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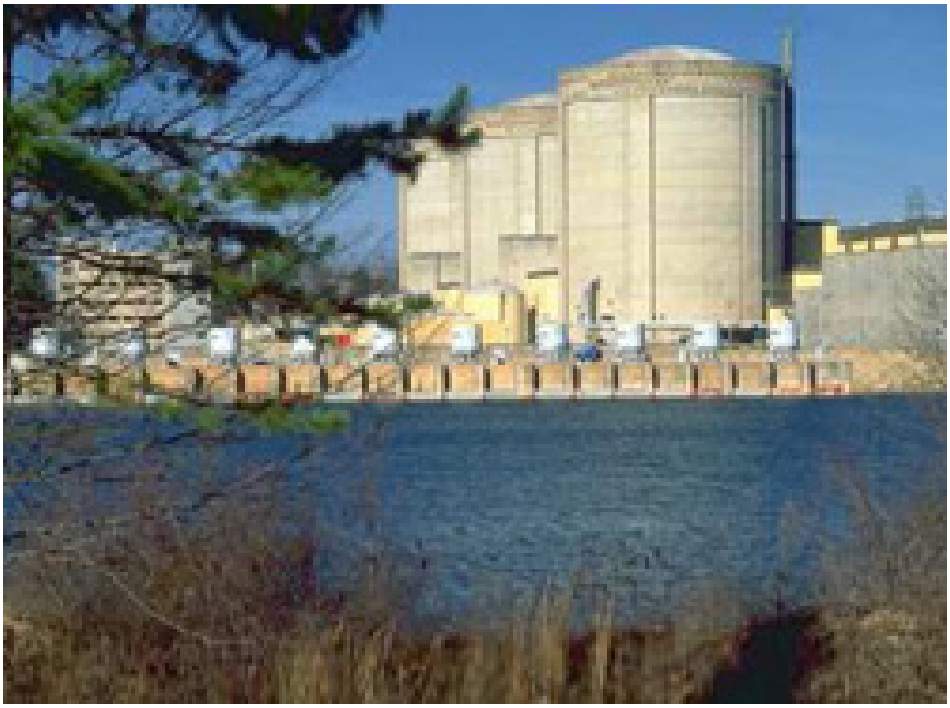
DECOMMISSIONING COST ANALYSIS

for the

OCONEE NUCLEAR STATION



prepared for

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REVISION LOG

No.	Date	Item Revised	Reason for Revision
0	12-09-2013		Original Issue

EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission the Oconee Nuclear Station (Oconee) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The estimates are designed to provide Duke Energy Corporation (Duke Energy) with sufficient information to assess its financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2008,[1] updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not a detailed engineering evaluation, but estimates prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear station. It may also not reflect the actual plan to decommission Oconee; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis. The plant confirmed that there were no substantive changes over the five year period to the configuration of the plant or site facilities (that would significantly impact decommissioning). However, some minor plant additions were identified and included in the current study.

The costs to decommission Oconee for the scenarios evaluated are tabulated at the end of this section. Costs are reported in 2013 dollars and include monies anticipated to be spent for radiological remediation and operating license termination, spent fuel management, and site restoration activities.

A complete discussion of the assumptions relied upon in this analysis is provided in Section 3, along with schedules of annual expenditures for each scenario. A sequence of significant project activities is provided in Section 4 with a timeline for each scenario. Detailed cost reports used to generate the summary tables contained within this document are provided in Appendices C and D.

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1 "Decommissioning Cost Analysis for the Oconee Nuclear Station," Document D03-1594-004, Rev. 0, TLG Services, Inc., December 2008

Consistent with the 2008 analysis, the current cost estimates assume that the shutdown of the nuclear station is a scheduled and pre-planned event (e.g., there is no delay in transitioning the plant and workforce from operations or in obtaining regulatory relief from operating requirements, etc.). The estimates include the continued operation of the fuel handling buildings as interim wet fuel storage facilities for ten years after Unit 3 operations cease. During this time period, it is assumed that the spent fuel residing in the pools will be transferred to the Department of Energy (DOE). Once the pools are emptied, the spent fuel stored at the independent spent fuel storage installation (ISFSI) will be transferred to the DOE. The ISFSI, consisting of transportable storage canisters to house the spent fuel assemblies, and horizontal storage modules, will remain operational until the DOE is able to complete the transfer of the fuel to a federal facility (e.g., a monitored retrievable storage facility).[2] DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such amendment would involve. For purposes of this analysis, it is assumed that DOE will accept already-canistered fuel.

Alternatives and Regulations

The Nuclear Regulatory Commission (NRC) provided general decommissioning requirements in a rule adopted on June 27, 1988. [3] In this rule, the NRC set forth technical and financial criteria for decommissioning licensed nuclear facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

> DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."[4]

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2 Projected expenditures for spent fuel management identified in the cost analyses do not consider the outcome of the litigation with the DOE with regard to the delays incurred by the owner in the timely removal of spent fuel from the site.

3 U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

4 Ibid. Page FR24022, Column 3

SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use."[5] Decommissioning is required to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.

ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property."[6] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety.

The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred pending the completion of additional research studies (e.g., on engineered barriers).

In 1996, the NRC published revisions to its general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.[7] The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, further described the methods and procedures that are acceptable to the NRC staff for implementing the requirements of the 1996 revised rule that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in

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5 Ibid.

6 Ibid. Page FR24023, Column 2

7 U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, Federal Register Volume 61, (p 39278 et seq.), July 29, 1996

the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued February 2005.[8]

Decommissioning Scenarios

Two decommissioning scenarios were evaluated for Oconee. The scenarios selected are representative of alternatives available and are defined as follows:

1. The first scenario assumes that the station would be promptly decommissioned (DECON alternative) upon the expiration of the current operating licenses, i.e., in 2033 and 2034. The spent fuel in the plant's spent fuel storage pools is transferred to the DOE within ten years of Unit 3 ceasing operation. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Site structures are then demolished. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2058.

2. In the second scenario, the nuclear station is placed into safe-storage (SAFSTOR alternative) at the end of its current operating license. The spent fuel in the plant's spent fuel storage pools is transferred to the DOE and the plant reconfigured for long-term storage. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2058. Decommissioning operations commence in 2085, with the decontamination and dismantling of Oconee completed in 2093, sixty years after the cessation of Unit 1 operations. Site structures are then demolished.

Methodology

The methodology used to develop the estimates follows the basic approach originally presented in the cost estimating guidelines[9] developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit cost factor method for estimating decommissioning activity costs. The unit cost factors used in this analysis incorporate site-specific costs and the latest available information about worker productivity in decommissioning.

An activity duration critical path is used to determine the total decommissioning program schedule. This is required for calculating the carrying costs, which include

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8 "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, Nuclear Regulatory Commission, February 2005

9 T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

program management, administration, field engineering, equipment rental, quality assurance, and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs. The estimates also reflect lessons learned from previously completed decommissioning projects, including TLG's involvement in the Shippingport Station decommissioning, completed in 1989, and the decommissioning of the Cintichem reactor, hot cells and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Connecticut Yankee and San Onofre-1 nuclear units have provided additional insight into the process, the regulatory aspects, and technical challenges of decommissioning commercial nuclear units.

Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."[10] The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

Low-Level Radioactive Waste Disposal

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is generally classified as low-level radioactive waste, although not all of the material is suitable for shallow-land disposal. With the passage of the "Low-Level Radioactive Waste Disposal Act" in 1980 and its

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[10] Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239.

Amendments of 1985, [11] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

South Carolina is a member of the three-state Atlantic Interstate Low-Level Radioactive Waste Management Compact, formed after South Carolina formally joined the Northeast Regional Compact. As such, the owners will continue to have access to the currently operating disposal facility in Barnwell, South Carolina.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to Duke Energy. The majority of the low-level radioactive waste designated for direct disposal (Class A[12]) can be sent to Energy*Solutions'* facility in Clive, Utah. The rate schedule for the Barnwell facility is used to generate disposal costs for the large components and the higher activity waste forms waste (Class B and C material[13]). It is also assumed that Duke Energy can access other disposal sites, should it prove cost-effective. Low activity waste forms (concrete debris, dry-active waste) and metallic waste suspected of being contaminated are routed to a Tennessee-based radioactive waste processor for decontamination, volume reduction and/or disposal.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in canisters compatible with the spent fuel dry storage system and either stored on site or shipped directly to a federal facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

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11 "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, January 15, 1986

12 Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55

13 U.S. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act" (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The DOE was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, even with the License Application for a geologic repository submitted by the DOE to the NRC in 2008. The current administration has cut the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle … and make recommendations for a new plan."[14] Towards this goal, the administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter includes a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."[15]

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"[16]

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14 Blue Ribbon Commission on America's Nuclear Future's Charter, http://cybercemetery.unt.edu/archive/brc/20120620215336/http://brc.gov/index.php?q=page/charter

15 Ibid.

16 "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," http://www.brc.gov/sites/default/files/documents/brc_finalreport_jan2012.pdf, p. 32, January 2012

- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."[17]

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."[18]

"With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048."[19]

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program had assumed that spent fuel allocations would be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.[20] Duke Energy's current spent fuel management plan for the Oconee spent fuel is based in general upon: 1) a 2025

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17 Ibid., p.27

18 "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013

19 Ibid., p.2

20 U.S. Code of Federal Regulations, Title 10, Part 961.11, Article IV – Responsibilities of the Parties, B. DOE Responsibilities, 5.(a) … DOE shall issue an annual acceptance priority ranking for receipt of SNF and/or HLW at the DOE repository. This priority ranking shall be based on the age of SNF and/or HLW as calculated from the date of discharge of such materials from the civilian nuclear power reactor. The oldest fuel or waste will have the highest priority for acceptance …"

start date for DOE initiating transfer of commercial spent fuel to a federal facility (based upon the proposed timeline for the availability of the larger interim storage facility), 2) expectations for spent fuel receipt by the DOE for the Oconee fuel, and 3) reassignment of allocations between the Oconee, McGuire and Catawba units in the Duke Energy fleet so as to minimize on-site storage costs.

The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. Assuming a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, [21] and the aforementioned assumptions on spent fuel management, the spent fuel from Oconee is completely removed from the site by 2058 if the units cease operating in 2033/2034.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE. [22] Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel handling buildings' storage pool as well as at an on-site ISFSI.

An ISFSI has been constructed to support continued plant operations. Spent fuel stored at the ISFSI will be transferred to the DOE once the spent fuel assemblies in the storage pools have been removed. Once the storage pools are emptied, the fuel handling buildings can be either decontaminated and dismantled or prepared for long-term storage.

Duke Energy's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim.

Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized is more efficient and less costly than if the process is deferred.

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21 "Acceptance Priority Ranking & Annual Capacity Report," DOE/RW-0567, July 2004

22 U.S. Code of Federal Regulations, Title 10, Part 50 – Domestic Licensing of Production and Utilization Facilities, Subpart 54 (bb), "Conditions of Licenses"

Consequently, this study assumes that site structures addressed by this analysis are removed to a nominal depth of three feet below the local grade level wherever possible. The site is then graded and stabilized. The cost for the site restoration of decontaminated and/or non-contaminated structures has been calculated and is separately presented as "Site Restoration" expenditures in this report.

Summary

The estimates to decommission Oconee assume the removal of all contaminated and activated plant components and structural materials such that Duke Energy may then have unrestricted use of the site with no further requirements for an operating license. Low-level radioactive waste, other than GTCC waste, is sent to a commercial processor for treatment/conditioning or to a controlled disposal facility.

Decommissioning is accomplished within the 60-year period required by current NRC regulations. In the interim, the spent fuel remains in storage at the site until such time that the transfer to a DOE facility is complete. Once emptied, the storage facility can also be decommissioned.

The alternatives evaluated in this analysis are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C and D. The major cost components are also identified in the cost summary provided at the end of this section.

The cost elements in the estimates for the DECON and SAFSTOR alternatives are assigned to one of three subcategories: NRC License Termination (radiological remediation), Spent Fuel Management, and Site Restoration. The subcategory "NRC License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the unit's operating license, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). Section 3.4.1 provides the basis for the ISFSI decommissioning cost.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE, as well as the eventual transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pools and the management of the ISFSI until such time that the transfer is complete. It does not include any

spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any costs related to the final disposal of the spent fuel.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, an owner may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As noted within this document, the estimates were developed and costs are presented in 2013 dollars. As such, the estimates do not reflect the escalation of costs (due to inflationary and market forces) over the remaining operating life of the plant or during the decommissioning period.

DECON COST SUMMARY
DECOMMISSIONING COST ELEMENTS
(thousands of 2013 dollars)

Cost Element	Unit 1	Unit 2	Unit 3	Total
Decontamination	10,735	12,914	18,184	41,834
Removal	85,078	88,240	138,181	311,499
Packaging	22,086	22,500	23,488	68,074
Transportation	11,752	12,568	17,065	41,385
Waste Disposal	66,427	70,905	84,754	222,085
Off-site Waste Processing	20,914	21,624	34,462	77,001
Program Management [1]	202,618	186,016	229,798	618,432
Site Security	25,613	26,660	34,347	86,620
Corporate A&G	18,880	17,809	21,878	58,566
Site O&M	1,572	1,501	1,821	4,894
Spent Fuel Pool Isolation	12,145	8,096	8,096	28,338
Spent Fuel (Direct Expenditures) [2]	21,299	20,847	31,949	74,096
Insurance and Regulatory Fees	14,401	12,195	15,504	42,099
Energy	5,067	4,973	4,899	14,939
Characterization and Licensing Surveys	18,151	16,076	20,151	54,378
Property Taxes	10,650	9,218	9,736	29,604
Miscellaneous Equipment	6,657	6,657	6,697	20,011
Miscellaneous Site Services	0	0	3,258	3,258
Total [3]	554,043	538,799	704,271	1,797,113

Cost Element	Unit 1	Unit 2	Unit 3	Total
License Termination	492,612	478,282	571,887	1,542,781
Spent Fuel Management	25,731	25,278	60,746	111,755
Site Restoration	35,700	35,239	71,638	142,577
Total [3]	554,043	538,799	704,271	1,797,113

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

SAFSTOR COST SUMMARY
DECOMMISSIONING COST ELEMENTS
(thousands of 2013 dollars)

Cost Element	Unit 1	Unit 2	Unit 3	Total
Decontamination	9,886	9,823	12,820	32,528
Removal	82,829	85,276	133,456	301,562
Packaging	16,255	16,506	17,220	49,981
Transportation	8,327	8,578	11,861	28,766
Waste Disposal	51,762	54,763	65,385	171,910
Off-site Waste Processing	23,656	24,715	38,265	86,637
Program Management [1]	276,445	199,158	209,190	684,793
Site Security	48,399	50,002	49,458	147,858
Corporate A&G	26,116	19,438	20,336	65,891
Site O&M	2,508	1,788	1,877	6,173
Spent Fuel Pool Isolation	12,145	8,096	8,096	28,338
Spent Fuel (Direct Expenditures) [2]	21,298	20,845	27,091	69,233
Insurance and Regulatory Fees	43,598	41,509	40,938	126,045
Energy	8,726	8,545	8,372	25,643
Characterization and Licensing Surveys	17,215	11,150	10,193	38,558
Property Taxes	10,958	9,538	9,975	30,471
Miscellaneous Equipment	17,840	17,836	21,027	56,703
Miscellaneous Site Services	0	3,810	3,258	7,068
Total [3]	677,963	591,377	688,819	1,958,159

Cost Element	Unit 1	Unit 2	Unit 3	Total
License Termination	523,998	478,238	536,114	1,538,350
Spent Fuel Management	117,249	76,965	80,584	274,797
Site Restoration	36,717	36,174	72,120	145,011
Total [3]	677,963	591,377	688,819	1,958,159

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

1. INTRODUCTION

This report presents estimates of the cost to decommission the Oconee Nuclear Station (Oconee) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The estimates are designed to provide Duke Energy Corporation (Duke Energy) with sufficient information to assess its financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2008,[1]* updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not a detailed engineering evaluation, but rather estimates prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear station. It may also not reflect the actual plan to decommission Oconee; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. The plant confirmed that there were no substantive changes over the five-year period to the configuration of the plant or site facilities (that would significantly impact decommissioning). However, some minor plant additions were identified and included in the current study.

1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the costs to decommission Oconee, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities. For the purposes of this study, the shutdown dates for the station are assumed to be February 6, 2033, October 6, 2033 and July 19, 2034 for Units 1, 2 and 3, respectively, based upon the current operating licenses and the approved extended periods of operation, i.e., license renewal.

* References provided in Section 7 of the document

1.2 SITE DESCRIPTION

Oconee is located in Oconee County, approximately 35 miles west of Greenville, South Carolina on the shore of Lake Keowee. The station is comprised of three nuclear units and an independent spent fuel storage installation (ISFSI). All three units are essentially identical except for certain auxiliary systems. In particular, one spent fuel pool is shared between Oconee 1 and 2, and a separate spent fuel pool is provided for Oconee 3.

Lake Keowee, created with the construction of the Keowee and Little River Dams, provides both the power source for the Keowee Hydroelectric Station, as well as the heat sink for the nuclear units. Both facilities were planned and constructed concurrently, to the extent that the Oconee intake dike structure forms part of the Keowee lake boundary. The turbine building houses turbine-generator sets for all three units. The pedestal structure for each is independent; only the steel superstructure is common to all three units.

The nuclear steam supply system (NSSS) for each unit consists of a pressurized water reactor and a two-loop reactor coolant system. The systems were supplied by the Babcock & Wilcox Company and have a referenced core design of 2568 MWt (thermal) with the reactor at rated power and a net dependable capability rating of 860 MWe (electric).

The reactor coolant system is comprised of the reactor vessel, two vertical once-through steam generators, four shaft-sealed reactor coolant pumps, an electrically heated pressurizer and interconnected piping. The system is housed within the reactor or "containment" building, a conventionally reinforced, post-tensioned structure. The building consists of a right circular cylinder and dome, connected to and supported by a massive reinforced concrete foundation slab. The entire interior surface is lined with a ¼ inch thick welded steel plate to assure a high degree of leak tightness.

Heat produced in the reactor is converted to electrical energy by the steam and power conversion system. A turbine-generator converts the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy. Each unit's turbine generator consists of a tandem (single shaft) arrangement of double-flow high-pressure turbine and three identical double-flow low pressure turbines driving a direct coupled generator at 1800 rpm. The turbines are operated in a closed feedwater cycle, which condenses the steam. The heated feedwater is returned to the steam generators.

The condenser circulating water system removes heat rejected in the main condensers and is the ultimate heat sink for the station. The Little River arm of Lake Keowee is the source of water for the system. Each unit has four condenser circulating water pumps supplying water into a common condenser intake header under the turbine building floor. The condenser discharge is returned to the Keowee River arm of Lake Keowee.

1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.[2] This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, “Assuring the Availability of Funds for Decommissioning Nuclear Reactors,”[3] which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant’s systems, structures and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations, while the SAFSTOR and ENTOMB alternatives defer the process.

