factors, sample laboratory analyses, and direct assay methods. Having performed an isotopic analysis of each container of disposable LLRW, the waste must then be classified according to one of the classifications (Class A, B, C, or Greater Than Class C (GTCC)) as defined in 10 CFR 61.

Energy*Solutions*' classification of LLRW resulting from decommissioning activities is based on AIF/NESP-036 (Ref. No. 2), NUREG/CR-0130 (Ref. No. 5), NUREG/CR-0672 (Ref. No. 6), and recent industry experience. The estimated curie content of the reactor vessel and internals at shutdown is derived from NUREG/CR-0130 for Pressurized Water Reactors (PWRs) and NUREG/CR-0672 for Boiling Water Reactors (BWRs), and adjusted for the different mass of components and period of decay.

Packaging

Selection of the type and quantity of containers required for Class B and C wastes is based on the most restrictive of either curie content, dose-rate, container weight limit, or container volume limit. GTCC wastes from segmentation of the reactor vessel internals is packaged in spent fuel canisters. The selection of container type for Class A waste is based on the transportation mode (rail, truck, barge, etc.) and waste form. The quantity of Class A waste containers is determined by the most restrictive of either container weight limit or container volume limit. Large components, such as steam generators, pressurizers, and reactor recirculation pumps, are shipped as their own containers with additional shielding as required.

Container costs are obtained from manufacturers specializing in the design and fabrication of storage containers for nuclear materials. Shielded transport cask and liner costs are obtained from the cask owners and operators.

Transportation

Transportation routes to processing and disposal facilities are determined based on available transportation modes (truck, rail, barge, or combinations). Transportation costs for the selected routes and modes are obtained from vendor quotes or published tariffs whenever possible.

Class A Disposal Options and Rates

In accordance with the existing Life-of-Plant Disposal Agreement (Ref. No. 7), all Class A waste that meets the waste acceptance criteria are to be disposed of at Energy*Solutions'* LLRW

disposal facility in Clive, Utah. All reported waste disposal costs include packaging, transportation, and any applicable surcharges.

Class B and C Disposal Options and Rates

Currently, within the United States, there are only three operational commercial near-surface disposal facilities licensed to accept Class B and C LLRW: the Barnwell facility, operated by Energy*Solutions* in Barnwell, South Carolina; the U.S. Ecology facility in Richland, Washington; and the recently licensed facility in Andrews County, Texas operated by Waste Control Specialists. Barnwell only accepts waste from states within the Atlantic Compact and U.S. Ecology only accepts waste from states within the Northwest and Rocky Mountain Compacts. However, the WCS facility will accept waste from the Texas Compact (comprised of Texas and Vermont) and from non-Compact generators. The Texas Compact Commission on March 23, 2012 approved amendments to rules allowing the import of non-compact generator LLRW for disposal at the WCS Andrews County facility.

Greater Than Class C (GTCC)

Wastes identified as 10 CFR 61 Class A, B, and C may be disposed of at near-surface disposal facilities. Certain components are highly activated and may exceed the radionuclide concentration limitations for 10 CFR 61 Class C waste. In accordance with 10 CFR 61, these components, which are referred to as Greater Than Class C (GTCC) wastes, cannot be disposed of in a near-surface LLRW disposal facility and must be transferred to a geologic repository or a similar site approved by the NRC.

Highly activated sections of the reactor vessel internals will result in GTCC waste. Presently, a facility does not exist for the disposal of wastes exceeding 10 CFR 61 Class C limitations. Energy*Solutions* assumes that the DOE will accept this waste along with spent fuel. Although courts have held that DOE is obligated to accept and dispose of GTCC, issues regarding potential costs remain potentially unsettled. Therefore, Energy*Solutions* conservatively estimates a GTCC waste disposal cost. Energy*Solutions* assumes that the GTCC waste will be packaged in spent fuel canisters and will be shipped to a storage or disposal facility operated by DOE along with the spent fuel. Additionally, Energy*Solutions* assumes shipping costs for GTCC waste to be equivalent to the commercial cost of shipping a Type B licensed, shielded cask such as the CNS 8-120B cask, which is owned and operated by Energy*Solutions*.

LLRW Volume Reduction

Becasue current Class A LLRW disposal rates are significantly lower than LLRW volume reduction rates, Energy*Solutions* does not assume on-site volume reduction techniques such as waste compaction or an aggressive decontamination, survey and release effort.

Non-Radioactive Non-Hazardous Waste Disposal

Energy*Solutions* assumes that recyclable, non-radioactive scrap metal resulting from the decommissioning program will be sold to a scrap metal dealer. However, no cost credit is assumed in the estimate for the value of the scrap metal. Clean (non-contaminated) concrete and demolition debris is assumed to be removed off site to an out of state Class III landfill consistent

with the Governor of the State of California Executive Order D-62-02 (Ref. No. 16). This study includes the costs of installation and operation of Energy*Solutions*' GAmma Radiation Detection and In-container ANalysis or GARDIAN System. The GARDIAN System performs radiological assays of bulk shipping containers. The GARDIAN System is a cost effective and efficient means to ensure all non-radiological waste and recyclable materials arising from the decommissioning and demolition of the SONGS' site comply with all applicable regulatory requirements.

Hazardous and Industrial Waste Disposal

Uncontaminated lead shielding remaining after shutdown was assumed to be removed from its installed locations and shipped offsite by entities having a need for the material. The entities will receive the lead at no charge in return for providing the removal and shipping services. Non-Radioactive contaminated surfaces coated with tightly adhering and undamaged lead based paint will be removed as non-hazardous building demolition debris. All other chemicals and hazardous materials present at shutdown will be removed and properly disposed of during decommissioning.

3.5 Final Status Survey

The cost of performing a final status survey (FSS) is based on NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," (Ref. No. 8). Estimates of MARSSIM Class I, II, and III survey designations are based on radiological assumptions regarding contamination resulting from small and large component removal activities. The FSS activity cost calculation includes the in-place remote survey of underground metal and concrete pipe, soil, and groundwater sampling and analysis. Estimated costs for NRC and Oak Ridge Institute for Science and Education (ORISE) verification are also included, and the NRC review period is incorporated into the project schedule.

3.6 Contingency

Contingencies are applied to cost estimates primarily to allow for unknown or unplanned occurrences during the actual program, e.g., increased radioactive waste materials volumes over that expected; equipment breakdowns, weather delays, and labor strikes. This is consistent with the definition provided in the DOE Cost Estimating Guide, DOE G 430.1-1, 3-28-97 (DOE G) (Ref. No. 9). Contingency "covers costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties within the defined project scope. The amount of contingency will depend on the status of design, procurement, and construction; and the complexity and uncertainties of the component parts of the project. Contingency is not to be used to avoid making an accurate assessment of expected costs." Energy*Solutions* determines site-specific contingency factors to be applied to each estimate based on industry practices.

The DOE has established a recommended range of contingencies as a function of completeness of program design, DOE G. The ranges are:

Type of Estimate	Contingency Range as a % of Total Estimate
Planning Phase Estimate	20-30
Budget Estimate	15-25
Title I (Preliminary Design Estimate)	10-20
Title II (Definitive Design Estimate)	5-15

Also, the Pacific Gas & Electric Company (PG&E) Technical Position Paper "Establishing an Appropriate Contingency Factor for Inclusion in the Decommissioning Revenue Requirements" (Ref. No. 13) was developed to review and determine a "conservative contingency factor" to be applied to decommissioning cost estimates. In that study it was determined that "based on an understanding of the level of project definition, and the extent and maturity of estimate input information used to develop decommissioning cost estimates, the 25 percent contingency factor is within the range of industry recognized cost engineering practices."

The contingencies presented in this study are consistent with the values presented in DOE G 430.1-1 for a Planning Phase estimate (Ref. No. 9) and the PG&E study (Ref. No. 13). As directed by SCE, Energy*Solutions* has applied a 25% contingency to all costs in this study, with the exception of following:

2013 and 2014 Actual Expenditures	0%
Department of Navy Easement Payments	15%
Hazardous and Asbestos Wastes	50%
Site Characterization Surveys	15%
Temporary Facilities	15%
Backfill and Compaction	15%

A reactor decommissioning program will be conducted under an NRC-approved Quality Assurance Program which meets the requirements of 10 CFR 50, Appendix B. However, the development of the quality assurance program, the performance of work under that program, and the effort required to ensure compliance with the program, is already included in the detailed cost estimate. Therefore, Energy*Solutions* does not include quality assurance as an element of the contingency allowance. The same is true for contamination. Where radioactive contamination or activated materials are dealt with, the Energy*Solutions* UCFs and associated calculations fully reflect the cost impact of that material, and a separate contingency is not required specifically due to working with contamination.

3.7 Cost Reporting

Total project costs are aggregated from the distributed activity and undistributed costs into the following categories – Labor, Materials and Equipment, Waste Disposal, and Other costs. Other costs include property taxes, insurance, license fees, permits, and energy. Waste Disposal costs are the summation of packaging, transportation, base disposal rate, and any applicable surcharges. Health physics (HP) supplies and small tool costs are calculated as a component of each distributed activity cost and included in the category of Material and Equipment, with the exception that HP supplies for the Utility HP staff are calculated and reported as an undistributed line item. A line item specific contingency is then calculated for each activity cost element.

4.0 SITE SPECIFIC TECHNICAL APPROACH

4.1 Facility Description

The San Onofre Nuclear Generating Station Units 2 & 3 site is located in southern California on the shore of the Pacific Ocean, about 62 miles Southeast of Los Angeles and approximately 51 miles Northwest of San Diego. The station is located entirely within the Camp Pendleton Marine Corps Base. The current Grant of Easement for the site from the United States Department of the Navy is currently scheduled to expire May 12, 2023 (Ref. No. 14). Units 2 & 3 occupy 52.8 acres of the 84 acre site. Approximately 16 acres are occupied by the North Industrial Area (formerly Unit 1), which is where the existing ISFSI is located.

The Nuclear Steam Supply System (NSSS) for both units are identical, with two independent loops, and utilizing pressurized light water cooled reactors (PWRs) supplied by Combustion Engineering, Inc. The construction permit was issued for an initial reactor power of 3,390 MWt with licensed Rated Thermal Power of 3,438 MWt.

The facility currently has an existing ISFSI containing spent fuel that was transferred into MPCs to maintain full core offload capability during operations and to facilitate decommissioning of Unit 1. This study also assumes that the MPCs will be licensed under a 10 CFR Part 72 general license, using the manufacturer's Certificate of Compliance. The 10 CFR Part 50 license will be maintained until decommissioning is complete and all spent fuel has been transferred to DOE.

Appendix A provides a list of the SONGS Unit 2 & 3 systems and structures included in the material inventory for this study.

4.2 Decommissioning Periods

The project periods consist of six License Termination periods, seven Spent Fuel Management periods (two of which are ISFSI decontamination and demolition periods), and six Site Restoration periods. As shown in Figure 1-1 above, the periods for each of these project areas are independent from (do not compete with) the periods for the other project areas. The project periods defined for this site-specific study and the major activities performed during each period are as follows:

License Termination Periods

Decon Pd 1 –Transition to Decommissioning

- Defuel Reactors
- Notification of Permanent Fuel Removal
- Disposition of LLRW Resins

Decon Pd 2 –Decommissioning Planning and Site Modifications

- Preparation of Decommissioning License Documents
- Preparation of NRC Deliverables
- Submit PSDAR to NRC
- Perform Historical Site Assessment and Site Characterization
- Planning, Design, and Implementation of Cold & Dark (Site Repowering)

- Design and Implement Spent Fuel Pool Support System Modifications, Control Room Relocation, and Spent Fuel Security System Modifications

- Select Decommissioning General Contractor (DGC)

Decon Pd 3 – Decommissioning Preparations and Reactor Internal Segmentation

- DGC Mobilization and Planning
- System Decontamination
- Reactor Internals Removal Preparations
- Reactor Internals Segmentation Planning and Implementation
- Purchase Dry Storage Modules for GTCC Waste
- Segment and Package Reactor Internals for Storage in the ISFSI

Decon Pd 4 – Plant Systems and Large Component Removal

- Upgrade Rail Spur on 'Owner Controlled Area' (does not affect spur connecting to CALTRANS).
- Install Large Array Radiation Detection System
- Remove, Package, and Dispose of Non-Essential Systems
- Asbestos and Lead Abatement
- Fuel Pool Closure
- Remove Spent Fuel Racks, Spent Fuel Pool Island Equipment, and Bridge Cranes
- Remove and Dispose of Legacy Class B & C Wastes
- Remove, Package, and Dispose of Essential Systems
- Removal and Disposal of Spent Resins, Filter Media, and Tank Sludge
- Large Component Removal
- Prepare License Termination Plan

Decon Pd 5 – Building Decontamination

- Decon Containment Buildings – Units 2 & 3
- Decon Turbine Buildings – Units 2 & 3
- Decon Fuel Handling Buildings – Units 2 & 3
- Decon Auxiliary Radwaste Building
- Decon Auxiliary Control Building
- Decon Penetration Buildings – Units 2 & 3
- Decon Safety Equipment and Main Steam Isolation Valve Buildings – Units 2 & 3
- Radiological Survey of Structures During Decon

Decon Pd 6 – License Termination During Decommissioning

- Final Status Survey
- ORISE Verification and NRC Approval

Spent Fuel Management Periods

SNF Pd 1 – Spent Fuel Transfer Management Transition

- Implementation of Security Enhancements Required for Reductions in Staff
- Cyber Security Modifications
- Post Fukushima Modifications – Unit 2
- Design and Fabricate Spent Fuel Canisters

SNF Pd 2 – Spent Fuel Transfer to Dry Storage
- Prepare Irradiated Fuel Management Plan
- Select Dry Storage System Canister Design and Vendor
- Design and Construct ISFSI Expansion
- Purchase, Deliver and Load Spent Fuel Canisters and Transfer to ISFSI

SNF Pd 3 – Dry Storage During Decommissioning Units 1, 2, & 3

SNF Pd 4 – Dry Storage Only – Units 1, 2, & 3

SNF Pd 5 – Dry Storage Only – Units 2, & 3

SNF D&D Pd 1 – ISFSI License Termination
- Preparation and NRC Review of License Termination Plan

SNF D&D Pd 2 – ISFSI Demolition
- Verification Survey of Horizontal Storage Modules
- Clean Demolition of ISFSI AHSMs and Pads
- Clean Demolition of ISFSI Support Structures
- Restore ISFSI Site
- Preparation of Final Report on Decommissioning and NRC Review

Site Restoration Periods

SR Pd 1 –Transition to Site Restoration
- Severance Costs from Post-Shutdown Reduction in Staffing
- Phase I and II Environmental Assessment of the Mesa Site
- Disposition of Hazardous Waste at the Mesa Site
- Site Characterization of the Mesa Site

SR Pd 2 –Building Demolition During Decommissioning
- Demolish South Access for Decommissioning, South Yard Facility, and Mesa Structures
- Finish Grade and Re-vegetate Mesa Site
- Mesa Lease Termination

SR Pd 3 – Subsurface Demolition Engineering & Permitting
- Hydrogeologic Investigation and Outfall Conduit Survey
- Subsurface Structure Removal Analyses for Lease Termination Activities
- Final Site Grading and Shoreline Protection Engineering Planning and Design
- Obtain Permits and Approvals

SR Pd 4 – Building Demolition to 3 Feet Below Grade
- Demolition Preparations
- De-Tension and Remove Containment Building Tendons – Units 2 & 3
- Demolish Diesel Generator Buildings – Units 2 & 3
- Demolish Condensate Buildings and Transformer Pads – Units 2 & 3

- Demolish Full Flow Areas and Turbine Buildings – Units 2 & 3
- Demolish Auxiliary Radwaste Building
- Demolish Auxiliary Control Building
- Remove Systems and Demolish Make-up Demineralizer Structures
- Demolish Penetration Buildings – Units 2 & 3
- Demolish Safety Equipment and Main Steam Isolation Valve Buildings – Units 2 & 3
- Demolish Fuel Handling Buildings to 3 Feet Below Grade – Units 2 & 3
- Demolish Containment Buildings to 3 Feet Below Grade – Units 2 & 3
- Demolish Intake and Discharge Structures to 3 Feet Below Grade

SR Pd 5 – Subgrade Structure Removal Below – 3 Feet

- Install Sheet Piling and Excavation Shoring, Dewatering System, and Effluent Treatment and Discharge Controls
- Demolish and Backfill Unit 3 Subsurface Structures
- Demolish and Backfill Unit 2 Subsurface Structures
- Demolish and Backfill Common Subsurface Structures
- Demolish and Backfill Intake Structure Inside Seawall Below -3 Feet
- Remove Off Shore Intake and Outfall Conduits
- Remove Sheet Piling, Excavation Shoring, and Dewatering and Effluent Treatment
- Finish Grading and Re-vegetate Site

SR Pd 6 – Final Site Restoration and Easement Termination

- Obtain Required Permits and Approvals
- Install Dewatering System and Effluent Treatment and Discharge Controls
- Remove and Stockpile Existing Seawall Erosion Protection
- Remove Unit 2 & 3 Seawall and Pedestrian Walkway
- Remove Remaining Intake Structure Beneath Seawall
- Backfill and Compaction of Excavation
- Remove Dewatering System & Effluent Treatment
- Remove Railroad Tracks, Gunite Slope Protection, Access Road, and North Parking Lot
- Finish Grading and Re-vegetate Site

4.3 Decommissioning Staff

Energy*Solutions* developed staffing based on the assumption that decommissioning will be performed by an experienced and qualified DGC, with oversight and management of the decommissioning operations performed by the Utility (Licensee) staff. It is also assumed that the Utility staff will be supplemented by a professional consulting engineering firm, particularly in the planning and preparation phase. The sizes of the Utility (Licensee) and DGC staffs are varied in each period in accordance with the requirements of the work activities. Details on the staff levels, by functional group, during each period are provided in Section 6.0.

4.4 Spent Fuel Management Staff

The largest spent fuel staff is in place while the fuel pool is operational during the spent fuel cooling period and the fuel assemblies are being transferred to dry storage. After all spent fuel

has been removed from the spent fuel pool, the staff is reduced. During spent fuel pool operations and the dry storage period, the full-time spent fuel management staff is supplemented with part-time staff to support fuel movements. Details on the staff levels, by functional group, during each period are provided in Section 6.0.

4.5 Spent Fuel Shipments

The spent fuel shipping schedules are based in part on the DOE's "Acceptance Priority Ranking & Annual Capacity Report," dated July 2004. (Ref. No. 12). The information regarding existing fuel inventory, planned transfers to dry storage and DOE's projected date of 2024 for acceptance of spent fuel is based on information provided by SCE. The spent fuel shipping schedule is provided in Appendix B. The spent fuel shipment schedule is based upon best current information and assumptions, as qualified and described elsewhere in this study, including in Section 2.2 above.

5.0 BASES OF ESTIMATE AND KEY ASSUMPTIONS

The bases of, and key assumptions for, this site-specific decommissioning estimate are presented below:

1. SCE's actual decommissioning expenses incurred from the time of permanent cessation of operations on June 7, 2013 until December 31, 2013 are included in the estimate. All other decommissioning cost data used in this study is current as of 2014. Totals and subtotals have been rounded to significant figures.

2. Energy*Solutions* developed a prompt dismantlement (DECON) project schedule based on a permanent shutdown date of June 7, 2013.

3. The decommissioning will be performed using currently available technologies.

4. DOE currently has no plans, program, or schedule in place for acceptance of utility spent fuel. However, for purposes of this decommissioning cost estimate, certain simplifying assumptions must be made regarding the schedule and rate of DOE performance. Therefore, while DOE's Standard Contract governing the acceptance of SCE's spent fuel allows for alternative removal schedules, including priority for shutdown reactors and exchanges of allocations, for purposes of this estimate DOE acceptance from the industry is assumed to commence in 2024 in accordance with SCE testimony to the Public Utilities Commission of the State of California (Ref. No. 17). The spent fuel shipment schedules are based upon the assumption that the DOE will accept spent fuel at the rate published in DOE's July 2004 Acceptance Priority Ranking & Annual Capacity Report (DOE/RW-0567) (Ref. No. 12). Additionally, SCE is reviewing available information from DOE to determine if the DOE start date assumption requires updating. The DCE will be revised accordingly as new information becomes available.

5. This estimate is based on site-specific building inventories and plant systems, as provided by Energy*Solutions*.

6. All transformers on site following shutdown are assumed to be polychlorinated biphenyl (PCB)-free, therefore, this study does not include costs for disposition of PCB contaminated transformers.

7. Cost for transportation of clean scrap metal to a recycler is included in the estimate; however, no credit is taken for the value of the scrap metal. Concrete debris and all other demolition debris is assumed to be removed from the site and disposed of at an out of state Class III landfill, consistent with the Governor of the State of California Executive Order D-62-02 (Ref. No. 16). The cost of installation and operation of Energy*Solutions*' GARDIAN system for bulk radiological assay of all wastes and recyclable materials leaving the SONGS site is included in the estimate. The purpose of the GARDIAN system is to ensure all materials not intended for disposal at a licensed facility meet all applicable requirements.

8. The estimate is based on final site restoration, in which all existing and proposed structures, with the exception of the switchyard, will be removed. Clean demolition costs are based on the assumption that all site improvements will be removed in their entirety. Clean backfill will be imported and placed to re-establish grade. The entire disturbed area of the site is to be graded, to restore the natural grade to the extent possible, and seeded.

9. Uncontaminated lead shielding remaining is assumed to be removed from its installed locations and shipped offsite by entities having a need for the material. The entities receive the lead at no charge in return for providing the removal and shipping services.

10. Site-specific information regarding contaminated soil was used as a basis for calculation of current costs for their remediation. While no known radiological or chemical remediation is required at the switchyard or the Mesa, those areas will be addressed as part of the Baseline Characterization Survey and Historical Site Assessment. If the studies conclude that radiological or chemical remediation is required at the switchyard or the Mesa, the DCE will be amended. For radiological contamination found at either the switchyard or the Mesa, the DCE will be amended to include all subsequent cost estimates for the remediation, which will be paid for by the SONGS participants in accordance with their cost allocations for the 'Common Facilities'. Chemical remediation of the switchyards will be paid by either SCE or SDG&E owners of the respective switchyards.

11. Costs for hazardous waste disposal, as well as asbestos and lead abatement, are included in this study.

12. All Class A waste is assumed to be disposed of at Energy*Solutions*' facility in Clive, Utah, in accordance with the existing Life-of-Plant Disposal Agreement between Energy*Solutions* and Southern California Edison, dated January 18, 2014 (Ref. No. 7). The following 2014 disposal rates will be applied:

    Demolition Debris and Soil - $57.97/Cubic Foot plus 5% Utah taxes
    Oversized Debris - $111.31/Cubic Foot plus 5% Utah taxes
    Containerized Waste Facility - $214.50/Cubic Foot plus 12% Utah taxes
    Large Components - $289.87/Cubic Foot plus 5% Utah taxes
    Cask Shipments - $44,059/Cask plus 12% Utah taxes

    Class A waste includes Dry Active Waste (DAW) arising from the disposal of contaminated protective clothing and health physics supplies.

13. Class B, C, and GTCC waste disposal costs are based on recent quotes for disposal of activated hardware and resins at the WCS facility. All resins and filter waste is assumed to be Class B.

14. Shipping costs for the Class B and C waste are based on a distance of 1,079 miles one way from SONGS to the WCS site.

15. GTCC is not subject to the same storage and security requirements as spent fuel and therefore is not required to be stored on the ISFSI pad. But for purposes of this estimate and to facilitate decommissioning, GTCC waste generated from the segmentation of the reactor internals is assumed to be packaged in Dry Shielded Canisters (DSCs) and placed in Advanced Horizontal Storage Modules (AHSMs) in the ISFSI to await final disposition at a DOE repository.

16. It is assumed that a total of six DSCs per unit will be required for GTCC waste.

17. Reactor vessel and internals curie estimates were derived from the values for the Reference PWR vessel and internals in NUREG/CR-0130 (Ref. No. 5). These values were adjusted for decay period.

18. The Energy*Solutions* site-specific classification of radioactive wastes for the SONGS Plant identified that the spent fuel assemblies and two components within the reactor vessel (the Core Shroud Assembly and the Lower Core Grid Plate) will exceed Class C limitations.

19. The spent fuel shipments are based upon best current information and assumptions, as qualified and described elsewhere in this study, including in Section 2.2. above.

20. Spent fuel will remain in the spent fuel pool for six years before being transferred to the ISFSI.

21. The costs for ISFSI construction and transfer of spent fuel from Units 2 & 3 to dry storage were developed by SCE and furnished to Energy*Solutions*. Following completion of spent fuel transfers to dry storage the cost of maintenance and operation of the ISFSI is distributed between Units 1, 2 and 3 based on the relative percentages of spent fuel assemblies in storage. The percentages are 10, 45, and 45 for Units 1, 2, and 3, respectively. The exception is that all property taxes are solely the liability of Units 2 & 3. Following completion of SNF Pd 4 – Dry Storage Only Units 1, 2, and 3, all ISFSI maintenance and operating costs are assigned to Units 2 & 3 until the ISFSI D&D. During ISFSI D&D costs are distributed to all three units in the same percentages of 10, 45, and 45.

22. DOE has not committed to accept SCE's canistered spent fuel. But for purposes of this estimate, it is assumed that an SCE-funded dry storage facility will not be necessary.

23. Costs for ISFSI demolition are included in this estimate. SCE assumes that portions of the AHSM concrete will be activated.

24. Energy*Solutions* has assumed that the 10 CFR Part 50 license will be maintained until DOE has taken possession of the spent fuel.

25. SCE's annual ISFSI insurance premiums of $302,000 are assumed to be incurred until all fuel shipments have been completed and the structure is no longer in use.

26. SCE's Emergency Preparedness (FEMA) fees of $500,000 per year and California Office of Emergency Services fees of $2,800,000 per year are applied until the spent fuel pool is empty. These fees were supplied by SCE.

27. SCE's current annual property taxes are assumed to be reduced to a constant $1,500,000 per year. The property taxes are a license termination expense until the completion of decommissioning, and then a spent fuel management expense until completion of the ISFSI D&D.

28. Energy*Solutions* has included the annual NRC 10 CFR 171.15(c)(2) fees, for reactors in decommissioning of $231,000/yr per unit until decommissioning is completed as a license termination expense. Following completion of decommissioning, this expense is continued as a spent fuel management cost for maintenance of the 10 CFR Part 50 license.

29. Energy*Solutions* has included Environmental Permits and Fees of $1,900,000 per year as supplied by SCE.

30. Energy*Solutions* has included NRC inspection fees during each decommissioning period based on the type and level of activities being performed.

31. SONGS annual insurance premiums, in 2014 dollars as supplied by SCE, are as follows:

    Nuclear Property Primary - $4,878,099
    Nuclear Liability - $1,151,075
    Additional Liability, Non-Nuclear - $3,576,519
    Workers' Compensation - $180,335
    Property Insurance - $353,286

    The premium amounts have been adjusted by Energy*Solutions* in accordance with information furnished by SCE to meet the requirements of each period.

32. Site operating expenses expected to be incurred during decommissioning and spent fuel management are included in the estimate. These costs include materials and services, utilities (water, gas, phone), telecommunications equipment, non-process computers, personal computers and tools and equipment. These costs were calculated based on information provided by SCE and adjusted by Energy*Solutions* to match the requirements of each period, based on staffing levels.

33. Site Lease and Easement expenses of $2,300,000 per year until the Mesa lease is terminated are included in the estimate. Following termination of the Mesa lease the site lease and easement expenses are reduced to $299,920 per year. These costs are based on information provided by SCE.

34. Utility (Licensee) staff positions and average direct burdened salary (i.e. total compensation) data in 2014 dollars were supplied by SCE.

35. Severance costs for those employees terminated as a result of SONGS decommissioning, including those costs required under California law are included in the estimate. Severance costs for Reductions-in-Force (RIFs) that occurred immediately after shutdown, and during the course of spent fuel management and decommissioning are assumed to be a site restoration expense and are included in the estimate.

36. Severance costs per employee were provided by SCE.

37. DGC staff salaries, including overhead and profit, were determined by Energy*Solutions* and represent Energy*Solutions*' standard assumptions for these rates.

38. The professional personnel used for the planning and preparation activities, and DGC personnel, are assumed to be paid per diem at the rate of $204/day, based on per diem rates from U.S. General Services Administration (GSA) for Orange County, California.

39. Craft labor rates were taken from the CA Union Craft Rate Sheet, dated January 9, 2014. Craft labor rates for disciplines not provided in the rate sheet have been taken from the 2014 RS Means Labor Rates for the Construction Industry (Ref. No. 10), for Anaheim, CA. Since the skilled laborers are assumed to be supplied by the local union hall, they will not be paid per diem.

40. The security guard force included in this estimate has been sized in accordance with the current Design Basis Threat assessment.

41. This study follows the occupational exposure principles of As Low As Reasonably Achievable (ALARA) through the use of productivity loss factors that incorporate such items as the use of respiratory protection and personnel protective clothing. These factors increase the work duration and cost.

42. The costs of all required safety analyses and safety measures for the protection of the general public, the environment, and decommissioning workers are included in the cost estimates. This reflects the requirements of:

10 CFR 20	Standards for Protection Against Radiation
10 CFR 50	Domestic Licensing of Production and Utilization Facilities
10 CFR 61	Licensing Requirements for Land Disposal of Radioactive Waste
10 CFR 71	Packaging of Radioactive Material for Transport
10 CFR 72	Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste
29 CFR 1910	Occupational Safety and Health Standards

49 CFR 170-189 Department of Transportation Regulations Governing the Transport of Hazardous Materials

Reg. Guide 1.159 Assuring the Availability of Funds for Decommissioning Nuclear Reactors

43. Activity labor costs do not include any allowance for delays between activities, nor is there any cost allowance for craft labor retained on site while waiting for work to become available.

6.0 STUDY RESULTS

This study analyzes the following technical approach to decommissioning as defined by SCE:

- Prompt DECON methodology.
- Permanent cessation of operations and commencement of decommissioning planning on June 7, 2013.
- Termination of spent fuel pool operation six years after permanent shutdown.
- Spent fuel will be stored in MPCs at an on-site ISFSI.
- A dry transfer facility will not be necessary for transfer of SNF for transport.
- Decommissioning will be performed by a DGC with oversight by the SONGS participants.
- LOP Disposal Rates are used for Class A LLRW.
- WCS Texas Disposal Rates are used for Class B and C LLRW.
- DOE begins accepting spent fuel from the industry in 2024.

Spent Fuel Shipping Schedule

The spent fuel shipping schedule is provided in Appendix B. Spent fuel shipments from the industry to DOE will begin in 2024. The spent fuel shipment schedules are based upon best current information and assumptions, as qualified and described elsewhere in this study, including in Section 2.2 above.

Cost and Schedule

Figure 6-1 is a summary project schedule. A detailed schedule is provided in Appendix C. Table 6-1 summarizes the period durations and total costs, including contingency, for License Termination, Spent Fuel, and Site Restoration activities. A detailed cost table is provided in Appendix D, and a table of annual expenditures is provided in Appendix E.

Project Staffing

This scenario is based on the assumption that decommissioning will be performed by an experienced and qualified DGC, with oversight and management of the decommissioning operations performed by the Licensee staff. Utility (Licensee) staffing levels, by organizational department and function, for each period are provided in Table 6-2. The DGC staffing levels, by organizational department and function, for each period are provided in Table 6-3.

LLRW Disposal Volumes

LLRW disposal is a significant element of the decommissioning project. The estimated cubic feet of waste are summarized as follows:

Waste Class	Unit 2	Unit 3	Total
Class A	1,832,961	1,819,680	3,652,641
Class B	7,600	7,600	15,200
Class C	4,095	4,095	8,190
GTCC	941	941	1,882

Waste disposal volumes and costs, itemized by packaging, transportation, surcharges and disposal costs by waste class and facility, are provided in Table 6-4. The waste disposal costs provided in Table 6-4 do not include contingency.

Figure 6-1
Summary Schedule

DECON with Dry Storage, 2013 Shutdown and DOE Acceptance in 2024

Task Name	Start	Finish
Post-Shutdown Spent Fuel Management	06/07/2013	09/08/2051
Spent Fuel Shipping Complete - Unit 1	12/31/2035	12/31/2035
Spent Fuel Shipping Complete - Units 2 & 3	12/31/2049	12/31/2049
SNF Pd 1 - Spent Fuel Management Transition	06/07/2013	12/31/2013
SNF Pd 2 - Spent Fuel Transfer to Dry Storage	1/1/2014	06/01/2019
SNF Pd 3 - Dry Storage During Decommissioning - Units 1, 2 and 3	06/01/2019	12/05/2031
SNF Pd 4 - Dry Storage Only - Units 1, 2 and 3	12/05/2031	12/31/2035
SNF Pd 5 - Dry Storage Only - Units 2 and 3	12/31/2035	12/31/2049
SNF D&D Pd 1 - ISFSI D&D Planning	12/31/2049	05/06/2050
SNF D&D Pd 2 - ISFSI D&D	05/06/2050	09/08/2051
Part 50 License Termination	06/07/2013	12/24/2032
Announcement of Cessation of Operations (June 7, 2013)	06/07/2013	06/07/2013
Decon Pd 1 - Transition to Decommissioning	06/07/2013	12/31/2013
Decon Pd 2 - Decommissioning Planning and Site Modifications	1/1/2014	06/30/2015
Decon Pd 3 - Decommissioning Preparations and Reactor Internals Segmentation	06/30/2015	06/01/2019
Decon Pd 4 - Plant Systems and Large Component Removal	06/01/2019	09/24/2022
Decon Pd 5 - Building Decontamination	09/24/2022	07/13/2024
Decon Pd 6 - License Termination During Demolition	07/13/2024	12/24/2032
Site Restoration	06/07/2013	12/15/2051
SR Pd 1 - Transition to Site Restoration	06/07/2013	06/30/2015
SR Pd 2 - Building Demolition During Decommissioning	06/30/2015	07/11/2017
SR Pd 3 - Subsurface Demolition Engineering and Permitting	10/01/2019	07/13/2024
SR Pd 4 - Building Demolition to 3 Feet Below Grade	07/13/2024	10/14/2028
SR Pd 5 - Subgrade Structure Removal Below -3 Feet	10/14/2028	12/05/2031
SR Pd 6 - Final Site Restoration and Lease Termination	05/06/2050	12/15/2051
Final Easement Termination	12/15/2051	12/15/2051

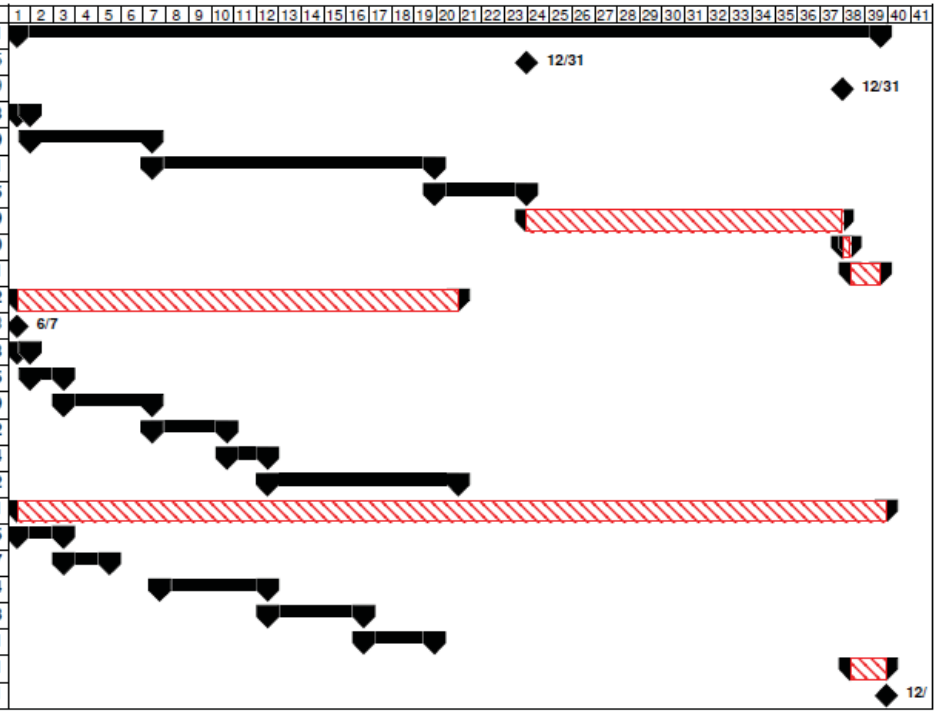


Table 6-1[3]
Cost and Schedule Summary
(2014 Dollars in Thousands)

Period No.	Period Description	Start	End	Years	Unit 2 Cost	Unit 3 Cost	Total Cost
License Termination (50.75(c))							
Decon Pd 1	Transition to Decommissioning	6/7/2013	12/31/2013	0.56	$25,749	$26,566	$52,315
Decon Pd 2	Decommissioning Planning and Site Modifications	1/1/2014	6/30/2015	1.49	$118,709	$122,430	$241,140
Decon Pd 3	Decommissioning Preparations and Reactor Internals Segmentation	6/30/2015	6/1/2019	3.92	$262,210	$276,799	$539,009
Decon Pd 4	Plant Systems and Large Component Removal	6/1/2019	9/24/2022	3.31	$392,029	$412,475	$804,504
Decon Pd 5	Building Decontamination	9/24/2022	7/13/2024	1.80	$212,447	$216,659	$429,106
Decon Pd 6	License Termination During Demolition	7/13/2024	12/24/2032	8.44	$23,085	$23,085	$46,171
Account Total				**19.52**	**$1,034,230**	**$1,078,016**	**$2,112,246**
Spent Fuel (50.54(bb)) and (72.30)							
SNF Pd 1	Spent Fuel Management Transition	6/7/2013	12/31/2013	0.56	$63,891	$66,105	$129,997
SNF Pd 2	Spent Fuel Transfer to Dry Storage	1/1/2014	6/1/2019	5.41	$344,629	$372,193	$716,822
SNF Pd 3	Dry Storage During Decommissioning - Units 1, 2 and 3	6/1/2019	12/5/2031	12.51	$61,425	$61,425	$122,849
SNF Pd 4	Dry Storage Only - Units 1, 2 and 3	12/5/2031	12/31/2035	4.07	$29,383	$29,383	$58,765
SNF Pd 5	Dry Storage Only - Units 2 and 3	12/31/2035	12/31/2049	14.00	$107,326	$107,326	$214,653
SNF D&D Pd 1	ISFSI License Termination	12/31/2049	5/6/2050	0.34	$1,260	$1,260	$2,520
SNF D&D Pd 2	ISFSI Demolition	5/6/2050	9/8/2051	1.34	$15,295	$15,295	$30,590
Account Total				**38.23**	**$623,209**	**$652,987**	**$1,276,196**
Site Restoration							
SR Pd 1	Transition to Site Restoration	6/7/2013	6/30/2015	2.06	$64,280	$66,210	$130,489
SR Pd 2	Building Demolition During Decommissioning	6/30/2015	7/11/2017	2.03	$13,003	$37,242	$50,245
SR Pd 3	Subsurface Demolition Engineering and Permitting	10/1/2019	7/13/2024	4.78	$15,593	$22,319	$37,912
SR Pd 4	Building Demolition to 3 Feet Below Grade	7/13/2024	10/14/2028	4.25	$124,953	$134,113	$259,066
SR Pd 5	Subgrade Structure Removal Below - 3 Feet	10/14/2028	12/5/2031	3.14	$171,987	$269,560	$441,547
SR Pd 6	Final Site Restoration and Lease Termination	5/6/2050	12/15/2051	1.60	$33,482	$70,064	$103,545
Account Total				**17.86**	**$423,297**	**$599,507**	**$1,022,804**
Grand Total					**$2,080,735**	**$2,330,511**	**$4,411,246**

[3] Rows and columns may not add correctly due to rounding.

