## 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 EnergySolutions 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) clean demolition of 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 (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.

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). EnergySolutions 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 and the co-owners:

- 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.
- 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 SCE and a Decommissioning General Contractor (DGC).
- 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<sup>1</sup>
(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 EnergySolutions' proprietary Unit Cost Factors (UCFs), were used to generate required man-hours, 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 schedule is shown in Figure 1-1, and may also be found in Section 6.0 of this report.

Rows and columns may not add correctly due to rounding.

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Figure 1-1 Summary Schedule

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

Task Name	Start	2 3 4 0 6	7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 35 37 38 39 40 41	36 37 38 39 40 41
Post-Shutdown Spent Fuel Management	06/07/2013	191		Ì
Spent Fuel Shipping Complete - Unit 1	12/31/2035	12/31/2035	12.31	•
Spent Fuel Shipping Complete - Units 2 & 3	12/31/2049	12/31/2049		12/31
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 🔷 6/7		
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	1	
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		12