The rule also placed limits on the time allowed to complete the decommissioning process. For all alternatives, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. At the conclusion of a 60-year dormancy period (or longer if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with rulemaking

permitting the controlled release of a site,[4] the NRC did re-evaluate the alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. The staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative.

The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.[5] However, the NRC's staff has subsequently recommended that rulemaking be deferred, based upon several factors (e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities), at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants.[6] When the decommissioning regulations were adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after the decision to cease operations. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices, along with related changes to Technical Specifications, entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing

decommissioning, the licensee is required to submit an application to the NRC to terminate the license, which includes a license termination plan (LTP).

1.3.1 Nuclear Waste Policy Act

Congress passed the "Nuclear Waste Policy Act" (NWPA) in 1982,[7] assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The NWPA Amendments Act of 1987[8] designated Yucca Mountain as the sole site to be considered for a permanent geologic repository. The DOE was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, even with the License Application for a geologic repository submitted by the DOE to the NRC in 2008. The current administration has cut the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle … and make recommendations for a new plan." Towards this goal, the administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy"[9] containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"
- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."[10]

"With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048."

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program had assumed that spent fuel allocations would be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.[11] Duke Energy's current spent fuel management plan for the Oconee spent fuel is based in general upon: 1) a 2025 start date for DOE initiating transfer of commercial spent fuel to a federal facility (based upon the proposed timeline for the availability of the larger interim storage facility), 2) expectations for spent fuel receipt by the DOE for the Oconee fuel, and 3) reassignment of allocations between the Oconee, McGuire and Catawba units in the Duke Energy fleet so as to minimize on-site storage costs.

The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. Assuming a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year,[12] and the aforementioned assumptions on spent fuel management, the spent fuel from Oconee is completely removed from the site by 2058 if the units cease operating in 2033/2034.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.[13] Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel handling buildings' storage pool as well as at an on-site ISFSI.

An ISFSI has been constructed to support continued plant operations. Spent fuel stored at the ISFSI will be transferred to the DOE once the spent fuel assemblies in the storage pools have been removed. Once the storage pools are emptied, the fuel handling buildings can be either decontaminated and dismantled or prepared for long-term storage.

Duke Energy's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim.

1.3.2 Low-Level Radioactive Waste Acts

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,[14] and its Amendments of 1985,[15] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

South Carolina is a member of the three-state Atlantic Interstate Low-Level Radioactive Waste Management Compact, formed after South Carolina formally joined the Northeast Regional Compact. As such, the owners will continue to have access to the currently operating disposal facility in Barnwell, South Carolina.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to Duke Energy. The majority of the low-level radioactive waste designated for direct disposal (Class A[16]) can be sent to Energy*Solutions*' facility in Clive, Utah. The rate schedule for the Barnwell facility is used to generate disposal costs for the large components and the higher activity waste forms waste (Class B and C material). It is also assumed that Duke Energy can access other disposal sites, should it prove cost-effective. Low activity waste forms (concrete debris, dry-active waste) and metallic waste suspected of being contaminated are routed to a Tennessee-based radioactive waste processor for decontamination, volume reduction and/or disposal.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for

shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in canisters compatible with the spent fuel dry storage system and either stored on site or shipped directly to a federal facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"[17] amending 10 CFR Part 20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The decommissioning estimates assume that the Oconee site will be remediated to a residual level consistent with the NRC-prescribed level.

It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).[18] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.[19]

On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)[20] provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

2. DECOMMISSIONING ALTERNATIVES

Detailed cost estimates were developed to decommission Oconee based upon the NRC-approved decommissioning alternatives DECON and SAFSTOR. Although the alternatives differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

Two decommissioning scenarios were evaluated for the Oconee Nuclear Station. The scenarios selected are representative of alternatives available and are defined as follows:

1. The first scenario assumes that the station would be promptly decommissioned (DECON alternative) upon the expiration of the current operating licenses, i.e., in 2033 and 2034. The spent fuel in the plant's spent fuel storage pools is transferred to the DOE within ten years of Unit 3 ceasing operation. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Site structures are then demolished. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2058.

2. In the second scenario, the nuclear station is placed into safe-storage (SAFSTOR alternative) at the end of its current operating license. The spent fuel in the plant's spent fuel storage pools is transferred to the DOE and the plant reconfigured for long-term storage. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2058. Decommissioning operations commence in 2085, with the decontamination and dismantling of Oconee completed in 2093, sixty years after the cessation of Unit 1 operations. Site structures are then demolished.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work, i.e., engineering and planning at the time of decommissioning.

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facility de-activation and closure. During the first phase, notification is to be provided to the NRC

certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee is then prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for Oconee are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

2.1 DECON

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility.

2.1.1 Period 1 - Preparations

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

Engineering and Planning

The PSDAR, required prior to or within two years of permanent cessation of operations, provides a description of the licensee's planned decommissioning activities, a timetable, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local hearing to be held in the vicinity of the reactor site.

Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, i.e., without specific NRC approval. Major activities are defined as 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 GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact, or
- violate the terms of the licensee's existing license

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered. Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, work packages, and procedures, would be assembled to support the proposed decontamination and dismantling activities.

Site Preparations

Following final plant shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the reactor vessel and its internals), internal piping, and biologic shield cores.
- Isolation of the spent fuel storage pools and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. The pools will remain operational for ten years following the cessation of Unit 3 operations before the inventory resident at shutdown can be transferred to the DOE.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful release of the site from the 10 CFR §50 operating license, exclusive of the ISFSI. Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. For example, this will include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This will include the upgrading of roads (on- and off-site) to facilitate hauling and transport. Modifications will be required to the containment structure to facilitate access of large/heavy equipment. Modifications will also be required to the refueling area of the Reactor Building to support the segmentation of the reactor vessel internals and component extraction.
- Transfer of the spent fuel from the storage pools to the DOE.

- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement (lease or purchase) of shipping casks, cask liners, and industrial packages.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from reactor vessel head. Segmentation of the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, i.e., by weight and activity. The operations are conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation of the remaining reactor internals, including the core former and lower core support assembly. Some material is expected to exceed Class C disposal requirements. As such, the segments will be packaged in modified fuel storage canisters for geologic disposal.
- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in-air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the associated cubicles necessary for access and component extraction are removed.
- Removal of the steam generators and pressurizer for material recovery and controlled disposal. These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized, e.g., with grout. Steel shielding will be added, as necessary, to those

external areas of the package to meet transportation limits and regulations.

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/ contaminated concrete.
- Surveys of the decontaminated areas of the containment structure.
- Remediation and removal of the contaminated equipment and material from the auxiliary and fuel buildings and any other contaminated facility. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity facilitates surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or

packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)."[21] This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on the requested change to the operating license (that would release the property, exclusive of the ISFSI, for unrestricted use).

The NRC will amend the operating license if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the property (exclusive of the ISFSI) is suitable for release.

2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities can begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled, safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including the reactor, fuel handling, radioactive waste, solidification facility and condensate polishing buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures

have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the station.

It is not currently anticipated that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized on site is more efficient than if the process is deferred.

This cost study presumes that site structures and other facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are removed to a nominal depth of three feet below grade. The three-foot depth allows for the placement of gravel for drainage, as well as topsoil, so that vegetation can be established for erosion control. Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding and inhibit the refloating of subsurface materials.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. The processed material is then used on site to backfill foundation voids. Excess non-contaminated materials are trucked to an off-site area for disposal as construction debris.

2.1.4 ISFSI Operations and Decommissioning

Transfer of spent fuel to a DOE repository or interim facility is assumed to be exclusively from the ISFSI once the fuel pools have been emptied and the fuel handling buildings released for decommissioning. The ISFSI will continue to operate as an independent facility following the amendment of the operating license to release the adjacent (power block) property.

Assuming the DOE starts accepting fuel from Oconee in 2031, transfer of spent fuel from the ISFSI is anticipated to continue through the year 2058.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the license(s) if it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the

facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license(s) for the ISFSI.

The ISFSI is comprised of a series of horizontal storage modules and dry storage canisters located on pre-cast concrete storage pads. For purposes of this cost analysis, it is assumed that once the inner canisters containing the spent fuel assemblies have been removed, any required decontamination performed, and the license(s) for the facility terminated, the modules can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pads will then be removed, and the area graded and landscaped to conform to the surrounding environment.

2.2 SAFSTOR

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems that are not required to support the spent fuel pools or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative, although a shorter time period is expected for these activities due to the more limited work scope. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing the plant in safe-storage includes, but is not limited to, the following activities:

- Isolation of the spent fuel storage services and fuel handling systems so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.
- Transferring the spent fuel from the storage pools to the DOE, following the minimum required cooling period in the spent fuel pools.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems including decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of plant, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building

maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented or detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to prevent unauthorized entry and to protect the public from the consequences of its own actions. The security fence, sensors, alarms, and other surveillance equipment are maintained throughout the dormancy period. Fire and radiation alarms are also functional.

Consistent with the DECON scenario, the spent fuel storage pools are emptied within ten years of the cessation of Unit 3 operations. The transfer of the spent fuel from the ISFSI to a DOE facility begins in 2031 and continues throughout the dormancy period until completed in 2058. Once emptied, the ISFSI is decommissioned along with the power block structures in Period 4.

After a period of storage (such that license termination is accomplished within 60 years of final shutdown), it is required that the licensee submit an application to terminate the license, along with a LTP (described in Section 2.1.2), thereby initiating the third phase.

2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning and the assembly of activity specifications and detailed work procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and this deferred scenario is the absence, in the latter, of any constraint on the dismantling process due to the operation of the spent fuel pools in the DECON option.

Radioactive decay over the length of the dormancy period will have some effect upon the quantities of radioactive wastes generated from system and structure removal operations. However, given the levels of radioactivity and spectrum of radionuclides expected from sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone. However, due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimate for this delayed scenario incorporates reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to ^{60}Co will substantially decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb, ^{59}Ni, and ^{63}Ni. Therefore, the dismantling procedures described for the DECON alternative would still be employed during this scenario. Portions of the biological shield will still be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities begin. Dismantling, as a continuation of the decommissioning process is a cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost is consistent with that described for DECON, presuming the removal of structures and site facilities to a nominal depth of three feet below grade and the limited restoration of the site.

3. COST ESTIMATES

The cost estimates prepared for decommissioning Oconee consider the unique features of the site, including the nuclear steam supply system, electric power generating systems, structures, and supporting facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

3.1 BASIS OF ESTIMATES

The current estimates were developed using the site-specific, technical information relied upon in the decommissioning analysis prepared in 2008. This information was reviewed for the current analysis and updated as deemed appropriate. The site-specific considerations and assumptions used in the previous evaluation were also revisited. Modifications were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

3.2 METHODOLOGY

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"[22] and the DOE "Decommissioning Handbook."[23] These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal ($/cubic yard), steel removal ($/ton), and cutting costs ($/inch) are developed using local labor rates. The activity-dependent costs are estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures rely upon information available in the industry publication, "Building Construction Cost Data," published by R.S. Means.[24]

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

This analysis reflects lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, and San Onofre-1 nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs are assigned to each unique set of unit factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

- Access Factor 10% to 20%
- Respiratory Protection Factor 10% to 50%
- Radiation/ALARA Factor 10% to 37%
- Protective Clothing Factor 10% to 30%
- Work Break Factor 8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiological controlled areas. The resulting labor-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities is based upon productivity information available from the "Building Construction Cost Data" publication. In the DECON alternative, dismantling of the fuel handing building systems and decontamination of the spent fuel pools is also dependent upon the timetable for the transfer of the spent fuel assemblies from the pool to the DOE.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services such as quality control and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

3.3 FINANCIAL COMPONENTS OF THE COST MODEL

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination, spent fuel management and site restoration.

3.3.1 Contingency

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook"[25] as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, contingency is included. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for a contingency percentage in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

- Decontamination 50%
- Contaminated Component Removal 25%
- Contaminated Component Packaging 10%
- Contaminated Component Transport 15%
- Low-Level Radioactive Waste Disposal 25%
- Low-Level Radioactive Waste Processing 15%

- Reactor Segmentation 75%
- NSSS Component Removal 25%
- Reactor Waste Packaging 25%
- Reactor Waste Transport 25%
- Reactor Vessel Component Disposal 50%
- GTCC Disposal 15%

- Non-Radioactive Component Removal 15%
- Heavy Equipment and Tooling 15%
- Construction 15%
- Supplies 25%
- Engineering 15%
- Energy 15%

- Characterization and Termination Surveys 30%
- Spent Fuel Transfer 15%
- Operations and Maintenance 15%
- Taxes and Fees 10%
- Insurance 10%
- Staffing (plant, contractor and security) 15%

The contingency values are applied to the appropriate components of the estimates on a line item basis. A composite value is then reported at the end of each detailed estimate (as provided in Appendices C and D). For example, the composite contingency value reported for the DECON

alternative in Appendix C is approximately 19.0%; the corresponding SAFSTOR alternative in Appendix D is approximately 17.8%.

3.3.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term "financial risk." Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with eliminating 50% to 80% of the site labor force shortly after the cessation of plant operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.
- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes, for example, affecting worker health and safety, site release criteria, waste transportation, and disposal.
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition, or in the timetable for such, or the start and rate of acceptance of spent fuel by the DOE.
- Pricing changes for basic inputs such as labor, energy, materials, and waste disposal.

This cost study does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk

are revisited periodically and addressed through repeated revisions or updates of the base estimates.

3.4 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impact of the considerations identified below is included in this cost study.

3.4.1 Spent Fuel Management

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission Oconee. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. As such, the disposal cost is financed by a 1 mill/kWhr surcharge paid into the DOE's waste fund during operations. However, the NRC requires licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy. This requirement is prepared for through inclusion of certain high-level waste cost elements within the estimates, as described below.

Completion of the decommissioning process is highly dependent upon the DOE's ability to remove spent fuel from the site. The timing for removal of spent fuel from the site is based upon the DOE's most recently published annual acceptance rates of 400 MTU/year for year 1, 3,800 MTU total for years 2 through 4 and 3,000 MTU/year for year 5 and beyond.[26] The DOE contracts provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shut down nuclear reactors. Because it is unclear how these mechanisms may operate once DOE begins accepting spent fuel from commercial reactors, this study assumes that DOE will accept spent fuel in an oldest fuel first order.

ISFSI

An ISFSI has been constructed within the protected area to support continued plant operations. The ISFSI will be expected to operate throughout decommissioning, and beyond the conclusion of the remediation phase in the DECON decommissioning scenario, until such

time that the transfer of spent fuel to the DOE can be completed. The scenario is similar for the SAFSTOR alternative; however, based upon the expected completion date for fuel transfer, the ISFSI will be emptied prior to the commencement of decommissioning operations.

Operation and maintenance costs for the spent fuel pools and the ISFSI are included within the estimates and address the cost for staffing the facility, as well as other costs (e.g., security, insurance, and licensing fees). The estimates also include the costs to transfer the transportable storage canisters to the DOE. Costs are also provided for the final disposition of the facilities once the transfer is complete.

Storage Canister Design

The design and capacity of the ISFSI is based upon the NUHOMS® dry cask storage system. The system consists of a transportable storage canister with a nominal capacity of 24 fuel assemblies and a horizontal concrete storage module.

For fuel transferred directly from the pools to the DOE, the DOE was assumed to provide Transport, Aging and Disposal (TAD) canisters with a 21 assembly capacity at no additional cost to the owner.

Canister Loading and Transfer

The estimates include the cost for the materials and labor equipment to seal and load each spent fuel canister (TAD) into the DOE transport cask from the wet storage pools and an allowance to transfer each spent fuel canister from the ISFSI to the DOE.

Operations and Maintenance

The estimates also include the cost of operating and maintaining the spent fuel pools and the ISFSI, respectively. Pool operations are expected to continue approximately ten years after the cessation of Unit 3 operations. ISFSI operating costs are based upon the previously stated assumptions on fuel transfer expectations.

ISFSI Decommissioning

In accordance with 10 CFR §72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate to implement. The plan should contain sufficient

information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste have been removed.

A multi-purpose (storage and transport) dry shielded storage canister with a horizontal, reinforced concrete storage module is used as a basis for the cost analysis. As an allowance for module remediation, 24 modules are assumed to have some level of neutron-induced activation (i.e., to levels exceeding free-release limits), equivalent to the number of modules required to accommodate the final core off load. The steel support structure is assumed to be removed from these modules and sent, along with the concrete, for controlled disposal. The cost of the disposition of this material, as well as the demolition of the ISFSI facility, is included in the estimate.

The cost estimate for decommissioning the ISFSI reflects: 1) the cost of an independent contractor performing the decommissioning activities; 2) an adequate contingency factor; and 3) the cost of meeting the criteria for unrestricted use. The cost summary for decommissioning the ISFSI is presented in Appendix E.

GTCC

The dismantling of the reactor internals is expected to generate radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. Although the DOE is responsible for disposing of GTCC waste, any costs for that service have not been determined. For purposes of this estimate, the GTCC is packaged in canisters compatible with the spent fuel dry storage system and disposed of at a cost equivalent to that envisioned for the spent fuel.

It is assumed that the DOE would not accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is reasonable to assume that this material would remain in storage at the Oconee site (for the DECON alternative). In the SAFSTOR scenario, the GTCC material is shipped

directly to a DOE facility as it is generated since the fuel has been removed from the site prior to the start of delayed dismantling.

3.4.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed in the refueling canal, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites that have been decommissioned. Access to navigable waterways has allowed these large packages to be transported to the disposal sites with minimal overland travel. Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available when the Oconee plant ceases operation. Future viability of this option will depend upon

the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes that the reactor vessel will require segmentation, as a bounding condition.

3.4.3 Primary System Components

In the DECON scenario, the reactor coolant system components are assumed to be decontaminated using chemical agents prior to the start of dismantling operations. This type of decontamination can be expected to have a significant ALARA impact, since in this scenario the removal work is done within the first few years of shutdown. A decontamination factor (average reduction) of 10 is assumed for the process. Disposal of the decontamination solution effluent is included within the estimate as a "process liquid waste" charge. In the SAFSTOR scenario, radionuclide decay is expected to provide the same benefit and, therefore, a chemical decontamination is not included.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, as well as their location within the reactor building, will ultimately determine the removal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient laydown space for processing these large components.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a dolly. Each generator is rotated into the horizontal position for extraction from the containment and placed onto a multi-wheeled vehicle for transport to an on-site processing and storage area.

Disposal costs are based upon the displaced volume and weight of the units. Each component is then loaded onto a rail car for transport to the disposal facility.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

3.4.4 Main Turbine and Condenser

The main turbine is dismantled using conventional maintenance procedures. The turbine rotors and shafts are removed to a laydown area. The lower turbine casings are removed from their anchors by controlled demolition. The main condensers are also disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it is surveyed and designated for either decontamination or volume reduction, conventional disposal, or controlled disposal. Components are packaged and readied for transport in accordance with the intended disposition.

3.4.5 Retired Components

The estimate includes the cost to dispose of six retired steam generators expected to be in storage at the site upon the cessation of plant operations. The components are processed for disposal in the same manner as described for the installed units. Three reactor closure heads with service structures are included with additional materials as stored in the retired steam generator storage facility.