Table 6-2
Utility Staff Levels

License Termination – 50.75(c) Utility Staff

Department	Decon Pd 1	Decon Pd 2	Decon Pd 3	Decon Pd 4	Decon Pd 5	Decon Pd 6
Decommissioning	0	21	21	25	18	0
Engineering	0	49	14	14	12	0
Maintenance and Work Control	0	38	10	10	3	0
Operations	0	15	7	7	0	0
Oversight and Nuclear Safety	0	7	2	2	1	0
Radiation Protection and Chemistry	0	27	26	31	26	0
Regulatory and Emergency Planning	0	10	4	4	4	0.5
Safety and Human Performance	0	13	7	7	7	0
Security Admin	0	6	6	6	6	0
Security Guard Force	0	12	12	12	12	0
Site Management and Administration	0	13	13	13	9	1
Period Totals	**0**	**211**	**122**	**131**	**98**	**1.5**

Spent Fuel - 50.54(bb) Utility Staff

Department	SNF Pd 1	SNF Pd 2	SNF Pd 3	SNF Pd 4	SNF Pd 5	SNF D&D Pd 1	SNF D&D Pd 2
Spent Fuel Shipping	0	0	0	2	2	0	0
Decommissioning	0	0	0	0	0	1	1
Engineering	0	1	1	1	1	0	1
Maintenance and Work Control	0	31	0	0	0	0	0
Operations	0	45	1	1	1	0	0
Oversight and Nuclear Safety	0	1	0.25	0.25	0.25	0	0
Radiation Protection and Chemistry	0	6	4	4	4	1	2
Regulatory and Emergency Planning	0	0	0	0	0	1	1
Security Admin	0	14	10	8	8	1	1
Security Guard Force	0	178	35	35	35	5	5
Site Management and Administration	0	0	0	0	0	1	1
Period Total	**0**	**276**	**51.25**	**54.25**	**54.25**	**10**	**12**

Site Restoration - Utility Staff

Department	SR Pd 1	SR Pd 2	SR Pd 3	SR Pd 4	SR Pd 5	SR Pd 6
Decommissioning	0	2	0	5	4	2
Engineering	0	1	0	2	1	0
Maintenance and Work Control	0	1	0	2	2	2
Regulatory and Emergency Planning	0	1	0	0	0	0
Safety and Human Performance	0	1	0	2	1	1
Security Admin	0	0	0	1	1	0
Security Guard Force	0	0	0	5	5	0
Site Management and Administration	0	0	0	4	3	3
Period Totals	**0**	**6**	**0**	**21**	**17**	**8**

Table 6-3
DGC Staff Levels

License Termination – 50.75(c) DGC Staff

Department	Decon Pd 3	Decon Pd 4	Decon Pd 5	Decon Pd 6
Administration	9	17	17	0
Engineering	15	29	14	0
Health Physics	16	73	73	2
Management	3	3	3	0
Quality Assurance	2	5	4	0
Waste Operations	7	16	16	0
Period Totals	**52**	**143**	**127**	**2**

Spent Fuel - 50.54(bb) - DGC Staff

Department	SNF D&D Pd 2
Administration	1
Engineering	2
Health Physics	3
Management	1
Quality Assurance	1
Waste Operations	4
Period Totals	**12**

Site Restoration DGC Staff

Department	SR Pd 1	SR Pd 2	SR Pd 3	SR Pd 4	SR Pd 5	SR Pd 6
Administration	0	0	0	10	5	4
Engineering	0	0	0	13	11	5
Health Physics	0	0	0	3	0	0
Management	0	0	0	2	2	1
Quality Assurance	0	0	0	2	1	0
Waste Operations	0	0	0	11	7	7
Period Totals	**0**	**0**	**0**	**41**	**26**	**17**

Table 6-4
Waste Disposal Volumes
(Cost Excludes Contingency - 2014 Dollars)

Facility and Waste Class	Waste Weight (LBs)	Waste Volume (CF)	Burial Volume (CF)	Packaging Cost	Transportation Cost	Base Burial Cost	Total Disposal Cost
Class B and C Facility							
Class B	1,132,323	6,696	15,199	$1,199,186	$6,433,599	$72,635,570	$80,268,355
Class C	407,380	1,546	8,191	$2,064,309	$26,706,007	$39,142,870	$67,913,186
GTCC	92,861	190	1,882	$196,288	$1,680,000	$38,775,980	$40,652,268
	1,632,564	**8,431**	**25,272**	**$3,459,782**	**$34,819,606**	**$150,554,420**	**$188,833,808**
Energy*Solutions*							
Class A – Debris	200,560,122	3,229,506	3,308,050	$3,804,262	$13,779,286	$211,423,909	$229,007,458
Class A – Oversize	9,967,521	146,943	184,730	$187,314	$784,285	$22,669,947	$23,641,545
Class A – Containerized Waste	1,053,914	12,287	16,303	$397,152	$364,322	$4,112,378	$4,873,851
Class A – Large Component	11,480,200	108,866	136,373	$6,313,568	$69,622,664	$43,582,464	$119,518,696
Class A – Mixed Waste	62,643	3,012	3,012	$67,887	$12,448	$801,226	$881,561
	223,124,400	**3,500,614**	**3,648,469**	**$10,770,182**	**$84,563,005**	**$282,589,924**	**$377,923,111**
Other							
Out of State Class III Landfill	1,909,207,440	25,212,269	29,372,422	$0	$146,326,469	$43,929,750	$190,256,219
Scrap Metal Recycler	184,787,372	377,117	7,391,495	$0	$911,926	$0	$911,926
	2,093,994,812	**25,589,386**	**36,763,917**	**$0**	**$147,238,394**	**$43,929,750**	**$191,168,144**
Grand Total	**2,318,751,776**	**29,098,431**	**40,437,658**	**$14,229,964**	**$266,621,006**	**$477,074,094**	**$757,925,064**

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Appendix A

List of Systems and Structures

SONGS Plant System and Structure List

Common

Type	System Name or Description
Non	Not Used
Struct	Administration Building (K-40/50)
Struct	AWS Building
Struct	Building L-50
Struct	Gunite Slope Protection
Struct	High Flow Make-Up Demineralizer Area
Struct	ISFSI Support Structures
Struct	Maintenance Building 1 (B-43/B-44)
Struct	Maintenance Building 2 (B-49/B-50)
Struct	Maintenance Building 4 (B-64/B-65)
Struct	Maintenance Building 5 (B-62/B-63)
Struct	Mesa Buildings
Struct	Not Used
Struct	Outage Control Center Building
Struct	REMS Staging Pad
Struct	Seawall - Units 2 & 3
Struct	Security Access Building (A-80, 81, 82)
Struct	Service Building (K-10, 20, 30)
Struct	South Security Processing Facility (K-70)
Struct	South Yard Facility Buildings (T-10, 20, 60 and Haz Mat.)
Struct	Staging Warehouse Building
Ess	Auxilary Control Systems - Unit 2
Ess	Fuel Handling Building Systems - Unit 2
Ess	Radwaste Systems - Unit 2
Non	Condenstate Storage Systems - Unit 2
Non	Containment Building Systems - Unit 2
Non	Diesel Generator Systems - Unit 2
Non	Full Flow Areas Systems - Unit 2
Non	Intake Systems - Unit 2
Non	Penetration Building Systems - Unit 2
Non	Safety Equipment Building Systems - Unit 2
Non	Turbine Bldg Equip to 9 ft - Unit 2
Struct	Condensate Storage Area - Unit 2
Struct	Containment Building - Unit 2
Struct	Control Building - Unit 2
Struct	Diesel Generator Building - Unit 2
Struct	Fuel Handling Building - Unit 2
Struct	Full Flow Building - Unit 2
Struct	Intake Structure - Unit 2
Struct	Penetration Building - Unit 2
Struct	Radwaste Building - Unit 2
Struct	Safety Equipment Building - Unit 2
Struct	Tunnels - Unit 2
Struct	Turbine Building - Unit 2
Ess	Auxilary Control Systems - Unit 3
Ess	Fuel Handling Building Systems - Unit 3

SONGS Plant System and Structure List

Unit 3

Type	System Name or Description
Ess	Radwaste Systems - Unit 3
Non	Condenstate Storage Systems - Unit 3
Non	Containment Building Systems - Unit 3
Non	Diesel Generator Systems - Unit 3
Non	Full Flow Areas Systems - Unit 3
Non	Intake Systems - Unit 3
Non	Penetration Building Systems - Unit 3
Non	Safety Equipment Building Systems - Unit 3
Non	Turbine Bldg Equip to 9 ft - Unit 3
Non	Turbine Generator to 63 ft - Unit 3
Struct	Condensate Storage Tank Area - Unit 3
Struct	Containment Building - Unit 3
Struct	Control Building - Unit 3
Struct	Diesel Generator Building - Unit 3
Struct	Fuel Handling Building - Unit 3
Struct	Full Flow Building - Unit 3
Struct	Intake Structure - Unit 3
Struct	Penetration Building - Unit 3
Struct	Radwaste Building - Unit 3
Struct	Safety Equipment Building - Unit 3
Struct	Tunnels - Unit 3
Struct	Turbine Building - Unit 3

Appendix B

Spent Fuel Shipping Schedule

SONGS Unit 2 & Unit 3
Spent Fuel Shipping Schedule
2024 DOE Acceptance

	On-Site Inventory (Beginning of Year)				On-Site Transfers (During Year)		Off-Site Transfers (During Year)			
Year	Units 2 & 3 Fuel Assemblies in Wet Storage	Units 2 & 3 Fuel Assemblies in Dry Storage	Units 2 & 3 Fuel Assemblies in On-Site Storage	Units 2 & 3 Canisters in ISFSI	Unit 2 & 3 Fuel Assemblies Transferred to ISFSI	Unit 2 & 3 Fuel Canisters Transferred to ISFSI	Unit 2 Assemblies Transferred to DOE	Unit 3 Assemblies Transferred to DOE	Units 2 & 3 Assemblies Transferred to DOE	Units 2 & 3 Canisters Transferred to DOE
2014	2668	792	3460	33	0	0	0	0	0	0
2015	2668	792	3460	33	0	0	0	0	0	0
2016	2668	792	3460	33	0	0	0	0	0	0
2017	2668	792	3460	33	768	24	0	0	0	0
2018	1900	1560	3460	57	1,536	48	0	0	0	0
2019	364	3096	3460	105	364	13	0	0	0	0
2020	0	3460	3460	118	0	0	0	0	0	0
2021	0	3460	3460	118	0	0	0	0	0	0
2022	0	3460	3460	118	0	0	0	0	0	0
2023	0	3460	3460	118	0	0	0	0	0	0
2024	0	3460	3460	118	0	0	0	0	0	0
2025	0	3460	3460	118	0	0	0	0	0	0
2026	0	3460	3460	118	0	0	0	0	0	0
2027	0	3460	3460	118	0	0	0	0	0	0
2028	0	3460	3460	118	0	0	0	0	0	0
2029	0	3460	3460	118	0	0	0	0	0	0
2030	0	3460	3460	118	0	0	48	48	96	4
2031	0	3364	3364	114	0	0	192	96	288	12
2032	0	3076	3076	102	0	0	120	120	240	10
2033	0	2836	2836	92	0	0	0	96	96	4
2034	0	2740	2740	88	0	0	112	120	232	8
2035	0	2508	2508	80	0	0	96	96	192	6
2036	0	2316	2316	74	0	0	128	96	224	7
2037	0	2092	2092	67	0	0	0	0	0	0
2038	0	2092	2092	67	0	0	96	128	224	7
2039	0	1868	1868	60	0	0	96	96	192	6
2040	0	1676	1676	54	0	0	96	96	192	6
2041	0	1484	1484	48	0	0	0	0	0	0
2042	0	1484	1484	48	0	0	96	96	192	6
2043	0	1292	1292	42	0	0	96	96	192	6
2044	0	1100	1100	36	0	0	96	96	192	6
2045	0	908	908	30	0	0	128	96	224	7
2046	0	684	684	23	0	0	96	128	224	7
2047	0	460	460	16	0	0	96	230	326	11
2048	0	134	134	5	0	0	0	0	0	0
2049	0	134	134	5	0	0	134	0	134	5
2050	0	0	0	0	0	0	0	0	0	0

Appendix C

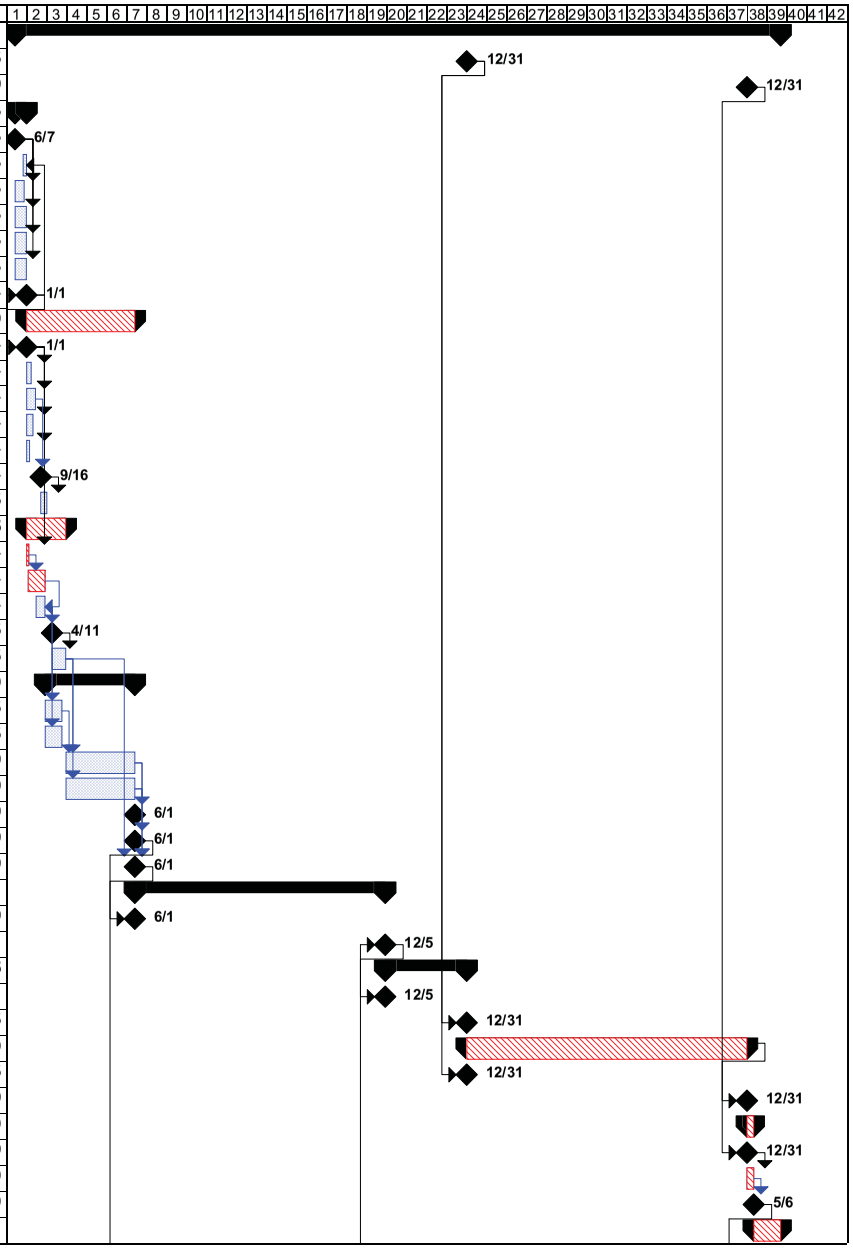
Detailed Project Schedule

SONGS 2 & 3

Detailed Project Schedule

Prompt DECON, DOE Repository Opens 2024

ID	Task Name	Duration	Start	Finish
1	**Post-Shutdown Spent Fuel Management**	**9982 days**	**06/07/2013**	**09/08/2051**
2	Spent Fuel Shipping Complete - Unit 1	0 days	12/31/2035	12/31/2035
3	Spent Fuel Shipping Complete - Units 2 & 3	0 days	12/31/2049	12/31/2049
4	**SNF Pd 1 - Spent Fuel Management Transition**	**149 days**	**06/07/2013**	**12/31/2013**
5	SNF Pd 1 Begins	0 days	06/07/2013	06/07/2013
6	Security Enhancements	45 days	10/31/2013	12/31/2013
7	Design and Fabricate Spent Fuel Canisters	120 days	06/07/2013	11/21/2013
8	Post Fukushima Modifications - Unit 2	148 days	06/07/2013	12/31/2013
9	Post Fukushima Modifications - Unit 3	148 days	06/07/2013	12/31/2013
10	Cyber Security Modifications	148 days	06/07/2013	12/31/2013
11	SNF Pd 1 Ends	0 days	01/01/2014	01/01/2014
12	**SNF Pd 2 - Spent Fuel Transfer to Dry Storage**	**1413 days**	**1/1/2014**	**06/01/2019**
13	SNF Pd 2 Begins	0 days	01/01/2014	01/01/2014
14	Security Enhancements	60 days	01/02/2014	03/26/2014
15	Prepare Irradiated Fuel Management Plan	118 days	01/02/2014	06/14/2014
16	Decay Heat Analysis	85 days	01/02/2014	04/30/2014
17	Zirconium Fire and Shine Analysis	42 days	01/02/2014	02/28/2014
18	Issue Irradiated Fuel Management Plan	0 days	09/16/2014	09/16/2014
19	NRC Review of Irradiated Fuel Management Plan	82 days	09/17/2014	01/08/2015
20	**ISFSI Expansion**	**513 days**	**01/02/2014**	**12/19/2015**
21	Select Dry Storage System Canister Design and Vendor	30 days	01/02/2014	02/12/2014
22	ISFSI Pad Study	220 days	02/03/2014	12/06/2014
23	Design ISFSI Expansion	120 days	06/24/2014	12/06/2014
24	ISFSI Permit Approved By California Coastal Commission	0 days	04/11/2015	04/11/2015
25	Construct ISFSI Expansion	180 days	04/14/2015	12/19/2015
26	**Canister Purchase, Fabrication and Fuel Tranfer**	**1170 days**	**12/09/2014**	**06/01/2019**
27	Purchase Spent Fuel Canisters and AHSMs - Unit 2	220 days	12/09/2014	10/10/2015
28	Purchase Spent Fuel Canisters and AHSMs - Unit 3	220 days	12/09/2014	10/10/2015
29	Load Spent Fuel Canisters and Transfer to ISFSI - Unit 2	900 days	12/22/2015	06/01/2019
30	Load Spent Fuel Canisters and Transfer to ISFSI - Unit 3	900 days	12/22/2015	06/01/2019
31	Unit 2 Spent Fuel Pool Empty	0 days	06/01/2019	06/01/2019
32	Unit 3 Spent Fuel Pool Empty	0 days	06/01/2019	06/01/2019
33	SNF Pd 2 Ends	0 days	06/01/2019	06/01/2019
34	**SNF Pd 3 - Dry Storage During Decommissioning - Units 1, 2 and 3**	**3265 days**	**06/01/2019**	**12/05/2031**
35	SNF Pd 3 Begins	0 days	06/01/2019	06/01/2019
36	SNF Pd 3 Ends	0 days	12/05/2031	12/05/2031
37	**SNF Pd 4 - Dry Storage Only - Units 1, 2 and 3**	**1061 days**	**12/05/2031**	**12/31/2035**
38	SNF Pd 4 Begins	0 days	12/05/2031	12/05/2031
39	SNF Pd 4 Ends	0 days	12/31/2035	12/31/2035
40	**SNF Pd 5 - Dry Storage Only - Units 2 and 3**	**3654 days**	**12/31/2035**	**12/31/2049**
41	SNF Pd 5 Begins	0 days	12/31/2035	12/31/2035
42	SNF Pd 5 Ends	0 days	12/31/2049	12/31/2049
43	**SNF D&D Pd 1 - ISFSI D&D Planning**	**90 days**	**12/31/2049**	**05/06/2050**
44	SNF D&D Pd 1 Begins	0 days	12/31/2049	12/31/2049
45	Preparation and NRC Review of License Termination Plan	90 days	01/01/2050	05/06/2050
46	SNF D&D Pd 1 Ends	0 days	05/06/2050	05/06/2050
47	**SNF D&D Pd 2 - ISFSI D&D**	**350 days**	**05/06/2050**	**09/08/2051**

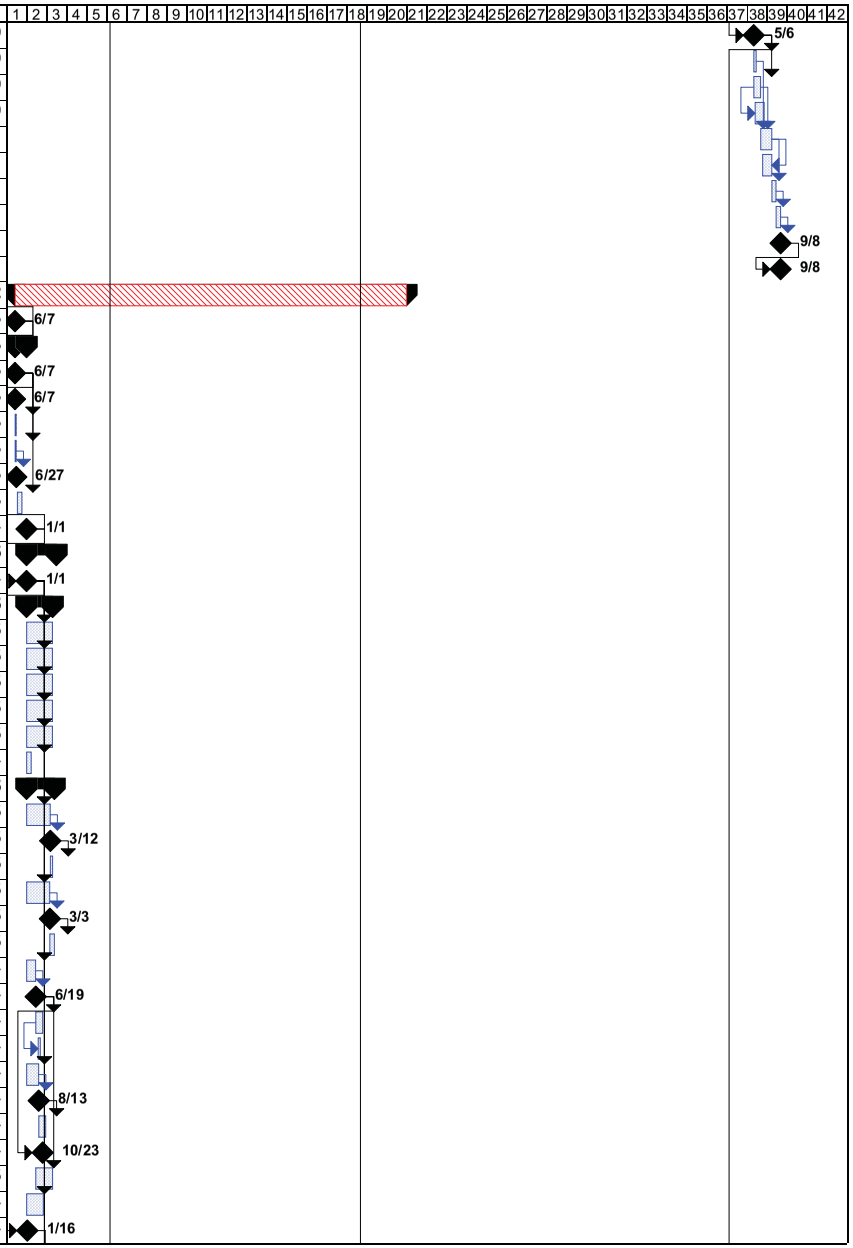


SONGS 2 & 3

Detailed Project Schedule

Prompt DECON, DOE Repository Opens 2024

ID	Task Name	Duration	Start	Finish
48	SNF D&D Pd 2 Begins	0 days	05/06/2050	05/06/2050
49	Install GARDIAN Bulk Assay System	30 days	05/07/2050	06/17/2050
50	Decon AHSMs	90 days	05/07/2050	09/09/2050
51	Final Status Survey of ISFSI	120 days	05/28/2050	11/11/2050
52	Clean Demolition of ISFSI AHSMs and Pad	145 days	09/10/2050	03/31/2051
53	Clean Demolition of ISFSI Support Structures	120 days	10/15/2050	03/31/2051
54	Restore ISFSI Site	55 days	04/01/2051	06/16/2051
55	Preparation of Final Report on Decommissioning and NRC Review	60 days	06/17/2051	09/08/2051
56	SNF D&D Pd 2 Ends - License Termination Complete	0 days	09/08/2051	09/08/2051
57	Post-Shutdown Spent Fuel Management Complete	0 days	09/08/2051	09/08/2051
58	**Part 50 License Termination**	**5102 days**	**06/07/2013**	**12/24/2032**
59	Announcement of Cessation of Operations (June 7, 2013)	0 days	06/07/2013	06/07/2013
60	**Decon Pd 1 - Transition to Decommissioning**	**149 days**	**06/07/2013**	**12/31/2013**
61	Decon Pd 1 Begins	0 days	06/07/2013	06/07/2013
62	Certification of Permanent Cessation Submitted to NRC (June 12, 2013)	0 days	06/07/2013	06/07/2013
63	Defuel Unit 3 Reactor	15 days	06/07/2013	06/27/2013
64	Defuel Unit 2 Reactor	15 days	06/07/2013	06/27/2013
65	Notification of Permanent Fuel Removal (July 23, 2013)	0 days	06/27/2013	06/27/2013
66	Disposition of Legacy Wastes	60 days	07/19/2013	10/10/2013
67	Decon Pd 1 Ends	0 days	01/01/2014	01/01/2014
68	**Decon Pd 2 - Decommissioning Planning and Site Modifications**	**389 days**	**1/1/2014**	**06/30/2015**
69	Decon Pd 2 Begins	0 wks	01/01/2014	01/01/2014
70	**Preparation of Decommissioning License Documents**	**340 days**	**01/02/2014**	**04/22/2015**
71	Develop Certified Fuel Handler Program	340 days	01/02/2014	04/22/2015
72	Prepare Post-Shutdown QA Plan	340 days	01/02/2014	04/22/2015
73	Prepare Post-Shutdown Security Plan	340 days	01/02/2014	04/22/2015
74	Prepare Post-Shutdown Fire Protection Plan	340 days	01/02/2014	04/22/2015
75	Prepare Defueled Radiation Protection Manual	340 days	01/02/2014	04/22/2015
76	Prepare Preliminary Defueled Technical Specifications	63 days	01/02/2014	03/29/2014
77	**NRC Deliverables**	**364 days**	**01/02/2014**	**05/26/2015**
78	Prepare Defueled Safety Analysis Report (DSAR)	311 days	01/02/2014	03/12/2015
79	Submit DSAR to NRC	0 days	03/12/2015	03/12/2015
80	Implement Technical Specification Modifications	30 days	03/13/2015	04/23/2015
81	Prepare Post-Shutdown Emergency Preparedness Plan	304 days	01/02/2014	03/03/2015
82	Submit Emergency Plan to NRC	0 days	03/03/2015	03/03/2015
83	NRC Review of Emergency Plan	60 days	03/04/2015	05/26/2015
84	Prepare Post-Shutdown Decommissioning Activities Report (PSDAR)	121 days	01/02/2014	06/19/2014
85	Submit PSDAR to NRC	0 days	06/19/2014	06/19/2014
86	NRC Review of PSDAR	90 days	06/20/2014	10/23/2014
87	Public Meeting on PSDAR	30 days	08/01/2014	09/11/2014
88	Prepare Decommissioning Cost Estimate (DCE)	160 days	01/02/2014	08/13/2014
89	Submit DCE to NRC	0 days	08/13/2014	08/13/2014
90	NRC Review of Decommissioning Cost Estimate	90 days	08/14/2014	12/17/2014
91	Commencement of Major Decommisisoning Activities Allowable	0 days	10/23/2014	10/23/2014
92	Respond to NRC quesitons on PSDAR	220 days	06/20/2014	04/23/2015
93	Disposition of Legacy Wastes	220 days	01/02/2014	11/05/2014
94	Contract Award for Historic Site Assessment and Site Characterization	0 wks	01/16/2014	01/16/2014



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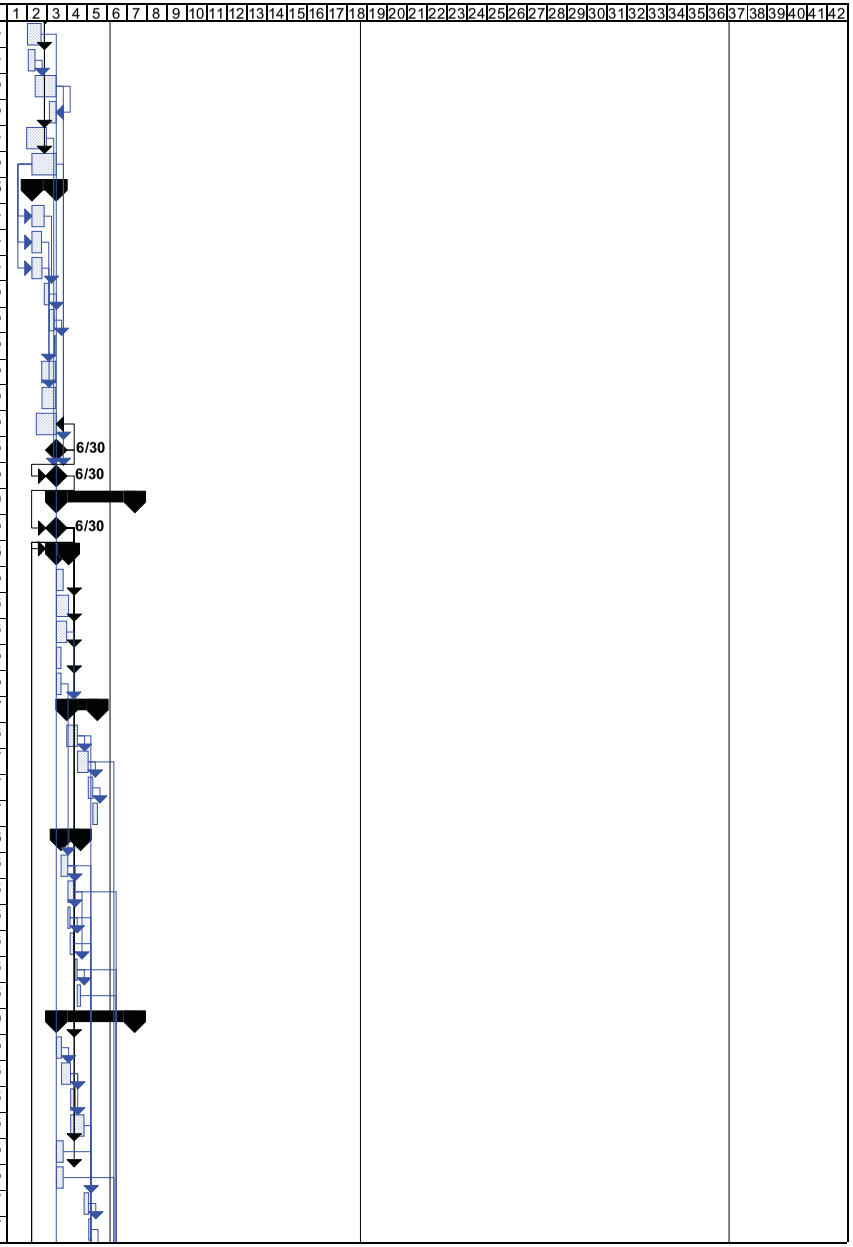
Detailed Project Schedule