3.4.6 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.[27] The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with 10 CFR Part 71, in Type B containers. It is conceivable that the reactor, due to its limited specific activity,

could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs, ^{90}Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, rail, and/or multi-wheeled transporter to the disposal facilities.

Transportation costs for material requiring controlled disposal are based upon the mileage to the Energy*Solutions* facility in Clive, Utah and the Waste Control Specialist facility in Andrews County, Texas. Transportation costs for off-site waste processing are based upon the mileage to Memphis, Tennessee. Truck transport costs are estimated using published tariffs from Tri-State Motor Transit.[28]

The transportation cost for the GTCC material is assumed to be inclusive of the disposal cost.

3.4.7 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream

is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in the detailed Appendices C and D, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for containerized material or a specific calculation for components serving as their own waste containers.

The more highly activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload.

Disposal fees are based upon estimated charges, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the lowest level and majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at Energy*Solutions* facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) are based upon the rate schedule for the Barnwell facility.

Material exceeding Class C limits (limited to material closest to the reactor core and comprising less than 1% of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multi-purpose canisters used for spent fuel storage/transport.

3.4.8 Site Conditions Following Decommissioning

The NRC will amend or terminate the site license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Building codes and environmental regulations will dictate the

next step in the decommissioning process, as well as Duke Energy's own future plans for the site.

All structures will be removed except for the switchyard. The switchyard is required for grid operations. Structures to be removed include, but are not limited to, the reactor buildings, auxiliary buildings, fuel buildings, service building, turbine buildings, intake and condenser discharge structures. The landfill and firing range will be remediated and closed.

The structures that may require decontamination or radiological remediation are the reactor buildings, auxiliary buildings, hot machine shops, interim radwaste building, radwaste facility, fuel building and the retired steam generator storage facility and the ground floor of the turbine building.

The estimates presented herein include the dismantling of the major structures to a nominal depth of three feet below grade, backfilling and the collapsing of below grade voids, and general terra-forming such that the site upon which the power block and supplemental structures are located is transformed into a "grassy plain."

The estimates do not assume the remediation of any significant volume of contaminated soil. This assumption may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

Costs are included for the remediation and post-closure care and maintenance of the landfill and shooting range at the site. Since the care and maintenance of the landfill will extend beyond the active decommissioning period in the DECON scenario, a lump-sum perpetuity payment is included in the final year of decommissioning for the remaining duration.

Environmental Remediation

Oconee has a cement lined lagoon and three chemical treatment ponds, samples will be taken of the settled material as part of closure requirements; to date sediment has met release criteria. All ponds will be backfilled to grade level.

3.5 ASSUMPTIONS

The following are the major assumptions made in the development of the estimates for decommissioning the site.

3.5.1 Estimating Basis

Decommissioning costs are reported in the year of projected expenditure; however, the values are provided in 2013 dollars. Costs are not inflated, escalated, or discounted over the periods of performance.
The estimates rely upon the physical plant inventory that was the basis for the 2008 analysis (updated to reflect any significant changes to the plant over the past five years).
The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

3.5.2 Labor Costs

For purposes of this analysis, Duke Energy will continue to provide site operations support, including decommissioning program management, licensing, radiological protection, and site security. Duke Energy will serve as the Decommissioning Operations Contractor, providing the supervisory staff needed to oversee the labor subcontractors, consultants, and specialty contractors needed to perform the work envisioned in the decontamination and dismantling effort. Duke Energy will also provide the engineering services needed to develop activity specifications, detailed procedures, detailed activation analyses, and support field activities such as structural modifications. Severance and retention costs are not included in the estimate. Reduction in staff levels will be handled through normal staffing processes.

Personnel costs are based upon average salary information provided by Duke Energy. Overhead costs are included for site and corporate support, reduced commensurate with the staffing of the project.

The craft labor required to decontaminate and dismantle the nuclear plant is acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel.

3.5.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs, ^{90}Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major NSSS components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.[29] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Oconee components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130[30] and NUREG/CR-0672,[31] and benchmarked to the long-lived values from NUREG/CR-3474.

Neutron activation of the containment building structure is assumed to be confined to the biological shield.

3.5.4 General

Transition Activities

Existing warehouses are cleared of non-essential material and remain for use by Duke Energy and its subcontractors. The plant's operating staff performs the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.

- Process operating waste inventories. Disposal of operating wastes (e.g., filtration media, resins) during this initial period is not considered a decommissioning expense.

Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. Duke Energy will make economically reasonable efforts to salvage equipment following final plant shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the value that an owner may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be more than offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet "furnace ready" conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property is removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts are also made available for alternative use.

Energy

For estimating purposes, the plant is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage.

Replacement power costs are used to calculate the cost of energy consumed during decommissioning for tooling, lighting, ventilation, and essential services.

Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of plant operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums, throughout the decommissioning process, are based upon the guidance and the limits for coverage defined in the NRC's proposed rulemaking "Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors."[32] The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

Taxes

Property tax payments continue throughout the decommissioning process, although at a substantially reduced level. The rate of decrease in disbursements is consistent over the same time interval for both the DECON and SAFSTOR alternatives.

The value of plant structures and equipment decreases from 100% to 0% over an eight-year period. The property taxes are determined based on a 100% value of the plant structures and equipment for the first two years, 66.7% of the value for the next three years, 33.3% of the value for the next three years, and 0% for the remainder of the decommissioning period.

Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

Integrated earthworks created during the initial formation of the Lake Keowee area and integral with it will be left intact and maintained in accordance with the current dam maintenance and inspection program. The on-site dike and earthwork network forming water retention ponds and lagoons will be disabled to relieve ongoing inspection requirements.

3.6 COST ESTIMATE SUMMARY

Schedules of expenditures are provided in Tables 3.2 through 3.7. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

The tables in Appendices C and D provide additional detail. The cost elements in these tables are assigned to one of three subcategories: "License Termination," "Spent Fuel Management," and "Site Restoration." The subcategory "License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the plant's operating license, recognizing that there may be some additional cost impact from spent fuel management.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE, as well as the eventual transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are also included for the operations of the pools and management of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., interim storage facility) is complete.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

As discussed in Section 3.4.1, it is assumed that the DOE will not accept the GTCC waste prior to completing the transfer of spent fuel. Therefore, the cost of GTCC disposal is shown in the final year of ISFSI operation (for the DECON alternative). While designated for disposal at a federal facility along with the spent fuel, GTCC waste is still classified as low-level radioactive waste and, as such, included as a "License Termination" expense.

Decommissioning costs are reported in 2013 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant). The schedules are based upon the detailed activity costs reported in Appendices C and D, along with the timelines presented in Section 4.

TABLE 3.1
SPENT FUEL MANAGEMENT SCHEDULE
(Fuel Assembly Totals by Location)

Year	Pools	ISFSI	DOE Acceptance
2025	1399	4392	0
2026	1394	4488	0
2027	1363	4488	0
2028	1271	4488	0
2029	1222	4488	0
2030	1263	4488	0
2031	1080	4423	65
2032	1080	4141	282
2033	1362	3895	246
2034	1395	3622	273
2035	1323	3424	198
2036	1179	3297	127
2037	1107	3030	267
2038	963	2969	61
2039	891	2865	104
2040	747	2577	288
2041	675	2486	91
2042	531	2330	156
2043	177	2330	0
2044	0	2330	0
2045		2330	0
2046		2330	0
2047		2330	0
2048		2330	0
2049		2330	0
2050		2330	0
2051		2330	0
2052		2330	0
2053		2330	0
2054		1876	454
2055		1360	516
2056		844	516

TABLE 3.1 (continued)
SPENT FUEL MANAGEMENT SCHEDULE
(Fuel Assembly Totals by Location)

Year	Pools	ISFSI	DOE Acceptance
2057		328	516
2058		0	328
Total			7,114

TABLE 3.2
DECON ALTERNATIVE, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	41,273	2,977	639	3,330	7,949	56,167
2034	48,703	16,218	1,048	13,092	22,998	102,058
2035	46,685	20,085	674	29,512	12,787	109,743
2036	32,113	9,032	562	12,860	8,992	63,558
2037	28,372	6,247	532	8,667	8,015	51,834
2038	18,843	4,185	376	5,210	5,614	34,228
2039	4,551	1,092	142	24	2,012	7,820
2040	4,563	1,095	142	24	2,018	7,842
2041	4,551	1,092	142	24	2,012	7,820
2042	4,551	1,092	142	24	2,012	7,820
2043	4,551	1,092	142	24	2,012	7,820
2044	8,756	2,301	178	1,630	2,933	15,798
2045	21,401	2,597	181	1,753	3,051	28,983
2046	8,909	5,615	73	1	1,096	15,693
2047	8,552	5,735	71	0	1,068	15,426
2048	3,023	2,136	25	0	465	5,649
2049	72	215	0	0	142	429
2050	72	215	0	0	142	429
2051	72	215	0	0	142	429
2052	72	216	0	0	143	431
2053	72	215	0	0	142	429
2054	72	215	0	0	142	429
2055	72	215	0	0	142	429
2056	72	216	0	0	143	431
2057	72	215	0	0	142	429
2058	51	592	0	0	11,273	11,916
Total	290,091	85,122	5,067	76,174	97,589	554,043

TABLE 3.2a
DECON ALTERNATIVE, UNIT 1
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	40,921	2,977	639	3,330	7,154	55,021
2034	47,474	16,041	1,048	13,092	22,131	99,786
2035	45,070	19,645	674	29,512	11,942	106,844
2036	31,282	8,498	562	12,860	8,275	61,477
2037	27,740	5,692	532	8,667	7,333	49,964
2038	18,378	3,592	376	5,210	4,932	32,488
2039	4,334	443	142	24	1,330	6,272
2040	4,346	444	142	24	1,333	6,289
2041	4,334	443	142	24	1,330	6,272
2042	4,334	443	142	24	1,330	6,272
2043	4,334	443	142	24	1,330	6,272
2044	8,567	1,736	178	1,630	2,386	14,499
2045	21,373	2,512	181	1,753	2,908	28,727
2046	647	38	4	1	53	743
2047	58	0	0	0	0	58
2048	20	0	0	0	0	20
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	440	0	0	11,167	11,607
Total	263,215	63,388	4,902	76,174	84,934	492,612

TABLE 3.2b
DECON ALTERNATIVE, UNIT 1
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	795	795
2034	50	149	0	0	801	1,001
2035	124	371	0	0	682	1,177
2036	170	511	0	0	684	1,365
2037	181	544	0	0	682	1,408
2038	195	586	0	0	682	1,464
2039	216	649	0	0	682	1,548
2040	217	651	0	0	684	1,552
2041	216	649	0	0	682	1,548
2042	216	649	0	0	682	1,548
2043	216	649	0	0	682	1,548
2044	188	565	0	0	547	1,300
2045	28	85	0	0	142	256
2046	1,476	0	0	0	523	2,000
2047	1,518	0	0	0	534	2,052
2048	575	141	0	0	279	995
2049	72	215	0	0	142	429
2050	72	215	0	0	142	429
2051	72	215	0	0	142	429
2052	72	216	0	0	143	431
2053	72	215	0	0	142	429
2054	72	215	0	0	142	429
2055	72	215	0	0	142	429
2056	72	216	0	0	143	431
2057	72	215	0	0	142	429
2058	51	152	0	0	106	309
Total	6,285	8,289	0	0	11,157	25,731

TABLE 3.2c
DECON ALTERNATIVE, UNIT 1
SITE RESTORATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	352	0	0	0	0	352
2034	1,179	28	0	0	65	1,272
2035	1,491	69	0	0	162	1,722
2036	660	23	0	0	32	715
2037	450	12	0	0	0	462
2038	270	7	0	0	0	277
2039	0	0	0	0	0	0
2040	0	0	0	0	0	0
2041	0	0	0	0	0	0
2042	0	0	0	0	0	0
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	6,785	5,577	69	0	519	12,951
2047	6,976	5,735	71	0	534	13,316
2048	2,427	1,995	25	0	186	4,633
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
Total	20,591	13,445	165	0	1,499	35,700

TABLE 3.3
DECON ALTERNATIVE, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	9,039	778	169	880	1,879	12,746
2034	38,286	5,704	878	3,213	11,853	59,934
2035	45,065	18,555	867	22,635	15,571	102,694
2036	44,789	18,518	656	27,352	11,822	103,136
2037	29,988	6,929	532	10,422	7,919	55,790
2038	29,988	6,929	532	10,422	7,919	55,790
2039	11,246	2,644	244	2,759	3,508	20,401
2040	4,570	1,117	142	24	1,939	7,793
2041	4,558	1,114	142	24	1,934	7,771
2042	4,558	1,114	142	24	1,934	7,771
2043	4,558	1,114	142	24	1,934	7,771
2044	8,776	2,352	178	1,727	2,859	15,892
2045	21,418	2,635	181	1,857	2,875	28,965
2046	8,851	5,589	73	1	1,090	15,604
2047	8,493	5,708	71	0	1,068	15,340
2048	3,002	2,127	25	0	465	5,619
2049	72	215	0	0	142	429
2050	72	215	0	0	142	429
2051	72	215	0	0	142	429
2052	72	216	0	0	143	431
2053	72	215	0	0	142	429
2054	72	215	0	0	142	429
2055	72	215	0	0	142	429
2056	72	216	0	0	143	431
2057	72	215	0	0	142	429
2058	51	592	0	0	11,273	11,916
Total	277,882	85,457	4,973	81,362	89,125	538,799

TABLE 3.3a
DECON ALTERNATIVE, UNIT 2
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	9,000	778	169	880	1,669	12,496
2034	38,029	5,645	878	3,213	10,971	58,737
2035	43,587	18,029	867	22,635	14,730	99,848
2036	43,143	17,907	656	27,352	11,013	100,071
2037	29,370	6,415	532	10,422	7,237	53,975
2038	29,370	6,415	532	10,422	7,237	53,975
2039	10,919	2,014	244	2,759	2,826	18,761
2040	4,346	444	142	24	1,255	6,211
2041	4,334	443	142	24	1,252	6,194
2042	4,334	443	142	24	1,252	6,194
2043	4,334	443	142	24	1,252	6,194
2044	8,583	1,771	178	1,727	2,312	14,570
2045	21,389	2,549	181	1,857	2,733	28,709
2046	615	38	4	1	47	704
2047	25	0	0	0	0	25
2048	9	0	0	0	0	9
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	440	0	0	11,167	11,607
Total	251,385	63,776	4,808	81,362	76,951	478,282

TABLE 3.3b
DECON ALTERNATIVE, UNIT 2
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	210	210
2034	20	59	0	0	882	960
2035	157	471	0	0	734	1,362
2036	181	544	0	0	684	1,410
2037	168	503	0	0	682	1,353
2038	168	503	0	0	682	1,353
2039	209	627	0	0	682	1,518
2040	224	673	0	0	684	1,581
2041	224	671	0	0	682	1,577
2042	224	671	0	0	682	1,577
2043	224	671	0	0	682	1,577
2044	194	581	0	0	547	1,321
2045	28	85	0	0	142	256
2046	1,476	0	0	0	523	2,000
2047	1,518	0	0	0	534	2,052
2048	575	141	0	0	279	995
2049	72	215	0	0	142	429
2050	72	215	0	0	142	429
2051	72	215	0	0	142	429
2052	72	216	0	0	143	431
2053	72	215	0	0	142	429
2054	72	215	0	0	142	429
2055	72	215	0	0	142	429
2056	72	216	0	0	143	431
2057	72	215	0	0	142	429
2058	51	152	0	0	106	309
Total	6,285	8,289	0	0	10,704	25,278

TABLE 3.3c
DECON ALTERNATIVE, UNIT 2
SITE RESTORATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	40	0	0	0	0	40
2034	238	0	0	0	0	238
2035	1,321	55	0	0	107	1,483
2036	1,464	66	0	0	124	1,655
2037	450	12	0	0	0	462
2038	450	12	0	0	0	462
2039	118	3	0	0	0	122
2040	0	0	0	0	0	0
2041	0	0	0	0	0	0
2042	0	0	0	0	0	0
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	6,760	5,551	69	0	519	12,900
2047	6,950	5,708	71	0	534	13,263
2048	2,418	1,986	25	0	186	4,615
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
Total	20,211	13,393	165	0	1,470	35,239

TABLE 3.4
DECON ALTERNATIVE, UNIT 3
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	17,287	1,602	322	1,679	4,152	25,042
2035	38,698	8,167	1,031	2,779	15,558	66,233
2036	49,674	20,930	708	32,928	13,589	117,829
2037	47,662	17,343	623	28,022	12,153	105,803
2038	43,443	10,374	532	16,741	10,426	81,516
2039	43,443	10,374	532	16,741	10,426	81,516
2040	9,450	1,622	160	804	3,205	15,241
2041	7,767	1,191	142	25	2,844	11,969
2042	7,767	1,191	142	25	2,844	11,969
2043	7,767	1,191	142	25	2,844	11,969
2044	11,463	2,607	178	2,127	3,697	20,072
2045	23,554	2,965	181	2,286	3,094	32,080
2046	13,363	12,319	73	1	1,531	27,287
2047	13,062	12,623	71	0	1,520	27,275
2048	5,800	4,533	25	0	1,318	11,675
2049	1,916	215	0	0	1,205	3,337
2050	1,916	215	0	0	1,205	3,337
2051	1,916	215	0	0	1,205	3,337
2052	1,922	216	0	0	1,209	3,346
2053	1,916	215	0	0	1,205	3,337
2054	1,916	215	0	0	1,205	3,337
2055	1,916	215	0	0	1,205	3,337
2056	1,922	216	0	0	1,209	3,346
2057	1,916	215	0	0	1,205	3,337
2058	3,229	1,763	20	2,923	13,766	21,701
2059	1,419	1,981	18	943	680	5,041
Total	362,103	114,715	4,899	108,049	114,504	704,271

TABLE 3.4a
DECON ALTERNATIVE, UNIT 3
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	17,172	1,485	322	1,679	3,529	24,187
2035	38,276	7,807	1,031	2,779	14,188	64,081
2036	46,929	20,247	708	32,928	12,269	113,081
2037	45,403	16,451	623	28,022	10,698	101,197
2038	42,224	9,116	532	16,741	8,717	77,330
2039	42,224	9,116	532	16,741	8,717	77,330
2040	9,161	868	160	804	1,972	12,966
2041	7,524	464	142	25	1,638	9,793
2042	7,524	464	142	25	1,638	9,793
2043	7,524	464	142	25	1,638	9,793
2044	11,255	1,984	178	2,127	2,716	18,261
2045	23,526	2,880	181	2,286	2,787	31,660
2046	684	42	4	1	45	775
2047	25	0	0	0	0	25
2048	9	0	0	0	0	9
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	1,740	1,611	20	2,923	12,874	19,168
2059	561	378	6	943	551	2,439
Total	301,760	73,379	4,723	108,049	83,976	571,887

TABLE 3.4b
DECON ALTERNATIVE, UNIT 3
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	39	117	0	0	623	779
2035	120	360	0	0	1,370	1,850
2036	185	555	0	0	1,183	1,923
2037	173	519	0	0	1,171	1,863
2038	150	451	0	0	1,171	1,772
2039	150	451	0	0	1,171	1,772
2040	239	716	0	0	1,174	2,129
2041	242	727	0	0	1,171	2,140
2042	242	727	0	0	1,171	2,140
2043	242	727	0	0	1,171	2,140
2044	208	623	0	0	945	1,775
2045	28	85	0	0	271	384
2046	1,476	0	0	0	930	2,406
2047	1,518	0	0	0	948	2,466
2048	1,783	141	0	0	1,093	3,017
2049	1,916	215	0	0	1,165	3,296
2050	1,916	215	0	0	1,165	3,296
2051	1,916	215	0	0	1,165	3,296
2052	1,922	216	0	0	1,168	3,306
2053	1,916	215	0	0	1,165	3,296
2054	1,916	215	0	0	1,165	3,296
2055	1,916	215	0	0	1,165	3,296
2056	1,922	216	0	0	1,168	3,306
2057	1,916	215	0	0	1,165	3,296
2058	1,489	152	0	0	863	2,504
Total	25,544	8,289	0	0	26,913	60,746

TABLE 3.4c
DECON ALTERNATIVE, UNIT 3
SITE RESTORATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	76	0	0	0	0	76
2035	302	0	0	0	0	302
2036	2,560	127	0	0	138	2,825
2037	2,086	373	0	0	284	2,743
2038	1,069	807	0	0	538	2,415
2039	1,069	807	0	0	538	2,415
2040	50	38	0	0	59	147
2041	0	0	0	0	36	36
2042	0	0	0	0	36	36
2043	0	0	0	0	36	36
2044	0	0	0	0	36	36
2045	0	0	0	0	36	36
2046	11,203	12,277	69	0	557	24,106
2047	11,519	12,623	71	0	572	24,784
2048	4,008	4,392	25	0	225	8,650
2049	0	0	0	0	41	41
2050	0	0	0	0	41	41
2051	0	0	0	0	41	41
2052	0	0	0	0	41	41
2053	0	0	0	0	41	41
2054	0	0	0	0	41	41
2055	0	0	0	0	41	41
2056	0	0	0	0	41	41
2057	0	0	0	0	41	41
2058	0	0	0	0	29	29
2059	858	1,604	12	0	129	2,603
Total	34,798	33,048	176	0	3,615	71,638

TABLE 3.5
SAFSTOR ALTERNATIVE, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	33,925	2,537	639	3,330	7,959	48,390
2034	25,670	4,745	484	1,084	18,662	50,645
2035	7,742	1,013	142	14	2,801	11,712
2036	7,763	1,016	142	14	2,808	11,744
2037	7,742	1,013	142	14	2,801	11,712
2038	7,742	1,013	142	14	2,801	11,712
2039	7,742	1,013	142	14	2,801	11,712
2040	7,763	1,016	142	14	2,808	11,744
2041	7,742	1,013	142	14	2,801	11,712
2042	7,742	1,013	142	14	2,801	11,712
2043	7,742	1,013	142	14	2,801	11,712
2044	6,301	876	124	12	2,344	9,657
2045	2,002	466	71	6	978	3,522
2046	2,002	466	71	6	978	3,522
2047	2,002	466	71	6	978	3,522
2048	2,007	467	71	6	980	3,532
2049	2,002	466	71	6	978	3,522
2050	2,002	466	71	6	978	3,522
2051	2,002	466	71	6	978	3,522
2052	2,007	467	71	6	980	3,532
2053	2,002	466	71	6	978	3,522
2054	2,002	466	71	6	978	3,522
2055	2,002	466	71	6	978	3,522
2056	2,007	467	71	6	980	3,532
2057	2,002	466	71	6	978	3,522
2058	1,914	422	71	6	935	3,349
2059	1,659	295	71	6	811	2,843
2060	1,664	296	71	6	813	2,851
2061	1,659	295	71	6	811	2,843
2062	1,659	295	71	6	811	2,843
2063	1,659	295	71	6	811	2,843
2064	1,664	296	71	6	813	2,851

TABLE 3.5 (continued)
SAFSTOR ALTERNATIVE, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	1,659	295	71	6	811	2,843
2066	1,659	295	71	6	811	2,843
2067	1,659	295	71	6	811	2,843
2068	1,664	296	71	6	813	2,851
2069	1,659	295	71	6	811	2,843
2070	1,659	295	71	6	811	2,843
2071	1,659	295	71	6	811	2,843
2072	1,664	296	71	6	813	2,851
2073	1,659	295	71	6	811	2,843
2074	1,659	295	71	6	811	2,843
2075	1,659	295	71	6	811	2,843
2076	1,664	296	71	6	813	2,851
2077	1,659	295	71	6	811	2,843
2078	1,659	295	71	6	811	2,843
2079	1,659	295	71	6	811	2,843
2080	1,664	296	71	6	813	2,851
2081	1,659	295	71	6	811	2,843
2082	1,659	295	71	6	811	2,843
2083	1,659	295	71	6	811	2,843
2084	1,664	296	71	6	813	2,851
2085	12,443	1,576	302	15	1,494	15,830
2086	32,933	4,598	709	33	2,984	41,257
2087	41,101	19,280	679	27,299	16,718	105,076
2088	32,643	12,719	588	20,520	11,211	77,681
2089	23,350	6,219	483	11,550	5,531	47,133
2090	890	113	142	6	403	1,555
2091	890	113	142	6	403	1,555
2092	13,822	942	142	19	1,150	16,075
2093	8,839	5,305	78	3	610	14,834
2094	7,548	5,735	71	0	508	13,861
2095	3,164	2,404	30	0	213	5,810
Total	384,365	90,455	8,726	64,251	130,165	677,963

TABLE 3.5a
SAFSTOR ALTERNATIVE, UNIT 1
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	33,925	2,537	639	3,330	7,166	47,597
2034	23,254	4,514	456	1,084	17,356	46,664
2035	1,659	433	71	14	850	3,027
2036	1,664	434	71	14	852	3,035
2037	1,659	433	71	14	850	3,027
2038	1,659	433	71	14	850	3,027
2039	1,659	433	71	14	850	3,027
2040	1,664	434	71	14	852	3,035
2041	1,659	433	71	14	850	3,027
2042	1,659	433	71	14	850	3,027
2043	1,659	433	71	14	850	3,027
2044	1,362	399	71	12	812	2,656
2045	474	295	71	6	694	1,540
2046	474	295	71	6	694	1,540
2047	474	295	71	6	694	1,540
2048	475	296	71	6	696	1,544
2049	474	295	71	6	694	1,540
2050	474	295	71	6	694	1,540
2051	474	295	71	6	694	1,540
2052	475	296	71	6	696	1,544
2053	474	295	71	6	694	1,540
2054	474	295	71	6	694	1,540
2055	474	295	71	6	694	1,540
2056	475	296	71	6	696	1,544
2057	474	295	71	6	694	1,540
2058	776	295	71	6	724	1,872
2059	1,659	295	71	6	811	2,843
2060	1,664	296	71	6	813	2,851
2061	1,659	295	71	6	811	2,843
2062	1,659	295	71	6	811	2,843
2063	1,659	295	71	6	811	2,843
2064	1,664	296	71	6	813	2,851

TABLE 3.5a (continued)
SAFSTOR ALTERNATIVE, UNIT 1
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	1,659	295	71	6	811	2,843
2066	1,659	295	71	6	811	2,843
2067	1,659	295	71	6	811	2,843
2068	1,664	296	71	6	813	2,851
2069	1,659	295	71	6	811	2,843
2070	1,659	295	71	6	811	2,843
2071	1,659	295	71	6	811	2,843
2072	1,664	296	71	6	813	2,851
2073	1,659	295	71	6	811	2,843
2074	1,659	295	71	6	811	2,843
2075	1,659	295	71	6	811	2,843
2076	1,664	296	71	6	813	2,851
2077	1,659	295	71	6	811	2,843
2078	1,659	295	71	6	811	2,843
2079	1,659	295	71	6	811	2,843
2080	1,664	296	71	6	813	2,851
2081	1,659	295	71	6	811	2,843
2082	1,659	295	71	6	811	2,843
2083	1,659	295	71	6	811	2,843
2084	1,664	296	71	6	813	2,851
2085	12,295	1,576	302	15	1,494	15,681
2086	32,167	4,598	709	33	2,984	40,491
2087	39,250	19,207	679	27,299	16,717	103,152
2088	31,450	12,674	588	20,520	11,211	76,443
2089	22,715	6,203	483	11,550	5,531	46,482
2090	890	113	142	6	403	1,555
2091	890	113	142	6	403	1,555
2092	13,822	942	142	19	1,150	16,075
2093	2,104	136	14	3	152	2,409
2094	76	0	0	0	0	76
2095	32	0	0	0	0	32
Total	279,291	68,725	7,842	64,251	103,888	523,998

TABLE 3.5b
SAFSTOR ALTERNATIVE, UNIT 1
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	793	793
2034	2,416	231	28	0	1,305	3,981
2035	6,083	581	71	0	1,951	8,685
2036	6,099	582	71	0	1,956	8,709
2037	6,083	581	71	0	1,951	8,685
2038	6,083	581	71	0	1,951	8,685
2039	6,083	581	71	0	1,951	8,685
2040	6,099	582	71	0	1,956	8,709
2041	6,083	581	71	0	1,951	8,685
2042	6,083	581	71	0	1,951	8,685
2043	6,083	581	71	0	1,951	8,685
2044	4,939	478	53	0	1,531	7,001
2045	1,528	171	0	0	283	1,982
2046	1,528	171	0	0	283	1,982
2047	1,528	171	0	0	283	1,982
2048	1,532	171	0	0	284	1,987
2049	1,528	171	0	0	283	1,982
2050	1,528	171	0	0	283	1,982
2051	1,528	171	0	0	283	1,982
2052	1,532	171	0	0	284	1,987
2053	1,528	171	0	0	283	1,982
2054	1,528	171	0	0	283	1,982
2055	1,528	171	0	0	283	1,982
2056	1,532	171	0	0	284	1,987
2057	1,528	171	0	0	283	1,982
2058	1,138	127	0	0	211	1,477
Total	83,143	8,289	720	0	25,097	117,249

TABLE 3.5c
SAFSTOR ALTERNATIVE, UNIT 1
SITE RESTORATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033-84	0	0	0	0	0	0
2085	149	0	0	0	0	149
2086	766	0	0	0	0	766
2087	1,851	73	0	0	1	1,924
2088	1,193	44	0	0	0	1,238
2089	635	16	0	0	0	651
2090	0	0	0	0	0	0
2091	0	0	0	0	0	0
2092	0	0	0	0	0	0
2093	6,734	5,169	64	0	458	12,426
2094	7,471	5,735	71	0	508	13,785
2095	3,132	2,404	30	0	213	5,778
Total	21,931	13,441	165	0	1,180	36,717

TABLE 3.6
SAFSTOR ALTERNATIVE, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	7,542	662	169	880	1,881	11,134
2034	32,470	4,942	709	3,134	15,600	56,855
2035	11,719	2,079	293	398	4,185	18,673
2036	4,572	1,022	142	13	2,364	8,113
2037	4,560	1,019	142	12	2,358	8,091
2038	4,560	1,019	142	12	2,358	8,091
2039	4,560	1,019	142	12	2,358	8,091
2040	4,572	1,022	142	13	2,364	8,113
2041	4,560	1,019	142	12	2,358	8,091
2042	4,560	1,019	142	12	2,358	8,091
2043	4,560	1,019	142	12	2,358	8,091
2044	3,920	881	124	11	2,007	6,943
2045	2,000	465	71	6	956	3,498
2046	2,000	465	71	6	956	3,498
2047	2,000	465	71	6	956	3,498
2048	2,005	466	71	6	958	3,507
2049	2,000	465	71	6	956	3,498
2050	2,000	465	71	6	956	3,498
2051	2,000	465	71	6	956	3,498
2052	2,005	466	71	6	958	3,507
2053	2,000	465	71	6	956	3,498
2054	2,000	465	71	6	956	3,498
2055	2,000	465	71	6	956	3,498
2056	2,005	466	71	6	958	3,507
2057	2,000	465	71	6	956	3,498
2058	1,740	421	71	6	897	3,134
2059	978	290	71	6	726	2,071
2060	981	291	71	6	728	2,077
2061	978	290	71	6	726	2,071
2062	978	290	71	6	726	2,071
2063	978	290	71	6	726	2,071
2064	981	291	71	6	728	2,077

TABLE 3.6 (continued)
SAFSTOR ALTERNATIVE, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	978	290	71	6	726	2,071
2066	978	290	71	6	726	2,071
2067	978	290	71	6	726	2,071
2068	981	291	71	6	728	2,077
2069	978	290	71	6	726	2,071
2070	978	290	71	6	726	2,071
2071	978	290	71	6	726	2,071
2072	981	291	71	6	728	2,077
2073	978	290	71	6	726	2,071
2074	978	290	71	6	726	2,071
2075	978	290	71	6	726	2,071
2076	981	291	71	6	728	2,077
2077	978	290	71	6	726	2,071
2078	978	290	71	6	726	2,071
2079	978	290	71	6	726	2,071
2080	981	291	71	6	728	2,077
2081	978	290	71	6	726	2,071
2082	978	290	71	6	726	2,071
2083	978	290	71	6	726	2,071
2084	981	291	71	6	728	2,077
2085	978	290	71	6	726	2,071
2086	3,697	586	151	9	915	5,358
2087	22,849	3,050	709	30	2,296	28,933
2088	35,780	15,681	689	20,250	12,736	85,136
2089	36,856	16,377	620	26,112	14,032	93,996
2090	27,916	7,771	532	15,425	6,235	57,879
2091	3,458	949	185	1,696	986	7,273
2092	13,512	930	142	19	985	15,589
2093	8,752	5,279	78	3	589	14,701
2094	7,478	5,708	71	0	508	13,765
2095	3,135	2,393	30	0	213	5,770
Total	309,770	89,756	8,545	68,311	114,996	591,377

TABLE 3.6a
SAFSTOR ALTERNATIVE, UNIT 2
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	7,542	662	169	880	1,672	10,925
2034	32,468	4,936	709	3,134	14,720	55,967
2035	9,049	1,514	240	398	2,769	13,970
2036	981	412	71	13	750	2,226
2037	978	411	71	12	748	2,220
2038	978	411	71	12	748	2,220
2039	978	411	71	12	748	2,220
2040	981	412	71	13	750	2,226
2041	978	411	71	12	748	2,220
2042	978	411	71	12	748	2,220
2043	978	411	71	12	748	2,220
2044	981	382	71	11	747	2,192
2045	978	294	71	6	737	2,086
2046	978	294	71	6	737	2,086
2047	978	294	71	6	737	2,086
2048	981	295	71	6	739	2,092
2049	978	294	71	6	737	2,086
2050	978	294	71	6	737	2,086
2051	978	294	71	6	737	2,086
2052	981	295	71	6	739	2,092
2053	978	294	71	6	737	2,086
2054	978	294	71	6	737	2,086
2055	978	294	71	6	737	2,086
2056	981	295	71	6	739	2,092
2057	978	294	71	6	737	2,086
2058	978	293	71	6	734	2,082
2059	978	290	71	6	726	2,071
2060	981	291	71	6	728	2,077
2061	978	290	71	6	726	2,071
2062	978	290	71	6	726	2,071
2063	978	290	71	6	726	2,071
2064	981	291	71	6	728	2,077

TABLE 3.6a (continued)
SAFSTOR ALTERNATIVE, UNIT 2
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	978	290	71	6	726	2,071
2066	978	290	71	6	726	2,071
2067	978	290	71	6	726	2,071
2068	981	291	71	6	728	2,077
2069	978	290	71	6	726	2,071
2070	978	290	71	6	726	2,071
2071	978	290	71	6	726	2,071
2072	981	291	71	6	728	2,077
2073	978	290	71	6	726	2,071
2074	978	290	71	6	726	2,071
2075	978	290	71	6	726	2,071
2076	981	291	71	6	728	2,077
2077	978	290	71	6	726	2,071
2078	978	290	71	6	726	2,071
2079	978	290	71	6	726	2,071
2080	981	291	71	6	728	2,077
2081	978	290	71	6	726	2,071
2082	978	290	71	6	726	2,071
2083	978	290	71	6	726	2,071
2084	981	291	71	6	728	2,077
2085	978	290	71	6	726	2,071
2086	3,675	586	151	9	915	5,336
2087	22,620	3,050	709	30	2,296	28,704
2088	34,250	15,623	689	20,250	12,736	83,548
2089	35,278	16,312	620	26,112	14,031	92,353
2090	27,190	7,753	532	15,425	6,235	57,134
2091	3,379	947	185	1,696	986	7,192
2092	13,512	930	142	19	985	15,589
2093	2,041	134	14	3	131	2,323
2094	33	0	0	0	0	33
2095	14	0	0	0	0	14
Total	239,994	68,079	7,707	68,311	94,146	478,238

TABLE 3.6b
SAFSTOR ALTERNATIVE, UNIT 2
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	210	210
2034	2	6	0	0	880	888
2035	2,669	566	52	0	1,416	4,703
2036	3,591	610	71	0	1,615	5,886
2037	3,581	608	71	0	1,610	5,870
2038	3,581	608	71	0	1,610	5,870
2039	3,581	608	71	0	1,610	5,870
2040	3,591	610	71	0	1,615	5,886
2041	3,581	608	71	0	1,610	5,870
2042	3,581	608	71	0	1,610	5,870
2043	3,581	608	71	0	1,610	5,870
2044	2,939	498	53	0	1,260	4,750
2045	1,022	171	0	0	219	1,412
2046	1,022	171	0	0	219	1,412
2047	1,022	171	0	0	219	1,412
2048	1,025	171	0	0	220	1,416
2049	1,022	171	0	0	219	1,412
2050	1,022	171	0	0	219	1,412
2051	1,022	171	0	0	219	1,412
2052	1,025	171	0	0	220	1,416
2053	1,022	171	0	0	219	1,412
2054	1,022	171	0	0	219	1,412
2055	1,022	171	0	0	219	1,412
2056	1,025	171	0	0	220	1,416
2057	1,022	171	0	0	219	1,412
2058	761	127	0	0	163	1,052
Total	48,334	8,289	673	0	19,670	76,965

TABLE 3.6c
SAFSTOR ALTERNATIVE, UNIT 2
SITE RESTORATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033-85	0	0	0	0	0	0
2086	22	0	0	0	0	22
2087	229	0	0	0	0	229
2088	1,529	58	0	0	0	1,588
2089	1,577	65	0	0	0	1,643
2090	726	19	0	0	0	745
2091	80	2	0	0	0	82
2092	0	0	0	0	0	0
2093	6,711	5,145	64	0	458	12,378
2094	7,445	5,708	71	0	508	13,732
2095	3,121	2,393	30	0	213	5,756
Total	21,441	13,388	165	0	1,180	36,174