Prompt DECON, DOE Repository Opens 2024

ID	Task Name	Duration	Start	Finish
95	Perform Historic Site Assessment and Site Characterization	180 days	01/17/2014	09/25/2014
96	Planning and Design For Cold and Dark	90 days	02/01/2014	06/06/2014
97	Implement Cold and Dark (Repower Site)	275 days	06/07/2014	06/26/2015
98	Install 12kV Service Line to Power Temporary Power Ring	90 days	02/21/2015	06/26/2015
99	Drain and De-Energize Non-Essential Systems (DEC Process)	260 days	01/02/2014	12/31/2014
100	Select Decommissioning General Contractor (DGC)	318 days	04/11/2014	06/30/2015
101	**Spent Fuel Pool Isolation**	**318 days**	**04/11/2014**	**06/30/2015**
102	Design Spent Fuel Pool Support System Modifications	160 days	04/11/2014	11/20/2014
103	Design Control Room Relocation	125 days	04/11/2014	10/02/2014
104	Design Spent Fuel Security System Modifications	130 days	04/11/2014	10/09/2014
105	Install Spent Fuel Pool System Modifications - Unit 2	66 days	11/21/2014	02/20/2015
106	Install Spent Fuel Pool System Modifications - Unit 3	66 days	02/21/2015	05/23/2015
107	Spent Fuel Pool Island System Training	10 days	05/26/2015	06/06/2015
108	Implement Control Room Modifications	185 days	10/03/2014	06/18/2015
109	Implement Spent Fuel Pool Security Modifications	180 days	10/10/2014	06/18/2015
110	Transition Project Modifictations	262 days	06/28/2014	06/30/2015
111	DGC Contract Award	0 days	06/30/2015	06/30/2015
112	Decon Pd 2 Ends	0 wks	06/30/2015	06/30/2015
113	**Decon Pd 3 - Decommissioning Preparations and Reactor Internals Segmenta**	**1024 days**	**06/30/2015**	**06/01/2019**
114	Decon Pd 3 Begins	0 days	06/30/2015	06/30/2015
115	**DGC Mobilization and Planning**	**160 days**	**07/01/2015**	**02/09/2016**
116	Prepare Integrated Work Sequence and Schedule for Decommissioning	90 days	07/01/2015	11/03/2015
117	Prepare Detailed Work Procedures for Decommissioning	160 days	07/01/2015	02/09/2016
118	Planning and Design of Primary System Decontamination	135 days	07/01/2015	01/05/2016
119	Planning and Design of Infrastructure Improvements	60 days	07/01/2015	09/22/2015
120	Design Containment Access Modifications	60 days	07/01/2015	09/22/2015
121	**System Decon**	**400 days**	**01/06/2016**	**07/18/2017**
122	Perform Primary System Decon- Unit 2	140 days	01/06/2016	07/19/2016
123	Perform Primary System Decon- Unit 3	140 days	07/20/2016	01/31/2017
124	Hot Spot Decontamination - Unit 2	60 days	02/01/2017	04/25/2017
125	Hot Spot Decontamination - Unit 3	60 days	04/26/2017	07/18/2017
126	**Rx Internals Removal Preparations**	**255 days**	**09/23/2015**	**09/13/2016**
127	Modify Containment Access- Unit 2	90 days	09/23/2015	01/26/2016
128	Modify Containment Access- Unit 3	90 days	01/27/2016	05/31/2016
129	Remove and Dispose of Missle Shields - Unit 2	30 days	01/27/2016	03/08/2016
130	Remove and Dispose of Reactor Head - Unit 2	45 days	03/09/2016	05/10/2016
131	Remove and Dispose of Missle Shields - Unit 3	30 days	06/01/2016	07/12/2016
132	Remove and Dispose of Reactor Head - Unit 3	45 days	07/13/2016	09/13/2016
133	**Reactor Internals Segmentation Planning and Implementation**	**1020 days**	**07/01/2015**	**05/28/2019**
134	Finalize Residual Radiation Inventory (Rx Vessel & Internals)	65 days	07/01/2015	09/29/2015
135	Prepare Activity Specification for Rx Vessel and Internals Segmentation	120 days	09/30/2015	03/15/2016
136	Select Shipping Casks and Obtain Shipping Permits	60 days	03/16/2016	06/07/2016
137	Design, Specify, and Procure Special Items and Materials	175 days	03/16/2016	11/15/2016
138	Purchase Dry Storage Modules for GTCC Waste - Unit 2	90 days	07/01/2015	11/03/2015
139	Purchase Dry Storage Modules for GTCC Waste - Unit 3	90 days	07/01/2015	11/03/2015
140	Test Special Cutting and Handling Equipment and Train Operators	60 days	11/16/2016	02/07/2017
141	Finalize Internals and Vessel Segmenting Details - Unit 2	30 days	02/08/2017	03/21/2017



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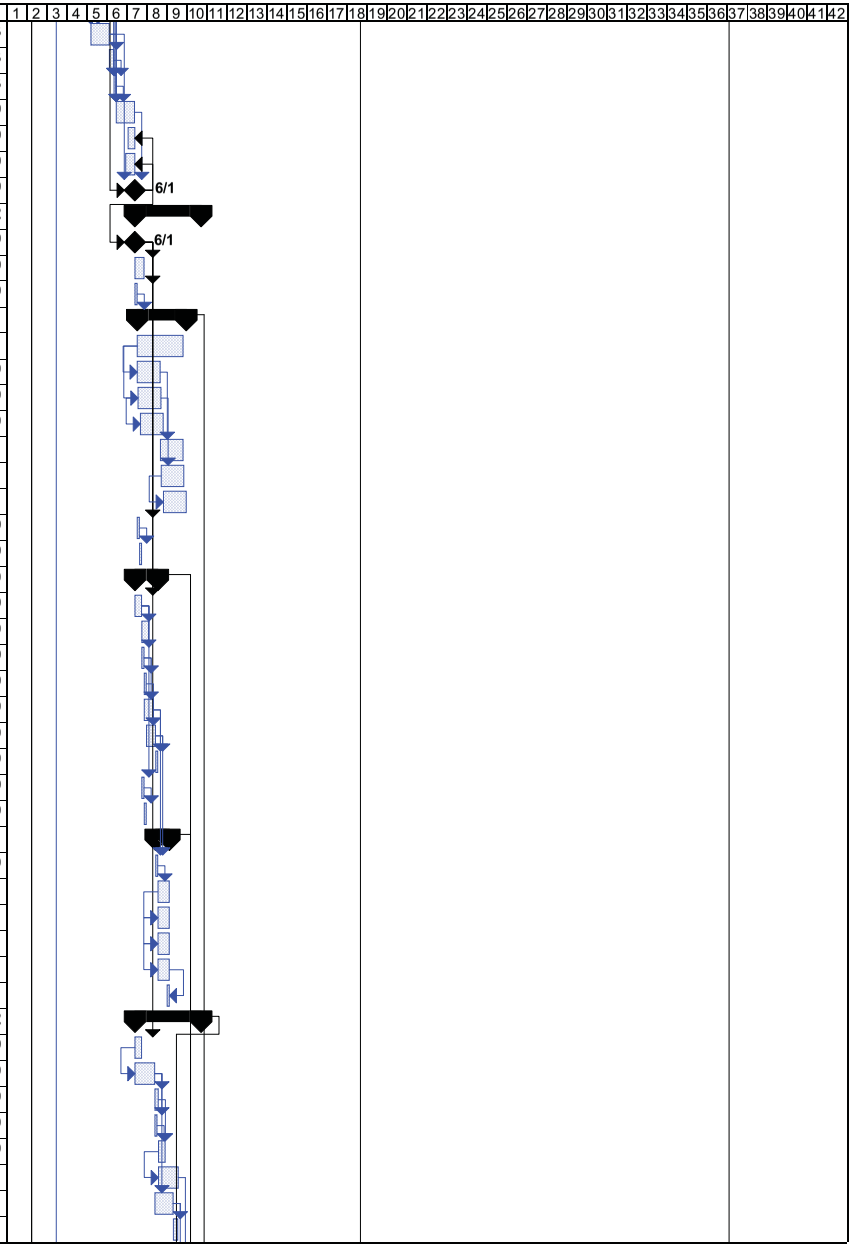
Detailed Project Schedule

Prompt DECON, DOE Repository Opens 2024

ID	Task Name	Duration	Start	Finish
142	Segment, Package and Dispose of Reactor Internals - Unit 2	240 days	03/22/2017	02/20/2018
143	Transfer Internals Segmentation Equipment to Unit 3	60 days	02/21/2018	05/15/2018
144	Finalize Internals and Vessel Segmenting Details - Unit 3	30 days	05/16/2018	06/26/2018
145	Segment, Package and Dispose of Reactor Internals - Unit 3	240 days	06/27/2018	05/28/2019
146	Construct new change rooms, hot laundry, in-plant laydown areas	90 days	01/29/2019	06/01/2019
147	Procure Non-Engineered Standard Equipment	120 days	12/18/2018	06/01/2019
148	Decon Pd 3 Ends	0 wks	06/01/2019	06/01/2019
149	**Decon Pd 4 - Plant Systems and Large Component Removal**	**865 days**	**06/01/2019**	**09/24/2022**
150	Decon Pd 4 Begins	0 days	06/01/2019	06/01/2019
151	Upgrade Rail Spur	120 days	06/04/2019	11/16/2019
152	Install GARDIAN Bulk Assay System	30 days	06/04/2019	07/13/2019
153	**Non Essential System Removal**	**640 days**	**07/16/2019**	**12/25/2021**
154	Scaffolding for Non-Essential System Removal	120 wks	07/16/2019	10/30/2021
155	Asbestos Abatement for Non-Essential Systems Removal - Unit 2	60 wks	07/16/2019	09/05/2020
156	Lead Abatement for Non-Essential Systems Removal - Unit 2	60 wks	07/30/2019	09/19/2020
157	Remove, Package and Dispose of Non-Essential Systems - Unit 2	60 wks	09/10/2019	10/31/2020
158	Asbestos Abatement for Non-Essential Systems - Unit 3	60 wks	09/08/2020	10/30/2021
159	Lead Abatement for Non-Essential Systems - Unit 3	60 wks	09/22/2020	11/13/2021
160	Remove, Package and Dispose of Non-Essential Systems - Unit 3	60 wks	11/03/2020	12/25/2021
161	Remove Underground Diesel Tank - Unit 2	30 days	07/16/2019	08/24/2019
162	Remove Underground Diesel Tank - Unit 3	30 days	08/27/2019	10/05/2019
163	**Fuel Pool Closure**	**300 days**	**06/04/2019**	**07/25/2020**
164	Remove and Dispose of Spent Fuel Storage Racks - Unit 2	90 days	06/04/2019	10/05/2019
165	Remove and Dispose of Spent Fuel Storage Racks - Unit 3	90 days	10/08/2019	02/08/2020
166	Remove and Dispose of Legacy Class B and C Waste - Unit 2	30 days	10/08/2019	11/16/2019
167	Remove and Dispose of Legacy Class B and C Waste - Unit 3	30 days	11/19/2019	12/28/2019
168	Drain Spent Fuel Pool and Process Liquid Waste - Unit 2	24 wks	11/19/2019	05/02/2020
169	Drain Spent Fuel Pool and Process Liquid Waste - Unit 3	24 wks	12/31/2019	06/13/2020
170	Segment, Package and Dispose of Spent Fuel Pool Island Equipment	30 days	06/16/2020	07/25/2020
171	Segment and Dispose of Fuel Pool Bridge Crane - Unit 2	30 days	10/08/2019	11/16/2019
172	Segment and Dispose of Fuel Pool Bridge Crane - Unit 3	30 days	11/19/2019	12/28/2019
173	**Essential Systems Removal**	**180 days**	**06/16/2020**	**02/20/2021**
174	Flush and Drain Essential Systems Following Fuel Pool Closure	30 days	06/16/2020	07/25/2020
175	Scaffolding for Essential System Removal	30 wks	07/28/2020	02/20/2021
176	Asbestos Abatement for Essential Systems	30 wks	07/28/2020	02/20/2021
177	Lead Abatement for Essential Systems Removal	30 wks	07/28/2020	02/20/2021
178	Remove, Package and Dispose of Essential Systems	30 wks	07/28/2020	02/20/2021
179	Removal and Disposal of Spent Resins, Filter Media and Tank Sludge	30 days	01/12/2021	02/20/2021
180	**Large Component Removal**	**865 days**	**06/04/2019**	**09/24/2022**
181	Reactor Vessel Insulation Removal and Disposal - Unit 2	90 days	06/04/2019	10/05/2019
182	Segment, Package and Dispose of Reactor Pressure Vessel - Unit 2	260 days	06/04/2019	05/30/2020
183	Transfer Rx Vessel Segmentation Equipment to Unit 3	45 days	06/02/2020	08/01/2020
184	Procure Replacement Non-Engineered Standard Equipment	30 days	06/02/2020	07/11/2020
185	Reactor Vessel Insulation Removal and Disposal - Unit 3	90 days	08/04/2020	12/05/2020
186	Segment, Package and Dispose of Reactor Pressure Vessel - Unit 3	260 days	08/04/2020	07/31/2021
187	Remove and Dispose of Steam Generators - Unit 2	240 days	06/02/2020	05/01/2021
188	Remove and Dispose of Pressurizer - Unit 2	60 days	05/04/2021	07/24/2021



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Detailed Project Schedule

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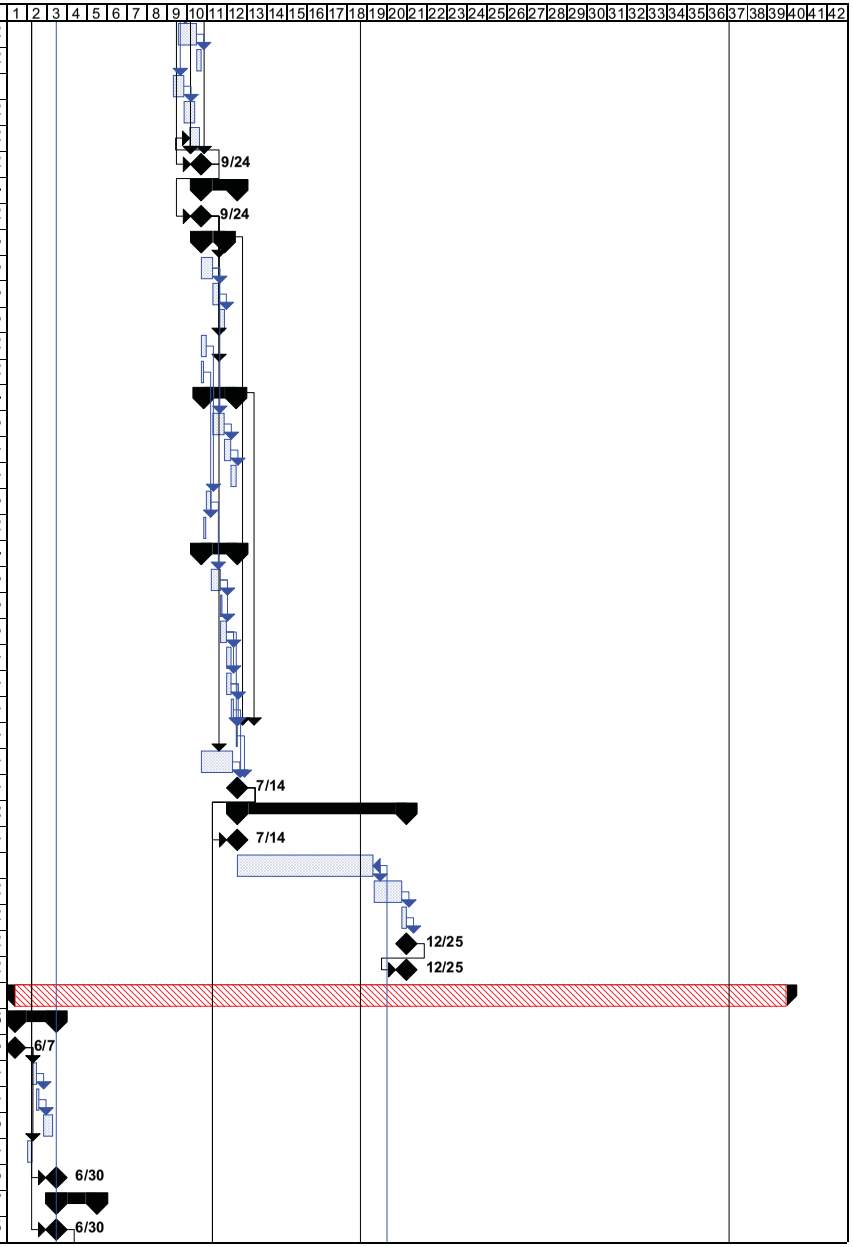
ID	Task Name	Duration	Start	Finish
189	Remove and Dispose of Steam Generators - Unit 3	240 days	08/03/2021	07/02/2022
190	Remove and Dispose of Pressurizer - Unit 3	60 days	07/05/2022	09/24/2022
191	Remove and Dispose of Turbine Gantry Crane - Unit 2	140 days	05/04/2021	11/13/2021
192	Remove and Dispose of Turbine Gantry Crane - Unit 3	140 days	11/16/2021	05/28/2022
193	Prepare License Termination Plan	26 wks	03/01/2022	08/27/2022
194	Decon Pd 4 Ends	0 days	09/24/2022	09/24/2022
195	**Decon Pd 5 - Building Decontamination**	**470 days**	**09/24/2022**	**07/13/2024**
196	Decon Pd 5 Begins	0 days	09/24/2022	09/24/2022
197	**Unit 3**	**305 days**	**09/27/2022**	**11/25/2023**
198	Decon Containment Building - Unit 3	150 days	09/27/2022	04/22/2023
199	Decon Penetration Building - Unit 3	85 days	04/25/2023	08/19/2023
200	Decon Safety Equipment and MSIV Building - Unit 3	70 days	08/22/2023	11/25/2023
201	Decon Fuel Handling Building - Unit 3	65 days	09/27/2022	12/24/2022
202	Decon Turbine Building - Unit 3	30 days	09/27/2022	11/05/2022
203	**Unit 2**	**425 days**	**11/08/2022**	**06/22/2024**
204	Decon Containment Building - Unit 2	150 days	04/25/2023	11/18/2023
205	Decon Penetration Building - Unit 2	85 days	11/21/2023	03/16/2024
206	Decon Safety Equipment and MSIV Building - Unit 2	70 days	03/19/2024	06/22/2024
207	Decon Fuel Handling Building - Unit 2	65 days	12/27/2022	03/25/2023
208	Decon Turbine Building - Unit 2	30 days	11/08/2022	12/17/2022
209	**Common**	**470 days**	**09/27/2022**	**07/13/2024**
210	Decon Auxiliary Radwaste Building - Common	120 days	03/28/2023	09/09/2023
211	Decon Auxiliary Control Building - Common	20 days	09/12/2023	10/07/2023
212	Decon Condensate Area and Tunnels - Units 2 and 3	80 days	09/12/2023	12/30/2023
213	Excavate, Remove and Dispose of Yard Area Drains	60 days	01/02/2024	03/23/2024
214	Remove and Dispose of Contaminated Sumps, Trenches and Pavement	60 days	01/02/2024	03/23/2024
215	Remove and Dispose of Radiologically Contaminated Soil	30 days	03/26/2024	05/04/2024
216	Dispose of Contaminated Decon Equipment and Tooling	15 days	06/25/2024	07/13/2024
217	Radiological Survey of Structures During Decon	410 days	09/27/2022	04/20/2024
218	Decon Pd 5 Ends	0 days	07/13/2024	07/13/2024
219	**Decon Pd 6 - License Termination During Demolition**	**2206 days**	**07/13/2024**	**12/24/2032**
220	Decon Pd 6 Begins	0 days	07/13/2024	07/13/2024
221	Final Status Survey	1771 days	07/13/2024	04/25/2031
222	ORISE Verification and NRC Approval	18 mons	05/17/2031	10/01/2032
223	Prepare Final Report of Dismantling Program	60 days	10/02/2032	12/24/2032
224	Decon Complete - Partial License Termination	0 days	12/24/2032	12/24/2032
225	Decon Pd 6 Ends	0 days	12/24/2032	12/24/2032
226	**Site Restoration**	**10052 days**	**06/07/2013**	**12/15/2051**
227	**SR Pd 1 - Transition to Site Restoration**	**538 days**	**06/07/2013**	**06/30/2015**
228	SR Pd 1 Begins	0 days	06/07/2013	06/07/2013
229	Mesa Site Phase I and II Site Assessment	60 days	04/11/2014	07/03/2014
230	Disposition Hazardous Waste from Mesa Site	30 days	07/04/2014	08/14/2014
231	Mesa Site Characterization Survey	120 days	11/07/2014	04/23/2015
232	Fuel Cancellation Expense	60 days	01/21/2014	04/12/2014
233	SR Pd 1 Ends	0 days	06/30/2015	06/30/2015
234	**SR Pd 2 - Building Demolition During Decommissioning**	**530 days**	**06/30/2015**	**07/11/2017**
235	SR Pd 2 Begins	0 days	06/30/2015	06/30/2015



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Detailed Project Schedule

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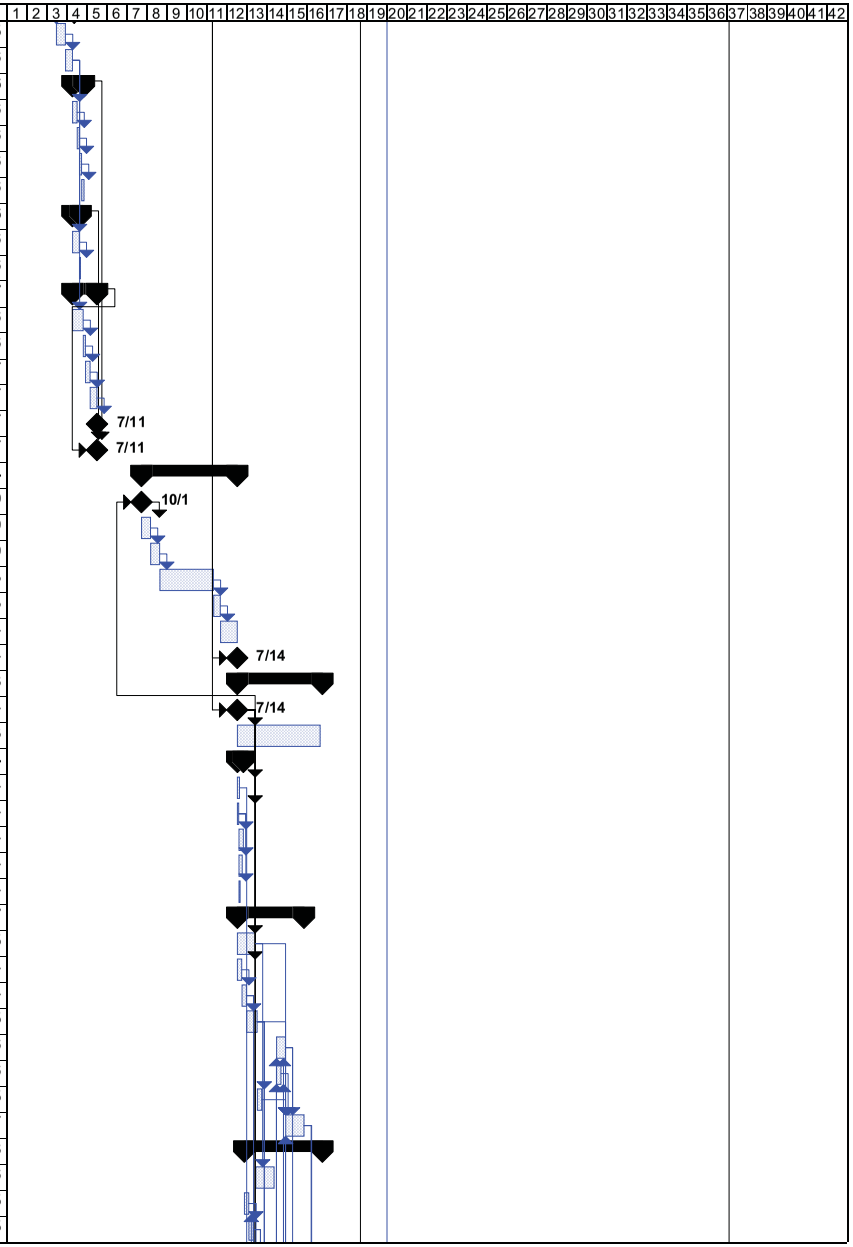
ID	Task Name	Duration	Start	Finish
236	Prepare Site Restoration Demolition Plan and Schedule	120 days	07/01/2015	12/15/2015
237	Obtain Required Permits For Mesa, South Access and South Yard	90 days	12/16/2015	04/19/2016
238	**South Access for Decommissioning**	**150 days**	**04/20/2016**	**11/15/2016**
239	Demolish Service Building (K-10, 20, 30)	60 days	04/20/2016	07/12/2016
240	Demolish South Security Processing Facility (K-70)	30 days	07/13/2016	08/23/2016
241	Demolish Staging Warehouse	30 days	08/24/2016	10/04/2016
242	Demolish Administration Building (K-40/50)	30 days	10/05/2016	11/15/2016
243	**South Yard Facility**	**105 days**	**04/20/2016**	**09/13/2016**
244	Demolish South Yard Area Buildings T-10, 20, 60 and Haz Mat.	90 days	04/20/2016	08/23/2016
245	Demolish REMS Staging Pad	15 days	08/24/2016	09/13/2016
246	**Mesa**	**320 days**	**04/20/2016**	**07/11/2017**
247	Demolish Mesa Buildings	140 days	04/20/2016	11/01/2016
248	Remove Underground Fuel Storage Tanks	30 days	11/02/2016	12/13/2016
249	Demolish Mesa Roads and Parking Lots	60 days	12/14/2016	03/07/2017
250	Finish Grading and Re-vegetate Mesa Site	90 days	03/08/2017	07/11/2017
251	Mesa Area Cleared for Easement Termination	0 days	07/11/2017	07/11/2017
252	SR Pd 2 Ends	0 days	07/11/2017	07/11/2017
253	**SR Pd 3 - Subsurface Demolition Engineering and Permitting**	**1250 days**	**10/01/2019**	**07/13/2024**
254	SR Pd 3 Begins	0 days	10/01/2019	10/01/2019
255	Hydrogeologic Investigation and Outfall Conduit Survey	120 days	10/01/2019	03/14/2020
256	Subsurface Structure Removal Engineering Planning and Design	120 days	03/17/2020	08/29/2020
257	Environmental Impacts Analyses for Lease Termination Activities	700 days	09/01/2020	05/06/2023
258	Final Site Grading and Shoreline Protection Engineering Planning and Design	90 days	05/09/2023	09/09/2023
259	Obtain Required Permits and Approvals	220 days	09/12/2023	07/13/2024
260	SR Pd 3 Ends	0 days	07/13/2024	07/13/2024
261	**SR Pd 4 - Building Demolition to 3 Feet Below Grade**	**1110 days**	**07/13/2024**	**10/14/2028**
262	SR Pd 4 Begins	0 days	07/13/2024	07/13/2024
263	Procure Building Demolition Equipment	1080 days	07/16/2024	09/02/2028
264	**Demolition Preparations**	**80 days**	**07/16/2024**	**11/02/2024**
265	Install Temporary Structures	30 days	07/16/2024	08/24/2024
266	Install Erosion and Sediment Controls	20 days	07/16/2024	08/10/2024
267	Remove Cathodic Protection Trench	60 days	08/13/2024	11/02/2024
268	Remove Protected Area Security Fencing	45 days	08/13/2024	10/12/2024
269	Remove Protected Area Pavement	20 days	08/13/2024	09/07/2024
270	**Unit 3**	**870 days**	**07/16/2024**	**11/13/2027**
271	Detension and Remove Unit 3 Containment Builidng Tendons	240 days	07/16/2024	06/14/2025
272	Demolish Diesel Generator Building - Unit 3	60 days	07/16/2024	10/05/2024
273	Demolish Condensate Building and Transformer Pads - Unit 3	60 days	10/08/2024	12/28/2024
274	Demolish Full Flow Area and Turbine Building - Unit 3	140 days	12/31/2024	07/12/2025
275	Demolish Unit 3 Fuel Handling Building to 3-Feet Below Grade	120 days	06/30/2026	12/12/2026
276	Demolish Penetration Building - Unit 3	60 days	06/30/2026	09/19/2026
277	Demolish Safety Equipmentand MSIV Building - Unit 3	60 days	07/15/2025	10/04/2025
278	Demolish Unit 3 Containment Building to 3-Feet Below Grade	240 days	12/15/2026	11/13/2027
279	**Unit 2**	**1020 days**	**11/19/2024**	**10/14/2028**
280	Detension and Remove Unit 2 Containment Builidng Tendons	240 days	06/17/2025	05/16/2026
281	Demolish Diesel Generator Building - Unit 2	60 days	11/19/2024	02/08/2025
282	Demolish Condensate Building and Transformer Pads - Unit 2	60 days	02/11/2025	05/03/2025



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Detailed Project Schedule

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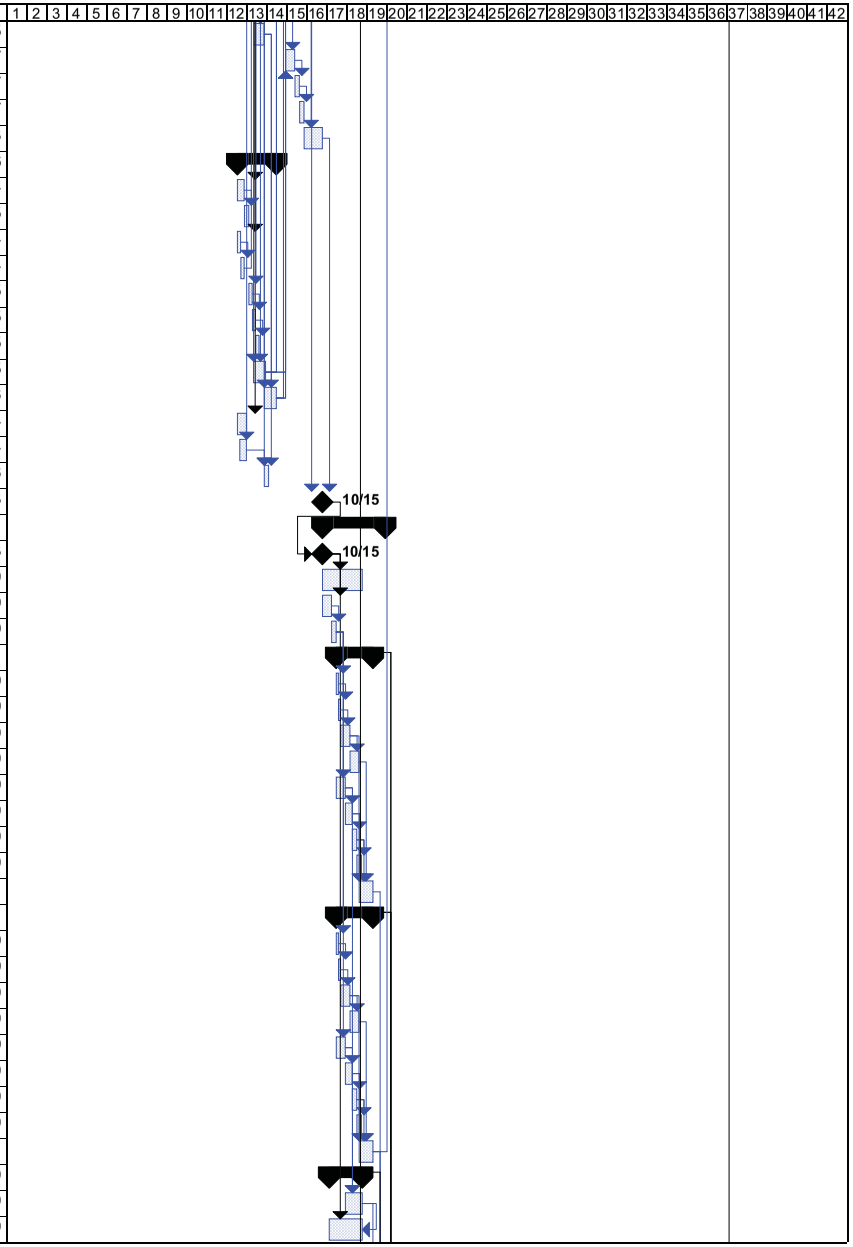
ID	Task Name	Duration	Start	Finish
283	Demolish Full Flow Area and Turbine Building - Unit 2	140 days	05/06/2025	11/15/2025
284	Demolish Unit 2 Fuel Handling Building to 3-Feet Below Grade	120 days	12/15/2026	05/29/2027
285	Demolish Penetration Building - Unit 2	60 days	06/01/2027	08/21/2027
286	Demolish Safety Equipment and MSIV Building - Unit 2	60 days	08/24/2027	11/13/2027
287	Demolish Unit 2 Containment Building to 3-Feet Below Grade	240 days	11/16/2027	10/14/2028
288	**Common**	**510 days**	**07/16/2024**	**06/27/2026**
289	Demolish AWS Building	90 days	07/16/2024	11/16/2024
290	Demolish Building L-50	60 days	11/19/2024	02/08/2025
291	Demolish Building B-64/B-65	45 days	07/16/2024	09/14/2024
292	Demolish Building B-62/B-63	45 days	09/17/2024	11/16/2024
293	Demolish Outage Control Center	45 days	02/11/2025	04/12/2025
294	Demolish Building B-49/B-50	45 days	04/15/2025	06/14/2025
295	Demolish Building B-43/B-44	45 days	06/17/2025	08/16/2025
296	Demolish Auxiliary Radwaste Building - Common	160 days	05/06/2025	12/13/2025
297	Demolish Auxiliary Control Building - Common	160 days	11/18/2025	06/27/2026
298	Remove Systems and Demolish Make-Up Demineralizer Structures	120 days	07/16/2024	12/28/2024
299	Install Concrete Plugs in Intake and Discharge Structures	90 days	08/27/2024	12/28/2024
300	Demolish Intake and Discharge Structures to 3-Feet Below Grade	60 days	11/18/2025	02/07/2026
301	SR Pd 4 Ends	0 days	10/14/2028	10/14/2028
302	**SR Pd 5 - Subgrade Structure Removal Below -3 Feet**	**820 days**	**10/14/2028**	**12/05/2031**
303	SR Pd 5 Begins	0 days	10/14/2028	10/14/2028
304	Procure Subsurface Structure Demolition Equipment	520 days	10/17/2028	10/11/2030
305	Install Sheet Piling and Excavation Shoring	120 days	10/17/2028	03/31/2029
306	Install Dewatering System and Effluent Treatment and Discharge Controls	60 days	04/01/2029	06/22/2029
307	**Unit 3 Subsurface Structures**	**480 days**	**06/23/2029**	**04/25/2031**
308	Demolish and Backfill Unit 3 Condensate Storage Area Below -3 Feet	30 days	06/23/2029	08/03/2029
309	Demolish and Backfill Unit 3 Diesel Generator Builidng Below -3 Feet	30 days	08/04/2029	09/14/2029
310	Demolish and Backfill Unit 3 Fuel Handling Building Below -3 Feet	120 days	09/15/2029	03/01/2030
311	Demolish and Backfill Unit 3 Radwaste Building Below -3 Feet	120 days	03/02/2030	08/16/2030
312	Demolish and Backfill Unit 3 Turbine Building Structure Below 9 Ft Elevatior	120 days	06/23/2029	12/07/2029
313	Demolish and Backfill Unit 3 Safety Equipment Building Below -3 Feet	90 days	12/08/2029	04/12/2030
314	Demolish and Backfill Unit 3 Penetration Area Below -3 Feet	60 days	04/13/2030	07/05/2030
315	Demolish and Backfill Unit 3 Full Flow Building Below -3 Feet	60 days	07/06/2030	09/27/2030
316	Demolish and Backfill Unit 3 Containment Building Below -3 Feet	180 days	08/17/2030	04/25/2031
317	**Unit 2 Subsurface Structures**	**480 days**	**06/23/2029**	**04/25/2031**
318	Demolish and Backfill Unit 2 Condensate Storage Area Below -3 Feet	30 days	06/23/2029	08/03/2029
319	Demolish and Backfill Unit 2 Diesel Generator Builidng Below -3 Feet	30 days	08/04/2029	09/14/2029
320	Demolish and Backfill Unit 2 Fuel Handling Building Below -3 Feet	120 days	09/15/2029	03/01/2030
321	Demolish and Backfill Unit 2 Radwaste Building Below -3 Feet	120 days	03/02/2030	08/16/2030
322	Demolish and Backfill Unit 2 Turbine Building Structure Below 9 Ft Elevatior	120 days	06/23/2029	12/07/2029
323	Demolish and Backfill Unit 2 Safety Equipment Building Below -3 Feet	90 days	12/08/2029	04/12/2030
324	Demolish and Backfill Unit 2 Penetration Area Below -3 Feet	60 days	04/13/2030	07/05/2030
325	Demolish and Backfill Unit 2 Full Flow Building Below -3 Feet	60 days	07/06/2030	09/27/2030
326	Demolish and Backfill Unit 2 Containment Building Below -3 Feet	180 days	08/17/2030	04/25/2031
327	**Common Subgrade Structures**	**432 days**	**02/16/2029**	**10/11/2030**
328	Demolish and Backfill Intake Structure Inside Seawall Below -3 Feet	220 days	12/08/2029	10/11/2030
329	Remove Off Shore Intake and Outfall Conduits	432 days	02/16/2029	10/11/2030

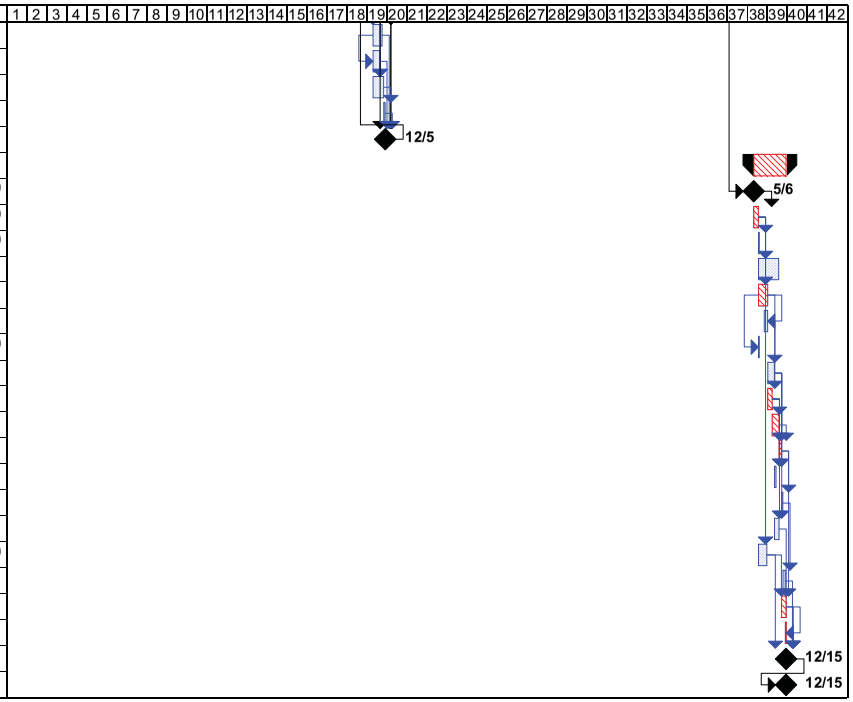


SONGS 2 & 3

Detailed Project Schedule

Prompt DECON, DOE Repository Opens 2024

ID	Task Name	Duration	Start	Finish
330	Remove Sheet Piling and Excavation Shoring	120 days	04/26/2031	10/10/2031
331	Remove Dewatering System and Effluent Treatment	90 days	04/26/2031	08/29/2031
332	Finish Grading and Re-Vegetate Site	140 days	04/26/2031	11/07/2031
333	Remove Temporary Structures	20 days	11/08/2031	12/05/2031
334	SR Pd 5 Ends	0 days	12/05/2031	12/05/2031
335	**SR Pd 6 - Final Site Restoration and Lease Termination**	**420 days**	**05/06/2050**	**12/15/2051**
336	SR Pd 6 Begins	0 days	05/06/2050	05/06/2050
337	Obtain Required Permits and Approvals	60 days	05/07/2050	07/29/2050
338	Install Temporary Structures	10 days	07/30/2050	08/12/2050
339	Procure Site Restoration Equipment	265 days	07/30/2050	08/04/2051
340	Install Temporary Seawall or Coffer Dam	120 days	07/30/2050	01/13/2051
341	Install Dewatering System and Effluent Treatment and Discharge Controls	45 days	11/12/2050	01/13/2051
342	Remove and Stockpile Existing Seawall Erosion Protection	10 days	07/30/2050	08/12/2050
343	Remove Unit 2 and 3 Seawall and Pedestrian Walkway	90 days	01/14/2051	05/19/2051
344	Remove Remaining Intake and Outfall Box Culvert	60 days	01/14/2051	04/07/2051
345	Remove Temporary Seawall or Coffer Dam	90 days	04/08/2051	08/11/2051
346	Backfill and Compaction of Excavation	30 days	08/12/2051	09/22/2051
347	Remove Dewatering System and Effluent Treatment	20 days	05/20/2051	06/16/2051
348	Install Shoreline Erosion Control and Restoration Features	20 days	09/23/2051	10/20/2051
349	Remove Railroad Tracks, Rails and Ballast	60 days	05/20/2051	08/11/2051
350	Remove Gunite Slope Protection	110 days	07/30/2050	12/30/2050
351	Remove Access Roads and Parking Lots	30 days	10/21/2051	12/01/2051
352	Finish Grading and Re-Vegetate Site	60 days	09/23/2051	12/15/2051
353	Remove Temporary Structures	10 days	12/02/2051	12/15/2051
354	SR Pd 6 Ends	0 days	12/15/2051	12/15/2051
355	Final Easement Termination	0 days	12/15/2051	12/15/2051



Appendix D

Detailed Cost Table

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
A. License Termination							
Decon Pd 1	**Transition to Decommissioning**						
Distributed							
1.05	Disposition of Legacy Wastes	$0	$0	$9,153	$735	$0	$9,888
Distributed	**Subtotal**	**$0**	**$0**	**$9,153**	**$735**	**$0**	**$9,888**
Undistributed							
1.01	Utility Staff	$30,049	$0	$0	$0	$0	$30,049
1.05	Insurance	$0	$0	$0	$5,352	$0	$5,352
1.07	NRC Decommissioning Fees	$0	$0	$0	$1,349	$0	$1,349
1.08	Materials and Services	$0	$0	$0	$1,007	$0	$1,007
1.10	Energy	$0	$0	$0	$2,422	$0	$2,422
1.17	Association Fees and Expenses	$0	$0	$0	$315	$0	$315
1.18	Utilities (Water, gas, phone)	$0	$0	$0	$840	$0	$840
1.20	Non-Process Computers	$0	$0	$0	$224	$0	$224
1.21	Telecommunications	$0	$0	$0	$41	$0	$41
1.22	Personal Computers	$0	$0	$0	$9	$0	$9
1.24	Environmental Permits and Fees	$0	$0	$0	$818	$0	$818
Undistributed	**Subtotal**	**$30,049**	**$0**	**$0**	**$12,378**	**$0**	**$42,426**
Decon Pd 1	**Subtotal**	**$30,049**	**$0**	**$9,153**	**$13,113**	**$0**	**$52,315**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
Decon Pd 2	**Decommissioning Planning and Site Modifications**						
Distributed							
2.01	Develop Certified Fuel Handler Program	$143	$1	$0	$0	$36	$180
2.02	Prepare Post-Shutdown QA Plan	$427	$1	$0	$0	$107	$535
2.03	Prepare Post-Shutdown Security Plan	$427	$1	$0	$0	$107	$535
2.04	Prepare Post-Shutdown Fire Protection Plan	$427	$1	$0	$0	$107	$535
2.05	Prepare Defueled Radiation Protection Manual	$427	$1	$0	$0	$107	$535
2.06	Prepare Preliminary Defueled Technical Specifications	$0	$0	$0	$135	$34	$169
2.07	Prepare Defueled Safety Analysis Report (DSAR)	$1,279	$5	$0	$0	$321	$1,605
2.08	Implement Technical Specification Modifications	$1,332	$5	$0	$0	$334	$1,671
2.09	Prepare Post-Shutdown Emergency Preparedness Plan	$634	$1	$0	$0	$159	$793
2.10	NRC Review of Emergency Preparedness Plan	$0	$0	$0	$105	$26	$131
2.11	Prepare Post-Shutdown Decommissioning Activities Report (PSDAR)	$550	$1	$0	$0	$138	$688
2.12	NRC Review of Post-Shutdown Decommissioning Activities Report (PSDAR)	$0	$0	$0	$105	$26	$131
2.13	Respond to NRC quesitons on PSDAR	$34	$1	$0	$0	$9	$43
2.14	Prepare Decommissioning Cost Estimate (DCE)	$1,429	$4	$0	$0	$358	$1,791
2.15	NRC Review of Decommissioning Cost Estimate	$0	$0	$0	$105	$26	$131
2.16	Disposition of Legacy Wastes	$0	$0	$16,457	$0	$4,114	$20,571
2.17	Perform Historic Site Assessment and Site Characterization	$6,784	$838	$0	$0	$1,143	$8,765
2.18	Planning and Design For Cold and Dark	$9,716	$90	$0	$0	$2,451	$12,257
2.19	Implement Cold and Dark (Repower Site)	$16,141	$17,860	$0	$0	$8,500	$42,501
2.20	Install 12kV Service Line to Power Temporary Power Ring	$0	$0	$0	$5,250	$1,313	$6,563
2.21	Drain and De-Energize Non-Essential Systems (DEC Process)	$822	$183	$1,485	$0	$623	$3,114
2.22	Select Decommissioning General Contractor	$645	$8	$0	$0	$163	$817
2.23	Design Spent Fuel Pool Support System Modifications	$622	$8	$0	$0	$157	$787
2.24	Design Control Room Relocation	$601	$7	$0	$0	$152	$760
2.25	Design Spent Fuel Security System Modifications	$459	$5	$0	$0	$116	$580
2.26	Install Spent Fuel Pool System Modifications - Unit 2	$1,863	$4,101	$0	$0	$1,491	$7,456
2.27	Install Spent Fuel Pool System Modifications - Unit 3	$1,863	$4,101	$0	$0	$1,491	$7,456
2.28	Spent Fuel Pool System Modification Training	$0	$0	$0	$273	$68	$341
2.29	Implement Control Room Modifications	$1,004	$1,519	$0	$0	$631	$3,153
2.30	Implement Spent Fuel Pool Security Modifications	$525	$795	$0	$0	$330	$1,650
2.31	Transition Project Modifications	$0	$0	$0	$105	$26	$131

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

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Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
Distributed	**Subtotal**	**$48,154**	**$29,538**	**$17,942**	**$6,077**	**$24,665**	**$126,376**
Undistributed							
1.01	Utility Staff	$56,478	$0	$0	$0	$14,119	$70,597
1.02	Utility Staff HP Supplies	$0	$1,781	$0	$0	$445	$2,226
1.03	Security Guard Force	$2,087	$0	$0	$0	$522	$2,609
1.04	Security Related Expenses	$77	$0	$0	$0	$19	$96
1.05	Insurance	$0	$0	$0	$4,446	$1,111	$5,557
1.06	Site Lease and Easement Expenses	$0	$0	$0	$470	$70	$540
1.07	NRC Decommissioning Fees	$0	$0	$0	$2,390	$598	$2,988
1.08	Materials and Services	$0	$3,208	$0	$0	$802	$4,010
1.09	DAW Disposal	$0	$0	$295	$0	$74	$369
1.10	Energy	$0	$0	$0	$6,338	$1,584	$7,922
1.13	Craft Worker Training	$234	$0	$0	$0	$58	$292
1.14	Workers Compensation Insurance	$0	$0	$0	$283	$71	$353
1.15	Community Outreach	$1,638	$0	$0	$1,830	$867	$4,335
1.16	Property Tax	$0	$0	$0	$2,350	$588	$2,938
1.17	Association Fees and Expenses	$0	$2,350	$0	$0	$588	$2,938
1.18	Utilities (Water, gas, phone)	$0	$738	$0	$0	$185	$923
1.20	Non-Process Computers	$0	$157	$0	$0	$39	$196
1.21	Telecommunications	$0	$157	$0	$0	$39	$196
1.24	Environmental Permits and Fees	$0	$0	$0	$2,977	$744	$3,721
1.25	Decommissioning Advisor	$0	$0	$0	$1,567	$392	$1,958
Undistributed	**Subtotal**	**$60,513**	**$8,391**	**$295**	**$22,650**	**$22,915**	**$114,764**
Decon Pd 2	**Subtotal**	**$108,667**	**$37,928**	**$18,237**	**$28,727**	**$47,581**	**$241,140**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
Decon Pd 3	**Decommissioning Preparations and Reactor Internals Segmentation**						
Distributed							
3.01	Prepare Integrated Work Sequence and Schedule for Decommissioning	$952	$0	$0	$0	$238	$1,190
3.02	Prepare Detailed Work Procedures and Activity Specifications for Decommissioning	$14,920	$70	$0	$0	$3,748	$18,738
3.03	Planning and Design of Primary System Decontamination	$516	$4	$0	$0	$130	$649
3.04	Planning and Design Site Infrastructure Improvements	$341	$4	$0	$0	$86	$431
3.05	Design Containment Access Modifications	$557	$6	$0	$0	$141	$705
3.06	Primary System Decontamination - Unit 2	$1,447	$1,857	$2,228	$0	$1,383	$6,914
3.07	Primary System Decontamination - Unit 3	$1,447	$1,857	$2,228	$0	$1,383	$6,914
3.08	Hot Spot Decontamination - Unit 2	$580	$887	$743	$0	$552	$2,761
3.09	Hot Spot Decontamination - Unit 3	$580	$913	$743	$0	$559	$2,794
3.10	Modify Containment Access- Unit 2	$315	$611	$0	$0	$231	$1,157
3.11	Modify Containment Access- Unit 3	$315	$611	$0	$0	$231	$1,157
3.12	Remove and Dispose of Missle Shields - Unit 2	$206	$30	$81	$0	$79	$395
3.13	Remove and Dispose of Reactor Head - Unit 2	$879	$453	$2,463	$0	$949	$4,744
3.14	Remove and Dispose of Missile Shields - Unit 3	$437	$178	$3,375	$0	$997	$4,987
3.15	Remove and Dispose of Reactor Head - Unit 3	$879	$453	$2,463	$0	$949	$4,744
3.16	Finalize Residual Radiation Inventory	$125	$0	$0	$287	$103	$516
3.17	Prepare Activity Specifications	$7,328	$696	$0	$0	$2,006	$10,031
3.18	Select Shipping Casks and Obtain Shipping Permits	$49	$0	$0	$0	$12	$62
3.19	Design, Specify, and Procure Special Items and Materials	$972	$5,379	$0	$0	$1,588	$7,938
3.22	Test Special Cutting and Handling Equipment and Train Operators	$1,157	$148	$0	$0	$326	$1,631
3.23	Finalize Internals and Vessel Segmenting Details - Unit 2	$212	$16	$0	$0	$57	$284
3.24	Segment, Package and Dispose of Reactor Internals - Unit 2	$5,669	$2,036	$62,661	$0	$17,591	$87,957
3.25	Transfer Internals Segmentation Equipment to Unit 3	$131	$19	$0	$0	$37	$187
3.26	Finalize Internals and Vessel Segmenting Details - Unit 3	$212	$16	$0	$0	$57	$284
3.27	Segment, Package and Dispose of Reactor Internals - Unit 3	$5,669	$2,036	$62,661	$0	$17,591	$87,957
3.28	Construct New Change Rooms, Hot Laundry, In-Plant Laydown Areas	$0	$1,290	$0	$0	$194	$1,484
3.29	Procure Non-Engineered Standard Equipment	$0	$5,454	$0	$0	$1,364	$6,818
Distributed	**Subtotal**	**$45,893**	**$25,024**	**$139,643**	**$287**	**$52,583**	**$263,431**
Undistributed							
1.01	Utility Staff	$79,350	$0	$0	$0	$19,837	$99,187

Table 1
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Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
1.02	Utility Staff HP Supplies	$0	$2,693	$0	$0	$673	$3,366
1.03	Security Guard Force	$5,484	$0	$0	$0	$1,371	$6,855
1.04	Security Related Expenses	$326	$0	$0	$0	$82	$408
1.05	Insurance	$0	$0	$0	$8,000	$2,000	$10,000
1.06	Site Lease and Easement Expenses	$0	$0	$0	$1,235	$185	$1,420
1.07	NRC Decommissioning Fees	$0	$0	$0	$6,281	$1,570	$7,851
1.08	Materials and Services	$0	$4,582	$0	$0	$1,145	$5,727
1.09	DAW Disposal	$0	$0	$424	$0	$106	$529
1.10	Energy	$0	$0	$0	$10,226	$2,556	$12,782
1.11	Decommissioning General Contractor Staff	$62,219	$0	$0	$0	$15,555	$77,773
1.12	DGC HP Supplies	$0	$1,558	$0	$0	$389	$1,947
1.13	Craft Worker Training	$1,842	$0	$0	$0	$460	$2,302
1.14	Workers Compensation Insurance	$0	$0	$0	$742	$186	$928
1.15	Community Outreach	$4,303	$0	$0	$4,808	$2,278	$11,390
1.16	Property Tax	$0	$0	$0	$6,175	$1,544	$7,719
1.17	Association Fees and Expenses	$0	$6,175	$0	$0	$1,544	$7,719
1.18	Utilities (Water, gas, phone)	$0	$1,106	$0	$0	$277	$1,383
1.19	Tools and Equipment	$0	$182	$0	$0	$45	$227
1.20	Non-Process Computers	$0	$412	$0	$0	$103	$515
1.21	Telecommunications	$0	$412	$0	$0	$103	$515
1.22	Personal Computers	$0	$0	$0	$89	$22	$111
1.24	Environmental Permits and Fees	$0	$0	$0	$7,822	$1,955	$9,777
1.25	Decommissioning Advisor	$0	$0	$0	$4,117	$1,029	$5,146
Undistributed	**Subtotal**	**$153,524**	**$17,119**	**$424**	**$49,495**	**$55,017**	**$275,579**
Decon Pd 3	**Subtotal**	**$199,417**	**$42,144**	**$140,067**	**$49,782**	**$107,600**	**$539,009**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
Decon Pd 4	**Plant Systems and Large Component Removal**						
Distributed							
4.01	Upgrade Rail Spur	$0	$0	$0	$3,277	$819	$4,096
4.02	Install GARDIAN System	$0	$0	$0	$525	$131	$656
4.03	Scaffolding for Non-Essential System Removal	$3,516	$1,144	$200	$0	$1,215	$6,075
4.04	Asbestos Abatement and Hazardous Waste Disposal for Non-Essential Systems - Unit	$0	$0	$0	$1,050	$525	$1,575
4.05	Lead Abatement for Non-Essential Systems Removal - Unit 2	$2,287	$23	$411	$0	$1,361	$4,082
4.06	Remove, Package and Dispose of Non-Essential Systems - Unit 2	$33,512	$5,597	$31,969	$0	$17,769	$88,847
4.07	Asbestos Abatement and Hazardous Waste Disposal for Non-Essential Systems - Unit	$0	$0	$0	$1,050	$525	$1,575
4.08	Lead Abatement for Non-Essential Systems - Unit 3	$2,287	$399	$411	$0	$1,549	$4,647
4.09	Remove, Package and Dispose of Non-Essential Systems - Unit 3	$36,851	$6,313	$36,610	$0	$19,944	$99,718
4.10	Remove Underground Diesel Tank - Unit 2	$111	$45	$0	$41	$49	$247
4.11	Remove Underground Diesel Tank - Unit 3	$111	$45	$0	$41	$49	$247
4.12	Remove and Dispose of Spent Fuel Storage Racks - Unit 2	$42	$36	$4,922	$0	$1,250	$6,250
4.13	Remove and Dispose of Spent Fuel Storage Racks - Unit 3	$42	$36	$4,922	$0	$1,250	$6,250
4.14	Remove and Dispose of Legacy Class B and C Waste - Unit 2	$0	$0	$500	$0	$125	$625
4.15	Remove and Dispose of Legacy Class B and C Waste - Unit 3	$0	$0	$500	$0	$125	$625
4.16	Drain Spent Fuel Pool and Process Liquid Waste - Unit 2	$557	$703	$0	$0	$315	$1,575
4.17	Drain Spent Fuel Pool and Process Liquid Waste - Unit 3	$557	$703	$0	$0	$315	$1,575
4.18	Segment, Package and Dispose of Spent Fuel Pool Island Equipment	$11	$2	$107	$0	$30	$150
4.19	Segment and Dispose of Fuel Pool Bridge Crane - Unit 2	$85	$12	$168	$0	$66	$332
4.20	Segment and Dispose of Fuel Pool Bridge Crane - Unit 3	$85	$12	$168	$0	$66	$332
4.21	Flush and Drain Essential Systems Following Fuel Pool Closure	$226	$181	$2,970	$0	$844	$4,221
4.22	Scaffolding for Essential System Removal	$989	$322	$56	$0	$342	$1,708
4.23	Asbestos Abatement and Hazardous Waste Disposal for Essential Systems	$0	$0	$0	$788	$394	$1,181
4.24	Lead Abatement for Essential Systems Removal	$332	$58	$59	$0	$225	$674
4.25	Remove, Package and Dispose of Essential Systems	$33,774	$5,869	$17,264	$0	$14,227	$71,134
4.26	Removal and Disposal of Spent Resins, Filter Media and Tank Sludge	$90	$40	$7,425	$0	$1,889	$9,445
4.27	Reactor Vessel Insulation Removal and Disposal - Unit 2	$105	$12	$147	$0	$66	$331
4.28	Segment, Package and Dispose of Reactor Pressure Vessel - Unit 2	$1,044	$2,834	$29,313	$0	$8,298	$41,489
4.29	Transfer Rx Vessel Segmentation Equipment to Unit 3	$122	$18	$0	$0	$35	$175
4.30	Procure Replacement Non-Engineered Standard Equipment	$0	$454	$0	$0	$114	$568
4.31	Reactor Vessel Insulation Removal and Disposal - Unit 3	$105	$12	$147	$0	$66	$331

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
4.32	Segment, Package and Dispose of Reactor Pressure Vessel - Unit 3	$1,044	$2,834	$29,313	$0	$8,298	$41,489
4.33	Remove and Dispose of Steam Generators - Unit 2	$2,789	$1,288	$18,154	$0	$5,558	$27,788
4.34	Remove and Dispose of Pressurizer - Unit 2	$462	$70	$2,620	$0	$788	$3,940
4.35	Remove and Dispose of Steam Generators - Unit 3	$2,789	$1,288	$18,154	$0	$5,558	$27,788
4.36	Remove and Dispose of Pressurizer - Unit 3	$462	$70	$2,620	$0	$788	$3,940
4.37	Remove and Dispose of Turbine Gantry Crane - Unit 2	$445	$229	$0	$4	$170	$848
4.38	Remove and Dispose of Turbine Gantry Crane - Unit 3	$445	$229	$0	$4	$170	$848
4.39	Prepare License Termination Plan	$1,646	$149	$0	$0	$449	$2,244
Distributed	**Subtotal**	**$126,926**	**$31,029**	**$209,131**	**$6,779**	**$95,755**	**$469,620**
Undistributed							
1.01	Utility Staff	$71,956	$0	$0	$0	$17,989	$89,945
1.02	Utility Staff HP Supplies	$0	$2,715	$0	$0	$679	$3,394
1.03	Security Guard Force	$4,638	$0	$0	$0	$1,159	$5,797
1.04	Security Related Expenses	$1,007	$0	$0	$0	$252	$1,259
1.05	Insurance	$0	$0	$0	$3,653	$913	$4,566
1.06	Site Lease and Easement Expenses	$0	$0	$0	$1,044	$157	$1,201
1.07	NRC Decommissioning Fees	$0	$0	$0	$5,312	$1,328	$6,639
1.08	Materials and Services	$0	$4,204	$0	$0	$1,051	$5,255
1.09	DAW Disposal	$0	$0	$1,568	$0	$392	$1,960
1.10	Energy	$0	$0	$0	$7,568	$1,892	$9,460
1.11	Decommissioning General Contractor Staff	$125,798	$0	$0	$0	$31,449	$157,247
1.12	DGC HP Supplies	$0	$5,834	$0	$0	$1,458	$7,292
1.13	Craft Worker Training	$7,788	$0	$0	$0	$1,947	$9,735
1.14	Workers Compensation Insurance	$0	$0	$0	$628	$157	$785
1.15	Community Outreach	$3,639	$0	$0	$4,066	$1,926	$9,632
1.16	Property Tax	$0	$0	$0	$5,222	$1,306	$6,528
1.18	Utilities (Water, gas, phone)	$0	$1,007	$0	$0	$252	$1,258
1.19	Tools and Equipment	$0	$423	$0	$0	$106	$529
1.20	Non-Process Computers	$0	$348	$0	$0	$87	$435
1.21	Telecommunications	$0	$348	$0	$0	$87	$435
1.24	Environmental Permits and Fees	$0	$0	$0	$6,615	$1,654	$8,268
1.25	Decommissioning Advisor	$0	$0	$0	$2,611	$653	$3,264

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
Undistributed	**Subtotal**	**$214,826**	**$14,879**	**$1,568**	**$36,718**	**$66,893**	**$334,884**
Decon Pd 4	**Subtotal**	**$341,752**	**$45,908**	**$210,699**	**$43,497**	**$162,649**	**$804,504**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
Decon Pd 5	**Building Decontamination**						
Distributed							
5.01	Decon Containment Building - Unit 3	$6,056	$3,318	$54,825	$0	$16,050	$80,249
5.02	Decon Penetration Building - Unit 3	$1,065	$351	$2,933	$0	$1,087	$5,437
5.03	Decon Safety Equipment and MSIV Building - Unit 3	$905	$390	$5,562	$0	$1,715	$8,573
5.04	Decon Fuel Handling Building - Unit 3	$1,275	$577	$16,101	$0	$4,488	$22,442
5.05	Decon Turbine Building - Unit 3	$100	$95	$3,925	$0	$1,030	$5,150
5.06	Decon Containment Building - Unit 2	$6,056	$3,318	$54,825	$0	$16,050	$80,249
5.07	Decon Penetration Building - Unit 2	$1,065	$351	$2,933	$0	$1,087	$5,437
5.08	Decon Safety Equipment and MSIV Building - Unit 2	$911	$396	$5,777	$0	$1,771	$8,854
5.09	Decon Fuel Handling Building - Unit 2	$1,275	$577	$16,101	$0	$4,488	$22,442
5.10	Decon Turbine Building - Unit 2	$100	$95	$3,925	$0	$1,030	$5,150
5.11	Decon Auxiliary Radwaste Building - Common	$943	$691	$17,999	$0	$4,908	$24,541
5.12	Decon Auxiliary Control Building - Common	$198	$163	$38	$0	$100	$499
5.13	Decon Condensate Area and Tunnels - Units 2 & 3	$375	$316	$403	$0	$274	$1,368
5.14	Excavate, Remove and Dispose of Yard Area Drains	$1,159	$128	$240	$0	$382	$1,908
5.15	Remove and Dispose of Contaminated Sumps, Trenches and Pavement	$185	$21	$746	$0	$238	$1,191
5.16	Remove and Dispose of Radiologically Contaminated Soil	$192	$216	$1,158	$0	$392	$1,958
5.17	Segment, Package and Dispose of Contaminated Decon Equipment and Tooling	$38	$6	$92	$0	$34	$170
5.18	Radiological Survey of Structures During Decon	$4,702	$3,666	$0	$0	$1,255	$9,623
Distributed	**Subtotal**	**$26,600**	**$14,676**	**$187,585**	**$0**	**$56,379**	**$285,240**
Undistributed							
1.01	Utility Staff	$29,516	$0	$0	$0	$7,379	$36,895
1.02	Utility Staff HP Supplies	$0	$997	$0	$0	$249	$1,247
1.03	Security Guard Force	$2,520	$0	$0	$0	$630	$3,150
1.04	Security Related Expenses	$560	$0	$0	$0	$140	$701
1.05	Insurance	$0	$0	$0	$1,985	$496	$2,481
1.06	Site Lease and Easement Expenses	$0	$0	$0	$567	$85	$652
1.07	NRC Decommissioning Fees	$0	$0	$0	$2,886	$722	$3,608
1.08	Materials and Services	$0	$1,668	$0	$0	$417	$2,086
1.09	DAW Disposal	$0	$0	$464	$0	$116	$580
1.10	Energy	$0	$0	$0	$2,336	$584	$2,920

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

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Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
1.11	Decommissioning General Contractor Staff	$56,286	$0	$0	$0	$14,071	$70,357
1.12	DGC HP Supplies	$0	$3,170	$0	$0	$792	$3,962
1.13	Craft Worker Training	$1,693	$0	$0	$0	$423	$2,116
1.14	Workers Compensation Insurance	$0	$0	$0	$341	$85	$426
1.15	Community Outreach	$862	$0	$0	$964	$457	$2,283
1.16	Property Tax	$0	$0	$0	$2,837	$709	$3,547
1.18	Utilities (Water, gas, phone)	$0	$413	$0	$0	$103	$517
1.19	Tools and Equipment	$0	$204	$0	$0	$51	$255
1.20	Non-Process Computers	$0	$189	$0	$0	$47	$236
1.21	Telecommunications	$0	$189	$0	$0	$47	$236
1.22	Personal Computers	$0	$0	$0	$71	$18	$88
1.24	Environmental Permits and Fees	$0	$0	$0	$3,594	$899	$4,493
1.25	Decommissioning Advisor	$0	$0	$0	$825	$206	$1,031
Undistributed	**Subtotal**	**$91,437**	**$6,832**	**$464**	**$16,406**	**$28,728**	**$143,866**
Decon Pd 5	**Subtotal**	**$118,037**	**$21,508**	**$188,049**	**$16,406**	**$85,106**	**$429,106**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
Decon Pd 6	**License Termination During Demolition**						
Distributed							
6.01	Final Status Survey	$9,613	$3,088	$0	$2,360	$2,259	$17,320
6.02	Prepare Final Report of Dismantling Program	$164	$4	$0	$0	$42	$210
Distributed	**Subtotal**	**$9,777**	**$3,091**	**$0**	**$2,360**	**$2,301**	**$17,530**
Undistributed							
1.01	Utility Staff	$1,378	$0	$0	$0	$345	$1,723
1.04	Security Related Expenses	$4	$0	$0	$0	$1	$5
1.07	NRC Decommissioning Fees	$0	$0	$0	$13,535	$3,384	$16,919
1.08	Materials and Services	$0	$47	$0	$0	$12	$58
1.09	DAW Disposal	$0	$0	$62	$0	$16	$78
1.10	Energy	$0	$0	$0	$1,872	$468	$2,340
1.11	Decommissioning General Contractor Staff	$651	$0	$0	$0	$163	$814
1.12	DGC HP Supplies	$0	$301	$0	$0	$75	$376
1.15	Community Outreach	$2,386	$0	$0	$2,666	$1,263	$6,315
1.18	Utilities (Water, gas, phone)	$0	$10	$0	$0	$3	$13
Undistributed	**Subtotal**	**$4,420**	**$357**	**$62**	**$18,074**	**$5,728**	**$28,641**
Decon Pd 6	**Subtotal**	**$14,197**	**$3,449**	**$62**	**$20,434**	**$8,029**	**$46,171**
A. License Termination	**Subtotal**	**$812,119**	**$150,936**	**$566,266**	**$171,959**	**$410,965**	**$2,112,246**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
B. Spent Fuel							
SNF Pd 1	**Spent Fuel Management Transition**						
Distributed							
7.01	Security Shut Down Strategy	$0	$0	$0	$8,388	$0	$8,388
7.02	Design and Fabricate Spent Fuel Canisters	$0	$0	$0	$8,842	$0	$8,842
7.03	Post Fukushima Modifications - Unit 2	$0	$0	$0	$126	$0	$126
7.05	Cyber Security Modifications	$0	$0	$0	$1,901	$0	$1,901
Distributed	**Subtotal**	**$0**	**$0**	**$0**	**$19,258**	**$0**	**$19,258**
Undistributed							
2.01	Utility Spent Fuel Staff	$38,478	$0	$0	$0	$0	$38,478
2.04	Security Guard Force	$69,889	$0	$0	$0	$0	$69,889
2.09	Emergency Preparedness Fees	$0	$0	$0	$2,340	$0	$2,340
2.10	Spent Fuel Maintenance	$0	$0	$0	$32	$0	$32
Undistributed	**Subtotal**	**$108,367**	**$0**	**$0**	**$2,372**	**$0**	**$110,739**
SNF Pd 1	**Subtotal**	**$108,367**	**$0**	**$0**	**$21,630**	**$0**	**$129,997**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
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Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SNF Pd 2	**Spent Fuel Transfer to Dry Storage**						
Distributed							
8.01	Security Shut Down Strategy	$0	$0	$0	$2,855	$714	$3,569
8.02	Decay Heat Analysis	$0	$0	$0	$105	$26	$131
8.03	Zirconium Fire/ Shine Analysis	$0	$0	$0	$105	$26	$131
8.05	NRC Review of Irradiated Fuel Management Plan	$0	$0	$0	$105	$26	$131
8.07	ISFSI Pad Study	$0	$0	$0	$103	$26	$129
8.08	Design ISFSI Expansion	$0	$0	$0	$3,150	$788	$3,938
8.09	Construct ISFSI Expansion	$0	$0	$0	$33,600	$8,400	$42,000
8.10	Purchase and Fabrication of Spent Fuel Canisters and AHSMs - Unit 2	$0	$49,613	$0	$0	$12,403	$62,016
8.11	Purchase and Fabrication Spent Fuel Canisters and AHSMs - Unit 3	$0	$50,794	$0	$0	$12,698	$63,492
8.12	Deliver and Load Spent Fuel Canisters and Transfer to ISFSI - Unit 2	$71,338	$17,478	$0	$0	$22,204	$111,021
8.13	Deliver and Load Spent Fuel Canisters and Transfer to ISFSI - Unit 3	$73,037	$17,894	$0	$0	$22,733	$113,664
Distributed	**Subtotal**	**$144,375**	**$135,779**	**$0**	**$40,023**	**$80,044**	**$400,221**
Undistributed							
2.01	Utility Spent Fuel Staff	$90,824	$0	$0	$0	$22,706	$113,530
2.02	Utility Staff HP Supplies	$0	$6,590	$0	$0	$1,647	$8,237
2.04	Security Guard Force	$112,313	$0	$0	$0	$28,078	$140,391
2.05	Security Related Expenses	$1,334	$0	$0	$0	$333	$1,667
2.06	Insurance	$0	$0	$0	$4,408	$1,102	$5,510
2.08	NRC Spent Fuel Fees	$0	$0	$0	$1,107	$277	$1,383
2.09	Emergency Preparedness Fees	$0	$0	$0	$18,756	$4,689	$23,445
2.10	Spent Fuel Maintenance	$0	$0	$0	$2,131	$533	$2,664
2.11	Materials and Services	$0	$5,848	$0	$0	$1,462	$7,310
2.12	DAW Disposal	$0	$0	$275	$0	$69	$343
2.13	Energy	$0	$0	$0	$3,991	$998	$4,989
2.15	Craft Worker Training	$2,119	$0	$0	$0	$530	$2,649
2.18	Utilities (Water, gas, phone)	$0	$3,572	$0	$0	$893	$4,465
2.22	Personal Computers	$0	$0	$0	$14	$3	$17
Undistributed	**Subtotal**	**$206,590**	**$16,010**	**$275**	**$30,406**	**$63,320**	**$316,601**
SNF Pd 2	**Subtotal**	**$350,965**	**$151,789**	**$275**	**$70,429**	**$143,364**	**$716,822**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SNF Pd 3	**Dry Storage During Decommissioning - Units 1, 2 and 3**						
Undistributed							
2.01	Utility Spent Fuel Staff	$39,894	$0	$0	$0	$9,973	$49,867
2.02	Utility Staff HP Supplies	$0	$1,487	$0	$0	$372	$1,859
2.04	Security Guard Force	$45,944	$0	$0	$0	$11,486	$57,430
2.05	Security Related Expenses	$2,556	$0	$0	$0	$639	$3,195
2.08	NRC Spent Fuel Fees	$0	$0	$0	$2,302	$576	$2,878
2.10	Spent Fuel Maintenance	$0	$0	$0	$1,478	$370	$1,848
2.11	Materials and Services	$0	$2,017	$0	$0	$504	$2,522
2.13	Energy	$0	$0	$0	$1,209	$302	$1,511
2.18	Utilities (Water, gas, phone)	$0	$1,380	$0	$0	$345	$1,725
2.22	Personal Computers	$0	$0	$0	$12	$3	$15
Undistributed	**Subtotal**	**$88,393**	**$4,884**	**$0**	**$5,001**	**$24,570**	**$122,849**
SNF Pd 3	**Subtotal**	**$88,393**	**$4,884**	**$0**	**$5,001**	**$24,570**	**$122,849**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SNF Pd 4	**Dry Storage Only - Units 1, 2 and 3**						
Undistributed							
2.01	Utility Spent Fuel Staff	$12,687	$0	$0	$0	$3,172	$15,859
2.02	Utility Staff HP Supplies	$0	$882	$0	$0	$220	$1,102
2.03	Additional Staff for Spent Fuel Shipping	$1,119	$0	$0	$0	$280	$1,398
2.04	Security Guard Force	$14,949	$0	$0	$0	$3,737	$18,687
2.05	Security Related Expenses	$2,506	$0	$0	$0	$626	$3,132
2.06	Insurance	$0	$0	$0	$2,538	$634	$3,172
2.07	Site Lease and Easement Expenses	$0	$0	$0	$1,154	$173	$1,327
2.08	NRC Spent Fuel Fees	$0	$0	$0	$1,638	$409	$2,047
2.10	Spent Fuel Maintenance	$0	$0	$0	$481	$120	$601
2.11	Materials and Services	$0	$778	$0	$0	$194	$972
2.13	Energy	$0	$0	$0	$393	$98	$492
2.16	Workers Compensation Insurance	$0	$0	$0	$694	$173	$867
2.17	Property Tax	$0	$0	$0	$6,412	$1,603	$8,015
2.18	Utilities (Water, gas, phone)	$0	$475	$0	$0	$119	$594
2.20	Non-Process Computers	$0	$192	$0	$0	$48	$240
2.21	Telecommunications	$0	$192	$0	$0	$48	$240
2.22	Personal Computers	$0	$0	$0	$15	$4	$18
Undistributed	**Subtotal**	**$31,261**	**$2,519**	**$0**	**$13,325**	**$11,661**	**$58,765**
SNF Pd 4	**Subtotal**	**$31,261**	**$2,519**	**$0**	**$13,325**	**$11,661**	**$58,765**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SNF Pd 5	**Dry Storage Only - Units 2 and 3**						
Undistributed							
2.01	Utility Spent Fuel Staff	$48,480	$0	$0	$0	$12,120	$60,601
2.02	Utility Staff HP Supplies	$0	$3,369	$0	$0	$842	$4,211
2.03	Additional Staff for Spent Fuel Shipping	$4,275	$0	$0	$0	$1,069	$5,344
2.04	Security Guard Force	$57,126	$0	$0	$0	$14,281	$71,407
2.05	Security Related Expenses	$4,124	$0	$0	$0	$1,031	$5,155
2.06	Insurance	$0	$0	$0	$9,698	$2,425	$12,123
2.07	Site Lease and Easement Expenses	$0	$0	$0	$4,409	$661	$5,071
2.08	NRC Spent Fuel Fees	$0	$0	$0	$6,259	$1,565	$7,823
2.10	Spent Fuel Maintenance	$0	$0	$0	$1,838	$459	$2,297
2.11	Materials and Services	$0	$2,972	$0	$0	$743	$3,715
2.13	Energy	$0	$0	$0	$1,503	$376	$1,879
2.16	Workers Compensation Insurance	$0	$0	$0	$2,651	$663	$3,314
2.17	Property Tax	$0	$0	$0	$22,053	$5,513	$27,566
2.18	Utilities (Water, gas, phone)	$0	$1,816	$0	$0	$454	$2,270
2.20	Non-Process Computers	$0	$735	$0	$0	$184	$919
2.21	Telecommunications	$0	$735	$0	$0	$184	$919
2.22	Personal Computers	$0	$0	$0	$32	$8	$40
Undistributed	**Subtotal**	**$114,005**	**$9,627**	**$0**	**$48,443**	**$42,578**	**$214,653**
SNF Pd 5	**Subtotal**	**$114,005**	**$9,627**	**$0**	**$48,443**	**$42,578**	**$214,653**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SNF D&D Pd 1	**ISFSI License Termination**						
Distributed							
12.01	Preparation and NRC Review of License Termination Plan	$116	$0	$0	$163	$70	$349
Distributed	**Subtotal**	**$116**	**$0**	**$0**	**$163**	**$70**	**$349**
Undistributed							
2.01	Utility Spent Fuel Staff	$366	$0	$0	$0	$91	$457
2.02	Utility Staff HP Supplies	$0	$11	$0	$0	$3	$14
2.04	Security Guard Force	$181	$0	$0	$0	$45	$226
2.05	Security Related Expenses	$70	$0	$0	$0	$18	$88
2.06	Insurance	$0	$0	$0	$215	$54	$269
2.07	Site Lease and Easement Expenses	$0	$0	$0	$98	$15	$112
2.08	NRC Spent Fuel Fees	$0	$0	$0	$75	$19	$94
2.11	Materials and Services	$0	$17	$0	$0	$4	$21
2.13	Energy	$0	$0	$0	$102	$26	$128
2.16	Workers Compensation Insurance	$0	$0	$0	$59	$15	$73
2.17	Property Tax	$0	$0	$0	$543	$136	$679
2.18	Utilities (Water, gas, phone)	$0	$7	$0	$0	$2	$9
Undistributed	**Subtotal**	**$617**	**$36**	**$0**	**$1,092**	**$426**	**$2,172**
SNF D&D Pd 1	**Subtotal**	**$733**	**$36**	**$0**	**$1,255**	**$496**	**$2,520**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SNF D&D Pd 2	**ISFSI Demolition**						
Distributed							
13.01	Install GARDIAN Bulk Assay System	$0	$0	$0	$525	$131	$656
13.02	Decon AHSMs	$339	$147	$443	$0	$232	$1,161
13.03	Final Status Survey of ISFSI	$1,589	$256	$0	$0	$277	$2,122
13.04	Clean Demolition of ISFSI AHSMs and Pad	$4,094	$2,590	$3,333	$0	$2,504	$12,521
13.05	Clean Demolition of ISFSI Support Structures	$1,126	$458	$1,372	$0	$739	$3,696
13.06	Restore ISFSI Site	$246	$161	$0	$0	$102	$509
13.07	Preparation of Final Report on Decommissioning and NRC Review	$52	$0	$0	$0	$13	$65
Distributed	**Subtotal**	**$7,446**	**$3,612**	**$5,148**	**$525**	**$3,998**	**$20,729**
Undistributed							
2.01	Utility Spent Fuel Staff	$1,801	$0	$0	$0	$450	$2,251
2.02	Utility Staff HP Supplies	$0	$72	$0	$0	$18	$90
2.04	Security Guard Force	$704	$0	$0	$0	$176	$880
2.05	Security Related Expenses	$37	$0	$0	$0	$9	$46
2.11	Materials and Services	$0	$93	$0	$0	$23	$116
2.12	DAW Disposal	$0	$0	$7	$0	$2	$8
2.13	Energy	$0	$0	$0	$268	$67	$334
2.14	Decommissioning General Contractor Staff	$4,525	$0	$0	$0	$1,131	$5,656
2.15	Craft Worker Training	$189	$0	$0	$0	$47	$236
2.18	Utilities (Water, gas, phone)	$0	$35	$0	$0	$9	$43
2.24	DGC HP Supplies	$0	$159	$0	$0	$40	$199
Undistributed	**Subtotal**	**$7,255**	**$359**	**$7**	**$268**	**$1,972**	**$9,861**
SNF D&D Pd 2	**Subtotal**	**$14,701**	**$3,972**	**$5,154**	**$793**	**$5,970**	**$30,590**
B. Spent Fuel	**Subtotal**	**$708,425**	**$172,826**	**$5,429**	**$160,876**	**$228,639**	**$1,276,196**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
C. Site Restoration							
SR Pd 1	**Transition to Site Restoration**						
Distributed							
14.01	Mesa Site Phase I and II Site Assessment	$0	$0	$0	$42	$11	$53
14.02	Disposition Hazardous Waste from Mesa Site	$0	$0	$0	$211	$106	$317
14.03	Mesa Site Characterization Survey	$988	$261	$0	$0	$312	$1,561
14.04	Fuel Cancellation Expense	$0	$0	$0	$17,679	$0	$17,679
Distributed	**Subtotal**	**$988**	**$261**	**$0**	**$17,932**	**$428**	**$19,610**
Undistributed							
3.05	Site Lease and Easement Expenses	$0	$0	$0	$1,030	$0	$1,030
3.11	Severance	$0	$0	$0	$109,850	$0	$109,850
Undistributed	**Subtotal**	**$0**	**$0**	**$0**	**$110,880**	**$0**	**$110,880**
SR Pd 1	**Subtotal**	**$988**	**$261**	**$0**	**$128,812**	**$428**	**$130,489**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