TABLE 3.7
SAFSTOR ALTERNATIVE, UNIT 3
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	14,430	1,380	322	1,679	4,036	21,847
2035	33,496	6,510	709	4,894	17,150	62,759
2036	5,932	1,231	170	95	3,258	10,685
2037	4,602	1,043	142	12	2,967	8,766
2038	4,602	1,043	142	12	2,967	8,766
2039	4,602	1,043	142	12	2,967	8,766
2040	4,614	1,046	142	13	2,975	8,790
2041	4,602	1,043	142	12	2,967	8,766
2042	4,602	1,043	142	12	2,967	8,766
2043	4,602	1,043	142	12	2,967	8,766
2044	3,961	902	124	11	2,502	7,500
2045	2,038	478	71	6	1,107	3,701
2046	2,038	478	71	6	1,107	3,701
2047	2,038	478	71	6	1,107	3,701
2048	2,044	479	71	6	1,110	3,711
2049	2,038	478	71	6	1,107	3,701
2050	2,038	478	71	6	1,107	3,701
2051	2,038	478	71	6	1,107	3,701
2052	2,044	479	71	6	1,110	3,711
2053	2,038	478	71	6	1,107	3,701
2054	2,038	478	71	6	1,107	3,701
2055	2,038	478	71	6	1,107	3,701
2056	2,044	479	71	6	1,110	3,711
2057	2,038	478	71	6	1,107	3,701
2058	1,778	433	71	6	1,011	3,299
2059	1,016	303	71	6	728	2,124
2060	1,019	304	71	6	730	2,130
2061	1,016	303	71	6	728	2,124
2062	1,016	303	71	6	728	2,124
2063	1,016	303	71	6	728	2,124
2064	1,019	304	71	6	730	2,130
2065	1,016	303	71	6	728	2,124

TABLE 3.7 (continued)
SAFSTOR ALTERNATIVE, UNIT 3
TOTAL ANNUAL EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	1,016	303	71	6	728	2,124
2067	1,016	303	71	6	728	2,124
2068	1,019	304	71	6	730	2,130
2069	1,016	303	71	6	728	2,124
2070	1,016	303	71	6	728	2,124
2071	1,016	303	71	6	728	2,124
2072	1,019	304	71	6	730	2,130
2073	1,016	303	71	6	728	2,124
2074	1,016	303	71	6	728	2,124
2075	1,016	303	71	6	728	2,124
2076	1,019	304	71	6	730	2,130
2077	1,016	303	71	6	728	2,124
2078	1,016	303	71	6	728	2,124
2079	1,016	303	71	6	728	2,124
2080	1,019	304	71	6	730	2,130
2081	1,016	303	71	6	728	2,124
2082	1,016	303	71	6	728	2,124
2083	1,016	303	71	6	728	2,124
2084	1,019	304	71	6	730	2,130
2085	1,016	303	71	6	728	2,124
2086	1,016	303	71	6	728	2,124
2087	1,016	303	71	6	728	2,124
2088	20,195	2,383	639	27	2,031	25,275
2089	32,445	11,956	696	13,899	8,833	67,829
2090	45,181	21,496	653	35,103	17,471	119,905
2091	44,028	14,011	532	27,013	9,198	94,782
2092	22,639	5,375	278	9,416	4,004	41,712
2093	12,204	12,024	78	3	602	24,910
2094	12,316	13,256	71	0	533	26,176
2095	5,163	5,557	30	0	224	10,973
Total	342,000	118,826	8,346	92,483	127,162	688,818

TABLE 3.7a
SAFSTOR ALTERNATIVE, UNIT 3
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	14,391	1,263	322	1,679	3,091	20,746
2035	33,376	6,149	709	4,894	15,380	60,508
2036	2,505	616	103	95	1,066	4,384
2037	1,017	424	71	12	741	2,264
2038	1,017	424	71	12	741	2,264
2039	1,017	424	71	12	741	2,264
2040	1,019	425	71	13	743	2,271
2041	1,017	424	71	12	741	2,264
2042	1,017	424	71	12	741	2,264
2043	1,017	424	71	12	741	2,264
2044	1,019	395	71	11	741	2,237
2045	1,016	307	71	6	732	2,133
2046	1,016	307	71	6	732	2,133
2047	1,016	307	71	6	732	2,133
2048	1,019	308	71	6	734	2,139
2049	1,016	307	71	6	732	2,133
2050	1,016	307	71	6	732	2,133
2051	1,016	307	71	6	732	2,133
2052	1,019	308	71	6	734	2,139
2053	1,016	307	71	6	732	2,133
2054	1,016	307	71	6	732	2,133
2055	1,016	307	71	6	732	2,133
2056	1,019	308	71	6	734	2,139
2057	1,016	307	71	6	732	2,133
2058	1,016	306	71	6	731	2,131
2059	1,016	303	71	6	728	2,124
2060	1,019	304	71	6	730	2,130
2061	1,016	303	71	6	728	2,124
2062	1,016	303	71	6	728	2,124
2063	1,016	303	71	6	728	2,124
2064	1,019	304	71	6	730	2,130
2065	1,016	303	71	6	728	2,124

TABLE 3.7a (continued)
SAFSTOR ALTERNATIVE, UNIT 3
LICENSE TERMINATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	1,016	303	71	6	728	2,124
2067	1,016	303	71	6	728	2,124
2068	1,019	304	71	6	730	2,130
2069	1,016	303	71	6	728	2,124
2070	1,016	303	71	6	728	2,124
2071	1,016	303	71	6	728	2,124
2072	1,019	304	71	6	730	2,130
2073	1,016	303	71	6	728	2,124
2074	1,016	303	71	6	728	2,124
2075	1,016	303	71	6	728	2,124
2076	1,019	304	71	6	730	2,130
2077	1,016	303	71	6	728	2,124
2078	1,016	303	71	6	728	2,124
2079	1,016	303	71	6	728	2,124
2080	1,019	304	71	6	730	2,130
2081	1,016	303	71	6	728	2,124
2082	1,016	303	71	6	728	2,124
2083	1,016	303	71	6	728	2,124
2084	1,019	304	71	6	730	2,130
2085	1,016	303	71	6	728	2,124
2086	1,016	303	71	6	728	2,124
2087	1,016	303	71	6	728	2,124
2088	20,038	2,383	639	27	2,031	25,118
2089	30,816	11,893	696	13,899	8,833	66,137
2090	41,997	21,167	653	35,103	17,415	116,335
2091	42,304	12,710	532	27,013	8,806	91,365
2092	22,040	4,922	278	9,416	3,868	40,523
2093	1,132	75	14	3	121	1,345
2094	33	0	0	0	0	33
2095	14	0	0	0	0	14
Total	260,516	77,630	7,564	92,483	97,921	536,114

TABLE 3.7b
SAFSTOR ALTERNATIVE, UNIT 3
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	39	117	0	0	622	778
2035	120	360	0	0	1,368	1,848
2036	3,426	615	68	0	2,156	6,265
2037	3,585	619	71	0	2,191	6,466
2038	3,585	619	71	0	2,191	6,466
2039	3,585	619	71	0	2,191	6,466
2040	3,595	621	71	0	2,197	6,484
2041	3,585	619	71	0	2,191	6,466
2042	3,585	619	71	0	2,191	6,466
2043	3,585	619	71	0	2,191	6,466
2044	2,942	507	53	0	1,727	5,229
2045	1,022	171	0	0	347	1,540
2046	1,022	171	0	0	347	1,540
2047	1,022	171	0	0	347	1,540
2048	1,025	171	0	0	348	1,544
2049	1,022	171	0	0	347	1,540
2050	1,022	171	0	0	347	1,540
2051	1,022	171	0	0	347	1,540
2052	1,025	171	0	0	348	1,544
2053	1,022	171	0	0	347	1,540
2054	1,022	171	0	0	347	1,540
2055	1,022	171	0	0	347	1,540
2056	1,025	171	0	0	348	1,544
2057	1,022	171	0	0	347	1,540
2058	761	127	0	0	259	1,148
Total	45,687	8,289	617	0	25,991	80,584

TABLE 3.7c
SAFSTOR ALTERNATIVE, UNIT 3
SITE RESTORATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	0	0	0	0	322	322
2035	0	0	0	0	403	403
2036	0	0	0	0	36	36
2037	0	0	0	0	36	36
2038	0	0	0	0	36	36
2039	0	0	0	0	36	36
2040	0	0	0	0	36	36
2041	0	0	0	0	36	36
2042	0	0	0	0	36	36
2043	0	0	0	0	36	36
2044	0	0	0	0	34	34
2045	0	0	0	0	28	28
2046	0	0	0	0	28	28
2047	0	0	0	0	28	28
2048	0	0	0	0	28	28
2049	0	0	0	0	28	28
2050	0	0	0	0	28	28
2051	0	0	0	0	28	28
2052	0	0	0	0	28	28
2053	0	0	0	0	28	28
2054	0	0	0	0	28	28
2055	0	0	0	0	28	28
2056	0	0	0	0	28	28
2057	0	0	0	0	28	28
2058	0	0	0	0	21	21
2059-87	0	0	0	0	0	0
2088	157	0	0	0	0	157
2089	1,628	64	0	0	0	1,692
2090	3,185	329	0	0	56	3,570
2091	1,724	1,301	0	0	392	3,417
2092	600	453	0	0	136	1,189
2093	11,072	11,948	64	0	481	23,565

TABLE 3.7c (continued)
SAFSTOR ALTERNATIVE, UNIT 3
SITE RESTORATION EXPENDITURES
(thousands, 2013 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2094	12,284	13,256	71	0	533	26,144
2095	5,149	5,557	30	0	224	10,959
Total	35,798	32,908	165	0	3,250	72,120

4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this analysis follow the sequences presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management described in Section 3.4.1.

A schedule or sequence of activities for the DECON alternative is presented in Figure 4.1. The scheduling sequence is based on the fuel being removed from the spent fuel pools within ten years of the cessation of Unit 3 operations. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional 2010" computer software.[33]

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual man-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the decommissioning schedule:

- The fuel handling buildings are isolated until such time that all spent fuel has been discharged from the spent fuel pools to the ISFSI. Decontamination and dismantling of the storage pools is initiated once the transfer of spent fuel is complete (DECON option).
- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.

- For plant systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

4.2 PROJECT SCHEDULE

The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedules for decommissioning. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second critical path is shown for the spent fuel storage period, which determines the release of the fuel handling buildings for final decontamination.

Project timelines are provided in Figures 4.2 and 4.3, with milestone dates based on the 2033 and 2034 shutdown dates. The fuel pools are emptied within ten years of the cessation of Unit 3 operations, while ISFSI operations continue until the DOE can complete the transfer of assemblies. Deferred decommissioning in the SAFSTOR scenario is assumed to commence so that the operating licenses are terminated within a 60-year period from the cessation of plant operations.

FIGURE 4.1
ACTIVITY SCHEDULE

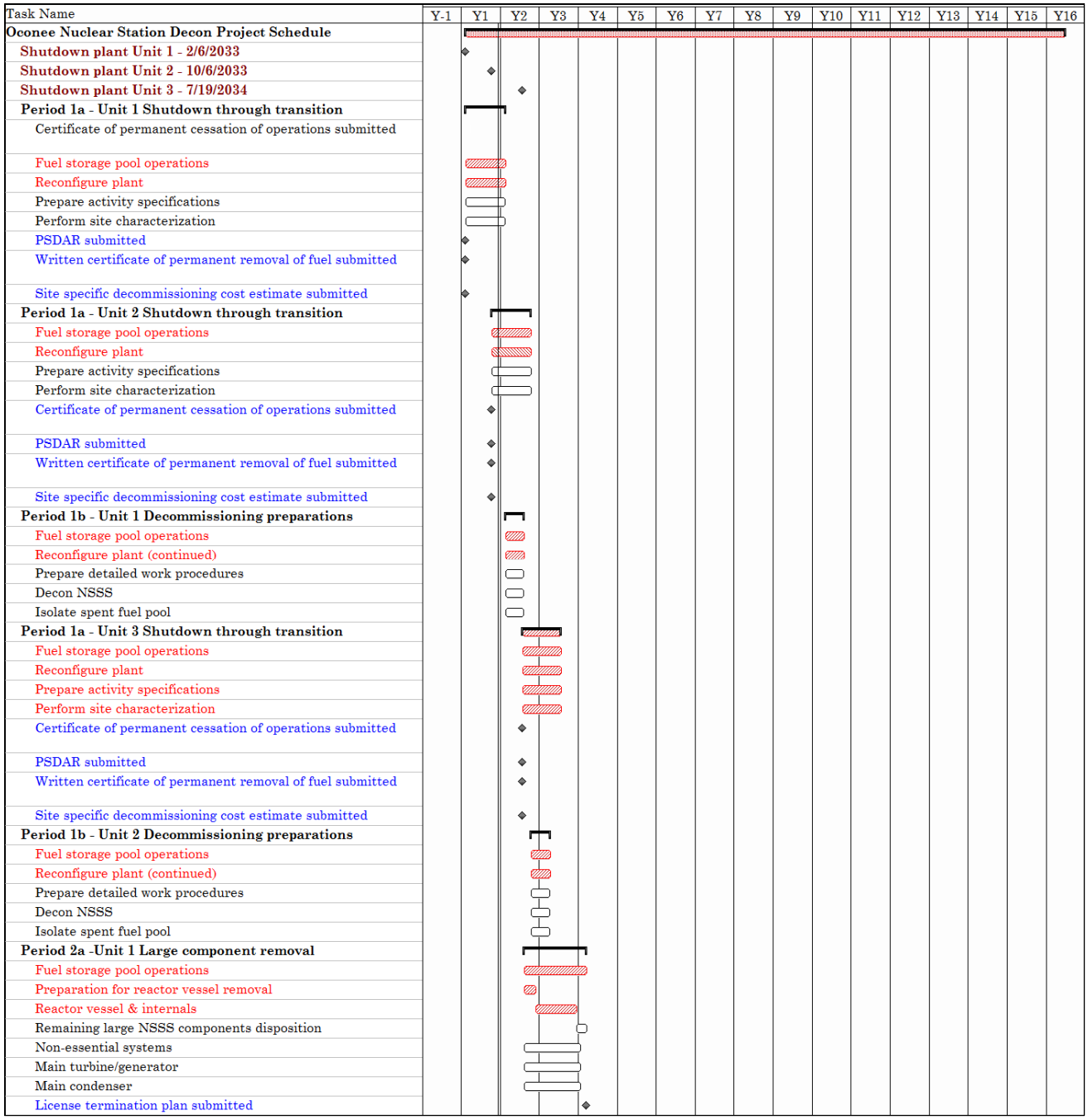


FIGURE 4.1 (continued)
ACTIVITY SCHEDULE

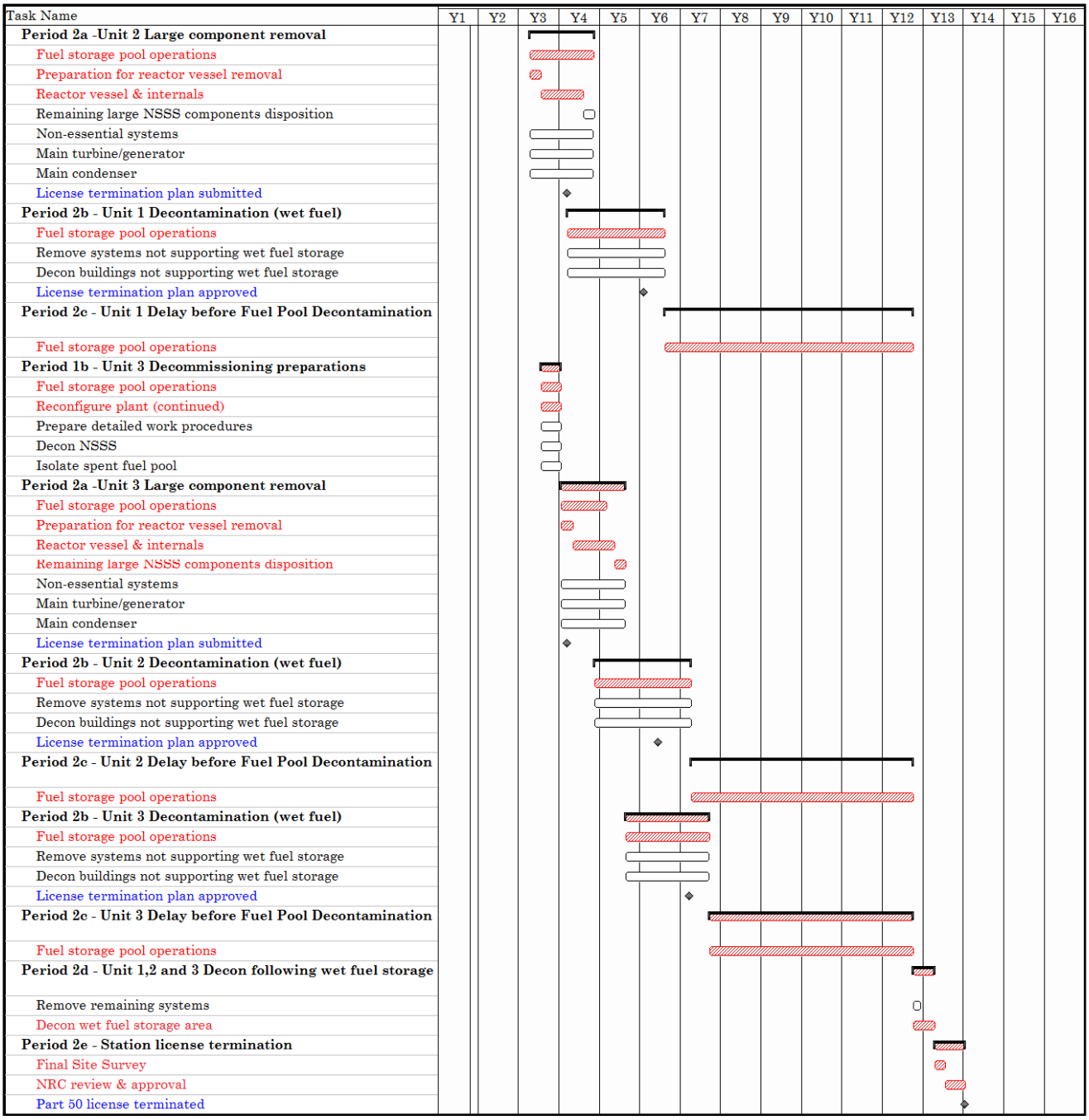


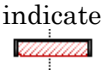
FIGURE 4.1 (continued)
ACTIVITY SCHEDULE

Task Name	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16
Period 3b - Site restoration																
Building demolitions, backfill and landscaping																
Period 3c - Fuel Storage Operations/Shipping (May 2048 - Sep 2058)																
Period 3d - GTCC Shipping (Sept 2058)																
ISFSI License Termination and Demolition																
Period 3e - ISFSI Decontamination (Sept 2058 - Jan 2059)																
Period 3f - ISFSI Site Restoration (Jan 2059 - Apr 2059)																

LEGEND

1. Red text and/or shaded scheduling bars indicate critical path activities

2. Shaded scheduling bars associated with major decommissioning periods, e.g., Period 1a, indicate overall duration of that period



3. Blue text and/or diamond symbols indicate major milestones

FIGURE 4.2
DECOMMISSIONING TIMELINE
DECON
(not to scale)

OCONEE NUCLEAR STATION
DECON

Shutdown and Decommisioning Preparation → Prompt Decommissioning DECON → Site Restoration → Post - Decommissioning ISFSI Operations → ISFSI Decon and Demolition

Unit 1

Periods	1a	1b	2a	2b	2c	2d	2f	3b	3c	3d			End
Start Dates	06-Feb-33	06-Feb-34	07-Aug-34	14-Mar-36	07-Aug-38	30-Sep-44	11-Apr-45	11-Jan-46	07-May-48	16-Sep-58			30-Sep-58
Durations (Years)	1.0	0.5	1.6	2.4	6.1	0.5	0.8	2.3	10.4	0.04			
Elapsed Time (Years)		1.5	3.1	5.5	11.6	12.2	12.9	15.2	25.6	25.6			

Unit 2

Periods	1a	1b	2a	2b	2c	2d	2f	3b	3c	3d			End
Start Dates	06-Oct-33	06-Oct-34	06-Apr-35	11-Nov-36	06-Apr-39	30-Sep-44	11-Apr-45	11-Jan-46	07-May-48	16-Sep-58			30-Sep-58
Durations (Years)	1.0	0.5	1.6	2.4	5.5	0.5	0.8	2.3	10.4	0.04			
Elapsed Time (Years)		1.5	3.1	5.5	11.0	11.5	12.3	14.6	24.9	25.0			

Unit 3

Periods	1a	1b	2a	2b	2c	2d	2f	3b	3c	3d	3e	3f	End
Start Dates	19-Jul-34	19-Jul-35	17-Jan-36	24-Aug-37	17-Jan-40	30-Sep-44	11-Apr-45	11-Jan-46	07-May-48	16-Sep-58	30-Sep-58	31-Jan-59	02-Apr-59
Durations (Years)	1.0	0.5	1.6	2.4	4.7	0.5	0.8	2.3	10.4	0.04	0.3	0.2	
Elapsed Time (Years)		1.5	3.1	5.5	10.2	10.7	11.5	13.8	24.2	24.2	24.5	24.7	

ONS Spent Fuel Schedule

ONS Pool (DOE Cask Loaded)		4	7	20	36							67	Total
ONS ISFSI (Cask to DOE)		8	5	30	11				97			151	Total

Note: Cask distribution is provided as a general representation of inventory per period, totals per period are not actuals as used to calculate costs.