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Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SR Pd 2	**Building Demolition During Decommissioning**						
Distributed							
15.01	Prepare Site Restoration Demolition Plan and Schedule	$684	$10	$0	$0	$173	$866
15.02	Obtain Required Permits For Mesa, South Access and South Yard	$209	$4	$0	$0	$53	$266
15.03	Demolish Service Building (K-10, 20, 30)	$250	$189	$481	$0	$230	$1,150
15.04	Demolish South Security Processing Facility (K-70)	$46	$44	$122	$0	$53	$264
15.05	Demolish Staging Warehouse	$67	$55	$126	$0	$62	$311
15.06	Demolish Administration Building (K-40/50)	$367	$258	$565	$0	$297	$1,487
15.07	Demolish South Yard Area Buildings T-10, 20, 60 and Haz Mat.	$670	$590	$1,370	$0	$658	$3,288
15.08	Demolish REMS Staging Pad	$98	$184	$549	$0	$208	$1,038
15.09	Demolish Mesa Buildings	$2,788	$1,879	$6,006	$0	$2,668	$13,341
15.10	Remove Underground Fuel Storage Tanks	$56	$22	$0	$21	$25	$123
15.11	Demolish Mesa Roads and Parking Lots	$582	$400	$0	$0	$245	$1,227
15.12	Finish Grading and Re-vegetate Mesa Site	$299	$404	$0	$0	$176	$878
Distributed	**Subtotal**	**$6,114**	**$4,038**	**$9,219**	**$21**	**$4,848**	**$24,239**
Undistributed							
3.01	Utility Staff	$2,563	$0	$0	$0	$641	$3,204
3.03	Security Related Expenses	$898	$0	$0	$0	$224	$1,122
3.05	Site Lease and Easement Expenses	$0	$0	$0	$4,266	$640	$4,906
3.06	Materials and Services	$0	$134	$0	$0	$34	$168
3.08	Decommissioning General Contractor Staff	$4,248	$0	$0	$0	$1,062	$5,310
3.09	Craft Worker Training	$318	$0	$0	$0	$80	$398
3.11	Severance	$0	$0	$0	$8,688	$2,172	$10,860
3.13	Utilities (Water, gas, phone)	$0	$29	$0	$0	$7	$36
Undistributed	**Subtotal**	**$8,027**	**$164**	**$0**	**$12,955**	**$4,860**	**$26,005**
SR Pd 2	**Subtotal**	**$14,141**	**$4,201**	**$9,219**	**$12,975**	**$9,708**	**$50,245**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SR Pd 3	**Subsurface Demolition Engineering and Permitting**						
Distributed							
16.01	Hydrogeologic Investigation and Outfall Conduit Survey	$297	$131	$0	$105	$133	$667
16.02	Subsurface Structure Removal Engineering Planning and Design	$1,264	$33	$0	$0	$324	$1,621
16.03	Environmental Impacts Analyses for Lease Termination Activities	$581	$50	$0	$525	$289	$1,445
16.04	Final Site Grading and Shoreline Protection Engineering Planning and Design	$242	$13	$0	$0	$64	$319
16.05	Obtain Required Permits and Approvals	$1,856	$20	$0	$263	$535	$2,673
Distributed	**Subtotal**	**$4,240**	**$248**	**$0**	**$893**	**$1,345**	**$6,726**
Undistributed							
3.03	Security Related Expenses	$275	$0	$0	$0	$69	$344
3.11	Severance	$0	$0	$0	$24,674	$6,168	$30,842
Undistributed	**Subtotal**	**$275**	**$0**	**$0**	**$24,674**	**$6,237**	**$31,186**
SR Pd 3	**Subtotal**	**$4,516**	**$248**	**$0**	**$25,566**	**$7,582**	**$37,912**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SR Pd 4	**Building Demolition to 3 Feet Below Grade**						
Distributed							
17.01	Procure Clean Building Demolition Equipment	$0	$10,691	$0	$0	$2,673	$13,363
17.02	Install Temporary Structures	$11	$190	$0	$0	$30	$230
17.03	Install Erosion and Sediment Controls	$123	$14	$0	$0	$34	$172
17.04	Remove Cathodic Protection Trench	$1,813	$1,527	$22	$0	$840	$4,201
17.05	Remove Protected Area Security Fencing	$57	$18	$0	$0	$19	$95
17.06	Remove Protected Area Pavement	$139	$97	$755	$0	$248	$1,239
17.07	Detension and Remove Unit 3 Containment Builidng Tendons	$0	$0	$0	$4,200	$1,050	$5,250
17.08	Demolish Diesel Generator Building - Unit 3	$618	$245	$794	$0	$414	$2,072
17.09	Demolish Condensate Building and Transformer Pads - Unit 3	$1,067	$1,755	$3,183	$0	$1,501	$7,505
17.10	Demolish Full Flow Area and Turbine Building - Unit 3	$3,221	$1,149	$3,444	$0	$1,953	$9,767
17.11	Demolish Unit 3 Fuel Handling Building to 3-Feet Below Grade	$306	$354	$1,470	$0	$533	$2,663
17.12	Demolish Penetration Building - Unit 3	$293	$167	$642	$0	$275	$1,377
17.13	Demolish Safety Equipment and MSIV Building - Unit 3	$336	$403	$1,858	$0	$649	$3,246
17.14	Demolish Unit 3 Containment Building to 3-Feet Below Grade	$2,418	$1,351	$6,198	$0	$2,492	$12,459
17.15	Detension and Remove Unit 2 Containment Builidng Tendons	$0	$0	$0	$4,200	$1,050	$5,250
17.16	Demolish Diesel Generator Building - Unit 2	$128	$168	$787	$0	$271	$1,353
17.17	Demolish Condensate Building and Transformer Pads - Unit 2	$1,067	$1,755	$3,183	$0	$1,501	$7,505
17.18	Demolish Full Flow Area and Turbine Building - Unit 2	$3,734	$1,186	$3,447	$0	$2,092	$10,458
17.19	Demolish Unit 2 Fuel Handling Building to 3-Feet Below Grade	$306	$354	$1,470	$0	$533	$2,663
17.20	Demolish Penetration Building - Unit 2	$99	$136	$639	$0	$219	$1,093
17.21	Demolish Safety and MSIV Equipment Building - Unit 2	$336	$403	$1,859	$0	$649	$3,247
17.22	Demolish Unit 2 Containment Building to 3-Feet Below Grade	$2,418	$1,351	$6,198	$0	$2,492	$12,459
17.23	Demolish AWS Building	$1,108	$1,050	$2,925	$0	$1,271	$6,354
17.24	Demolish Building L-50	$59	$33	$67	$0	$40	$198
17.25	Demolish Maintenance Building 4 (B-64/B-65)	$24	$13	$25	$0	$16	$78
17.26	Demolish Maintenance Building 5 (B-62/B-63)	$35	$20	$37	$0	$23	$115
17.27	Demolish Outage Control Center	$98	$57	$148	$0	$76	$378
17.28	Demolish Maintenance Building 2 (B-49/B-50)	$49	$32	$82	$0	$41	$205
17.29	Demolish Maintenance Building 1 (B-43/B-44)	$163	$196	$857	$0	$304	$1,520
17.30	Demolish Auxilary Radwaste Building - Common	$1,521	$1,984	$9,214	$0	$3,180	$15,898
17.31	Demolish Auxilary Control Building - Common	$1,491	$811	$3,219	$0	$1,380	$6,901

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

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Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
17.32	Remove Systems and Demolish Make-Up Demineralizer Structures	$737	$122	$471	$0	$332	$1,662
17.33	Install Concrete Plugs in Intake and Discharge Structures	$272	$1,614	$0	$0	$472	$2,358
17.34	Demolish Intake and Discharge Structures to 3-Feet Below Grade	$82	$114	$535	$0	$183	$914
Distributed	**Subtotal**	**$24,128**	**$29,358**	**$53,530**	**$8,400**	**$28,834**	**$144,249**
Undistributed							
3.01	Utility Staff	$12,553	$0	$0	$0	$3,138	$15,691
3.02	Security Guard Force	$2,480	$0	$0	$0	$620	$3,100
3.03	Security Related Expenses	$1,158	$0	$0	$0	$290	$1,448
3.04	Insurance	$0	$0	$0	$3,995	$999	$4,993
3.05	Site Lease and Easement Expenses	$0	$0	$0	$1,340	$201	$1,541
3.06	Materials and Services	$0	$751	$0	$0	$188	$938
3.07	Energy	$0	$0	$0	$1,184	$296	$1,480
3.08	Decommissioning General Contractor Staff	$50,906	$0	$0	$0	$12,727	$63,633
3.09	Craft Worker Training	$1,999	$0	$0	$0	$500	$2,498
3.10	Workers Compensation Insurance	$0	$0	$0	$806	$201	$1,007
3.11	Severance	$0	$0	$0	$7,273	$1,818	$9,091
3.12	Property Tax	$0	$0	$0	$6,701	$1,675	$8,377
3.13	Utilities (Water, gas, phone)	$0	$214	$0	$0	$53	$267
3.14	Tools and Equipment	$0	$156	$0	$0	$39	$195
3.15	Non-Process Computers	$0	$223	$0	$0	$56	$279
3.16	Telecommunications	$0	$223	$0	$0	$56	$279
Undistributed	**Subtotal**	**$69,096**	**$1,567**	**$0**	**$21,298**	**$22,856**	**$114,817**
SR Pd 4	**Subtotal**	**$93,224**	**$30,924**	**$53,530**	**$29,698**	**$51,690**	**$259,066**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
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Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SR Pd 5	**Subgrade Structure Removal Below - 3 Feet**						
Distributed							
18.01	Procure Subsurface Structure Demolition Equipment	$0	$6,630	$0	$0	$1,658	$8,288
18.02	Install Sheet Piling and Excavation Shoring	$8,468	$17,219	$0	$0	$6,422	$32,109
18.03	Install Dewatering System and Effluent Treatment and Discharge Controls	$0	$0	$0	$9,651	$2,413	$12,064
18.04	Demolish and Backfill Unit 3 Condensate Storage Area Below -3 Feet	$179	$305	$912	$0	$349	$1,746
18.05	Demolish and Backfill Unit 3 Diesel Generator Builidng Below -3 Feet	$130	$173	$442	$0	$186	$932
18.06	Demolish and Backfill Unit 3 Fuel Handling Building Below -3 Feet	$271	$696	$1,170	$0	$534	$2,671
18.07	Demolish and Backfill Unit 3 Radwaste and Control Building Below -3 Feet	$1,367	$3,268	$5,249	$0	$2,471	$12,355
18.08	Demolish and Backfill Unit 3 Turbine Building Structure Below 9 Ft Elevation	$3,956	$9,277	$12,551	$0	$6,446	$32,231
18.09	Demolish and Backfill Unit 3 Safety Equipment Building Below -3 Feet	$717	$1,883	$2,713	$0	$1,328	$6,641
18.10	Demolish and Backfill Unit 3 Penetration Area Below -3 Feet	$294	$586	$1,285	$0	$541	$2,706
18.11	Demolish and Backfill Unit 3 Full Flow Building Below -3 Feet	$167	$527	$411	$0	$276	$1,382
18.12	Demolish and Backfill Unit 3 Containment Building Below -3 Feet	$1,211	$2,214	$4,636	$0	$2,015	$10,077
18.13	Demolish and Backfill Unit 2 Condensate Storage Area Below -3 Feet	$179	$305	$912	$0	$349	$1,746
18.14	Demolish and Backfill Unit 2 Diesel Generator Builidng Below -3 Feet	$130	$173	$442	$0	$186	$932
18.15	Demolish and Backfill Unit 2 Fuel Handling Building Below -3 Feet	$271	$696	$1,170	$0	$534	$2,671
18.16	Demolish and Backfill Unit 2 Radwaste and Control Building Below -3 Feet	$1,415	$3,308	$5,249	$0	$2,493	$12,466
18.17	Demolish and Backfill Unit 2 Turbine Building Structure Below 9 Ft Elevation	$3,959	$9,277	$12,551	$0	$6,447	$32,234
18.18	Demolish and Backfill Unit 2 Safety Equipment Building Below -3 Feet	$717	$1,883	$2,713	$0	$1,328	$6,641
18.19	Demolish and Backfill Unit 2 Penetration Area Below -3 Feet	$294	$586	$1,285	$0	$541	$2,706
18.20	Demolish and Backfill Unit 2 Full Flow Building Below -3 Feet	$167	$527	$411	$0	$276	$1,382
18.21	Demolish and Backfill Unit 2 Containment Building Below -3 Feet	$1,211	$2,214	$4,636	$0	$2,015	$10,077
18.22	Demolish and Backfill Intake Structure Below -3 Feet	$6,664	$12,970	$36,706	$0	$14,085	$70,426
18.23	Remove Off Shore Intake and Outfall Conduits	$12,406	$44,308	$19,580	$0	$19,073	$95,367
18.24	Remove Sheet Piling and Excavation Shoring	$11,776	$0	$0	$0	$2,944	$14,721
18.25	Remove Dewatering System and Effluent Treatment	$0	$0	$0	$2,308	$577	$2,885
18.26	Finish Grading and Re-Vegetate Site	$945	$813	$0	$0	$440	$2,198
18.27	Remove Temporary Structures	$58	$48	$0	$0	$16	$122
Distributed	**Subtotal**	**$56,952**	**$119,889**	**$115,025**	**$11,959**	**$75,946**	**$379,772**
Undistributed							
3.01	Utility Staff	$7,082	$0	$0	$0	$1,771	$8,853

Table 1
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		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
3.02	Security Guard Force	$1,830	$0	$0	$0	$458	$2,288
3.03	Security Related Expenses	$139	$0	$0	$0	$35	$173
3.04	Insurance	$0	$0	$0	$2,948	$737	$3,685
3.05	Site Lease and Easement Expenses	$0	$0	$0	$989	$148	$1,137
3.06	Materials and Services	$0	$415	$0	$0	$104	$519
3.07	Energy	$0	$0	$0	$814	$204	$1,018
3.08	Decommissioning General Contractor Staff	$26,176	$0	$0	$0	$6,544	$32,720
3.09	Craft Worker Training	$983	$0	$0	$0	$246	$1,229
3.10	Workers Compensation Insurance	$0	$0	$0	$595	$149	$743
3.11	Severance	$0	$0	$0	$2,050	$513	$2,563
3.12	Property Tax	$0	$0	$0	$4,946	$1,237	$6,183
3.13	Utilities (Water, gas, phone)	$0	$128	$0	$0	$32	$160
3.14	Tools and Equipment	$0	$73	$0	$0	$18	$91
3.15	Non-Process Computers	$0	$165	$0	$0	$41	$206
3.16	Telecommunications	$0	$165	$0	$0	$41	$206
Undistributed	**Subtotal**	**$36,211**	**$946**	**$0**	**$12,343**	**$12,276**	**$61,775**
SR Pd 5	**Subtotal**	**$93,163**	**$120,834**	**$115,025**	**$24,302**	**$88,222**	**$441,547**

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
SR Pd 6	**Final Site Restoration and Lease Termination**						
Distributed							
19.01	Obtain Required Permits and Approvals	$404	$20	$0	$131	$139	$693
19.02	Install Temporary Structures	$6	$35	$0	$0	$6	$48
19.03	Procure Site Restoration Equipment	$0	$404	$0	$0	$101	$505
19.04	Install Temporary Seawall or Coffer Dam	$8,551	$17,624	$0	$0	$6,544	$32,718
19.05	Install Dewatering System and Effluent Treatment and Discharge Controls	$0	$0	$0	$1,427	$357	$1,784
19.06	Remove and Stockpile Existing Seawall Erosion Protection	$6	$11	$0	$0	$4	$21
19.07	Remove Unit 2 and 3 Seawall and Pedestrian Walkway	$3,206	$3,060	$4,558	$0	$2,706	$13,530
19.08	Remove Remaining Intake and Outfall Box Culvert	$336	$468	$2,188	$0	$748	$3,739
19.09	Remove Temporary Seawall or Coffer Dam	$11,791	$143	$0	$0	$2,983	$14,917
19.10	Backfill and Compaction of Excavation	$1,471	$2,238	$0	$0	$556	$4,265
19.11	Remove Dewatering System and Effluent Treatment	$0	$0	$0	$592	$148	$740
19.12	Install Shoreline Erosion Control and Restoration Features	$10	$144	$0	$0	$38	$192
19.13	Remove Railroad Tracks, Rails and Ballast	$63	$35	$0	$0	$24	$122
19.14	Remove Gunite Slope Protection	$262	$366	$1,710	$0	$585	$2,923
19.15	Remove Access Roads and Parking Lots	$240	$181	$0	$0	$105	$527
19.16	Finish Grading and Re-Vegetate Site	$27	$28	$0	$0	$14	$68
19.17	Remove Temporary Structures	$8	$7	$0	$0	$2	$18
Distributed	**Subtotal**	**$26,380**	**$24,763**	**$8,456**	**$2,151**	**$15,061**	**$76,810**
Undistributed							
3.01	Utility Staff	$2,219	$0	$0	$0	$555	$2,773
3.04	Insurance	$0	$0	$0	$605	$151	$756
3.05	Site Lease and Easement Expenses	$0	$0	$0	$507	$76	$583
3.06	Materials and Services	$0	$142	$0	$0	$35	$177
3.07	Energy	$0	$0	$0	$418	$104	$522
3.08	Decommissioning General Contractor Staff	$8,062	$0	$0	$0	$2,016	$10,078
3.09	Craft Worker Training	$504	$0	$0	$0	$126	$630
3.10	Workers Compensation Insurance	$0	$0	$0	$305	$76	$381
3.11	Severance	$0	$0	$0	$6,077	$1,519	$7,596
3.12	Property Tax	$0	$0	$0	$2,536	$634	$3,169
3.13	Utilities (Water, gas, phone)	$0	$31	$0	$0	$8	$38

Table 1
SONGS Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

		License Status	POL	Unit 2 Shut Down:	6/7/2013
Decommissioning Alternative	DECON	Fuel Pool Systems	Modified	Unit 3 Shut Down:	6/7/2013
Spent Fuel Alternative	Dry	Repository Opening Date:	1/1/2024		

2014 Dollars in Thousands

No	Item Description	Labor	Equipment	Disposal	Other	Contingency	Total
3.14	Tools and Equipment	$0	$24	$0	$0	$6	$31
Undistributed	**Subtotal**	**$10,785**	**$197**	**$0**	**$10,446**	**$5,307**	**$26,735**
SR Pd 6	**Subtotal**	**$37,165**	**$24,960**	**$8,456**	**$12,597**	**$20,367**	**$103,545**
C. Site Restoration	**Subtotal**	**$243,198**	**$181,428**	**$186,230**	**$233,951**	**$177,997**	**$1,022,804**
	Total	**$1,763,742**	**$505,191**	**$757,925**	**$566,786**	**$817,601**	**$4,411,246**

Appendix E

Annual Cash Flow Table

SONGS Annual Cost By Account

Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

Unit No: Unit 2

2014 Dollars in Thousands

Year	License Termination	Spent Fuel	Site Restoration	Total
2013	$25,749	$63,891	$49,067	$138,706
2014	$79,799	$35,719	$15,089	$130,607
2015	$69,196	$106,308	$7,439	$182,943
2016	$54,541	$59,308	$3,730	$117,579
2017	$111,903	$59,308	$1,957	$173,168
2018	$47,520	$59,308	$0	$106,828
2019	$108,328	$27,554	$13,539	$149,420
2020	$185,482	$4,908	$36	$190,426
2021	$79,081	$4,908	$36	$84,026
2022	$54,785	$4,908	$1,927	$61,621
2023	$158,207	$4,908	$36	$163,151
2024	$37,930	$4,908	$16,848	$59,687
2025	$2,922	$4,908	$44,621	$52,451
2026	$2,922	$4,908	$19,412	$27,243
2027	$2,922	$4,908	$22,469	$30,299
2028	$2,922	$4,908	$31,688	$39,518
2029	$2,922	$4,908	$66,873	$74,704
2030	$2,922	$4,908	$71,867	$79,697
2031	$2,055	$5,089	$23,181	$30,325
2032	$2,122	$7,214	$0	$9,336
2033	$0	$7,214	$0	$7,214
2034	$0	$7,214	$0	$7,214
2035	$0	$7,228	$0	$7,228
2036	$0	$7,665	$0	$7,665
2037	$0	$7,665	$0	$7,665
2038	$0	$7,665	$0	$7,665
2039	$0	$7,665	$0	$7,665
2040	$0	$7,665	$0	$7,665
2041	$0	$7,665	$0	$7,665
2042	$0	$7,665	$0	$7,665
2043	$0	$7,665	$0	$7,665
2044	$0	$7,665	$0	$7,665
2045	$0	$7,665	$0	$7,665
2046	$0	$7,665	$0	$7,665
2047	$0	$7,665	$0	$7,665
2048	$0	$7,665	$0	$7,665

SONGS Annual Cost By Account

Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

Unit No: Unit 2

2014 Dollars in Thousands

Year	License Termination	Spent Fuel	Site Restoration	Total
2049	$0	$7,667	$0	$7,667
2050	$0	$9,974	$20,177	$30,151
2051	$0	$6,573	$11,928	$18,500
2052	$0	$0	$1,377	$1,377
Total	$1,034,230	$623,209	$423,297	$2,080,735

SONGS Annual Cost By Account

Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

Unit No: Unit 3

2014 Dollars in Thousands

Year	License Termination	Spent Fuel	Site Restoration	Total
2013	$26,566	$66,105	$49,067	$141,739
2014	$78,964	$40,156	$15,969	$135,089
2015	$74,096	$112,024	$9,390	$195,509
2016	$61,451	$64,405	$25,227	$151,083
2017	$40,631	$64,405	$3,799	$108,835
2018	$86,348	$64,405	$0	$150,753
2019	$96,521	$29,675	$13,908	$140,104
2020	$120,873	$4,908	$2,135	$127,916
2021	$194,090	$4,908	$575	$199,574
2022	$135,313	$4,908	$2,467	$142,688
2023	$114,581	$4,908	$1,511	$121,000
2024	$26,874	$4,908	$36,778	$68,560
2025	$2,922	$4,908	$40,655	$48,485
2026	$2,922	$4,908	$21,676	$29,507
2027	$2,922	$4,908	$25,848	$33,678
2028	$2,922	$4,908	$20,945	$28,776
2029	$2,922	$4,908	$117,321	$125,151
2030	$2,922	$4,908	$116,672	$124,503
2031	$2,055	$5,089	$25,501	$32,645
2032	$2,122	$7,214	$0	$9,336
2033	$0	$7,214	$0	$7,214
2034	$0	$7,214	$0	$7,214
2035	$0	$7,228	$0	$7,228
2036	$0	$7,665	$0	$7,665
2037	$0	$7,665	$0	$7,665
2038	$0	$7,665	$0	$7,665
2039	$0	$7,665	$0	$7,665
2040	$0	$7,665	$0	$7,665
2041	$0	$7,665	$0	$7,665
2042	$0	$7,665	$0	$7,665
2043	$0	$7,665	$0	$7,665
2044	$0	$7,665	$0	$7,665
2045	$0	$7,665	$0	$7,665
2046	$0	$7,665	$0	$7,665
2047	$0	$7,665	$0	$7,665
2048	$0	$7,665	$0	$7,665

SONGS Annual Cost By Account

Prompt DECON Base Case, 2024 DOE Acceptance, Dry Storage

Unit No: Unit 3

2014 Dollars in Thousands

Year	License Termination	Spent Fuel	Site Restoration	Total
2049	$0	$7,667	$0	$7,667
2050	$0	$9,974	$23,120	$33,094
2051	$0	$6,573	$45,566	$52,139
2052	$0	$0	$1,377	$1,377
Total	$1,078,016	$652,987	$599,507	$2,330,511

Appendix F

SDG&E SONGS Decommissioning Costs (100%)

San Diego Gas & Electric Company (SDG&E) provides the following information regarding its internal decommissioning costs, which it expects to incur and to fund on its own behalf (100%) in addition to its 20% share of the Decommissioning Cost Estimate.

I. BACKGROUND

As the 20% minority owner, SDG&E is contractually obligated to pay its 20% ownership share of decommissioning expenses for SONGS. These costs, outlined in the DCE, will be incurred by the decommissioning agent and SDG&E will receive invoicing for its proportional share.

II. SDG&E COSTS

Table F-1

SDG&E SONGS DECOMMISSIONING COSTS (1,000's, $2014)

Total Units 2 & 3	SDG&E Labor	Other/ Non-Labor	Total Costs
License Termination	$3,832	$1,047	$4,879
Spent Fuel Management	$2,729	$417	$3,147
Site Restoration	$1,904	$401	$2,305
Total	$8,465	$1,865	$10,330

In addition to SDG&E's 20% share of the costs outlined in the DCE, SDG&E also incurs internal costs related to its SONGS ownership. SDG&E incurs 100% of these Labor and Non-Labor costs related to SDG&E's oversight activities. These costs are apportioned into SCE's DCE categories of License Termination, Spent Fuel Management, and Site Restoration by determining the percentage of costs SCE allocated to each category and multiplying SDG&E's

costs by that same percentage for each category. SDG&E estimates that its total internal costs over the decommissioning period to be $10.33 million (2014$).

a. SDG&E LABOR

The first category, "SDG&E Labor" includes SDG&E staff who provide oversight of SONGS costs and activities. SDG&E's internal staffing efforts are expected to mirror site staffing where the three (3) full-time equivalents ("FTEs") are reduced after 2016 to two (2) FTEs, then to one (1) FTE after 2025, and eventually to zero (0) FTEs after 2032. After 2032, invoicing and oversight activities are anticipated to be minor during this period. Once ISFSI decommissioning is initiated on or around 2049, SDG&E plans to identify one (1) full-time equivalent through 2052.

These costs are shown in Table F-1 under the column heading of "SDG&E Labor" and are apportioned into SCE's categories of License Termination, Spent Fuel Management, and Site Restoration.

b. OTHER/NON-LABOR

The second type of SDG&E-specific costs are "Other/Non-Labor", which consist of outside decommissioning consultants and direct costs related to oversight activities.

To provide oversight of decommissioning activities, SDG&E has retained an external decommissioning consultant who has the expertise SDG&E requires. The external consultant is utilized to a greater extent through 2016 and then the consultant services are tapered off annually through 2025.

SDG&E also incurs direct costs related specifically to SDG&E's oversight activities at SONGS. These costs, which include travel reimbursement, phone services, training, and wireless

communication from SONGS, will coincide with the number of SDG&E SONGS oversight personnel FTEs.

These costs are shown in Table F-1 under the column heading of Other/Non-labor and are apportioned into SCE's categories of License Termination, Spent Fuel Management, and Site Restoration.

III. CONCLUSION

All of SDG&E's internal decommissioning costs presented in Table F-1 are separate and distinct from the costs incurred by the decommissioning agent and invoiced to SDG&E.

SDG&E will seek authority to access its nuclear decommissioning trust funds to pay for its proportional share of SONGS related decommissioning expenses and for its internal decommissioning costs incurred through a Commission-approved advice letter process consistent with the terms of the SDG&E Master Trust Agreement, and relevant rules and regulations of the Internal Revenue Service and the Nuclear Regulatory Commission.

SDG&E SONGS Detailed Annual Expenditures

Base Case: Prompt DECON, Time Reasonable Schedule, DOE Repository Opening 2024, Utility and DGC, Dry Storage
(2014 Dollars in Thousands)

Account Totals

	Unit 2			Unit 3			Total			
	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Total
License Termination	$1,905	$0	$487	$1,927	$0	$560	$3,832	$0	$1,047	$4,879
Spent Fuel Management	$1,349	$0	$184	$1,380	$0	$233	$2,729	$0	$417	$3,147
Site Restoration	$761	$0	$153	$1,143	$0	$248	$1,904	$0	$401	$2,305
	$4,016	**$0**	**$823**	**$4,450**	**$0**	**$1,041**	**$8,465**	**$0**	**$1,865**	**$10,330**

Unit 2

	License Termination			Spent Fuel Management			Site Restoration			ISFSI D&D		
Year	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other
2013	$25	$0	$0	$91	$0	$0	$0	$0	$1	$0	$0	$0
2014	$240	$0	$41	$122	$0	$22	$0	$0	$28	$0	$0	$0
2015	$225	$0	$20	$123	$0	$66	$6	$0	$5	$0	$0	$0
2016	$133	$0	$41	$203	$0	$22	$10	$0	$3	$0	$0	$0
2017	$88	$0	$77	$138	$0	$23	$4	$0	$2	$0	$0	$0
2018	$74	$0	$34	$144	$0	$24	$0	$0	$0	$0	$0	$0
2019	$162	$0	$47	$78	$0	$7	$0	$0	$21	$0	$0	$0
2020	$244	$0	$89	$11	$0	$1	$0	$0	$0	$0	$0	$0
2021	$146	$0	$35	$13	$0	$1	$0	$0	$0	$0	$0	$0
2022	$184	$0	$25	$20	$0	$1	$0	$0	$5	$0	$0	$0
2023	$206	$0	$57	$21	$0	$1	$0	$0	$0	$0	$0	$0
2024	$139	$0	$14	$29	$0	$1	$45	$0	$21	$0	$0	$0
2025	$6	$0	$1	$23	$0	$0	$89	$0	$9	$0	$0	$0
2026	$7	$0	$1	$30	$0	$0	$74	$0	$7	$0	$0	$0
2027	$7	$0	$1	$28	$0	$0	$73	$0	$7	$0	$0	$0
2028	$7	$0	$1	$27	$0	$0	$88	$0	$10	$0	$0	$0
2029	$5	$0	$0	$20	$0	$0	$71	$0	$6	$0	$0	$0
2030	$5	$0	$0	$21	$0	$0	$71	$0	$7	$0	$0	$0
2031	$3	$0	$1	$25	$0	$1	$82	$0	$7	$0	$0	$0
2032	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2033	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2034	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2035	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2036	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2037	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2041	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2042	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2043	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2047	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2049	$0	$0	$0	$114	$0	$9	$0	$0	$0	$0	$0	$0
2050	$0	$0	$0	$46	$0	$2	$111	$0	$6	$0	$0	$0
2051	$0	$0	$0	$24	$0	$1	$35	$0	$4	$0	$0	$0
2052	$0	$0	$0	$0	$0	$0	$0	$0	$4	$0	$0	$0
	$1,905	**$0**	**$487**	**$1,349**	**$0**	**$184**	**$761**	**$0**	**$153**	**$0**	**$0**	**$0**

Unit 3

	License Termination			Spent Fuel Management			Site Restoration			ISFSI D&D		
Year	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other
2013	$25	$0	$0	$91	$0	$0	$0	$0	$1	$0	$0	$0
2014	$235	$0	$41	$122	$0	$30	$2	$0	$28	$0	$0	$0
2015	$228	$0	$23	$123	$0	$71	$15	$0	$5	$0	$0	$0
2016	$134	$0	$53	$206	$0	$32	$34	$0	$38	$0	$0	$0
2017	$71	$0	$33	$139	$0	$34	$6	$0	$4	$0	$0	$0
2018	$83	$0	$67	$145	$0	$36	$0	$0	$0	$0	$0	$0
2019	$127	$0	$46	$79	$0	$10	$1	$0	$21	$0	$0	$0
2020	$174	$0	$50	$11	$0	$1	$5	$0	$0	$0	$0	$0
2021	$272	$0	$94	$13	$0	$1	$1	$0	$0	$0	$0	$0
2022	$220	$0	$83	$20	$0	$1	$1	$0	$6	$0	$0	$0
2023	$192	$0	$51	$21	$0	$1	$6	$0	$1	$0	$0	$0
2024	$125	$0	$13	$29	$0	$1	$79	$0	$51	$0	$0	$0
2025	$6	$0	$1	$23	$0	$0	$83	$0	$8	$0	$0	$0
2026	$7	$0	$1	$30	$0	$0	$80	$0	$8	$0	$0	$0
2027	$7	$0	$1	$28	$0	$0	$83	$0	$8	$0	$0	$0
2028	$7	$0	$1	$27	$0	$0	$73	$0	$5	$0	$0	$0
2029	$5	$0	$0	$20	$0	$0	$108	$0	$12	$0	$0	$0
2030	$5	$0	$0	$21	$0	$0	$105	$0	$11	$0	$0	$0
2031	$3	$0	$1	$25	$0	$1	$89	$0	$8	$0	$0	$0
2032	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2033	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2034	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2035	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2036	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2037	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2041	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2042	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2043	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2047	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2049	$0	$0	$0	$114	$0	$9	$0	$0	$0	$0	$0	$0
2050	$0	$0	$0	$46	$0	$2	$69	$0	$8	$0	$0	$0
2051	$0	$0	$0	$24	$0	$1	$152	$0	$11	$0	$0	$0
2052	$0	$0	$0	$24	$0	$1	$152	$0	$11	$0	$0	$0
	$1,927	**$0**	**$560**	**$1,380**	**$0**	**$233**	**$1,143**	**$0**	**$248**	**$0**	**$0**	**$0**

SDG&E SONGS Detailed Annual Expenditures

Base Cas: Prompt DECON, Time Reasonable Schedule, DOE Repository Opening 2024, Utility and DGC, Dry Storage
(2014 Dollars in Thousands)

Account Totals

	Unit 2			Unit 3			Total			
	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Total
License Termination	$1,905	$0	$487	$1,927	$0	$560	$3,832	$0	$1,047	$4,879
Spent Fuel Management	$1,349	$0	$184	$1,380	$0	$233	$2,729	$0	$417	$3,147
Site Restoration	$761	$0	$153	$1,143	$0	$248	$1,904	$0	$401	$2,305
	$4,016	**$0**	**$823**	**$4,450**	**$0**	**$1,041**	**$8,465**	**$0**	**$1,865**	**$10,330**

Unit 2 and 3 Total

	License Termination			Spent Fuel Management			Site Restoration			ISFSI D&D		
Year	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other	Labor	LLRW Burial	Other
2013	$50	$0	$0	$182	$0	$1	$0	$0	$3	$0	$0	$0
2014	$474	$0	$82	$243	$0	$51	$2	$0	$56	$0	$0	$0
2015	$453	$0	$42	$245	$0	$137	$21	$0	$10	$0	$0	$0
2016	$267	$0	$95	$409	$0	$53	$44	$0	$41	$0	$0	$0
2017	$159	$0	$109	$277	$0	$57	$10	$0	$5	$0	$0	$0
2018	$157	$0	$101	$289	$0	$60	$0	$0	$0	$0	$0	$0
2019	$288	$0	$93	$157	$0	$16	$1	$0	$42	$0	$0	$0
2020	$418	$0	$139	$23	$0	$2	$5	$0	$0	$0	$0	$0
2021	$419	$0	$129	$26	$0	$2	$1	$0	$0	$0	$0	$0
2022	$404	$0	$107	$41	$0	$3	$2	$0	$11	$0	$0	$0
2023	$399	$0	$108	$42	$0	$3	$6	$0	$1	$0	$0	$0
2024	$264	$0	$27	$58	$0	$2	$124	$0	$72	$0	$0	$0
2025	$11	$0	$1	$45	$0	$0	$171	$0	$17	$0	$0	$0
2026	$15	$0	$3	$60	$0	$1	$153	$0	$15	$0	$0	$0
2027	$14	$0	$2	$57	$0	$1	$157	$0	$15	$0	$0	$0
2028	$13	$0	$2	$53	$0	$1	$161	$0	$16	$0	$0	$0
2029	$10	$0	$0	$39	$0	$0	$179	$0	$18	$0	$0	$0
2030	$10	$0	$0	$42	$0	$0	$176	$0	$18	$0	$0	$0
2031	$6	$0	$2	$50	$0	$1	$172	$0	$15	$0	$0	$0
2032	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2033	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2034	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2035	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2036	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2037	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2041	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2042	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2043	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2047	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2049	$0	$0	$0	$228	$0	$18	$0	$0	$0	$0	$0	$0
2050	$0	$0	$0	$93	$0	$4	$180	$0	$14	$0	$0	$0
2051	$0	$0	$0	$48	$0	$3	$187	$0	$16	$0	$0	$0
2052	$0	$0	$0	$24	$0	$1	$152	$0	$16	$0	$0	$0
	$3,832	**$0**	**$1,047**	**$2,729**	**$0**	**$417**	**$1,904**	**$0**	**$401**	**$0**	**$0**	**$0**

Unit 2 and 3 Project Totals

License Term	Spent Fuel	Site Restoration	Total
$51	$182	$3	$236
$557	$294	$58	$909
$496	$382	$31	$909
$362	$462	$85	$909
$269	$334	$15	$618
$258	$349	$0	$608
$381	$173	$43	$598
$557	$25	$5	$588
$548	$28	$2	$578
$511	$43	$13	$567
$506	$44	$7	$557
$291	$60	$196	$547
$12	$45	$188	$246
$18	$60	$168	$246
$16	$57	$172	$246
$15	$54	$177	$246
$10	$39	$197	$246
$11	$42	$194	$246
$9	$51	$187	$246
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$0	$0	$0
$0	$246	$0	$246
$0	$97	$195	$291
$0	$51	$203	$253
$0	$25	$168	$193
$4,879	**$3,147**	**$2,305**	**$10,330**

Appendix A-2

Post-Shutdown Decommissioning Activities Report (PSDAR)

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Thomas J. Palmisano
Vice President & Chief Nuclear Officer

10 CFR 50.82(a)(4)(i)

September 23, 2014

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington D.C. 20555-0001

Subject: **Docket Nos. 50-361 and 50-362,**
San Onofre Nuclear Generating Station, Units 2 and 3
Post-Shutdown Decommissioning Activities Report

Reference Letter from P.T. Dietrich (SCE) to the U.S. Nuclear Regulatory Commission dated June 12, 2013; Subject: Certification of Permanent Cessation of Power Operations, San Onofre Nuclear Generating Station, Units 2 and 3

Dear Sir or Madam:

On June 12, 2013, in accordance with 10 CFR 50.82(a)(1)(i), Southern California Edison (SCE) submitted the referenced letter to the U.S. Nuclear Regulatory Commission (NRC) certifying the permanent cessation of operations at San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. In accordance with 10 CFR 50.54(bb) and 10 CFR 50.82(a)(4)(i), SCE is required to submit an Irradiated Fuel Management Plan (IFMP), Site Specific Decommissioning Cost Estimate (DCE) and Post-Shutdown Decommissioning Activities Report (PSDAR) within two years of permanent cessation of operations.

The SONGS, Units 2 and 3 PSDAR is attached. The SONGS, Units 2 and 3 IFMP and DCE are being concurrently submitted under separate cover letters. The descriptions of decommissioning activities and phases in the PSDAR are consistent with those described in the DCE. Both the PSDAR and DCE represent SCE's current plans and are subject to change as the project progresses.

Changes to significant details will be included in subsequent revisions to the PSDAR as required by 10 CFR 50.54(bb). Financial assurance information will be provided on an annual basis as required by 10 CFR 50.75(f)(1).

This letter does not contain any new commitments.

If there are any questions or if additional information is needed, please contact me or Ms. Andrea Sterdis at (949) 368-9985.

Sincerely,

P.O. Box 128
San Clemente, CA 92672
(949) 368-6575 PAX 86575
Fax: (949) 368-6183
Tom.Palmisano@sce.com

Enclosure: San Onofre Nuclear Generating Station Units 2 and 3 Post-Shutdown Decommissioning Activities Report

cc: M. L. Dapas, Regional Administrator, NRC Region IV
T. J. Wengert, NRC Project Manager, San Onofre Units 2 and 3 Decommissioning
R. E. Lantz, NRC Region IV, San Onofre Units 2 and 3
G. G. Warrick, NRC Senior Resident Inspector, San Onofre Units 2 and 3
S. Y. Hsu, California Department of Health Services, Radiologic Health Branch

San Onofre Nuclear Generating Station Units 2 and 3
Post-Shutdown Decommissioning Activities Report

TABLE OF CONTENTS

List of Acronyms and Abbreviations

AADT	Average Annual Daily Traffic
AIF	Atomic Industrial Forum
ALARA	As Low As Reasonably Achievable
BMP	Best Management Practices
CCC	California Coastal Commission
CFR	Code of Federal Regulations
CRWQCB	California Regional Water Quality Control Board
CSLC	California State Lands Commission
DBA	Design Basis Accident
DCE	Decommissioning Cost Estimate
Decon Pd	License Termination Period
DGC	Decommissioning General Contractor
DOE	United States Department of Energy
DOT	United States Department of Transportation
DSC	Dry Storage Canister
FES	Final Environmental Statement, SONGS Units 2 and 3 (NUREG-0490)
GEIS	Generic Environmental Impact Statement (NUREG-0586)
GTCC	Greater than Class C
HSM	Horizontal Storage Modules
IFMP	Irradiated Fuel Management Plan
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
LLRW	Low Level Radioactive waste
MARRSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MWDOC	Municipal Water District of Orange County
MWt	Megawatt-thermal
NEI	Nuclear Energy Institute
NPDES	National Pollutant Discharge Elimination System
NRC	United States Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
PSDAR	Post-Shutdown Decommissioning Activities Report
PWR	Pressurized Water Reactor
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RV	Reactor Vessel
SONGS	San Onofre Nuclear Generating Station
SCE	Southern California Edison
SDAPCD	San Diego Air Pollution Control District
SFP	Spent Fuel Pool
SNF Pd	Spent Fuel Period
SFSM	Spent Fuel Storage Modules
SPCC	Spill Prevention Control and Countermeasures
SR Pd	Site Restoration Period
SSC	Structures, Systems, and Components
UFSAR	Updated Final Safety analysis Report
USCB	United States Census Bureau

I. INTRODUCTION AND SUMMARY

A. Introduction

1. Historical Perspectives

San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 have been owned by four entities. Two are municipalities (Riverside and Anaheim) and two are investor owned utilities: San Diego Gas & Electric (SDG&E) and Southern California Edison (SCE, the Owner-Operator and agent for the participants). The relative obligation for operation and decommissioning varies by unit and entity. The term "SONGS Participants" is used in this report to represent the four entities that have continuing decommissioning obligations.

SONGS Unit 1 was shut down in 1992 with on-shore facilities largely dismantled by 2009 and off-shore conduits being fully dispositioned this year (2014). The decision has been made to shut down and decommission Units 2 and 3. Since the decision to shut down SONGS Units 2 and 3, the focus of SONGS staff and other personnel has been to plan and begin execution of the necessary steps to achieve timely, cost-effective, and safe decommissioning and restoration of the SONGS site.

In developing its plans, SONGS has benchmarked the experiences of commercial decommissioning projects in the 1990s and 2000s and has sought the input from experienced individuals and groups with a wide range of such experience. SONGS maintains close communications with those facilities currently undergoing decommissioning and with many of the organizations supporting those efforts. In particular, both the Zion and Humboldt Bay plants are currently undergoing active decommissioning. Three others (Kewaunee, Crystal River 3, and Vermont Yankee) are, or soon will be, entering SAFSTOR conditions of varying durations prior to dismantlement.

Earlier decommissioning projects faced a number of first-time technical challenges, such as cutting reactor vessel (RV) internals in a high radiation environment. SONGS' reviews indicate that many of the technical challenges confronting SONGS decommissioning now have mature solutions. Similarly, our predecessors provide a wealth of knowledge to minimize worker radiation exposure, efficiently plan, and sequence a decommissioning project and safely manage and transport waste.

The SONGS Participants have the responsibility to restore the site in accordance with applicable regulations and agreements. The SONGS Participants have a responsibility to their stakeholders and the communities they serve to do so in a transparent and effective manner while striving to attain high standards of safety and environmental protection. Further, the SONGS Participants will have a limited, if any, role in the future use of the site. The ultimate use for the site is for the land-owner (U.S. Navy) to determine with input from the community at large.

2. Community Engagement

A key lesson-learned in our review of other decommissioning projects is the continued importance of community engagement during the decommissioning process. The SONGS Participants are committed

to engaging the local community and its leaders in an open, transparent, and proactive manner. SONGS is actively engaged with external stakeholders to: understand their priorities; inform them of SONGS plans; and, to seek their input on the safe, timely, and cost-effective decommissioning of SONGS.

The SONGS Participants are actively engaging with the community through public outreach including briefings for community groups and routine educational updates for local, state, and federal officials. The SONGS participants have formed the Community Engagement Panel (CEP) with members representing a broad range of stakeholders to advise SONGS on decommissioning matters. The panel meets at least quarterly to facilitate dialogue and includes several representatives of government, members from academia, labor, business, environmental organization, and a local anti-nuclear leader. Members of the CEP were provided with the opportunity to review and provide input on this document as well as the Decommissioning Cost Estimate (DCE) and the Irradiated Fuel Management Plan (IFMP). As a precursor to review of these submittals, SONGS hosted two workshops with external technical experts to provide the CEP members with a depth of knowledge in these areas. Feedback from the panel was addressed prior to finalization and SCE senior management authorization of the submittals.

SONGS also has established a website, www.SONGScommunity.com, as a dedicated online source for information on the plant and the decommissioning process. The website includes background information on decommissioning, links to other websites including the NRC, and an "opt-in" feature that allows members of the community to register for automatic updates on decommissioning matters.

3. Regulatory Basis

In accordance with the requirements of 10 CFR 50.82, "Termination of License," paragraph (a)(4)(i), this report constitutes the Post-Shutdown Decommissioning Activities Report (PSDAR) for SONGS Units 2 and 3. The PSDAR contains the following:

1. A description of the planned decommissioning activities along with a schedule for their accomplishment.
2. A site-specific DCE including the projected cost of managing irradiated fuel and site restoration (being submitted concurrently).
3. A discussion that provides the basis for concluding that the environmental impacts associated with the site-specific decommissioning activities will be bounded by the appropriate previously issued generic and plant specific environmental impact statements.

The PSDAR has been developed consistent with NRC Regulatory Guide 1.185, Revision 1, "Standard Format and Content for Post-Shutdown Decommissioning Activities Report." This report is based on currently available information; however, the plans discussed may be modified as additional information becomes available or as circumstances change. As required by 10 CFR 50.82(a)(7), SCE will notify the Nuclear Regulatory Commission (NRC) in writing before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules described in the PSDAR, including changes that significantly increase the decommissioning cost.

The IFMP and DCE are being submitted concurrently with the PSDAR. The technical, schedule, and cost information provided is consistent among these submittals.

B. Background

The SONGS site is located on the coast of southern California in San Diego County, approximately 62 miles southeast of Los Angeles and 51 miles northwest of San Diego. The site is located entirely within the boundaries of the United States Marine Corps Base Camp Pendleton. The site is approximately 4,500 feet long and 800 feet wide, comprising 84 acres. The site does not include office buildings and related facilities located east of Interstate 5 (I-5) referred to as "the Mesa" or other adjacent parcels.

The property on which the station is built is subject to an easement from the United States Government through the U. S. Navy. The nearest privately owned land is approximately 2.5 miles from the site.

SONGS Units 2 and 3 is a two-unit site with supporting facilities. The reactors were previously licensed to produce 3,438 MWt each. An on-site Independent Spent Fuel Storage Installation (ISFSI) used to store SONGS Units 1, 2 and 3 fuel, located on the portion of the site previously occupied by SONGS Unit 1. Storage at the ISFSI was initiated in 2003 and the pad was subsequently (2007) expanded to support the currently placed 63 Horizontal Storage Modules in which 51 Dry Storage Containers (DSCs) have been installed to-date: 50 containing irradiated fuel and one (1) containing Greater-Than-Class-C (GTCC) materials. The most recent loading campaign was conducted in 2012. As discussed in the Spent Fuel Management Period details and the concurrently submitted IFMP, it will be necessary to further expand the current ISFSI capacity to store the complete inventory of Units 2 and 3 spent fuel. The location, capacity, and technology to be employed have not yet been finalized.

A brief history of the major milestones related to plant construction and operation is as follows:

	UNIT 2	UNIT 3
• Construction Permit Issued	October 18, 1973	October 18, 1973
• Operating License Issued	February 16, 1982	November 15, 1982
• Full Power Operation	June 15, 1983	November 18, 1983
• Final Reactor Operation	January 9, 2012	January 31, 2012

On June 7, 2013, SCE announced its decision to permanently cease power operations and decommission SONGS Units 2 and 3. By letter dated June 12, 2013 (Reference 3), SCE notified the NRC of its decision to permanently cease power operations. SCE has submitted two letters dated July 22, 2013 (Reference 5) and June 28, 2013 (Reference 4) certifying that fuel has been removed from the Unit 2 and 3 reactors, respectively.

Pursuant to 10 CFR 50.51(b), "Continuation of License," the license for a facility that has permanently ceased operations, continues in effect beyond the expiration date to authorize ownership and possession of the facility until the NRC notifies the licensee in writing that the license has been

terminated. During the period that the license remains in effect, 10 CFR 50.51 (b) requires the licensee to:

(1) Take actions necessary to decommission and decontaminate the facility and continue to maintain the facility, including, where applicable, the storage, control and maintenance of the spent fuel, in a safe condition, and

(2) Conduct activities in accordance with all other restrictions applicable to the facility in accordance with the NRC regulations and the provisions of the specific 10 CFR part 50 licenses for the facility.

C. Summary of Decommissioning Alternatives

The NRC has evaluated the environmental impacts of three general methods for decommissioning power reactor facilities in NUREG-0586, "Final Generic Environmental Impact Statement (GEIS) on Decommissioning Nuclear Facilities," Supplement 1 (Reference 6). The three general methods are:

- **DECON:** The equipment, structures, and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license after cessation of operations.
- **SAFSTOR:** The facility is placed in a safe stable condition and maintained in that state (safe storage) until it is subsequently decontaminated and dismantled to levels that permit license termination. During SAFSTOR, a facility is left intact or may be partially dismantled, but the fuel has been removed from the reactor vessel and radioactive liquids have been drained from systems and components and then processed. Radioactive decay occurs during the SAFSTOR period, thus reducing the levels of radioactivity in and on the material and potentially the quantity of radioactive material that must be disposed of during the decontamination and dismantlement.
- **ENTOMB:** Radioactive structures, systems, and components are encased in a structurally long-lived substance such as concrete. The entombed structure is appropriately maintained and continued surveillance is carried out until the radioactivity decays to a level that permits termination of the license.

The SONGS Participants have chosen the DECON method. SONGS is currently in the planning period during which the site is preparing for safe and orderly transition to dismantlement. More specifically:

- Permanent cessation of operations was announced on June 7, 2013.
- DECON methodology was selected (prompt decontamination and dismantlement after initial planning period).
- Additional ISFSI capacity will be added to meet all of the site's needs.
- Initial site characterization activities are underway.
- Plans to isolate the Spent Fuel Pools (referred to as "islanding") are in development.
- Other necessary actions to facilitate safe system retirement and removal (referred to as "cold and dark") are in development.

When the required regulatory reviews, planning, and preparation are sufficiently complete, the site will move into active decontamination and dismantlement. Current plans are for that period to overlap with completion of the relocation of spent fuel from the Spent Fuel Pools to the ISFSI.

The SONGS facility will be decontaminated and dismantled (D&D) to levels that permit termination of the NRC licenses and in accordance with the requirements agreed to by the United States Navy in the easement for the site. In support of this and in accordance with 10 CFR 50.82(a)(9), a License Termination Plan will be developed and submitted for NRC approval at least two years prior to termination of the license.

The decommissioning approach for SONGS is described in more detail in the following sections:

- Section II summarizes the planned decommissioning activities and general timing of their implementation.
- Section III summarizes the cost estimating methodology employed by Energy*Solutions* and references the site specific DCE being submitted concurrently.
- Section IV describes the basis for concluding that the environmental impacts associated with decommissioning SONGS Units 2 and 3 are bounded by the most recent site-specific environmental impact statement and NRC GEIS related to decommissioning.

II. DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

The SONGS Units 2 and 3 decommissioning project is currently in the planning period transitioning to DECON as soon as necessary planning, approvals, and conditions permit doing so in a safe and cost-effective manner. DECON is defined in Section I.C of this report.

Table II-1 provides a summary of the current decommissioning plan and schedule for SONGS Units 2 and 3. The major decommissioning periods and general sequencing of the activities that will occur during each period identified in Table II-1 are discussed in more detail in the sections that follow. The periods are logical groupings of activities. The categories are also consistent with the Nuclear Decommissioning Trust (NDT) funds which are allocated based on specific regulatory requirements. The activities executed during these periods will, in many cases progress in parallel, and may not be as completely segregated as the description implies. For instance, while distinct decontamination and dismantlement activities are listed, it may be determined to be more effective from dose, labor, or waste disposal perspectives to dismantle structures and systems and dispose of them as radioactive waste rather than decontaminate them and dispose of the balance as non-radioactive waste.

The planning required for each decommissioning activity, including the selection of the process to perform the work, will be performed in accordance with appropriate governance and oversight processes. Based on current plans, no decommissioning activities unique to the site have been identified and no activities or environmental impacts outside the bounds considered in the GEIS have been identified. Appropriate radiological and environmental programs will be maintained throughout

the decommissioning process to ensure radiological safety of the workforce and the public and environmental compliance is maintained.

Table II-1
San Onofre Nuclear Generating Station Units 2 and 3
Current Schedule of Decommissioning Periods

Task Name	Start	Finish
Part 50 License Termination (other than ISFSI)		
Announcement of Cessation of Operations	06/07/2013	N/A
Decon Period 1 – Transition to Decommissioning	06/07/2013	12/31/2013
Decon Period 2 – Decommissioning Planning and Site Modifications	01/01/2014	06/30/2015
Decon Period 3 – Decommissioning Preps/Reactor Internals Segmentation	06/30/2015	06/01/2019
Decon Period 4 – Plant Systems and Large Component Removal	06/01/2019	09/24/2022
Decon Period 5 – Building Decontamination	09/24/2022	07/13/2024
Decon Period 6 – License Termination During Demolition	07/13/2024	12/24/2032
Spent Fuel Management		
SNF Period 1 – Spent Fuel Management Transition	06/07/2013	12/31/2013
SNF Period 2 - Spent Fuel Transfer to Dry Storage	01/01/2014	06/01/2019
SNF Period 3 – Dry Storage During Decommissioning – Units 1, 2 & 3	06/01/2019	12/05/2031
SNF Period 4 – Dry Storage Only – Units 1, 2 & 3	12/05/2031	12/31/2035
SNF Period 5 – Dry Storage Only – Units 2 & 3	12/31/2035	12/31/2049
SNF D&D Period 1 – ISFSI Part 50 License Termination	12/31/2049	05/06/2050
SNF D&D Period 2 – ISFSI Demolition	05/06/2050	09/08/2051
Site Restoration		
SR Period 1 – Transition to Site Restoration	06/07/2013	06/30/2015
SR Period 2 – Building Demolition During Decommissioning	06/30/2015	07/11/2017
SR Period 3 – Subsurface Demolition Engineering and Permitting	10/01/2019	07/13/2024
SR Period 4 – Building Demolition to 3 Feet Below Grade	07/13/2024	10/14/2028
SR Period 5 – Subgrade Structure Removal Below -3 Feet	10/14/2028	12/5/2031
SR Period 6 – Final Site Restoration and Easement Termination	05/06/2050	12/15/2051
Final Easement Termination	12/15/2051	N/A

Note [1]: Shipping dates are assumed based on the previously documented positions of the DOE, which indicates that shipments from the industry could begin as early as 2024 and SONGS place in the current queue. Both are subject to changes.

A. Detailed Breakdown of License Termination Periods

The License Termination Periods (referred to as decontamination periods) include those activities necessary to remove or reduce the levels of radioactive contamination to levels necessary to terminate the Part 50 licenses for the site (other than the ISFSI) and release it back to the Navy. Also included are the development, submittal, and support for the review of the primary decommissioning documents.

Periods 1 and 2 generally consist of planning and transition of the site to a condition where it is ready for significant decontamination and dismantlement activities. As detailed below, these periods include: system abandonment and isolation of the remaining structures, systems and components (SSC) from normal power and water sources. System abandonment and isolation allow the decontamination and dismantlement to proceed safely and in an efficient sequence. Additionally, the selection of the contractor for managing the bulk of the decommissioning activities will be made.

Period 3 is focused on decontamination and dismantlement of the major components in the containment building (RV internals, vessel, head, steam generators, pressurizer, and main piping).

Period 4 addresses the decontamination and dismantlement of SSCs known to be substantially contaminated and the removal of the components from both Periods 3 and 4.

Period 5 is focused on decontamination of the various buildings. As noted elsewhere it may be more appropriate to simply proceed with dismantlement if it is more timely and cost-effective to simply dispose of building material as radioactive waste.

Period 6 is focused on the final site survey to confirm that the site is acceptable for release back to the Navy. The process for doing so "Multi-Agency Radiation Survey and Site Investigation Manual" (MARRSIM) was developed by the four federal agencies having authority over radioactive materials (Department of Defense, Department of Energy, the Environmental Protection Agency and the NRC) and is the consensus standard endorsed by other stakeholders. Its application will be validated by the NRC.

Decontamination Period 1 – Transition to Decommissioning

- Announcement of Cessation of Operations
- Defuel Reactors
- Notification of Permanent Fuel Removal
- Disposition of legacy Low Level Radioactive Waste (LLRW)

Decontamination Period 2 – Decommissioning Planning and Site Modifications

- Preparation of Decommissioning Related Licensing Submittals
  - Permanently Defueled Technical Specifications (Submitted March 21, 2014)
  - Permanently Defueled Radiological Emergency Plan (Submitted March 31, 2014)
- Submit PSDAR, DCE and IFMP to NRC
- Perform Historical Site Assessment and Site Characterization
- Planning, Design, and Implementation of Cold and Dark (Site Repowering)
- Design and Install Spent Fuel Pool Islanding, Control Room Relocation, and Security Modifications
- Select Decommissioning General Contractor (DGC)

Decontamination Period 3 – Decommissioning Preparations and Reactor Internal Segmentation

- DGC Mobilization and Planning
- System Decontamination
- Reactor Internals Removal Preparations

- Reactor Internals Segmentation Planning and Implementation
- Purchase Dry Storage Canisters for GTCC Waste
- Segment and Package Reactor Internals for Storage in the ISFSI

Decontamination Period 4 – Plant Systems and Large Component Removal

- Upgrade Rail Spur in Owner Controlled Area
- Install Large Array Radiation Detection System to Monitor Shipments In/Out of Site
- Remove, Package, and Dispose of Non-Essential Systems
- Asbestos and Lead Abatement
- Spent Fuel Pool Closure
- Remove Spent Fuel Pool Racks, Spent Fuel Pool Island Equipment, and Bridge Crane
- Remove and Dispose of Legacy Class B and C Wastes
- Remove, Package, and Dispose of Essential Systems
- Removal and Disposal of Spent Resins, Filter Media, and Tank Sludge
- Large Component Removal
- Prepare License Termination Plan

Decontamination Period 5 – Building Decontamination

- Decontaminate Containment Buildings
- Decontaminate Turbine Buildings
- Decontaminate Fuel Handling Buildings
- Decontaminate Auxiliary Rad-waste Building
- Decontaminate Auxiliary Control Building
- Decontaminate Penetration Buildings
- Decontaminate Safety Equipment and Main Steam Isolation Valve (MSIV) Buildings
- Radiological Survey of Structures During Decontamination

Decontamination Period 6 – License Termination

- Final Status Survey
- Verification and NRC Approval

B. Detailed Breakdown of Spent Fuel Management Periods

The Spent Nuclear Fuel Management Periods began with all spent fuel off-loaded from the reactor vessel into the Spent Fuel Pools and the certification of permanent defueling letters submitted to the NRC in accordance with 10 CFR 50.82(a)(1)(ii) (References 4 and 5).

During Period 1 measures will be planned, designed, and implemented to ensure spent fuel storage and handling systems will continue to function to support fuel storage in the spent fuel pool and to facilitate transfer of the spent fuel to the ISFSI. Systems, structures, and programs needed to support the safe storage and transfer of spent fuel such as security, fire protection, and environmental and radiological monitoring will be maintained in accordance with applicable requirements. Equipment maintenance, inspection, and operations will be performed on these systems and structures as appropriate.

During Period 2 the ISFSI capacity will be expanded to accommodate transfer of all spent fuel to dry storage. All spent fuel for Units 1, 2 and 3 will be transferred to the ISFSI and stored there until it is accepted by the Department of Energy (DOE) and transferred to an off-site facility.

The next three periods reflect slightly different ISFSI conditions. Period 3 is concurrent with ongoing site decontamination and dismantlement activities. Period 4 reflects the ISFSI with spent fuel from all three units in dry storage and Period 5 recognizes the potential that Unit 1 fuel may be accepted by the DOE earlier than Units 2 and 3 fuel and ends with DOE acceptance of all Units 2 and 3 fuel.

The SNF D&D Periods (1 and 2) follow DOE acceptance and may be well after License Termination for the balance of the site.

Spent Nuclear Fuel Period 1 – Spent Fuel Transfer Management Transition

- Implementation of Initial Security Enhancements Required for Reductions in Staff
- Design and Fabricate Dry Storage Canisters for Current ISFSI Scope

Spent Nuclear Fuel Period 2 – Spent Fuel Transfer to Dry Storage

- Submit IFMP
- Select Dry Storage System Canister Design and Vendor for Balance of the ISFSI
- Design and Construct ISFSI Expansion
- Purchase, Deliver, and Load Dry Storage Canisters and Storage Models for Balance of the ISFSI
- Complete Transfer of Spent Fuel to ISFSI

Spent Nuclear Fuel Period 3 – Dry Storage during Decommissioning Units 1, 2, and 3 Fuel

Spent Nuclear Fuel Period 4 – Dry Storage Only – Units 1, 2, and 3 Fuel

Spent Nuclear Fuel Period 5 – Dry Storage Only – Units 2 and 3 Fuel

Spent Nuclear Fuel Period D&D 1 – ISFSI License Termination

- Preparation and NRC Review of ISFSI Portion/Revision of License Termination Plan

Spent Nuclear Fuel Period D&D 2 – ISFSI Demolition

- Decontamination of Storage Modules (SFSMs)
- Final Status Survey of ISFSI
- Clean Demolition of HSM's and ISFSI Pad
- Clean Demolition of ISFSI Support Structures
- Restore ISFSI Site
- Preparation of Final Report on ISFSI Decommissioning and NRC Review

C. Detailed Breakdown of Site Restoration Periods

The Site Restoration periods reflect the planning and implementation of dismantlement activities not associated with radioactive materials. The DCE and descriptions below conservatively include activities

from which the SONGS Participants will plan to seek alternatives. These include the complete removal of the intake and discharge conduits in the Pacific Ocean currently required by the California State Lands Commission (CSLC) easement. Previously, the CSLC and SONGS developed an alternative for the SONGS Unit 1 conduits. Another is associated with removal of all subsurface structures that may be required by the US Navy easement. The typical practice has been to remove structures to that depth necessary to remove contaminated materials.

Also included as part of site restoration are severance costs and cost associated with returning the Mesa and other parcels to the U. S. Navy.

Site Restoration Period 1 –Transition to Site Restoration

- Severance Costs Associated with Staffing Reduction in Accordance with State Law
- Other off-site activities are included in the DCE but are not considered part of the Units 2 and 3 PSDAR activities

Site Restoration Period 2 –Building Demolition During Decommissioning

- Demolish South Access for Decommissioning, South Yard Facility
- Other off-site activities are included in the DCE but are not considered part of the Units 2 and 3 PSDAR activities

Site Restoration Period 3 – Subsurface Demolition Engineering and Permitting

- Hydro-geologic Investigation and Outfall Conduit Survey
- Subsurface Structure Removal Analyses for Lease Termination Activities
- Final Site Grading and Shoreline Protection Engineering Planning and Design

Site Restoration Period 4 – Building Demolition to Three Feet Below-Grade

- Demolition Preparations
- De-tension and Remove Containment Building Tendons
- Demolish Diesel Generator Buildings
- Demolish Condensate Buildings and Transformer Pads
- Demolish Full Flow Areas and Turbine Buildings
- Demolish Auxiliary Rad-waste Building
- Demolish Auxiliary Control Building
- Remove Systems and Demolish Make-up Demineralizer Structures
- Demolish Penetration Buildings
- Demolish Safety Equipment and MSIV Buildings
- Demolish Fuel Handling Buildings
- Demolish Containment Buildings
- Demolish Intake and Discharge Structures

Site Restoration Period 5 – Subgrade Structure Removal below Three Feet (if required)

- Install Sheet Piling and Excavation Shoring, Dewatering System, and Effluent Treatment and Discharge Controls

- Demolish and Backfill Subsurface Structures
- Demolish and Backfill Intake Structure Inside Seawall
- Remove Off-shore Intake and Outfall Conduits
- Remove Sheet Piling and Excavation Shoring, and Perform Dewatering and Effluent Treatment
- Finish Grading and Re-vegetate Site As Needed/Required

Site Restoration Period 6 – Final Site Restoration and Easement Termination [details subject to final resolution of negotiations with the U. S. Navy]

- Install Dewatering System and Effluent Treatment and Discharge Controls
- Remove and Stockpile Existing Seawall Erosion Protection
- Remove Seawall and Pedestrian Walkway
- Remove Remaining Intake Structure Beneath Seawall
- Backfill and Compaction of Excavation
- Remove Dewatering System and Effluent Treatment
- Remove Railroad Tracks, Stabilized Slopes, Access Road, and North Parking Lot
- Finish Grading and Re-vegetate Site as Needed/Required

D. General Decommissioning Considerations

1. Major Decommissioning Activities

As defined in 10 CFR 50.2, “Definitions,” a “major decommissioning activity” is “any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than Class C waste in accordance with 10 CFR 61.55." The following discussion provides a general summary of the major decommissioning activities currently planned for SONGS Units 2 and 3. These activities may be modified as conditions dictate.

Prior to starting a major decommissioning activity, the plant components will be radiologically surveyed and decontaminated, as required, to minimize worker radiation exposure. Shipping casks and other equipment necessary to conduct decommissioning activities will be designed and procured.