FIGURE 4.3
DECOMMISSIONING TIMELINE
SAFSTOR
(not to scale)

OCONEE NUCLEAR STATION
SAFSTOR

Shutdown and Decommisioning Preparation → Preparations for Safe-Storage → Wet & Dry & No Fuel Dormancy → Delayed Decommissioning SAFSTOR → Site Restoration

Unit 1														
Periods	1a	1b	1c	2a	2b	2c	3a	3b	4a	4b	4e	4f	5b	End
Start Dates	06-Feb-33	06-Feb-34	09-May-34	09-Aug-34	30-Sep-44	30-Sep-58	22-Aug-85	22-Aug-86	24-Feb-87	21-May-88	16-Nov-89	07-May-92	06-Feb-93	03-Jun-95
Durations (Years)	1.0	0.3	0.3	10.1	14.0	26.9	1.0	0.5	1.2	1.5	2.5	0.8	2.3	
Elapsed Time (Years)		1.3	1.5	11.6	25.6	52.5	53.5	54.0	55.3	56.8	59.2	60.0	62.3	
Unit 2														
Periods	1a	1b	1c	2a	2b	2c	3a	3b	4a	4b	4e	4f	5b	End
Start Dates	06-Oct-33	06-Oct-34	06-Jan-35	08-Apr-35	30-Sep-44	30-Sep-58	16-Nov-86	16-Nov-87	20-May-88	15-Aug-89	10-Feb-91	07-May-92	06-Feb-93	03-Jun-95
Durations (Years)	1.0	0.3	0.3	9.5	14.0	28.1	1.0	0.5	1.2	1.5	1.2	0.8	2.3	
Elapsed Time (Years)		1.3	1.5	11.0	25.0	53.1	54.1	54.6	55.9	57.3	58.6	59.3	61.7	
Unit 3														
Periods	1a	1b	1c	2a	2b	2c	3a	3b	4a	4b		4f	5b	End
Start Dates	19-Jul-34	19-Jul-35	19-Oct-35	19-Jan-36	30-Sep-44	30-Sep-58	11-Feb-88	10-Feb-89	15-Aug-89	10-Nov-90		07-May-92	06-Feb-93	03-Jun-95
Durations (Years)	1.0	0.3	0.3	8.7	14.0	29.4	1.0	0.5	1.2	1.5		0.8	2.3	
Elapsed Time (Years)		1.3	1.5	10.2	24.2	53.6	54.6	55.1	56.3	57.8		58.6	60.9	
ONS Spent Fuel Schedule														
ONS Pool (DOE Cask Loaded)		4	7	56									67	Total
ONS ISFSI (Cask to DOE)		8	5	41	97								151	Total

Note: Cask distribution is provided as a general representation of inventory per period, totals per period are not actuals as used to calculate costs.

5. RADIOACTIVE WASTES

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,[34] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The destinations for the various waste streams from decommissioning are identified in Figures 5.1 and 5.2. The volumes are shown on a line-item basis in Appendices C and D and summarized in Tables 5.1 and 5.2. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping casks.

No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone (i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides). While the dose rates decrease with time, radionuclides such as ^{137}Cs will still control the disposition requirements.

The waste material produced in the decontamination and dismantling of the nuclear plant is primarily generated during Period 2 of DECON and Period 4 of SAFSTOR. Material that is considered potentially contaminated when removed from the radiological controlled area (e.g., concrete and dry active waste) and metal with low levels of contamination are sent to processing facilities in Tennessee for conditioning and disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling. Heavily contaminated components and activated materials are routed for direct, controlled disposal.

For purposes of constructing the estimates, the cost for disposal at the Energy*Solutions*' and Barnwell facilities were used as a proxy for future disposal facilities. Separate rates were used for containerized waste and large components, including the steam generators and reactor coolant pump motors. Demolition debris including miscellaneous steel, scaffolding, and concrete was disposed of at a bulk rate. The decommissioning waste stream also included resins and dry active waste.

Since Energy*Solutions* is not currently able to receive the more highly radioactive components generated in the decontamination and dismantling of the reactor, disposal costs for the Class B and C material were based upon the rate schedule for the Barnwell facility. Additional surcharges were included for activity, dose rate, and/or handling added as appropriate for the particular package.

A small quantity of material will be generated during the decommissioning will not be considered suitable for near-surface disposal, and is assumed to be disposed of in a geologic repository, in a manner similar to that envisioned for spent fuel disposal. This material, known as GTCC material, is estimated to require seven spent fuel storage canisters (or the equivalent) per unit to dispose of the most radioactive portions of the reactor vessel internals. The volume and weight reported in Tables 5.1 and 5.2 represent the packaged weight and volume of the spent fuel storage canisters.

FIGURE 5.1
RADIOACTIVE WASTE DISPOSITION

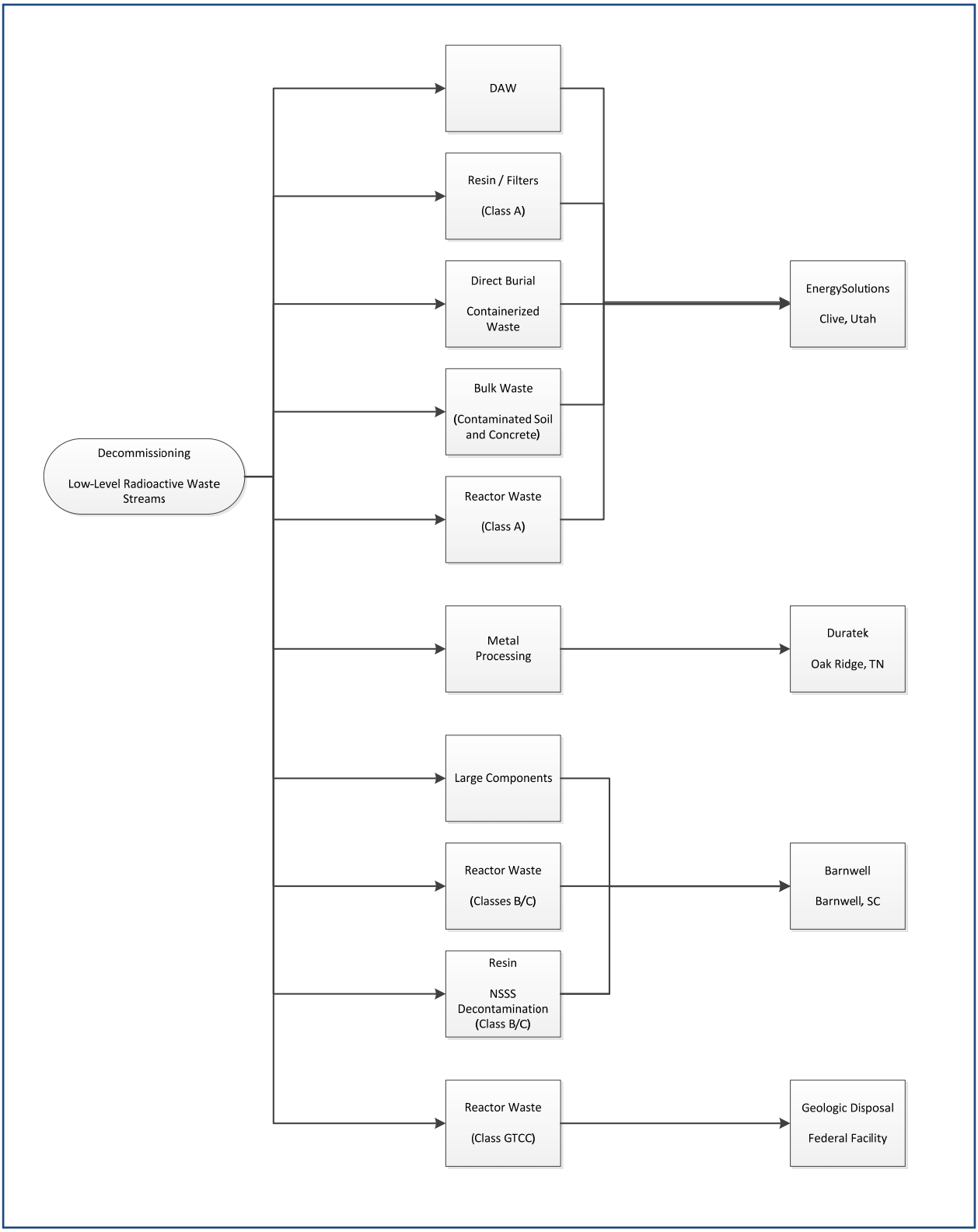


FIGURE 5.2
DECOMMISSIONING WASTE DESTINATIONS
RADIOLOGICAL

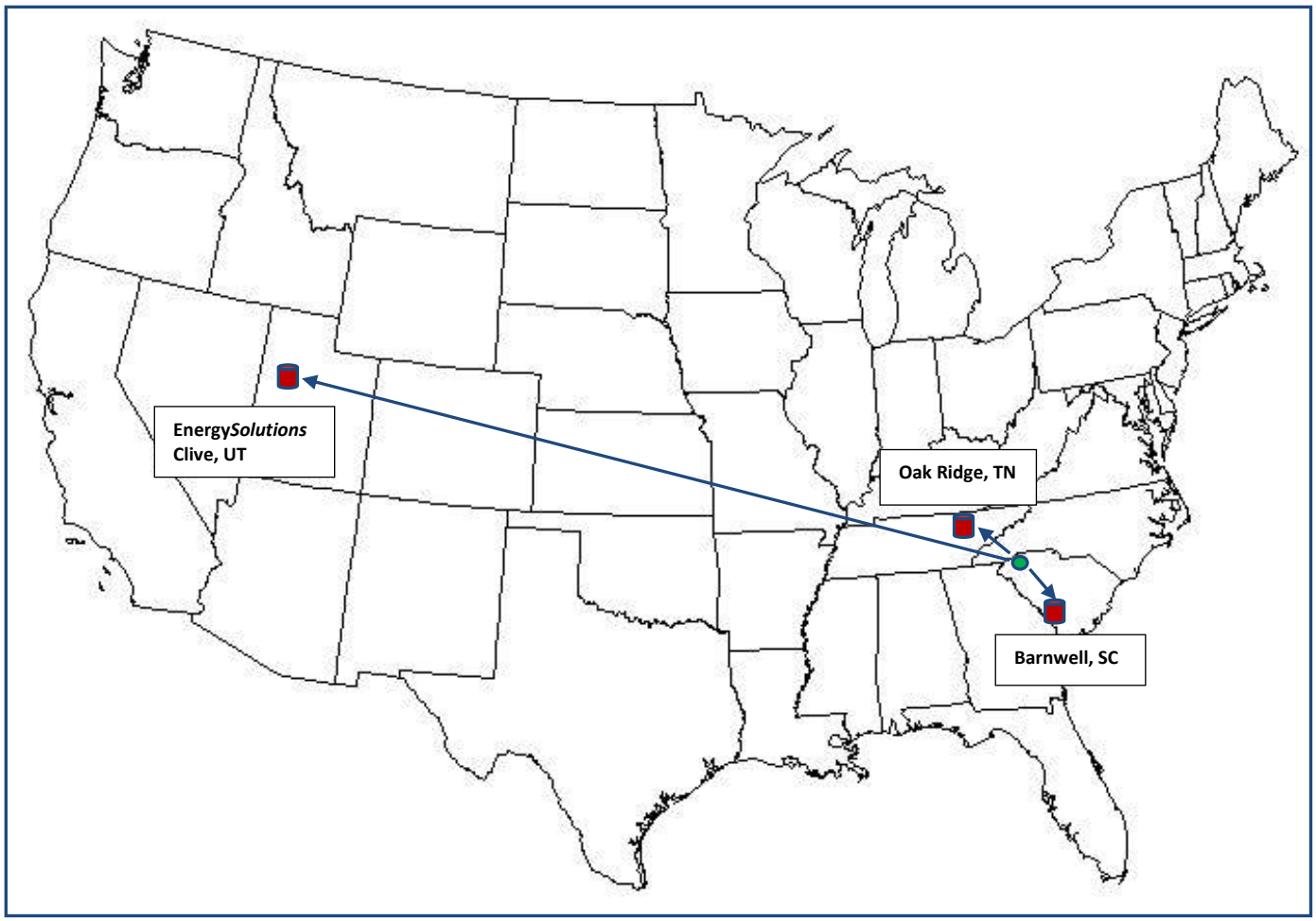


TABLE 5.1
DECON ALTERNATIVE
DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Form	Waste Volume (cubic feet)	Weight (pounds)
Low-Level Radioactive Waste (near-surface disposal)	Energy*Solutions*	A	Containerized	231,646	16,000,227
		A	Bulk	208,141	10,975,769
	Barnwell	A	Large Components	163,256	20,632,783
	Barnwell	B	Shielded Cask	5,526	668,618
	Barnwell	C	Shielded Cask	1,178	176,169
GTCC (geologic repository)	Spent Fuel Equivalent	GTCC	DSC	5,356	1,059,300
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	Bulk	660,735	27,218,364
Total [2]				1,275,838	76,731,230

[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

[2] Columns may not add due to rounding.

TABLE 5.2
SAFSTOR ALTERNATIVE
DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Form	Waste Volume (cubic feet)	Weight (pounds)
Low-Level Radioactive Waste (near-surface disposal)	Energy*Solutions*	A	Containerized	128,858	9,599,638
		A	Bulk	219,339	11,444,561
	Barnwell	A	Large Components	163,011	20,099,542
	Barnwell	B	Shielded Cask	3,005	292,800
	Barnwell	C	Shielded Cask	1,178	176,169
GTCC (geologic repository)	Spent Fuel Equivalent	GTCC	DSC	5,356	1,059,300
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	Bulk	741,714	30,624,511
Total [2]				1,262,460	73,296,511

[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

[2] Columns may not add due to rounding.

6. RESULTS

The analysis to estimate the costs to decommission Oconee relied upon the site-specific, technical information developed for a previous analysis prepared in 2008. While not an engineering study, the estimates provide the Duke Energy with sufficient information to assess its financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The estimates described in this report are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the station's spent fuel pools for a minimum of ten years following the cessation of Unit 3 operations for continued cooling of the assemblies.

The cost projected to promptly decommission (DECON) Oconee is estimated to be $1,797.1 million. The majority of this cost (approximately 85.8%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 6.2% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 8.0% is for the demolition of the designated structures and limited restoration of the site.