The initial major decommissioning activities will focus on removal, packaging and disposal of piping and components. Following RV and cavity reflood and RV head removal and disposal; the reactor vessel internals will be removed from the reactor vessel and segmented as necessary to separate the GTCC waste which will be placed in storage canisters and modules on the ISFSI designated for that purpose. Using this approach, the internals will be packaged and disposed of independent of the reactor vessel (RV). When the internals segmentation effort is completed, the RV and cavity will be drained and any remaining debris will be removed.

Removal of the reactor vessel follows the removal of the reactor internals. It is likely that the components will be removed by sectioning or segmenting performed remotely. These activities may be

performed in air, rather than underwater, using a control envelope to preclude the spread of contaminated materials.

Additional major decommissioning activities that will be conducted include removal and disposal of the steam generators, pressurizer, spent fuel storage racks, and spent fuel bridge crane. The dismantling of the containment structure will be undertaken as part of the reactor building demolition. As detailed in Section 3 (below) appropriate radiation protection and contamination control measures will be employed to manage these activities.

2. Other Decommissioning Activities

In addition to the major decommissioning activities discussed above, plant components will be removed from the Turbine Building including the turbine generator, condenser, feedwater heaters, moisture separator/reheaters, and miscellaneous system and support equipment. As detailed in Section 3 (below) appropriate radiation protection and contamination control measures will be employed to manage these activities.

3. Decontamination and Dismantlement Activities

The objectives of the decontamination effort are two-fold. The first objective is to reduce radiation levels throughout the facility to minimize personnel radiation exposure during dismantlement. The second objective is to clean as much material as possible to 'unrestricted use' levels, thereby allowing non-radiological demolition and disposal and minimizing the quantities of material that must be disposed of by costly burial as radioactive waste. The second objective will be achieved by decontaminating structural components including steel framing and concrete surfaces. The methods to accomplish this are typically mechanical, requiring the removal of the surface or surface coating and are used regularly in industrial and contaminated sites.

The decontamination and/or dismantlement of contaminated SSCs may be accomplished by: decontamination in place; decontamination and dismantlement; or dismantlement and disposal. A combination of these methods may be utilized to reduce contamination levels, worker radiation exposures, and project costs. Material below the applicable radiological limits may be released for unrestricted disposition (e.g., scrap, recycle, or general disposal). Radioactive contaminated or activated materials will be removed from the site as necessary to allow the site to be released for unrestricted use.

LLRW will be processed in accordance with plant procedures and existing commercial options. Contaminated material will be characterized and segregated for additional onsite decontamination or processing, off-site processing (e.g., disassembly, chemical cleaning, volume reduction, waste treatment), and/or packaged for controlled disposal at a low-level waste disposal facility.

Contaminated concrete and structural steel components will be decontaminated and removed as required to gain access to plant SSCs. After the SSCs are removed and processed as described above,

the remaining contaminated concrete and structural steel components will be decontaminated and/or removed. Contaminated concrete will be packaged and shipped to a low-level waste disposal facility. Contaminated structural steel components may be removed to a processing area for decontamination, volume reduction, and packaging for shipment to processing facility or to a low-level waste disposal facility, as necessary.

Buried and embedded contaminated components (e.g., piping, drains) will be decontaminated in place, or excavated and decontaminated. Appropriate contamination controls will be employed to minimize the spread of contamination and to protect personnel.

4. Radioactive Waste Management

A major component of the total cost of decommissioning SONGS Units 2 and 3 is the cost of safely packaging and disposing of contaminated SSCs, contaminated soil, resins, water, and other plant process liquids. A waste management plan will be developed consistent with regulatory requirements for each waste type. Currently, LLRW Classes B and C may be disposed of at the Waste Control Services (WCS) waste disposal site in Andrews County, Texas. The waste management plan will be based on the evaluation of available methods and strategies for processing, packaging, and transporting radioactive waste in conjunction with the available disposal facility and associated waste acceptance criteria.

Class A LLRW will be disposed at a licensed disposal site. (SONGS has contracted with Energy*Solutions* to use the facility located in Clive, Utah as well as WCS). If other licensed Class B and C LLRW facilities become available in the future, SONGS may choose to use them as well.

5. Removal of Mixed Wastes

Mixed wastes (hazardous and radioactive) generated during decommissioning, if any, will be managed in accordance with applicable Federal and State regulations. If technology, resources, and approved processes are available, the processes will be evaluated to render the mixed waste non-hazardous. Otherwise, mixed wastes from SONGS will be transported by authorized and licensed transporters and shipped to authorized and licensed facilities.

6. Site Characterization

During the decommissioning process, a site characterization will be performed in which radiological, regulated, and hazardous wastes will be identified, categorized, and quantified. Surveys will be conducted to establish the contamination and radiation levels throughout the plant. The information will be used in developing procedures to ensure the contaminated areas are removed and ensure that worker exposure is controlled. Surveys of the selected outdoor areas will also be performed including surveys of soil and groundwater near the site. As decontamination and dismantlement work proceeds, surveys will be conducted to maintain the site characterization current and ensure that decommissioning activities are adjusted accordingly.

7. Groundwater Protection

A groundwater protection program was initiated at SONGS in accordance with NEI 07-07, "Industry Groundwater Protection Initiative, Final Guidance Document," in August 2007 (Reference 11). A site hydrology study was initially completed as part of this initiative and was updated in 2012. Monitoring wells were installed around the plant to monitor for radionuclides. Acceptable levels of contaminants, as defined by the program, have been observed throughout the sampling program implemented as part of this initiative. Appropriate program elements will be maintained during decommissioning.

8. Change to Management and Staffing

With the plant shut down and defueled, plant management and staffing levels have been and continue to be adjusted to reflect the transition from an operating plant to a plant in decommissioning status. Staffing plans are addressed in the DCE.

III. ESTIMATE OF EXPECTED DECOMMISSIONING AND SPENT FUEL MANAGEMENT COSTS

10 CFR 50.82(a)(8)(iii) requires that a site-specific decommissioning cost estimate be prepared, and submitted within two years following permanent cessation of operations. 10 CFR 50.82 (a)(4)(i) requires that the PSDAR contain a site-specific decommissioning cost estimate including the projected costs of managing irradiated fuel.

Energy*Solutions* has prepared a site-specific DCE for SONGS, which also provides projected costs of managing irradiated fuel, as well as non-radiological decommissioning and other site restoration costs,. The site-specific decommissioning cost analysis is being submitted concurrent with the IFMP and this PSDAR and fulfills the requirements of 10 CFR 50.82(a)(4)(i) and 10 CFR 50.82(a)(8)(iii). A summary of the annual costs associated with decommissioning, irradiated fuel management and site restoration are provided in the Irradiated Fuel Management Plan also being concurrently submitted in accordance with 10 CFR 50.54(bb).

The methodology used by Energy*Solutions* to develop the site-specific decommissioning cost analysis follows the approach originally developed by the Atomic Industrial Forum (now Nuclear Energy Institute) in their program to develop a standardized model for decommissioning cost estimates. The results of this program were published as AIF/NESP-036, "A Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Reference 7). This document includes a unit cost factor method for estimating direct activity costs, simplifying the estimating process. The unit cost factors used in the study reflect the latest available data at the time of the study concerning worker productivity during decommissioning.

The decommissioning of the SONGS site will be funded from Nuclear Decommissioning Trusts established by each SONGS Participant for each unit. The relative liabilities of each SONGS Participant are detailed in the DCE. Sufficient funds (based on balances and earnings) are projected to be available to complete the planned decommissioning activities.

As discussed in Section IV of the IFMP the CPUC will establish processes for oversight of withdrawals from the nuclear decommissioning trusts by SCE and SDG&E, and designate the specific amounts from the existing fund balances that are available for the three decommissioning cost categories: (1) spent fuel management; (2) site restoration; and (3) license termination. As entities not subject to CPUC jurisdiction, Anaheim and Riverside are not required to obtain CPUC authorization with respect to withdrawals from their respective Nuclear Decommissioning Trusts.

IV. ENVIRONMENTAL IMPACTS

As shown in this section, SCE has evaluated the environmental impacts of decommissioning SONGS Units 2 and 3 to determine if anticipated impacts are bounded by existing environmental impact statements, the NRC's generic decommissioning EIS (GEIS, Reference 6) and the SONGS Final Environmental Statement (FES, Reference 8). As noted in Regulatory Guide 1.185, C.4 "the PSDAR does not need to include the analysis of the specific environmental impacts associated with decommissioning activities….the licensee must ensure that supporting documentation and analyses are available at the reactor site for inspection by the NRC Staff." Such detailed documentation and analyses are contained in the Environmental Impact Evaluation (EIE) and its supporting references as noted in the Developmental References. They are available on-site for NRC review as well as on the SONGScommunity.com website and are summarized below. Both the detailed documentation and analyses and the following summary were reviewed by internal and external subject matter experts, independent third-party reviewers and the Community Engagement Panel discussed in the Introduction to this report.

In the GEIS, the NRC reviewed the environmental impacts resulting from decommissioning on a generic basis, and identified a need for site-specific analyses for: (1) threatened and endangered species and (2) environmental justice. In addition, site-specific analyses are called for whenever decommissioning plans indicate that activities will impact areas beyond the operational portions of a facility. The SONGS FES addresses decommissioning, but does not establish bounding environmental impacts specific to decommissioning. However, the FES' discussion of impacts for construction does describe bounding impacts as it related to potential dewatering during decommissioning.

The NRC, in its GEIS, identified additional activities that are performed in conjunction with decommissioning. These activities are regulated by the NRC but any associated environmental impacts are addressed directly in conjunction with those regulated activities. These activities include those related to the decision to permanently cease operations, irradiated fuel management in wet or dry storage, irradiated fuel transport and disposal, and the treatment, and/or disposal of LLRW. SCE similarly excluded consideration of such activities to remain consistent with the NRC's approach.

A. Environmental Impacts of Decommissioning SONGS

SCE assessed the potential for environmental impacts to each resource area from decommissioning activities using the evaluations in the GEIS as a guide. Like the GEIS, the analysis assumed that operational mitigation measures will be continued and did not rely on the implementation of new

mitigation measures unless specified. Releases to the environment, waste volumes, and other environmental interfaces were estimated in the DCE or other sources referenced in the EIE. This information was then assessed against the potential for impact and the existing environmental conditions at SONGS to identify impacts and determine whether the GEIS and FES remain bounding. The GEIS categorizes significance levels as SMALL (impacts are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource or do not exceed permissible levels in the NRC's regulations), MODERATE (impacts are sufficient to alter noticeably, but not to destabilize, important attributes of the resource), or LARGE (impacts are clearly noticeable, and are sufficient to destabilize important attributes of the resource).

To support the evaluation, SCE established the baseline environmental and societal conditions through site-specific information as well as vicinity and regional data available from local, state, and federal agencies. In addition, the evaluation considered the existing permit conditions and limitations for water and air permits and NRC regulatory requirements, including those focused on occupational dose, public dose, radiological effluents, and LLRW shipping. Federal, state, and local requirements for non-radiological interfaces with the environment were considered. These include regulatory limits on water withdrawal and discharges, air emissions including fugitive dust, noise levels, and protection of avian, terrestrial and aquatic species, protection of cultural resources, disposal of non-radiological waste, and worker health protection.

SCE reviewed the planned decommissioning activities for SONGS Units 2 and 3 and compared these to the decommissioning activities that NRC evaluated in the GEIS. The planned activities fall within the activities that NRC evaluated. While each decommissioning site is unique, no unusual site-specific features or aspects of the planned SONGS Units 2 and 3 decommissioning have been identified. Furthermore, the practices used to accomplish the individual decommissioning tasks will employ conventional methods.

SCE's review confirmed that the anticipated or potential impacts are within the bounds of the generic impacts that the NRC described in the GEIS. There are no applicable bounding impacts for threatened and endangered species and environmental justice. The site-specific analyses determined that the planned SONGS Units 2 and 3 decommissioning activities are not likely to result in significant impacts to threatened and endangered species nor have disproportionate impacts on minority or low-income populations. The following discussions summarize the full Environmental Impact Evaluation focusing on the reasons for reaching this conclusion.

1. Onsite/Offsite Land Use

SCE's decommissioning plans include building demolition and removal within the 84-acre easement hosting the SONGS Units 2 and 3 reactor units and infrastructure. SCE plans to seek an easement lease amendment from the CSLC for the partial removal or abandonment in-place of the SONGS Units 2 and 3 intake and discharge conduits. In addition, the existing rail spur serving the site will most likely be used in support of waste shipments.

The SONGS site is currently used for utility-related industrial land uses, with the majority of the property within the easement having been previously disturbed during construction and operation of the plant. The coastal bluff areas located in the northwest and southeast portions of the 84-acre easement have remained undeveloped in compliance with the California Coastal Commission (CCC) Guarantee Agreement, in which SCE provided assurance that they will be protected and that they will remain in their natural state. It is anticipated that there will be no changes in onsite land use patterns during decommissioning.

The GEIS assessment for land use concluded that the impact would be SMALL for sites that did not require additional land for decommissioning activities. If additional land was needed the impact should be determined on a site-specific basis. Because no additional lands are needed SONGS onsite land use impacts during decommissioning are bounded by the GEIS and are categorized as SMALL.

2. Water Use

SONGS Units 2 and 3 acquires potable water through the South Coast Water District, a member agency of the Municipal Water District of Orange County (MWDOC). The site historically used water from the Pacific Ocean for its condenser cooling and service water cooling functions. The operational demand for cooling and makeup water has been significantly reduced since SONGS Units 2 and 3 permanently ceased operation. Condenser cooling is not required when the plant is not operating and service water cooling demands have been reduced to the extent possible (primarily spent fuel pool cooling). The normal operation demand was previously over 830,000 gpm per unit and is currently approximately 34,000 gpm total for both Units 2 and 3. During the decommissioning period, SONGS intends to continue to reduce cooling water demands with the intent to eliminate such demands on the Pacific Ocean as soon as possible.

The GEIS assessment of water use concluded the impact on water use would be SMALL if the decommissioning did not significantly increase water use. Water uses for decommissioning include staff usage, fuel storage (replacement of evaporative losses, etc.), fuel transfer (washing down transport casks), large component segmentation generally performed underwater, decontamination and dismantlement (if water-jet or similar techniques are employed). Water uses are anticipated to be significantly less than during operation. Thus water use impacts during decommissioning are bounded by the GEIS.

3. Water Quality – Non-Radiological

Major activities that could impact surface and groundwater quality during decommissioning include site excavation, stabilization, decontamination, dismantlement, and dewatering. These activities present the potential of spills, migration of low concentrations of radioactivity or hazardous substances not previously identified, and leaching from subsurface structures.

As discussed in Section 2 above, the site uses water from the Pacific Ocean for its condenser cooling and service water cooling functions. Water used for cooling functions is discharged through the ocean outfalls for Units 2 and 3, and is currently regulated under individual National Pollutant Discharge Elimination System (NPDES) Permits from the San Diego Regional Water Quality Control Board (SDRWQCB). The individual unit permits may be merged into a single NPDES Permit which would also continue to address groundwater dewatering discharges, and multiple minor waste stream discharges from within SONGS Units 2 and 3.

Storm water discharge is regulated and controlled through an industrial storm water general permit issued by the SDRWQCB. This permit requires SONGS to develop, maintain, and implement a storm water pollution prevention plan (SWPPP) for the facility. Storm water-related monitoring plans and reporting protocols will be updated as necessary to address permit requirements and decommissioning activities.

A previous SCE study concluded that no drinking water pathway exists for exposure from SONGS operations. Furthermore, the nearest drinking water well is more than one mile inland. Previous studies indicate that even under extreme pumping conditions, a seaward gradient will exist. Therefore, any dewatering is not expected to result in saltwater intrusion.

The GEIS assessment of water quality impacts concluded the impacts would be SMALL based on compliance with regulatory requirements including the appropriate application of best management practices (BMPs) and controls. SCE will follow standard storm water BMPs as documented in the current Industrial SWPPP and implement the current SPCC plan to minimize the chance of both groundwater and surface water contamination. In the event an unknown area of hazardous substances is identified during sub-grade soil excavation and structures removal, the area will be assessed and controlled. Due to the implementation of BMPs and compliance with permits, the potential impacts of decommissioning on nonradioactive aspects of water quality for both surface water and groundwater are bounded by those addressed in the GEIS.

4. Air Quality

Emission sources in San Diego County are primarily mobile sources (vehicular traffic) and ambient air quality standards are frequently exceeded for ozone and particulate matter due to routine vehicular traffic. Relatively minor stationary sources, such as those planned for use at SONGS, are projected to be a fraction of the average daily emissions permitted by the San Diego Air Pollution Control District (SDAPCD).

The most likely impact of decommissioning on air quality will be due to dust. SCE will employ standard dust control measures during decommissioning in accordance with SDAPCD dust abatement and visible emissions requirements. Air emissions due to commuting workers will actually be less since the work force during all phases of decommissioning is expected to be smaller than the peak number of workers used for construction or refueling outages.

The NRC's GEIS generically determined air quality impacts associated with decommissioning to be SMALL due to the sufficiency of current and commonly used control and mitigation measures. SCE will implement standard mitigation measures to reduce emissions during decommissioning per the requirements of the SDAPCD. Therefore, air quality impacts related to decommissioning of SONGS Units 2 and 3 are bounded by the GEIS.

5. Aquatic Ecology

SCE has characterized the aquatic environment in the vicinity of the SONGS Units 2 and 3 intake and discharge conduits prior to construction of and during the operation of SONGS. There are a variety of habitat types surrounding the SONGS Units 2 and 3 conduits. The marine habitat offshore of SONGS consists of a mixture of sand, cobble, and isolated areas of exposed rock. The area of high marine productivity in the immediate vicinity of the plant site is the shallow sub-tidal zone, approximately 1,300 feet north of SONGS. This area supports a biological community dominated by surfgrass, and feather boa kelp. The San Onofre kelp bed is approximately 650 feet south of SONGS Unit 2 diffusers in a water depth of 40 to 50 feet. The benthic fish community is generally dominated by queenfish; northern anchovy; white croaker and speckled sanddab.

Since ceasing permanent operations at SONGS Units 2 and 3, SCE has reduced ocean water withdrawals and discharge by approximately 96 percent from normal operating flows. The remaining flow is primarily associated with cooling spent fuel while in wet storage. As noted earlier, spent fuel storage and cooling are existing operational activities and is not re-addressed as part of this environmental review. SONGS will continue to comply with its applicable regulatory and permit requirements associated with reduction of impingement and entrainment impacts due to water withdrawals.

SCE sought and obtained an amendment to the CSLC easement lease for Unit 1 which allowed the intake and discharge conduits to remain buried beneath the seafloor. SCE is planning to pursue similar amendments for SONGS Units 2 and 3. If the CSLC approves the amendment to allow SCE to abandon the conduits in place, the environmental impacts are projected to be SMALL with the application of appropriate mitigation measures enumerated in the lease amendment. Complete removal of the conduits, as is currently required by the CSLC lease, is anticipated to have significant adverse environmental impacts. The detailed Environmental Impact Evaluation assumes the CSLC lease is amended. If the CSLC lease is not amended, the environmental impacts from complete removal of the conduits will have to be further addressed. If necessary, SCE will update the PSDAR and initiate other regulatory interactions to address the results of this analysis.

There are no surface water bodies on the SONGS site, but the Pacific Ocean borders the site and vernal pools are found northwest of SONGS Parking Lot 4. Decommissioning activities for SONGS Units 2 and 3 will include the application of common BMPs, compliance with the SONGS storm water permit, and implementation of the storm water pollution prevention plan, which will be updated as necessary to address decommissioning activities. These measures will ensure that any changes in surface water quality will be non-detectable and non-destabilizing.

The NRC determined aquatic ecology impacts to be SMALL when only aquatic resources within a plant's operational areas are disturbed. The potential impacts to aquatic ecology are bounded by the GEIS and no additional mitigation measures beyond those anticipated as conditions of the CSLC easement lease amendment are likely to be warranted.

6. Terrestrial Ecology

The SONGS site is almost entirely paved and developed. However, there are small strips of intact scrub-shrub habitat and ornamental vegetation surrounding the parking lots and between developed areas of the plant. The SONGS site also has undeveloped coastal bluffs that are explicitly protected from development under the CCC Guarantee Agreement. The onsite coastal bluff in the northwest area of SONGS is sparsely vegetated, California desert-thorn scrub habitat. The larger onsite coastal bluff in the southeast area of SONGS is approximately 5 acres and is dominated by California sagebrush scrub vegetation. This bluff is contiguous with the San Onofre bluffs of the San Onofre State Beach, which supports two native vegetation associations (Diegan coastal sage scrub and southern foredune) and small areas of disturbed coastal sage scrub habitat. The coastal bluff areas provide opportunity to support wildlife; however, the light, noise, and frequent human presence due to the proximity of SONGS and the state beach result in a more disturbed habitat than will otherwise be optimal for many species. Avian species are highly mobile and not subject to barriers such as roads and developed areas and may utilize scrub habitat or open surfaces for nesting and temporary perching.

The decommissioning activities will include noise and dust from dismantlement of facilities and heavy equipment traffic, surface runoff, emissions from construction equipment, and the potential for bird interactions with crane booms or other construction equipment. These activities will be conducted in compliance with air quality and noise regulations, and SCE will use avoidance and minimization measures to address potential impacts. Compliance with applicable regulations, air permits, noise restrictions along with the temporary nature of the various decommissioning tasks (e.g., use of cranes) will minimize the impacts to terrestrial species as well as the human community. Decommissioning plans do not currently include the use of explosives, which could disturb terrestrial resources. Should those plans change the environmental impacts will be reevaluated.

SONGS is located within the coastal zone and prior to active dismantlement, SCE will file a coastal development permit application with the CCC. As part of this permitting process, decommissioning activities within the coastal sage habitat areas, coastal bluff, and beach areas will be reviewed by the CCC and United States Fish and Wildlife Service (USFWS) for potential environmental impacts including

the federally listed coastal California gnatcatcher and other protected species and species of concern. Any necessary mitigation measures will be included as conditions of the CCC permit. The removal of various current SONGS features along the perimeter of the developed plant adjacent to and within the natural area could potentially require ground disturbance in unpaved areas. Appropriate avoidance and minimization measures will be used to minimize the impact of any ground disturbance.

With the implementation of appropriate avoidance and minimization measures and compliance with permit conditions as discussed above, decommissioning of SONGS Units 2 and 3 is not anticipated to adversely impact any terrestrial resources and the impacts will be bounded by the GEIS which determined them to be SMALL.

7. Threatened and Endangered Species

Seventeen federally or state protected species utilize habitat within the vicinity (a 6-mile radius) of the SONGS site. These species are listed in Table IV-1, along with their protection status and critical habitat designation. Other species of concern are also addressed in the detailed Environmental Impact Evaluation including both the critically imperiled and imperiled species listed in the California Natural Diversity Data Base and located within one mile of the site but are not otherwise addressed here.

The list includes four federally listed marine turtles. However, none is considered a full-time resident in the vicinity of SONGS and they only migrate through the vicinity. Another federally listed marine reptile, the Hawksbill turtle, sporadically nests in the southern part of the Baja peninsula and foraging sub-adults and juveniles have been sighted along the California coast. Given the SMALL impacts on water use and water quality during decommissioning and the ability of these species to migrate away from the site, these species should not be adversely impacted by decommissioning.

The decommissioning activities will indirectly impact protected species through dust generation from structure demolition, noise from dismantlement of facilities and heavy equipment traffic, surface runoff, emissions from construction equipment, and potential bird interactions with crane booms or other construction equipment. The decommissioning activities will be conducted in compliance with air quality and noise regulations and SCE will use appropriate avoidance and minimization measures. Compliance with applicable regulations, air permits, and noise restrictions related to daylight working along with the temporary nature of the various decommissioning tasks will minimize any such impacts. Decommissioning plans do not currently include the use of explosives, which could disturb protected species. These measures will minimize impacts to protected terrestrial species that inhabit or visit the SONGS site.

Although rare on the site, there has historically been one protected plant species in the vicinity of SONGS, the thread-leaved brodiaea. Decommissioning activities will generally be confined to previously disturbed areas (e.g., paved, high traffic areas). Otherwise, the SCE environmental staff will conduct an environmental assessment per established procedures. The procedure requires an assessment prior to any land disturbance, soil addition, digging, grading, or trenching outside the paved and concreted areas; maintenance activities near surface water, and wetlands and trimming or removal of native plants

other than landscape maintenance. Therefore, adverse impacts on protected plant species are not anticipated.

Decommissioning of SONGS Units 2 and 3 is not anticipated to adversely impact any federally or state-listed species. As discussed above, decommissioning activities will generally be limited to previously disturbed areas on-site, near-shore and off-shore. SCE will employ mitigation measures as required by the regulatory agencies to minimize impacts to the environment and protect listed species. In addition, SCE will implement BMPs and conduct assessments as called for in its environmental protection procedure(s), as well as comply with permit and regulatory requirements to minimize indirect impacts from noise, air emission, dust, and runoff. Therefore, impacts to threatened or endangered species from decommissioning are expected to be SMALL.

Table IV-1

Threatened and Endangered Species Identified within the Vicinity of SONGS

Scientific Name	Common Name	State Status[a]	Federal Status[b]	Critical Habitat within Vicinity
AMPHIBIAN SPECIES				
Anaxyrus californicus	Arroyo toad	—	FE	yes[c]
AVIAN SPECIES				
Charadrius alexandrinus nivosus	Western snowy plover	—	FT	yes[c]
Empidonax traillii extimus	Southwestern willow flycatcher	SE	FE	No
Haliaeetus leucocephalus	Bald eagle	SE	delisted	No
Polioptilacalifornica californica	Coastal California gnatcatcher	—	FT	yes[c]
Vireo bellii pusillus	Least Bell's vireo	SE	FE	yes[c]
FISH SPECIES				
Orcorhynchus mykiss	Steelhead trout	—	FE	yes[c]
INVERTEBRATE SPECIES				
Branchinecta sandiegoensis	San Diego fairy shrimp	—	FE	yes[c]
Streptocephalus woottoni	Riverside fairy shrimp	—	FE	No
MAMMALIAN SPECIES				

Scientific Name	Common Name	State Status[a]	Federal Status[b]	Critical Habitat within Vicinity
Dipodomys stephensi	Stephen's kangaroo rat	ST	FE	No
Perognathus longimembris pacificus	Pacific pocket mouse	—	FE	No
PLANT SPECIES				
Brodiaea filifolia	Thread-leafed brodiaea	SE	FT	yes[c]
REPTILIAN SPECIES				
Caretta caretta	Loggerhead sea turtle	—	FE	No
Chelonia mydas	Green sea turtle	—	FT	No
Dermochelys coriacea	Leatherback sea turtle	—	FE	No
Lepidochelys olivacea	Olive Ridley's turtle	—	FT	No

a. SE = state endangered; ST = state threatened;
b. FE = federally endangered; FT = federally threatened
c. The USFWS has critical habitat delineated within the SONGS site vicinity. However, the designation explicitly excludes Camp Pendleton and thus the SONGS site. Further, the term vicinity includes any area within a 6 mile radius of the site and is not limited to the site itself.

8. Radiological

Decommissioning activities have the potential to contribute to radiological impacts. SONGS Units 2 and 3 may continue to have limited gaseous and liquid radiological effluents until most of the decommissioning activities are complete and the irradiated fuel is transferred to dry storage. SCE is evaluating options to significantly reduce, if not eliminate, routine liquid effluents through the use of self-contained clean-up systems for ongoing systems and activities.

Occupational Dose
The GEIS estimates for the reference pressurized water reactor (PWR) dose is 1,215 person-rem for DECON. In the most recent supplement to the GEIS, the NRC reviewed data available from decommissioning experience subsequent to their initial review (in 1988). Because the range of cumulative occupational doses reported by reactors undergoing decommissioning was similar to the range of estimates for reference plants presented in the 1988 revision of the GEIS, the NRC did not update its estimates for occupational dose.

SCE expects the SONGS dose to be bounded by the referenced PWR dose since: a number of major components which often contribute to area dose rates are relatively new (steam generators and reactor vessel head); and, as a result of SONGS operational dose reduction efforts (i.e., zinc injection). A more detailed estimate will be developed to support evaluation of decontamination scope.

The regulatory standard for worker exposure is a dose limit per worker rather than a cumulative dose. Detailed occupational dose estimates will be performed as part of the work planning process. Such planning will address means to reduce occupational dose where appropriate. SCE remains committed to keeping dose to plant personnel 'As Low as Reasonably Achievable' (ALARA). The activities that have potential radiological impacts will be conducted in a manner to keep doses ALARA and well within regulatory limits.

Public Dose

The NRC generically concluded that reactors undergoing decommissioning could reasonably be expected to have emissions and public doses comparable to or substantially less than the levels experienced during normal operation of those facilities. The Radiological Environmental Monitoring Program (REMP) results demonstrate that the radiological environmental impact of the operation of SONGS Units 2 and 3, and the resulting dose to a member of the general public, is negligible.

SCE will continue to monitor effluents, comply with all applicable regulatory limits, and continue its REMP to assess the impacts to the environment from these effluents.

In summary, SCE estimates that SONGS Units 2 and 3 decommissioning activities will result in occupational and public doses within NRC estimates. Therefore, SONGS' radiological impacts during decommissioning are bounded by the GEIS which determined the radiological impacts to be SMALL.

9. Radiological Accidents

Many activities that occur during decommissioning are similar to activities that commonly take place during maintenance outages at operating plants such as decontamination and equipment removal. Accidents that could occur during these activities may result in injury and local contamination. However, they are not likely to result in contamination off-site.

The limiting design basis accidents (DBAs) applicable to a decommissioning plant are those involving the spent fuel pool. All DBAs and severe accidents involving the reactor are precluded as a result of transfer of spent fuel from the reactor vessels to the pools and ultimately the ISFSI. The environmental impacts of DBAs, including those associated with the spent fuel pool, were evaluated during the initial licensing process and documented in the FES. Furthermore, the impacts of these events are less than previously evaluated due to the time since the fuel was most recently irradiated.

The NRC's GEIS analysis relies in part on the waste confidence rule regarding spent nuclear fuel related severe accidents. The waste confidence GEIS (Reference 9) continues to consider severe accidents involving the spent fuel pool to be a SMALL risk.

Thus, SONGS' radiological accident impacts during decommissioning are bounded by NRC's Decommissioning GEIS which determined such risks to be SMALL.

10. Occupational Issues

SONGS currently has an industrial safety program and safety personnel to promote safe work practices and respond to occupational injuries and illnesses. Equivalent safety programs will continue to be in effect during decommissioning activities.

SONGS has an average occupational injury rate well below that of the heavy construction industry sector and consistent with the power generation and nuclear power industry. Decommissioning activities will be conducted in a manner reflecting personnel safety as a critical element. Therefore, SONGS occupational safety impacts are considered to be bounded by the GEIS which generically determined occupational safety impacts to be SMALL.

11. Cost

Decommissioning costs for SONGS are discussed in the DCE being submitted concurrently.

12. Socioeconomics

The primary socioeconomic impacts of decommissioning are related to staffing changes and decreasing tax revenues. Impacts related to the decision to permanently cease operations are outside the scope of this evaluation. SCE determined the staff reduction impacts from the decision to be minimal. The staff reductions represent 0.04 percent and 0.03 percent of San Diego County's and Orange County's workforces, respectively. Any impacts will be deferred somewhat due to the employment of temporary staff necessary to accomplish the various decommissioning activities.

Similarly, SONGS is located in San Diego County and its property assessment is a relatively small portion of San Diego County's total tax collections. Historically, SONGS' contribution to the county property tax collections has been consistently less than 1 percent. SONGS' tax obligations will be reduced due to decommissioning, but SCE and SONGS will continue to contribute to county tax revenues.

It is anticipated that there will be limited or no changes or impacts to the local community and socioeconomic conditions and less impact than would be expected generically where other nuclear facilities have a higher relative impact on the job market or tax base. Thus, SONGS' impacts are bounded by those considered in the GEIS in which the NRC generically determined socioeconomic impacts to be SMALL.

13. Environmental Justice

Decommissioning activities that may potentially affect identified minority and low-income populations include those related to staffing changes and offsite transportation. However, the assessment of environmental justice also considered other specific issues (e.g., water use, air quality). SCE has determined that no significant offsite impacts will be created by SONGS 2 & 3 decommissioning activities. As generic NRC guidance recognizes, if no significant offsite impacts occur in connection with the proposed action, then no member of the public will be substantially affected. Therefore, there can

be no disproportionately high and adverse impacts on members of the public, including minority and low-income populations. In addition, staffing is not anticipated to be an impact due to the large population and robust job market in the area (see Section 12 above).

The environmental justice evaluations utilize a 50-mile radius around the plant as the potentially impacted area. To complete this evaluation, the 2006–2010 low-income data and 2010 minority population data for California were obtained from the United States Census Bureau (USCB) and processed using ESRI ArcGIS 10.1 software. All census data were downloaded in USCB block group level geography so that the environmental justice evaluations were consistent between the minority and low-income analyses. The evaluations and results are detailed in the EIE which concluded there were no disproportionate impacts.

In its GEIS, the NRC concluded that adverse environmental justice impacts and associated significance of the impacts must be determined on a site-specific basis. Unlike many nuclear sites, SONGS is located in and near relatively large communities with significant other commercial and industrial activities. Thus, the impact of SONGS shutdown is less severe than may otherwise be the case. Further, SCE has determined that no significant offsite environmental impacts will be created by SONGS Units 2 and 3 decommissioning activities. Since no significant offsite impacts occur in connection with the proposed action, no member of the public will be substantially affected. Therefore, it is unlikely for there to be a disproportionately high and adverse impact or effects on specific groups or members of the public, including minority and low-income populations, resulting from the decommissioning of SONGS Units 2 and 3.

14. Cultural Historic and Archeological Resources

No prehistoric or historic archaeological sites or historic sites eligible for listing or listed on the National Register of Historic Places, California Register of Historical Resources, or San Diego County Local Register of Historical Resources are located within the SONGS site lease easement and no traditional cultural properties are known to be present. Two prehistoric archaeological sites and three historic archaeological sites were identified within 0.5 miles of SONGS Units 2 and 3.

All of these areas are outside the operational/decommissioning site. In its GEIS, the NRC concluded that for plants where the disturbance of lands beyond the operational areas is not anticipated, the impacts on cultural, historic, and archeological resources will be SMALL. Since decommissioning activities are confined to the SONGS site, no adverse impacts are anticipated. SONGS' impacts on cultural, historical, and archeological resources during decommissioning fall well within the bounds established by the NRC in the GEIS.

15. Aesthetic Issues

In its GEIS, the NRC stated that removal of structures is generally considered to be a beneficial aesthetic impact and drew the generic conclusion that for all plants, the potential impacts from decommissioning on aesthetics are SMALL and that any mitigation measures are not likely to be beneficial enough to be

warranted. Similarly, the aesthetic impact of final result of decommissioning SONGS Units 2 and 3 will be less than that of the current aesthetic impact of the plant. During dismantlement, any adverse visual intrusion will be temporary and will ultimately serve to reduce the aesthetic impact of the site. Therefore, the impacts of SONGS on aesthetic resources during decommissioning are bounded by the GEIS.

16. Noise

Offsite noise sources that affect the ambient noise environment in the vicinity of SONGS include Interstate-5, the San Diego Northern Railroad, and military operations. During the decommissioning process, the sounds that might be heard at offsite locations include noise from construction vehicles and tools. The timing of noise impacts and the duration or intensity will vary. The nearest sensitive receptors to SONGS are recreational users of San Onofre State Beach where the ambient noise environment can exceed 70 dBA. The more intense decommissioning activities will occur 400 ft or more from the beach access public walkway in front of the SONGS sea wall.

Due to the relatively high ambient noise levels surrounding SONGS, decommissioning activities are not expected to produce noise levels that could impact the activities of humans or threatened and endangered species. In addition, SCE will comply with the local noise regulations for construction sites, which restrict the average sound level at the property boundary to 75 dBA between 7 a.m. and 7 p.m., and any additional agency permit requirements including any lower allowed limits during evenings and overnight. Therefore, noise impacts during decommissioning of SONGS Units 2 and 3 are bounded by the previously issued GEIS, which generically determined the noise impacts associated with decommissioning to be SMALL.

17. Transportation

Transportation impacts are dependent on the number of shipments to and from the facility, the type of shipments, the distance that material is shipped, and the number of workers commuting to and from the site.

Transportation infrastructure within the vicinity of SONGS includes one major north- and south-bound freeway, I-5, an assortment of local and county roads, passenger and cargo rail service (part of the Los Angeles–San Diego corridor), and an existing rail spur serving the SONGS site. The 2011 average annual daily traffic (AADT) count for this portion of I-5 was 132,000 vehicles.