The cost projected for deferred decommissioning (SAFSTOR) is estimated to be $1,958.2 million. The majority of this cost (approximately 78.6%) is associated with placing the plant in storage, ongoing caretaking of the plant during dormancy, and the eventual physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 14.0% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 7.4% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 and 6.2, are either labor-related or associated with the management and disposition of the radioactive waste. Program management is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that Duke Energy will oversee the decommissioning program, acting as the DOC to manage the decommissioning labor force and the associated subcontractors. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating license is terminated, the staff is

substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pools will remain operational for a minimum of ten years following the cessation of Unit 3 operations. The pools will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool areas. Over the ten-year period, the spent fuel will be packaged into transportable canisters for loading into a DOE-provided transport cask. Spent fuel will also be in storage at the ISFSI (from operations). This inventory will be transferred to the DOE after the pools are emptied.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposition of the low-level radioactive material requiring controlled disposal is at the Energy*Solutions*' and Barnwell facilities. Highly activated components, requiring additional isolation from the environment (GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing union wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license. Prompt demolition reduces future liabilities and can be more cost effective than deferral, due to the deterioration of the facilities (and therefore the working conditions) with time.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear plant.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

TABLE 6.1
DECON ALTERNATIVE
DECOMMISSIONING COST ELEMENTS
(thousands of 2013 dollars)

Cost Element	Unit 1	Unit 2	Unit 3	Total	%
Decontamination	10,735	12,914	18,184	41,834	2.3
Removal	85,078	88,240	138,181	311,499	17.3
Packaging	22,086	22,500	23,488	68,074	3.8
Transportation	11,752	12,568	17,065	41,385	2.3
Waste Disposal	66,427	70,905	84,754	222,085	12.4
Off-site Waste Processing	20,914	21,624	34,462	77,001	4.3
Program Management [1]	202,618	186,016	229,798	618,432	34.4
Site Security	25,613	26,660	34,347	86,620	4.8
Corporate A&G	18,880	17,809	21,878	58,566	3.3
Site O&M	1,572	1,501	1,821	4,894	0.3
Spent Fuel Pool Isolation	12,145	8,096	8,096	28,338	1.6
Spent Fuel (Direct Expenditures) [2]	21,299	20,847	31,949	74,096	4.1
Insurance and Regulatory Fees	14,401	12,195	15,504	42,099	2.3
Energy	5,067	4,973	4,899	14,939	0.8
Characterization and Licensing Surveys	18,151	16,076	20,151	54,378	3.0
Property Taxes	10,650	9,218	9,736	29,604	1.6
Miscellaneous Equipment	6,657	6,657	6,697	20,011	1.1
Miscellaneous Site Services	0	0	3,258	3,258	0.2
Total [3]	554,043	538,799	704,271	1,797,113	100.0

Cost Element	Unit 1	Unit 2	Unit 3	Total	%
License Termination	492,612	478,282	571,887	1,542,781	85.8
Spent Fuel Management	25,731	25,278	60,746	111,755	6.2
Site Restoration	35,700	35,239	71,638	142,577	7.9
Total [3]	554,043	538,799	704,271	1,797,113	100.0

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

TABLE 6.2
SAFSTOR ALTERNATIVE
DECOMMISSIONING COST ELEMENTS
(thousands of 2013 dollars)

Cost Element	Unit 1	Unit 2	Unit 3	Total	%
Decontamination	9,886	9,823	12,820	32,528	1.7
Removal	82,829	85,276	133,456	301,562	15.4
Packaging	16,255	16,506	17,220	49,981	2.6
Transportation	8,327	8,578	11,861	28,766	1.5
Waste Disposal	51,762	54,763	65,385	171,910	8.8
Off-site Waste Processing	23,656	24,715	38,265	86,637	4.4
Program Management [1]	276,445	199,158	209,190	684,793	35.0
Site Security	48,399	50,002	49,458	147,858	7.6
Corporate A&G	26,116	19,438	20,336	65,891	3.4
Site O&M	2,508	1,788	1,877	6,173	0.3
Spent Fuel Pool Isolation	12,145	8,096	8,096	28,338	1.4
Spent Fuel (Direct Expenditures) [2]	21,298	20,845	27,091	69,233	3.5
Insurance and Regulatory Fees	43,598	41,509	40,938	126,045	6.4
Energy	8,726	8,545	8,372	25,643	1.3
Characterization and Licensing Surveys	17,215	11,150	10,193	38,558	2.0
Property Taxes	10,958	9,538	9,975	30,471	1.6
Miscellaneous Equipment	17,840	17,836	21,027	56,703	2.9
Miscellaneous Site Services	0	3,810	3,258	7,068	0.4
Total [3]	677,963	591,377	688,819	1,958,159	100.0

Cost Element	Unit 1	Unit 2	Unit 3	Total	%
License Termination	523,998	478,238	536,114	1,538,350	78.6
Spent Fuel Management	117,249	76,965	80,584	274,797	14.0
Site Restoration	36,717	36,174	72,120	145,011	7.4
Total [3]	677,963	591,377	688,819	1,958,159	100.0

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

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APPENDIX A

UNIT COST FACTOR DEVELOPMENT

APPENDIX A
UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	60	60
	Totals (Activity/Critical)	355	255

Duration adjustment(s):	
+ Respiratory protection adjustment (50% of critical duration)	128
+ Radiation/ALARA adjustment (37.1% of critical duration)	95
Adjusted work duration	478
+ Protective clothing adjustment (30% of adjusted duration)	143
Productive work duration	621
+ Work break adjustment (8.33 % of productive duration)	52
Total work duration (minutes)	673

*** Total duration = 11.217 hr ***

* alpha designators indicate activities that can be performed in parallel

APPENDIX A
(continued)

3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate ($/hr)	Cost
Laborers	3.00	11.217	$**.**	$***.**
Craftsmen	2.00	11.217	$**.**	$***.**
Foreman	1.00	11.217	$**.**	$***.**
General Foreman	0.25	11.217	$**.**	$**.**
Fire Watch	0.05	11.217	$**.**	$**.**
Health Physics Technician	1.00	11.217	$**.**	$***.**
Total Labor Cost				$3,194.92

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
-Universal Sorbent 50 @ $0.65 sq. ft. {1}	$32.50
-Tarpaulins (oil resistant/fire retardant) 50 @ $0.29/sq. ft. {2}	$14.50
-Gas torch consumables 1 @ $17.92/hr. x 1 hr. {3}	$17.92
Subtotal cost of equipment and materials	$64.92
Overhead & profit on equipment and materials @ 16.00 %	$10.39
Total costs, equipment & material	$75.31

TOTAL COST:

Removal of contaminated heat exchanger <3000 pounds:	$3,270.23
Total labor cost:	$3,194.92
Total equipment/material costs:	$75.31
Total craft labor man-hours required per unit:	81.88

** denotes business sensitive information

5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

- References for equipment & consumables costs:

    1. www.mcmaster.com online catalog, McMaster Carr Spill Control (7193T88)
    2. R.S. Means (2013) Division 01 56, Section 13.60-0600, page 22
    3. R.S. Means (2013) Division 01 54 33, Section 40-6360, page 688

- Material and consumable costs were adjusted using the regional indices for Greenville, South Carolina

APPENDIX B

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean instrument and sampling tubing, $/linear foot	0.32
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	3.31
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	4.92
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	10.25
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	19.14
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	25.02
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	36.78
Removal of clean pipe >36 inches diameter, $/linear foot	43.64
Removal of clean valve >2 to 4 inches	66.76
Removal of clean valve >4 to 8 inches	102.47
Removal of clean valve >8 to 14 inches	191.40
Removal of clean valve >14 to 20 inches	250.20
Removal of clean valve >20 to 36 inches	367.77
Removal of clean valve >36 inches	436.37
Removal of clean pipe hanger for small bore piping	23.86
Removal of clean pipe hanger for large bore piping	78.58
Removal of clean pump, <300 pound	175.64
Removal of clean pump, 300-1000 pound	499.34
Removal of clean pump, 1000-10,000 pound	1,932.32
Removal of clean pump, >10,000 pound	3,746.60
Removal of clean pump motor, 300-1000 pound	206.98
Removal of clean pump motor, 1000-10,000 pound	800.40
Removal of clean pump motor, >10,000 pound	1,800.90
Removal of clean heat exchanger <3000 pound	1,043.33
Removal of clean heat exchanger >3000 pound	2,639.62
Removal of clean feedwater heater/deaerator	7,400.61
Removal of clean moisture separator/reheater	15,160.26
Removal of clean tank, <300 gallons	225.60
Removal of clean tank, 300-3000 gallon	706.08
Removal of clean tank, >3000 gallons, $/square foot surface area	6.17

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean electrical equipment, <300 pound	93.55
Removal of clean electrical equipment, 300-1000 pound	337.01
Removal of clean electrical equipment, 1000-10,000 pound	674.01
Removal of clean electrical equipment, >10,000 pound	1,625.56
Removal of clean electrical transformer < 30 tons	1,128.93
Removal of clean electrical transformer > 30 tons	3,251.12
Removal of clean standby diesel generator, <100 kW	1,153.10
Removal of clean standby diesel generator, 100 kW to 1 MW	2,573.81
Removal of clean standby diesel generator, >1 MW	5,328.28
Removal of clean electrical cable tray, $/linear foot	8.91
Removal of clean electrical conduit, $/linear foot	3.90
Removal of clean mechanical equipment, <300 pound	93.55
Removal of clean mechanical equipment, 300-1000 pound	337.01
Removal of clean mechanical equipment, 1000-10,000 pound	674.01
Removal of clean mechanical equipment, >10,000 pound	1,625.56
Removal of clean HVAC equipment, <300 pound	113.11
Removal of clean HVAC equipment, 300-1000 pound	404.95
Removal of clean HVAC equipment, 1000-10,000 pound	807.05
Removal of clean HVAC equipment, >10,000 pound	1,625.56
Removal of clean HVAC ductwork, $/pound	0.34
Removal of contaminated instrument and sampling tubing, $/linear foot	1.14
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	16.78
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	27.78
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	45.86
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	86.95
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	103.84
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	142.29
Removal of contaminated pipe >36 inches diameter, $/linear foot	167.45
Removal of contaminated valve >2 to 4 inches	341.35
Removal of contaminated valve >4 to 8 inches	411.04

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated valve >8 to 14 inches	814.94
Removal of contaminated valve >14 to 20 inches	1,032.14
Removal of contaminated valve >20 to 36 inches	1,368.41
Removal of contaminated valve >36 inches	1,620.00
Removal of contaminated pipe hanger for small bore piping	109.63
Removal of contaminated pipe hanger for large bore piping	339.46
Removal of contaminated pump, <300 pound	737.47
Removal of contaminated pump, 300-1000 pound	1,719.45
Removal of contaminated pump, 1000-10,000 pound	5,344.79
Removal of contaminated pump, >10,000 pound	13,016.65
Removal of contaminated pump motor, 300-1000 pound	749.91
Removal of contaminated pump motor, 1000-10,000 pound	2,195.65
Removal of contaminated pump motor, >10,000 pound	4,929.69
Removal of contaminated heat exchanger <3000 pound	3,270.23
Removal of contaminated heat exchanger >3000 pound	9,543.85
Removal of contaminated tank, <300 gallons	1,230.29
Removal of contaminated tank, >300 gallons, $/square foot	23.80
Removal of contaminated electrical equipment, <300 pound	558.36
Removal of contaminated electrical equipment, 300-1000 pound	1,375.76
Removal of contaminated electrical equipment, 1000-10,000 pound	2,649.95
Removal of contaminated electrical equipment, >10,000 pound	5,227.43
Removal of contaminated electrical cable tray, $/linear foot	27.05
Removal of contaminated electrical conduit, $/linear foot	13.29
Removal of contaminated mechanical equipment, <300 pound	621.13
Removal of contaminated mechanical equipment, 300-1000 pound	1,519.17
Removal of contaminated mechanical equipment, 1000-10,000 pound	2,921.40
Removal of contaminated mechanical equipment, >10,000 pound	5,227.43
Removal of contaminated HVAC equipment, <300 pound	621.13
Removal of contaminated HVAC equipment, 300-1000 pound	1,519.17
Removal of contaminated HVAC equipment, 1000-10,000 pound	2,921.40

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated HVAC equipment, >10,000 pound	5,227.43
Removal of contaminated HVAC ductwork, $/pound	1.76
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	2.95
Additional decontamination of surface by washing, $/square foot	6.08
Additional decontamination of surfaces by hydrolasing, $/square foot	29.09
Decontamination rig hook up and flush, $/ 250 foot length	5,232.87
Chemical flush of components/systems, $/gallon	20.02
Removal of clean standard reinforced concrete, $/cubic yard	125.40
Removal of grade slab concrete, $/cubic yard	157.65
Removal of clean concrete floors, $/cubic yard	337.43
Removal of sections of clean concrete floors, $/cubic yard	969.71
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	222.90
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	1,825.95
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	281.83
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	2,414.19
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cubic yard	401.71
Removal of below-grade suspended floors, $/cubic yard	337.43
Removal of clean monolithic concrete structures, $/cubic yard	775.80
Removal of contaminated monolithic concrete structures, $/cubic yard	1,816.18
Removal of clean foundation concrete, $/cubic yard	613.40
Removal of contaminated foundation concrete, $/cubic yard	1,692.95
Explosive demolition of bulk concrete, $/cubic yard	28.19
Removal of clean hollow masonry block wall, $/cubic yard	80.01
Removal of contaminated hollow masonry block wall, $/cubic yard	279.95
Removal of clean solid masonry block wall, $/cubic yard	80.01
Removal of contaminated solid masonry block wall, $/cubic yard	279.95
Backfill of below-grade voids, $/cubic yard	35.16
Removal of subterranean tunnels/voids, $/linear foot	97.14
Placement of concrete for below-grade voids, $/cubic yard	128.55
Excavation of clean material, $/cubic yard	3.46

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Excavation of contaminated material, $/cubic yard	40.57
Removal of clean concrete rubble (tipping fee included), $/cubic yard	24.87
Removal of contaminated concrete rubble, $/cubic yard	25.57
Removal of building by volume, $/cubic foot	0.30
Removal of clean building metal siding, $/square foot	0.97
Removal of contaminated building metal siding, $/square foot	3.54
Removal of standard asphalt roofing, $/square foot	1.50
Removal of transite panels, $/square foot	1.75
Scarifying contaminated concrete surfaces (drill & spall), $/square foot	11.28
Scabbling contaminated concrete floors, $/square foot	6.39
Scabbling contaminated concrete walls, $/square foot	16.45
Scabbling contaminated ceilings, $/square foot	56.05
Scabbling structural steel, $/square foot	5.26
Removal of clean overhead crane/monorail < 10 ton capacity	491.08
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,459.57
Removal of clean overhead crane/monorail >10-50 ton capacity	1,178.60
Removal of contaminated overhead crane/monorail >10-50 ton capacity	3,502.39
Removal of polar crane > 50 ton capacity	4,972.29
Removal of gantry crane > 50 ton capacity	20,319.49
Removal of structural steel, $/pound	0.17
Removal of clean steel floor grating, $/square foot	3.89
Removal of contaminated steel floor grating, $/square foot	11.52
Removal of clean free standing steel liner, $/square foot	9.24
Removal of contaminated free standing steel liner, $/square foot	27.70
Removal of clean concrete-anchored steel liner, $/square foot	4.62
Removal of contaminated concrete-anchored steel liner, $/square foot	32.31
Placement of scaffolding in clean areas, $/square foot	13.40
Placement of scaffolding in contaminated areas, $/square foot	21.04
Landscaping with topsoil, $/acre	25,695.32
Cost of CPC B-88 LSA box & preparation for use	2,153.99

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Cost of CPC B-25 LSA box & preparation for use	1,964.28
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,587.98
Cost of CPC B-144 LSA box & preparation for use	11,276.67
Cost of LSA drum & preparation for use	189.65
Cost of cask liner for CNSI 8 120A cask (resins)	8,483.14
Cost of cask liner for CNSI 8 120A cask (filters)	8,326.74
Decontamination of surfaces with vacuuming, $/square foot	0.67

APPENDIX C

DETAILED COST ANALYSIS

DECON

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C-2 Unit 2, DECON Decommissioning Cost Estimate..... 10

C-3 Unit 3, DECON Decommissioning Cost Estimate..... 18

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	98	15	112	112	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	150	23	173	173	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	345	52	397	397	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	98	15	112	112	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	563	84	647	647	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	233	35	268	268	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	375	56	432	432	-	-	-	-	-	-	-	-	-	5,000
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	307	46	354	354	-	-	-	-	-	-	-	-	-	4,096
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	369	55	425	382	-	42	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	313	47	360	324	-	36	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	38	6	43	43	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	533	80	613	613	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	488	73	561	561	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	38	6	43	43	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	234	35	269	269	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	120	18	138	69	-	69	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	30	5	35	-	-	35	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	30	5	35	-	-	35	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	234	35	269	135	-	135	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	345	52	397	397	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	68	10	78	39	-	39	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	2,839	426	3,265	2,875	-	390	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	180	27	207	207	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,900	435	3,335	3,335	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	92	14	106	106	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	10,636	1,595	12,231	11,841	-	390	-	-	-	-	-	-	-	73,753
Period 1a Additional Costs																					
1a.2.1	Asbestos Abatement	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
1a.2	Subtotal Period 1a Additional Costs	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
Period 1a Collateral Costs																					
1a.3.1	Small tool allowance	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	881	88	969	969	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	1,963	196	2,159	2,159	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	672	-	-	-	-	-	168	840	840	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	2	-	30	-	9	55	55	-	-	-	616	-	-	-	12,311	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,164	116	1,280	1,280	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	129	13	142	-	142	-	-	-	-	-	-	-	-	-
1a.4.9	FEMA Fees	-	-	-	-	-	-	173	26	199	-	199	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	470	70	540	-	540	-	-	-	-	-	-	-	-	-
1a.4.11	Corporate A&G	-	-	-	-	-	-	2,593	389	2,982	2,982	-	-	-	-	-	-	-	-	-	-
1a.4.12	Site O&M	-	-	-	-	-	-	154	23	177	177	-	-	-	-	-	-	-	-	-	-

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1a Period-Dependent Costs (continued)																					
1a.4.13	Security Staff Cost	-	-	-	-	-	-	1,405	211	1,615	1,615	-	-	-	-	-	-	-	-	-	46,678
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,614	3,842	29,456	29,456	-	-	-	-	-	-	-	-	-	433,829
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,243	13	2	-	30	35,162	5,330	41,780	40,899	882	-	-	616	-	-	-	12,311	20	480,507
1a.0	TOTAL PERIOD 1a COST	-	4,666	17	321	-	2,955	45,797	8,556	62,313	61,041	882	390	-	26,071	-	-	-	343,226	38,641	554,260
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	355	53	409	368	-	41	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	101	15	117	29	-	87	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	90	14	104	52	-	52	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	34	5	39	39	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	90	14	104	104	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	345	52	397	397	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	75	11	86	43	-	43	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	117	18	135	-	-	135	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	117	18	135	-	-	135	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	205	31	236	212	-	24	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	205	31	236	212	-	24	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	2,495	374	2,870	2,330	-	540	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	646	-	-	-	-	-	-	323	969	969	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	646	-	-	-	-	-	2,495	697	3,839	3,299	-	540	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	10,561	1,584	12,145	12,145	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	2,788	837	3,625	3,625	-	-	-	-	-	-	-	-	19,100	7,852
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	13,349	2,421	15,770	15,770	-	-	-	-	-	-	-	-	19,100	7,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
1b.3.2	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	26	-	12	59	-	69	-	40	206	206	-	-	-	165	-	-	-	9,880	32	-
1b.3.4	Process decommissioning chemical flush waste	2	-	54	365	-	588	-	208	1,216	1,216	-	-	-	-	793	-	-	84,540	148	-
1b.3.5	Small tool allowance	-	1	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,500	-	-	-	-	-	-	225	1,725	1,725	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,473	1,101	65	424	-	656	1,130	950	6,800	6,800	-	-	-	165	793	-	-	94,421	181	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	29	-	-	-	-	-	-	7	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	439	44	483	483	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	979	98	1,076	1,076	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	273	-	-	-	-	-	68	342	342	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	285	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	1	-	17	-	5	31	31	-	-	-	353	-	-	-	7,062	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	615	92	707	707	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	342	34	376	376	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	65	6	71	-	71	-	-	-	-	-	-	-	-	-
1b.4.10	FEMA Fees	-	-	-	-	-	-	86	13	99	-	99	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	234	35	269	-	269	-	-	-	-	-	-	-	-	-
1b.4.12	Corporate A&G	-	-	-	-	-	-	1,616	242	1,858	1,858	-	-	-	-	-	-	-	-	-	-
1b.4.13	Site O&M	-	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	700	105	805	805	-	-	-	-	-	-	-	-	-	23,275
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	16,272	2,441	18,713	18,713	-	-	-	-	-	-	-	-	-	270,400
1b.4	Subtotal Period 1b Period-Dependent Costs	29	558	8	1	-	17	21,445	3,249	25,306	24,867	440	-	-	353	-	-	-	7,062	12	293,675