SCE compared the assumptions and analysis inputs used for NRC's analysis with waste volumes estimated for SONGS Units 2 and 3 decommissioning, transport mode, and disposal facility options. Due to the availability of the rail line, a substantial portion of the shipments will likely use that mode of transportation. The NRC indicates use of rail reduces radiological impacts by more than a factor of 10 over truck shipments. Furthermore, disposal facilities available for SONGS Units 2 and 3 radiological wastes are less than half the distance assumed by NRC in its analysis. Therefore the generic impacts bound those associated with SONGS Units 2 and 3.

Furthermore, SCE will comply with all applicable NRC and U.S. Department of Transportation (DOT) regulations, including Federal Railroad Administration regulations and requirements, and will use approved packaging and shipping containers for waste shipment. SCE will also comply with State of California regulations enforced by Caltrans and the California Highway Patrol. The NRC has generically concluded that the radiological impacts of transporting radiological waste from decommissioning will be SMALL and those for SONGS Units 2 and 3 are bounded by the GEIS.

SCE estimated a peak of approximately 560 workers during decommissioning and the vehicular traffic due to commuting will likely exceed the 200 per peak hour threshold, prompting review for potential to impact traffic congestion as required under the local congestion management plan. SCE estimated peak truck traffic due to waste shipments to be approximately 150 per day. The decommissioning traffic associated with SONGS is considered negligible compared to existing traffic volumes and will not be expected to significantly alter congestion on roadways. In addition, this amount of traffic is not expected to significantly deteriorate roadways; therefore the GEIS is bounding and the non-radiological transportation impacts of decommissioning are SMALL.

Offshore activities to remove vertical risers on the intake and discharge conduits will increase marine vessel traffic in the area. It is expected that these activities will not cause either a navigational safety hazard or a substantial delay in the normal movements of commercial or recreational vessels. The environmental impacts review for the Unit 1 conduit disposition indicated that impacts to recreational and commercial transportation will be insignificant.

18. Irreversible and Irretrievable Commitment of Resources

SONGS Units 2 and 3 decommissioning will involve dismantlement and removal of structures and restoration of the property to a state for unrestricted release per NRC regulations in accordance with the criteria for license termination in 10 CFR 20, Subpart E. Furthermore, the property will be returned to the U.S. Navy under negotiated terms of the easement. The activities necessary to decommission SONGS Units 2 and 3 involve a minor irretrievable commitment of consumable materials (including materials for decontamination, solvents, industrial gases, tools, fuel, etc.). The irreversible commitment of such resources is not unique and is bounded by those considered by the NRC in the GEIS which concluded consumption to be minor.

Waste from decommissioning of SONGS Units 2 and 3 will consume space at waste facilities. California has multiple facilities permitted for the storage, treatment, and disposal of hazardous and universal waste. The nonradioactive waste is assumed to be shipped to an out-of-state landfill due to the moratorium on disposal of decommissioned materials at California nonhazardous landfills. The decommissioning of SONGS Units 2 and 3 will result in minor irretrievable or irreversible commitment of resources bounded by the GEIS in which the NRC determined will be SMALL impacts.

B. Environmental Impacts of License Termination – NUREG-1496

The License Termination Plan (LTP) has not yet been developed. As noted earlier, it is required to be submitted at least two years prior to the proposed termination date. In general, the LTP outlines the basis for an administrative/legal activity. No physical work beyond that already addressed is anticipated. Thus, there are no environmental impacts beyond those already addressed that need to be addressed at this point in the process.

C. Discussion of Decommissioning in the FES

Applicable portions of the FES were addressed as noted in each of the topics previously summarized.

D. Additional Considerations

SCE has not identified any unique considerations that need to be further addressed. The previous topic summaries address a sufficiently wide range of issues.

E. Conclusion

SCE has performed an environmental review to evaluate environmental impacts associated with decommissioning activities, confirming that the anticipated or potential impacts are within the bounds of the generic impacts that NRC described in the GEIS. Further, while there are no applicable bounding impacts for threatened and endangered species and environmental justice discussed in the GEIS, the SONGS Units 2 and 3 decommissioning activities are not anticipated to result in significant impacts to threatened and endangered species or disproportionate impacts on minority or low-income populations. This is principally due to the following:

- Planned activities fall within the activities that the NRC evaluated. There are no unique aspects of the plant or decommissioning techniques that will invalidate previously drawn conclusions.
- Methods to be employed to dismantle and decontaminate the site are standard construction-based techniques fully considered in the GEIS.
- SCE will continue to comply with NRC dose limits and conduct activities in accordance with ALARA principles.
- SCE will continue to comply with the SONGS Offsite Dose Calculation Manual, Radiological Effluent Monitoring Program, and the Ground Water Protection Initiative Program during decommissioning. Each will likely be modified somewhat to reflect changes in site configuration, etc.
- SCE will comply with all applicable NRC and DOT regulations, including Federal Railroad Administration regulations and requirements, and use approved packaging and shipping containers for the shipping of radiological waste. SCE will also comply with State of California regulations enforced by Caltrans and the California Highway Patrol.

- SCE will continue to comply with federal, state, and local requirements for non-radiological interfaces with the environment including limitations on water withdrawal and discharges, air emissions including criteria pollutants and fugitive dust, noise levels, protection of avian, terrestrial and aquatic species, cultural resources, disposal of non-radiological waste, and worker health protection.
- SCE will seek and comply with an amendment to its CSLC easement lease to largely abandon the intake and discharge conduits in place.
- SCE will seek and comply with a coastal development permit from the CCC for decommissioning.

V. REFERENCES

A. GENERAL DEVELOPMENTAL REFERENCES

1. NRC Regulatory Guide 1.185, Revision 1, June 2013, Standard Format and Content Guide for Post-Shutdown Decommissioning Activities Report
2. Energy*Solutions* Document No. 164001, "2014 Decommissioning Cost Analysis of the San Onofre Nuclear Generating Station Units 2 and 3"
3. Enercon Technical Data Record No. SONGS002, "SONGS Units 2 and 3 Environmental Impact Evaluation"

B. SPECIFIC REFERENCES IN TEXT

1. Letter from Thomas J. Palmisano (SCE) to the U. S. Nuclear Regulatory Commission dated February 13, 2014; Subject: Access to Nuclear Decommissioning Trust Funds, San Onofre Nuclear Station, Units 2 and 3.
2. Letter from Richard C. Brabec (SCE) to the U. S. Nuclear Regulatory Commission dated March 31, 2014; Subject: Decommissioning Funding Status Report, San Onofre Nuclear Generating Station Units 2 and 3
3. Letter from P. T. Dietrich (SCE) to the U. S. Nuclear Regulatory Commission dated June 12, 2013; Subject: Certification of Permanent Cessation of Power Operations San Onofre Nuclear Generating Station, Units 2 and 3
4. Letter from P. T. Dietrich (SCE) to the U. S. Nuclear Regulatory Commission dated June 28, 2013; Subject: Permanent Removal of Fuel from the Reactor Vessel, San Onofre Nuclear Generating Station Unit 3
5. Letter from P. T. Dietrich (SCE) to the U. S. Nuclear Regulatory Commission dated July 22, 2013; Subject: Permanent Removal of Fuel from the Reactor Vessel, San Onofre Nuclear Generating Station Unit 2
6. U. S. Nuclear Regulatory Commission; NUREG-0586, "Final Generic Environmental Impact Statement (GEIS) on Decommissioning Nuclear Facilities" (November 2002)
7. AIF/NESP-036, "A Guideline for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates"
8. U.S. Nuclear Regulatory Commission, NUREG-0490, "Final Environmental Statement related to the operation of San Onofre Nuclear Generating Station, Units 2 and 3" (April 1981)
9. U. S. Nuclear Regulatory Commission, NUREG-2157, "Waste Confidence Generic Environmental Impact Statement, Report for Comment" (August 2014)
10. U. S. Nuclear Regulatory Commission, NUREG-1496, Volume 1, "Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities" (July 1997)
11. NEI 07-07, "Industry Groundwater Protection Initiative, Final Guidance Document," in August 2007

Appendix A-3

Irradiated Fuel Management Plan (IFMP)

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Thomas J. Palmisano
Vice President & Chief Nuclear Officer

10 CFR 50.82(a)(4)(i)

September 23, 2014

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington D.C. 20555-0001

Subject: **Docket Nos. 50-361 and 50-362,**
San Onofre Nuclear Generating Station, Units 2 and 3
Irradiated Fuel Management Plan

Reference Letter from P.T. Dietrich (SCE) to the U.S. Nuclear Regulatory Commission, dated June 12, 2013; Subject: Certification of Permanent Cessation of Power Operations, San Onofre Nuclear Generating Station, Units 2 and 3

Dear Sir or Madam:

On June 12, 2013, SCE submitted the referenced letter to the U.S. Nuclear Regulatory Commission (NRC) certifying the permanent cessation of operations at San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, in accordance with 10 CFR 50.54(bb) and 10 CFR 50.82(a)(4)(i), Southern California Edison (SCE) is required to submit an Irradiated Fuel Management Plan (IFMP), Site Specific Decommissioning Cost Estimate (DCE) and Post-Shutdown Decommissioning Activities Report (PSDAR) within two years of permanent cessation of operations.

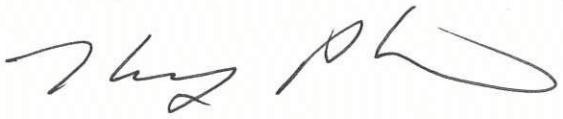
The SONGS, Units 2 and 3 IFMP is attached. The DCE and PSDAR are being concurrently submitted under separate cover letters. The IFMP represents SCE's current plans and is subject to change as the project progresses. In particular, the Independent Spent Fuel Storage Installation location, and storage equipment and vendor(s) have not been selected. The decision making and procurement activities are underway but have not been finalized.

Changes to significant details will be included in subsequent revisions to the IFMP as required by 10 CFR 50.54(bb). Financial assurance information will be provided on an annual basis as required by 10 CFR 50.75(f)(1).

This letter does not contain any new commitments.

If there are any questions or if additional information is needed, please contact me or Ms. Andrea Sterdis at (949) 368-9985.

Sincerely,



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Enclosure: San Onofre Nuclear Generating Station Units 2 and 3 Irradiated Fuel Management Plan

cc: M. L. Dapas, Regional Administrator, NRC Region IV
T. J. Wengert, NRC Project Manager, SONGS, Units 2 and 3
T. J, Warnick, NRC Project Manager, San Onofre Units 2 and 3 Decommissioning
R. E. Lantz, NRC Region IV, San Onofre Units 2 and 3
S. Y. Hsu, California Department of Health Services, Radiologic Health Branch

I. Background and Introduction

On June 12, 2013, Southern California Edison (SCE) submitted a letter to the U.S. Nuclear Regulatory Commission (NRC) (Reference 1) certifying the permanent cessation of operations at San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 effective June 7, 2013, in accordance with 10 CFR 50.82(a)(1)(i). All fuel was removed from the SONGS Units 2 and 3 reactor vessels and placed in their respective spent fuel pools as certified in accordance with 10 CFR 50.82(a)(1)(ii) (References 2 and 3).

Pursuant to 10 CFR 50.54(bb), licensees are required to submit a plan for the management of irradiated fuel until title and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository. The Irradiated Fuel Management Plan (IFMP) is required to be submitted to the Commission either five years before expiration of the Operating License or within two years following permanent cessation of operations, whichever occurs first. Therefore, the SONGS Units 2 and 3 plans are required to be submitted prior to June 7, 2015, two years following the cessation of operations. This submittal constitutes SCE's IFMP for SONGS Units 2 and 3, submitted on behalf of itself and the other SONGS Participants responsible for the funding of the SONGS decommissioning. The other SONGS Participants are the City of Anaheim, the City of Riverside, and San Diego Gas & Electric Company (SDG&E).

Energy*Solutions*, LLC has prepared a site-specific decommissioning cost estimate (DCE) for SONGS Units 2 and 3 (Reference 15). The DCE identifies the details, schedules, and costs of spent fuel management activities associated with the IFMP, along with license termination and site restoration activities and costs. This DCE is being submitted concurrent with the Post-Shutdown Decommissioning Activities Report (PSDAR, Reference 4) and this plan. The assumptions regarding the United States Department of Energy (US DOE) acceptance of irradiated fuel is consistent with the Energy*Solutions* DCE and is based on testimony filed with the California Public Utility Commission (Reference 13). The SONGS Units 2 and 3 DCE and this IFMP are based on commencement of industry-wide acceptance of spent fuel by US DOE in 2024.

II. Irradiated Fuel Management Strategy

The safe initial interim storage of SONGS Units 2 and 3 irradiated fuel will be "wet storage" in each unit's respective spent fuel pool. The spent fuel pools will be isolated from their normal support systems and those systems replaced by stand-alone cooling and filtration units (also termed a "spent fuel pool island"). Doing so facilitates earlier system abandonment and parallel decommissioning activities.

Subsequently, all irradiated fuel in the SONGS Units 2 and 3 spent fuel pools will be safely transferred to "dry storage" at the common Independent Spent Fuel Storage Installation (ISFSI) located on the SONGS site. Dry storage is also considered interim storage pending transfer to the US DOE.

A total of 1,726 irradiated fuel assemblies have been generated in SONGS Unit 2 and 1,734 irradiated fuel assemblies have been generated in SONGS Unit 3, for a total of 3,460 irradiated fuel assemblies. At present, 792 SONGS Units 2 and 3 irradiated fuel assemblies have already been transferred to the common ISFSI. The remaining 2,668 irradiated fuel assembles will be loaded into Dry Shielded Canisters (DSCs) and transferred to the ISFSI.

The current ISFSI is located inside the Owner Controlled Area. It was constructed to accommodate SONGS Unit 1 irradiated fuel and provides additional capacity for a limited amount of SONGS Units 2 and 3 irradiated fuel.

The ISFSI currently contains 18 DSCs storing Unit 1 fuel and Greater than Class C (GTCC) waste. The ISFSI also contains 33 DSCs which store Units 2 and 3 fuel. All of the fuel on the ISFSI is stored in Transnuclear NUHOMS Model Number-24PT1 or PT4 DSCs.

The major IFMP activity phases, including start and end dates and associated costs for each period are identified in Table 1. The identified Spent Nuclear Fuel (SNF) Periods are developed in and align with the site-specific DCE (Reference 15).

The current plans are to obtain necessary permits for the ISFSI to be expanded to accommodate the remaining inventory of the SONGS Units 2 and 3 spent fuel pools. SONGS plans to commence the movement of irradiated fuel from the Unit 2 and Unit 3 pools to the ISFSI in 2017. SONGS expects to complete the transfer in 2019. Additional DSCs will be procured from one or more of the available dry storage system suppliers beginning in 2014. An additional 47 DSCs will be required for the SONGS Unit 2 irradiated fuel and an additional 44 DSCs will be required for the SONGS Unit 3

irradiated fuel (depending on the capacity of the selected system and the number of DSCs needed to store GTCC waste and other materials). The spent fuel pool inventory is forecast to be transferred to the ISFSI no later than the end of 2019.

The US DOE Standard Contracts for acceptance and disposal of spent nuclear fuel and high level waste contain the basis for the initial ranking of industry-wide spent fuel acceptance obligations based upon the date of permanent removal of the spent nuclear fuel from service ("oldest fuel first" allocation). Those Standard Contracts also contain provisions allowing for "exchanges" of acceptance obligations, and priority for retired units. Given the US DOE's lack of performance, a common assumption for purposes of this fuel management plan is to base acceptance projections upon application of an "oldest fuel first" allocation scheme to a projected start date for repository operations. This plan is based upon a 2024 start date (Reference 13) for US DOE acceptance of spent fuel from the industry and the SONGS Units 2 and 3 positions in the queue. As indicated in Table 3, SCE is therefore assuming all fuel will be removed from the SONGS site as of 2049. Based on this assumption, the ISFSI will be subsequently decommissioned by the 2051 final license termination date.

III. Financial Assurance

The regulations (10 CFR 50.54(bb)) also require that funding adequacy be demonstrated to support the irradiated fuel management plan.

The cost of twelve (12) additional DSCs to be stored on the current ISFSI was funded from sources other than the Nuclear Decommissioning Trusts (NDT) (Reference 5), as are the costs associated with ongoing storage of Unit 1 spent fuel at the GE-Hitachi Nuclear America LLC's Morris Operation ISFSI located in Morris, Illinois. Table 1 includes the costs of procurement and construction of the expanded ISFSI capacity and all loading costs. Operation of the spent fuel pools is modeled as being discontinued in 2019 after all of the fuel has been transferred to dry storage. ISFSI operations continue until the US DOE is able to complete the transfer of the SONGS fuel to a repository or interim storage facility, which is currently assumed to occur by 2049.

SONGS management is committed to providing consistent and up-to-date information to all of its stakeholders and regulators. Aspects of the SONGS Nuclear Decommissioning Trust Fund are regulated by both the California Public Utilities Commission (CPUC) and the NRC. Previous Decommissioning Cost Estimates (DCEs) were updated and submitted to the CPUC as part of the Nuclear Decommissioning Cost Triennial Proceedings (Reference 5). Financial assurance reports including the balances and expenditures for SONGS Unit 1 were supplied to the NRC (as required by 10 CFR

50.82(a)(8)(v)) annually (most recently in Reference 6) and balances for SONGS Units 2 and 3 were submitted on a biennial basis (as required by 10 CFR 50.75(f)(1)) (most recently in Reference 7). Reports regarding ISFSI costs and decommissioning funding assurance for these costs were summarized triennially as required by 10 CFR 72.30(c) (most recently in Reference 8). Going forward, balances and expenditures will be supplied annually to the NRC for all three units and the ISFSI.

An updated site-specific DCE will be concurrently submitted to the NRC. As summarized in Table 1, this plan is based on decommissioning and the termination of the license by 2051, approximately 38 years following the permanent cessation of operations. The summary in Table 1 includes the funds for dry storage through 2049 and final release of the ISFSI in 2051.

Tables 4A and 4B summarize the estimated annual spending for all decommissioning activities (License Termination, Spent Fuel Management, and Site Restoration), and combined NDT current balances in 2014 dollars. Table 2 reflects key tasks addressed by the NRC staff in a recent safety evaluation.

The total of all Nuclear Decommissioning Trust funds balances for SONGS Units 2 and 3 was $3,926 million as of December 31, 2013 (Reference 9). Evaluation of the projected cash flows assuming earnings on existing balances as permitted by NRC regulations demonstrates the adequacy of the existing funds to cover all aspects of decommissioning, including the costs of irradiated fuel management. This demonstrates that the balance in the decommissioning trust is adequate to fund all aspects of decommissioning as well as the costs of irradiated fuel management. As decommissioning proceeds the DCE will be updated as appropriate and annual updates of spending and trust fund balances will be docketed as required.

IV. Regulatory Activities

The IFMP assumes that the SONGS Participants will make withdrawals from their nuclear decommissioning trusts for spent fuel management purposes. The SONGS Participants have collected funds from ratepayers and accumulated funds in the nuclear decommissioning trusts for the purpose of funding three primary categories of costs: (1) License Termination; (2) Spent Fuel Management; and (3) Site Restoration. On November 18, 2013, SCE filed a Tier 3 Advice Letter (Reference 10) with the CPUC to obtain authorization for the use of funds in the near term and to establish processes for further CPUC oversight of withdrawals from the nuclear decommissioning trusts. On February 21, 2014, SDG&E filed a similar letter (Reference 14) with the CPUC. In addition to authorizing and overseeing the withdrawals, the CPUC is expected to

designate the specific amounts from the existing fund balances that are available for License Termination and therefore subject to 10 CFR 50.82(a)(8)(i)(A) and 10 CFR 50.75(h)(2). The fund balances would then be allocated to separate subaccounts within each trust fund and, as such, available for spent fuel management and site restoration, consistent with the requirements of 10 CFR 50.75, 10 CFR 50.82, and 10 CFR 72.30.

To confirm such access, SCE requested (Reference 11) an exemption from 10 CFR 50.75 and 50.82 to authorize the use of trust funds to pay for spent fuel management and site restoration including other transitional costs. The regulations limit the use of the nuclear trust fund to decommissioning costs. This exemption was granted on September 5, 2014 (Reference 12).

The SONGS Participants responsible for decommissioning will periodically review the amount of cash contributions required for the decommissioning fund to ensure that withdrawals do not inhibit the ability of the licensee to complete NRC License Termination, Spent Fuel Management, and Site Restoration. The SONGS Participants will obtain authorization as necessary through the ratemaking processes to provide for further contributions if required.

In accordance with 10 CFR 50.82(a)(8)(vii), SONGS will annually submit to the NRC by March 31st a report on the status of the funding for managing spent fuel. The report will include, current through the end of the previous calendar year, the amount of funds accumulated to cover the cost of managing the spent fuel, the projected cost of managing spent fuel until title to the fuel and possession of the fuel is transferred to the Secretary of Energy, and if the funds accumulated do not cover the projected cost, a plan to provide additional funding assurance using one of the methods allowed by NRC regulations.

V. References

1. Letter from P. Dietrich, Southern California Edison, to U.S. Nuclear Regulatory Commission, Subject: Dockets 50-361 and 50,362, Certification of Permanent Cessation of Power Operations, San Onofre Nuclear Generating Station Units 2 and 3, dated June 12, 2013

2. Letter from P. Dietrich, Southern California Edison, to U.S. Nuclear Regulatory Commission, Subject: Dockets 50-361 Permanent Removal of Fuel from Reactor Vessel, San Onofre Nuclear Generating Station, Unit 2, dated July 22, 2013

3. Letter from P. Dietrich, Southern California Edison, to U.S. Nuclear Regulatory Commission, Subject: Dockets 50-362 Permanent Removal of Fuel from Reactor Vessel, San Onofre Nuclear Generating Station, Unit 3, dated June 28, 2013

4. SONGS Units 2 and 3 Post-Shutdown Decommissioning Activities Report, San Onofre Nuclear Generating Station

5. Decommissioning Cost Estimate, 2013 Scenario, dated July 11, 2013, ABZ, Incorporated. Used in support of Nuclear Decommissioning Cost Triennial Proceeding, Exhibit SCE-12

6. Letter from Richard C. Brabec, Southern California Edison to U. S. Nuclear Regulatory Commission, Subject: 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v-vii) Decommissioning Funding Status Report San Onofre Nuclear Generating Station Unit 1 dated March 31, 2014

7. Letter from Richard C. Brabec, Southern California Edison to U. S. Nuclear Regulatory Commission, Subject: 10 CFR 50.75(f)(1) Decommissioning Funding Status Report, San Onofre Nuclear Generating Station Units 2 and 3 dated March 31, 2014

8. Letter from Douglas R. Bauder, Southern California Edison U. S. Nuclear Regulatory Commission , Subject: 10 CFR 72.30 ISFSI Decommissioning Funding Plan, San Onofre Nuclear Generating Station Units 1, 2 & 3 dated December 14, 2012

9. Letter from Richard C. Brabec, Southern California Edison to U.S. Nuclear Regulatory Commission, Subject: San Onofre Nuclear Generating Station, Units 2 and 3 Access to Nuclear Decommissioning Trust Funds, Supplemental Information, Dated March 12, 2014

10. Letter from Megan Scott-Kakures, Southern California Edison, to Public Utilities Commission of the State of California Energy Division Submitting a Tier 3 Advice Letter Requesting (1) Authorization of Disbursements from the Master Trusts for San Onofre Nuclear Generating Station; (2) Approval of Tier 2 Advice Letter to Process for Future Disbursements; (3) Designation of Trust Amounts Set Aside for License Termination; and (4) Approval of Balancing Account, dated November 18, 2013

11. Letter from Tom J. Palmisano, Southern California Edison, to U. S. Nuclear Regulatory Commission, Subject: San Onofre Nuclear Generating Station Units 2 and 3, Access to Nuclear Decommissioning Trust Funds, dated February 13, 2014

12. Letter from Thomas Wengert, Nuclear Regulatory Commission to Tom J. Palmisano, Southern California Edison, Granting Exemptions from the Requirements of 10 CFR 50, Sections 50.82(a)(8)(i)(A) and 50.75(h)(2) (TAC Nos. MF3544 an MF 3545) dated September 5, 2014

13. Testimony on Nuclear Decommissioning of SONGS 2 & 3 and Palo Verde, exhibit No. SCE-2, dated December 21, 2012

14. Letter from Clay Faber, San Diego Gas & Electric, to Public Utilities Commission of the State of California submitting a Tier 3 Advice Letter Requesting (1) Designation of SONGS 2&3 Costs Incurred During and After June 2013 As Decommissioning Costs Eligible for Payment with Trust Funds; (2) Authorization of Disbursements from the Master Trusts for San Onofre Nuclear Generating Station; (3) Approval of Tier 2 Advice Letter Process for Future Trust Disbursements; (4) Acknowledgement That Funds Have Been Collected From Ratepayers and Have Been Accumulating In The Trusts To Be Used for NRC and Non-NRC Jurisdictional Decommissioning Cost Categories; and (5) Designation of an Allocation of the SDG&E SONGS 2&3 Trusts Among the Major Decommissioning Cost Categories, dated February 21, 2014

15. EnergySolutions Document No. 164001, “2014 Decommissioning Cost Analysis of the San Onofre Nuclear Generating Station Units 2 and 3”

Table 1

Irradiated Fuel Management Plan – Summary Schedule

Cost and Schedule Summary (2014 Dollars in thousands)							
Spent Fuel 10 CFR 50.54(bb)							
Period No.	**Period Description**	**Start**	**End**	**Years**	**Unit 2 Cost**	**Unit 3 Cost**	**Total Cost**
SNF Pd 1	Spent Fuel Management Transition	6/7/2013	12/31/2013	0.56	$63,891	$66,105	$129,997
SNF Pd 2	Spent Fuel Transfer to Dry Storage	1/1/2014	6/1/2019	5.41	$344,629	$372,193	$716,822
SNF Pd 3	Dry Storage During Decommissioning – Units 1, 2 and 3	6/1/2019	12/5/2031	12.51	$61,425	$61,425	$122,849
SNF Pd 4	Dry Storage Only – Units 1, 2 and 3	12/5/2031	12/31/2035	4.07	$29,383	$29,383	$58,765
SNF Pd 5	Dry Storage Only – Units 2 and 3	12/31/2035	12/31/2049	14.00	$107,326	$107,326	$214,653
SNF D&D Pd 1	ISFSI License Termination	12/31/2049	5/6/2050	0.34	$1,260	$1,260	$2,520
SNF D&D Pd 2	ISFSI Demolition	5/6/2050	9/8/2051	1.34	$15,295	$15,295	$30,590
	Category Total			**38.23**	**$623,209**	**$652,987**	**$1,276,196**

Table 2
Major Fuel Management Tasks

Major Fuel Management Task Direct Costs (Note 1)	Explanatory or Additional Details	Estimate in DCE (in Thousands)	Schedule in DCE
Estimated Costs to isolate spent fuel pools and fuel handling systems	• Estimated cost for Islanding • No additional costs are required for fuel handling systems. Cranes are single-failure proof	$ 22,183 (Note 2)	6/2015
Estimated cost to construct an ISFSI or a combination of wet/dry storage	• ISFSI in operation; so, current costs are for wet/dry combination. • Costs are associated with capacity expansion (pad and associated facility costs, DSCs and HSMs).	$ 396,391 (Note 3)	6/2019
Estimated annual cost for the operation of the selected option	• Operational and maintenance costs are NOT readily separable (fuel storage support vice other demands); but, are included in Table 4 cash flows.	N/A	Ongoing
Estimated cost for preparation, packaging and shipping of fuel to DOE	• Off-site transportation costs are part of contract with US DOE.	$ 6,742 (Note 4)	Thru 12/2049
Estimated cost to decommission the ISFSI	• Funded from both Unit 1 and Units 2&3 Decommissioning Trust Funds.	$ 33,110 (Note 5)	2049-2051
Brief discussion of selected storage method or methods and estimated time frame for these activities	• See Section II for selected methods. • See Table 1 for time frames.	N/A	N/A

Notes:

1. Tasks from NRC Safety Evaluation (SE) on Kewaunee Integrated Fuel Management Plan dated, September 28, 2009, publically available under ADAMS Accession No. ML092321079
2. Cost based on DCE, DECON Pd 2, Items 2.23 through 2.30
3. Cost based on DCE, SNF Pd 2, Items 8.05 through 8.13
4. Cost based on SNF Pd 4 and SNF Pd 5, Item 2.03
5. Cost based on DCE, total of SNF D&D Pd 1 and SNF Pd 2

Table 3

SONGS Unit 2 & Unit 3
Spent Fuel Shipping Schedule
2024 DOE Acceptance

	On-Site Inventory (Beginning of the Year)				On-Site Transfers (During Year)		Off-Site Transfers (During Year)			
Year	Unit 2 & 3 Fuel Assemblies in Wet Storage	Units 2 & 3 Fuel Assemblies in Dry Storage	Units 2 & 3 Fuel Assemblies in On-Site Storage	Units 2 &3 Canisters in ISFSI	Unit 2 & 3 Fuel Assemblies Transferred to ISFSI	Unit 2 & 3 Canisters Transferred to ISFSI	Unit 2 Assemblies Transferred to DOE	Unit 3 Assemblies Transferred to DOE	Unit 2 & 3 Assemblies Transferred to DOE	Unit 2 & 3 Canisters Transferred to DOE
2014	2668	792	3460	33	0	0	0	0	0	0
2015	2668	792	3460	33	0	0	0	0	0	0
2016	2668	792	3460	33	0	0	0	0	0	0
2017	2668	792	3460	33	768	24	0	0	0	0
2018	1900	1560	3460	57	1536	48	0	0	0	0
2019	364	3096	3460	105	364	13	0	0	0	0
2020	0	3460	3460	118	0	0	0	0	0	0
2021	0	3460	3460	118	0	0	0	0	0	0
2022	0	3460	3460	118	0	0	0	0	0	0
2023	0	3460	3460	118	0	0	0	0	0	0
2024	0	3460	3460	118	0	0	0	0	0	0
2025	0	3460	3460	118	0	0	0	0	0	0
2026	0	3460	3460	118	0	0	0	0	0	0
2027	0	3460	3460	118	0	0	0	0	0	0
2028	0	3460	3460	118	0	0	0	0	0	0
2029	0	3460	3460	118	0	0	0	0	0	0
2030	0	3460	3460	118	0	0	48	48	96	4
2031	0	3364	3364	114	0	0	192	96	288	12
2032	0	3076	3076	102	0	0	120	120	240	10
2033	0	2836	2836	92	0	0	0	96	96	4
2034	0	2740	2740	88	0	0	112	120	232	8
2035	0	2508	2508	80	0	0	96	96	192	6
2036	0	2316	2316	74	0	0	128	96	224	7
2037	0	2092	2092	67	0	0	0	0	0	0
2038	0	2092	2092	67	0	0	96	128	224	7
2039	0	1868	1868	60	0	0	96	96	192	6
2040	0	1676	1676	54	0	0	96	96	192	6
2041	0	1484	1484	48	0	0	0	0	0	0
2042	0	1484	1484	48	0	0	96	96	192	6
2043	0	1292	1292	42	0	0	96	96	192	6
2044	0	1100	1100	36	0	0	96	96	192	6
2045	0	908	908	30	0	0	128	96	224	7
2046	0	684	684	23	0	0	96	128	224	7
2047	0	460	460	16	0	0	96	230	326	11
2048	0	134	134	5	0	0	0	0	0	0
2049	0	134	134	5	0	0	134	0	134	5
2050	0	0	0	0	0	0	0	0	0	0

Note: The number of canisters listed are for storage of irradiated fuel not GTCC waste.

Table 4A
SONGS Unit 2
Decommissioning Funding Plan

Year	Radiological Decontamination	Spent Fuel Management	Site Restoration	Total Decommissioning Costs	Available Funds
2013	$25,749	$63,891	$49,067	$138,706	$1,847,000
2014	$79,799	$35,719	$15,089	$130,607	
2015	$69,196	$106,308	$7,439	$182,943	
2016	$54,541	$59,308	$3,730	$117,579	
2017	$111,903	$59,308	$1,957	$173,168	
2018	$47,520	$59,308	$0	$106,828	
2019	$108,328	$27,554	$13,539	$149,420	
2020	$185,482	$4,908	$36	$190,426	
2021	$79,081	$4,908	$36	$84,026	
2022	$54,785	$4,908	$1,927	$61,621	
2023	$158,207	$4,908	$36	$163,151	
2024	$37,930	$4,908	$16,848	$59.687	
2025	$2,922	$4,908	$44,621	$52,451	
2026	$2,922	$4,908	$19,412	$27,243	
2027	$2,922	$4,908	$22,469	$30,299	
2028	$2,922	$4,908	$31,688	$39,518	
2029	$2,922	$4,908	$66,873	$74,704	
2030	$2,922	$4,908	$71,867	$79,697	
2031	$2,055	$5,089	$23,181	$30.325	
2032	$2,122	$7,214	$0	$9,336	
2033	$0	$7,214	$0	$7,214	
2034	$0	$7,214	$0	$7,214	
2035	$0	$7,228	$0	$7,228	
2036	$0	$7,665	$0	$7,665	
2037	$0	$7,665	$0	$7,665	
2038	$0	$7,665	$0	$7,665	
2039	$0	$7,665	$0	$7,665	
2040	$0	$7,665	$0	$7,665	
2041	$0	$7,665	$0	$7,665	
2042	$0	$7,665	$0	$7,665	
2043	$0	$7,665	$0	$7,665	
2044	$0	$7,665	$0	$7,665	
2045	$0	$7,665	$0	$7,665	
2046	$0	$7,665	$0	$7,665	
2047	$0	$7,665	$0	$7,665	
2048	$0	$7,665	$0	$7,665	
2049	$0	$7,667	$0	$7,667	
2050	$0	$9,974	$20,177	$30,151	
2051	$0	$6,573	$11,928	$18,500	
2052	$0	$0	$1,377	$1,377	

Notes: Costs are in 2014 dollars (in thousands) and are not escalated from the base year
SONGS Unit 2 Trust fund balances at end of 2013 were $1,847,000

Table 4B
SONGS Unit 3
Decommissioning Funding Plan

Year	Radiological Decontamination	Spent Fuel Management	Site Restoration	Total Decommissioning Costs	Available Funds
2013	$26,566	$66,105	$49,067	$141,739	$2,079,400
2014	$78,964	$40,156	$15,969	$135,089	
2015	$74,096	$112,024	$9,390	$195,509	
2016	$61,451	$64,405	$25,227	$151,083	
2017	$40,631	$64,405	$3,799	$108,835	
2018	$86,348	$64,405	$0	$150,753	
2019	$96,521	$29,675	$13,908	$140.014	
2020	$120,873	$4,908	$2,135	$127,916	
2021	$194,090	$4,908	$575	$199,574	
2022	$135,313	$4,908	$2,467	$142,688	
2023	$114,581	$4,908	$1,511	$121,000	
2024	$26,874	$4,908	$36,778	$68,560	
2025	$2,922	$4,908	$40,655	$48,485	
2026	$2,922	$4,908	$21,676	$29,507	
2027	$2,922	$4,908	$25,848	$33,678	
2028	$2,922	$4,908	$20,945	$28,776	
2029	$2,922	$4,908	$117,321	$125,151	
2030	$2,922	$4,908	$116,672	$124,503	
2031	$2,055	$5,089	$25,501	$32,645	
2032	$2,122	$7,214	$0	$9,336	
2033	$0	$7,214	$0	$7,214	
2034	$0	$7,214	$0	$7,214	
2035	$0	$7,228	$0	$7,228	
2036	$0	$7,665	$0	$7,665	
2037	$0	$7,665	$0	$7,665	
2038	$0	$7,665	$0	$7,665	
2039	$0	$7,665	$0	$7,665	
2040	$0	$7,665	$0	$7,665	
2041	$0	$7,665	$0	$7,665	
2042	$0	$7,665	$0	$7,665	
2043	$0	$7,665	$0	$7,665	
2044	$0	$7,665	$0	$7,665	
2045	$0	$7,665	$0	$7,665	
2046	$0	$7,665	$0	$7,665	
2047	$0	$7,665	$0	$7,665	
2048	$0	$7,665	$0	$7,665	
2049	$0	$7,667	$0	$7,667	
2050	$0	$9,974	$23,120	$33,094	
2051	$0	$6,573	$45,566	$52,139	
2052	$0	$0	$1,377	$1,377	

Notes: Costs are in 2014 dollars (in thousands) and are not escalated from the base year
SONGS Unit 3 Trust Fund balances at end of 2013 were $2,079,400