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
1b.0	TOTAL PERIOD 1b COST	3,148	1,659	73	425	-	673	38,419	7,316	51,714	50,735	440	540	-	518	793	-	-	101,482	20,359	334,770
PERIOD 1 TOTALS		3,148	6,325	90	747	-	3,629	84,216	15,873	114,027	111,776	1,321	930	-	26,588	793	-	-	444,708	59,000	889,030
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	162	163	21	39	-	417	-	234	1,036	1,036	-	-	-	1,023	-	-	-	116,897	7,013	-
2a.1.1.2	Pressurizer Relief Tank	15	12	4	8	-	74	-	31	144	144	-	-	-	188	-	-	-	20,849	612	-
2a.1.1.3	Reactor Coolant Pumps & Motors	99	77	190	218	-	1,766	-	562	2,913	2,913	-	-	-	6,309	-	-	-	780,400	4,632	100
2a.1.1.4	Pressurizer	43	47	466	105	-	986	-	342	1,989	1,989	-	-	-	3,521	-	-	-	381,437	2,569	625
2a.1.1.5	Steam Generators	145	2,064	1,702	1,298	-	5,740	-	2,388	13,336	13,336	-	-	-	20,507	-	-	-	2,803,298	11,616	1,167
2a.1.1.6	Retired Steam Generator Units	-	-	1,089	1,259	-	5,588	-	1,695	9,631	9,631	-	-	-	19,963	-	-	-	2,630,356	5,400	750
2a.1.1.7	CRDMs/ICIs/Service Structure Removal	141	104	335	107	-	523	-	277	1,488	1,488	-	-	-	5,513	-	-	-	146,613	5,070	-
2a.1.1.8	Reactor Vessel Internals	92	3,088	9,251	1,368	-	7,939	304	9,032	31,075	31,075	-	-	-	876	1,049	393	-	279,756	30,033	1,333
2a.1.1.9	Reactor Vessel	93	5,405	2,259	1,537	-	3,019	304	6,604	19,222	19,222	-	-	-	9,551	-	-	-	979,803	30,033	1,333
2a.1.1	Totals	790	10,959	15,318	5,939	-	26,053	609	21,165	80,834	80,834	-	-	-	67,451	1,049	393	-	8,139,409	96,979	5,308
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	319	331	98	564	456	-	326	2,094	2,094	-	-	3,819	2,127	-	-	-	369,734	7,674	-
2a.1.3	Main Condensers	-	956	161	64	558	497	-	473	2,709	2,709	-	-	5,044	2,107	-	-	-	366,238	23,585	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	777	-	-	-	-	-	117	893	893	-	-	-	-	-	-	-	-	9,379	-
2a.1.4.2	Auxiliary Building	-	103	-	-	-	-	-	15	119	119	-	-	-	-	-	-	-	-	1,333	-
2a.1.4.3	Turbine Building	-	189	-	-	-	-	-	28	217	217	-	-	-	-	-	-	-	-	3,027	-
2a.1.4.4	Fuel Building	-	77	-	-	-	-	-	12	88	88	-	-	-	-	-	-	-	-	961	-
2a.1.4	Totals	-	1,146	-	-	-	-	-	172	1,318	1,318	-	-	-	-	-	-	-	-	14,700	-
Disposal of Plant Systems																					
2a.1.5.1	Chemical Addition	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	821	-
2a.1.5.2	Chemical Addition RCA	-	25	0	1	22	-	-	10	57	57	-	-	222	-	-	-	-	9,016	510	-
2a.1.5.3	Condensate	-	557	-	-	-	-	-	84	640	-	-	640	-	-	-	-	-	-	15,699	-
2a.1.5.4	Condensate (Contaminated)	-	628	47	88	3,035	-	-	630	4,429	4,429	-	-	30,383	-	-	-	-	1,233,881	15,479	-
2a.1.5.5	Condenser Circulating Water	-	355	-	-	-	-	-	53	408	-	-	408	-	-	-	-	-	-	10,040	-
2a.1.5.6	Electro Hydraulic Turbine Control	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	499	-
2a.1.5.7	Feedwater & Emergency Feedwater	-	172	-	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	4,862	-
2a.1.5.8	Feedwater & Emergency Feedwater (Cont.)	-	179	8	14	487	-	-	121	809	809	-	-	4,873	-	-	-	-	197,906	4,387	-
2a.1.5.9	Feedwater & Emergency Feedwater RCA	-	262	8	14	481	-	-	140	905	905	-	-	4,815	-	-	-	-	195,560	5,622	-
2a.1.5.10	Heater Drains	-	387	-	-	-	-	-	58	445	-	-	445	-	-	-	-	-	-	11,003	-
2a.1.5.11	Heater Drains (Contaminated)	-	306	8	16	541	-	-	161	1,033	1,033	-	-	5,419	-	-	-	-	220,074	7,497	-
2a.1.5.12	Heater Vent	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,002	-
2a.1.5.13	High Pressure Extraction	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	729	-
2a.1.5.14	Hydraulic Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	75	-
2a.1.5.15	Hydrogen	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	848	-
2a.1.5.16	Hydrogen Seal Oil	-	32	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	923	-
2a.1.5.17	Low Pressure Extraction	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,096	-
2a.1.5.18	Main Steam	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,558	-
2a.1.5.19	Main Steam RCA	-	326	45	80	2,778	-	-	515	3,744	3,744	-	-	27,808	-	-	-	-	1,129,284	7,747	-
2a.1.5.20	Moisture Separator Reheater Drains	-	7	0	0	6	-	-	3	17	17	-	-	65	-	-	-	-	2,629	166	-
2a.1.5.21	Post Accident Monitoring	-	30	1	1	40	-	-	14	85	85	-	-	401	-	-	-	-	16,304	785	-
2a.1.5.22	Reactor Building Spray	-	95	3	6	210	-	-	56	371	371	-	-	2,105	-	-	-	-	85,488	2,170	-
2a.1.5.23	Sample Monitoring	-	117	14	15	24	146	-	73	389	389	-	-	244	618	-	-	-	50,777	3,113	-
2a.1.5.24	Stator Coolant	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,507	-
2a.1.5.25	Steam Drain	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	2,668	-
2a.1.5.26	Steam Seal	-	52	1	2	53	-	-	21	129	129	-	-	533	-	-	-	-	21,649	1,169	-
2a.1.5.27	Turbine Oil	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,518	-
2a.1.5.28	Vacuum	-	120	-	-	-	-	-	18	138	-	-	138	-	-	-	-	-	-	3,438	-
2a.1.5	Totals	-	4,179	135	236	7,679	146	-	2,067	14,442	11,968	-	2,474	76,870	618	-	-	-	3,162,567	109,930	-
2a.1.6	Scaffolding in support of decommissioning	-	464	10	2	48	9	-	127	661	661	-	-	433	38	-	-	-	22,021	14,104	-
2a.1	Subtotal Period 2a Activity Costs	790	18,023	15,955	6,340	8,849	27,161	609	24,330	102,058	99,584	-	2,474	86,166	72,341	1,049	393	-	12,059,970	266,973	5,308

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,627	488	2,115	2,115	-	-	-	-	-	-	-	-	33,315	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	1,627	488	2,115	2,115	-	-	-	-	-	-	-	-	33,315	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	53	-	24	121	-	141	-	82	421	421	-	-	-	338	-	-	-	20,272	66	-
2a.3.3	Small tool allowance	-	225	-	-	-	-	-	34	259	233	-	26	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	690	103	793	-	793	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	53	225	24	121	-	141	690	219	1,472	653	793	26	-	338	-	-	-	20,272	66	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	93	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	622	62	684	684	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,362	236	2,598	2,338	-	260	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,161	-	-	-	-	-	540	2,701	2,701	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,506	-	-	-	-	-	526	4,032	4,032	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	92	13	-	206	-	63	373	373	-	-	-	4,214	-	-	-	84,287	137	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	939	141	1,080	1,080	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	999	100	1,098	1,098	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	208	21	228	-	228	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	753	113	866	-	866	-	-	-	-	-	-	-	-	-
2a.4.11	Corporate A&G	-	-	-	-	-	-	4,096	614	4,710	4,710	-	-	-	-	-	-	-	-	-	-
2a.4.12	Site O&M	-	-	-	-	-	-	398	60	458	458	-	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	3,089	463	3,552	3,552	-	-	-	-	-	-	-	-	-	94,436
2a.4.14	Utility Staff Cost	-	-	-	-	-	-	41,520	6,228	47,748	47,748	-	-	-	-	-	-	-	-	-	685,286
2a.4	Subtotal Period 2a Period-Dependent Costs	93	5,667	92	13	-	206	54,984	9,190	70,244	68,891	1,094	260	-	4,214	-	-	-	84,287	137	779,721
2a.0	TOTAL PERIOD 2a COST	935	23,916	16,071	6,475	8,849	27,507	57,909	34,227	175,890	171,243	1,887	2,760	86,166	76,893	1,049	393	-	12,164,530	300,491	785,030
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Component Cooling	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,374	-
2b.1.1.2	Component Cooling RCA	-	129	2	4	143	-	-	54	333	333	-	-	1,430	-	-	-	-	58,079	2,726	-
2b.1.1.3	Core Flood	-	120	12	13	161	85	-	79	470	470	-	-	1,611	360	-	-	-	89,255	2,799	-
2b.1.1.4	Electrical (Clean)	-	614	-	-	-	-	-	92	706	-	-	706	-	-	-	-	-	-	16,347	-
2b.1.1.5	Electrical (Contaminated)	-	207	12	15	91	126	-	100	552	552	-	-	910	533	-	-	-	72,183	4,756	-
2b.1.1.6	Electrical (Contaminated) RCA	-	1,313	24	44	1,516	-	-	565	3,463	3,463	-	-	15,179	-	-	-	-	616,410	28,392	-
2b.1.1.7	High Pressure Injection	-	985	386	372	1,270	3,447	-	1,393	7,853	7,853	-	-	12,713	14,584	-	-	-	1,481,804	23,951	-
2b.1.1.8	Incore Instrumentation	-	17	1	0	-	4	-	5	28	28	-	-	-	18	-	-	-	1,228	466	-
2b.1.1.9	Low Pressure Injection	-	553	91	100	569	858	-	462	2,634	2,634	-	-	5,697	3,663	-	-	-	471,820	13,495	-
2b.1.1.10	On-Site/Off-Site Power	-	98	-	-	-	-	-	15	112	-	-	112	-	-	-	-	-	-	2,517	-
2b.1.1.11	Purge	-	162	8	14	484	-	-	116	783	783	-	-	4,842	-	-	-	-	196,641	3,632	-
2b.1.1.12	RFS Refueling Water	-	51	6	5	31	43	-	29	165	165	-	-	314	180	-	-	-	24,695	1,140	-
2b.1.1.13	Radiation Instrument Alarm	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	323	-
2b.1.1.14	Radiation Instrument Alarm RCA	-	29	0	0	6	-	-	8	44	44	-	-	63	-	-	-	-	2,565	788	-
2b.1.1.15	Reactor Building Cooling	-	362	30	54	1,873	-	-	383	2,701	2,701	-	-	18,745	-	-	-	-	761,247	8,761	-
2b.1.1.16	Reactor Coolant	-	260	32	23	51	223	-	135	723	723	-	-	510	939	-	-	-	83,034	6,528	-
2b.1.1.17	Reactor Coolant Storage	460	543	80	82	243	773	-	616	2,797	2,797	-	-	2,430	3,326	-	-	-	315,292	22,260	-
2b.1.1.18	Ventilation (Clean)	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,666	-
2b.1.1.19	Ventilation (Contaminated)	-	614	22	34	887	85	-	315	1,957	1,957	-	-	8,878	361	-	-	-	384,448	13,306	-
2b.1.1.20	Ventilation (clean) RCA	-	258	8	14	492	-	-	141	913	913	-	-	4,925	-	-	-	-	200,000	4,619	-
2b.1.1	Totals	460	6,568	714	775	7,817	5,644	-	4,547	26,525	25,415	-	1,110	78,247	23,965	-	-	-	4,758,701	163,845	-
2b.1.2	Scaffolding in support of decommissioning	-	580	13	3	60	11	-	159	826	826	-	-	542	48	-	-	-	27,527	17,631	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor Building	815	904	37	308	465	1,657	-	1,167	5,354	5,354	-	-	4,658	12,908	-	-	-	990,468	37,633	-
2b.1.3.2	Auxiliary Building	337	179	8	81	63	141	-	271	1,078	1,078	-	-	629	2,359	-	-	-	228,875	11,559	-
2b.1.3.3	Turbine Building	243	24	1	9	-	15	-	133	424	424	-	-	-	260	-	-	-	22,500	6,486	-
2b.1.3	Totals	1,395	1,107	45	397	528	1,812	-	1,571	6,856	6,856	-	-	5,286	15,526	-	-	-	1,241,843	55,678	-
2b.1	Subtotal Period 2b Activity Costs	1,854	8,256	773	1,175	8,405	7,468	-	6,276	34,207	33,097	-	1,110	84,075	39,539	-	-	-	6,028,071	237,153	-

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2b Additional Costs																					
2b.2.1	Containment Paint Remediation	79	-	9	14	-	105	-	69	275	275	-	-	-	452	-	-	-	-	800	-
2b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,439	732	3,171	3,171	-	-	-	-	-	-	-	-	49,937	-
2b.2.3	RX Closure Head Disposal	-	117	551	795	-	785	-	400	2,647	2,647	-	-	-	3,050	-	-	-	354,825	3,761	2,000
2b.2	Subtotal Period 2b Additional Costs	79	117	560	809	-	890	2,439	1,200	6,093	6,093	-	-	-	3,501	-	-	-	354,825	54,499	2,000
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	87	-	40	205	-	239	-	138	709	709	-	-	-	573	-	-	-	34,368	112	-
2b.3.2	Process decommissioning chemical flush waste	0	-	11	77	-	124	-	44	256	256	-	-	-	167	-	-	-	17,782	31	-
2b.3.3	Small tool allowance	-	167	-	-	-	-	-	25	192	192	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,515	227	1,742	-	1,742	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	87	167	52	282	-	362	1,515	434	2,900	1,157	1,742	-	-	740	-	-	-	52,151	143	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	864	-	-	-	-	-	-	216	1,081	1,081	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	932	93	1,025	1,025	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	2,756	276	3,032	3,032	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,408	-	-	-	-	-	602	3,010	3,010	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	5,204	-	-	-	-	-	781	5,985	5,985	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	93	13	-	208	-	63	377	377	-	-	-	4,258	-	-	-	85,155	139	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,111	167	1,278	1,278	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,497	150	1,647	1,647	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	311	31	342	-	342	-	-	-	-	-	-	-	-	-
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,128	169	1,298	-	1,298	-	-	-	-	-	-	-	-	-
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	477	72	549	549	-	-	-	-	-	-	-	-	-	-
2b.4.12	Corporate A&G	-	-	-	-	-	-	4,418	663	5,080	5,080	-	-	-	-	-	-	-	-	-	-
2b.4.13	Site O&M	-	-	-	-	-	-	429	64	493	493	-	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	4,631	695	5,326	5,326	-	-	-	-	-	-	-	-	-	141,573
2b.4.15	Utility Staff Cost	-	-	-	-	-	-	44,192	6,629	50,821	50,821	-	-	-	-	-	-	-	-	-	739,186
2b.4	Subtotal Period 2b Period-Dependent Costs	864	7,612	93	13	-	208	61,883	10,670	81,344	79,704	1,640	-	-	4,258	-	-	-	85,155	139	880,759
2b.0	TOTAL PERIOD 2b COST	2,885	16,153	1,477	2,280	8,405	8,928	65,837	18,580	124,544	120,051	3,382	1,110	84,075	48,038	-	-	-	6,520,201	291,934	882,759
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,628	694	5,323	-	5,323	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	4,628	694	5,323	-	5,323	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	2,386	239	2,625	2,625	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	1,601	160	1,761	1,761	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,137	-	-	-	-	-	534	2,671	2,671	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	52	8	-	116	-	35	211	211	-	-	-	2,382	-	-	-	47,641	78	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	758	114	872	872	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	1,813	181	1,994	1,994	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	796	80	876	-	876	-	-	-	-	-	-	-	-	-
2c.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	2,889	433	3,322	-	3,322	-	-	-	-	-	-	-	-	-
2c.4.9	Corporate A&G	-	-	-	-	-	-	1,418	213	1,631	1,631	-	-	-	-	-	-	-	-	-	-
2c.4.10	Site O&M	-	-	-	-	-	-	138	21	159	159	-	-	-	-	-	-	-	-	-	-
2c.4.11	Security Staff Cost	-	-	-	-	-	-	9,152	1,373	10,525	10,525	-	-	-	-	-	-	-	-	-	272,607
2c.4.12	Utility Staff Cost	-	-	-	-	-	-	14,027	2,104	16,131	16,131	-	-	-	-	-	-	-	-	-	237,329
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,137	52	8	-	116	34,978	5,486	42,777	38,579	4,198	-	-	2,382	-	-	-	47,641	78	509,936
2c.0	TOTAL PERIOD 2c COST	-	2,137	52	8	-	116	39,606	6,181	48,099	38,579	9,520	-	-	2,382	-	-	-	47,641	78	509,936
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	335	33	156	80	-	819	-	408	1,832	1,832	-	-	-	3,470	-	-	-	229,389	956	-
Disposal of Plant Systems																					
2d.1.2.1	Spent Fuel Cooling	292	268	40	43	164	390	-	345	1,541	1,541	-	-	1,644	1,656	-	-	-	175,927	9,579	-
2d.1.2	Totals	292	268	40	43	164	390	-	345	1,541	1,541	-	-	1,644	1,656	-	-	-	175,927	9,579	-

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Building	210	234	3	9	91	18	-	183	748	748	-	-	916	202	-	-	-	53,669	10,107	-
2d.1.3	Totals	210	234	3	9	91	18	-	183	748	748	-	-	916	202	-	-	-	53,669	10,107	-
2d.1.4	Scaffolding in support of decommissioning	-	116	3	1	12	2	-	32	165	165	-	-	108	10	-	-	-	5,505	3,526	-
2d.1	Subtotal Period 2d Activity Costs	836	651	202	131	268	1,229	-	968	4,285	4,285	-	-	2,667	5,338	-	-	-	464,489	24,168	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	553	166	719	719	-	-	-	-	-	-	-	-	-	4,160
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	537	161	698	698	-	-	-	-	-	-	-	-	10,991	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	1,090	327	1,417	1,417	-	-	-	-	-	-	-	-	10,991	4,160
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	31	-	16	83	-	97	-	54	282	282	-	-	-	232	-	-	-	13,908	45	-
2d.3.2	Process decommissioning chemical flush waste	1	-	30	204	-	328	-	116	679	679	-	-	-	443	-	-	-	47,232	83	-
2d.3.3	Small tool allowance	-	23	-	-	-	-	-	3	27	27	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	36	664	125	-	151	1,119	1,119	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	191	29	219	-	219	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	32	23	190	323	664	550	191	353	2,325	2,106	219	-	6,000	1,204	-	-	-	366,108	216	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	66	-	-	-	-	-	-	17	83	83	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	205	21	226	226	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	381	-	-	-	-	-	95	477	477	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,145	-	-	-	-	-	172	1,317	1,317	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	19	3	-	42	-	13	75	75	-	-	-	851	-	-	-	17,017	28	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	130	20	150	150	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	281	28	309	309	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	68	7	75	-	75	-	-	-	-	-	-	-	-	-
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	210	31	241	241	-	-	-	-	-	-	-	-	-	-
2d.4.11	Corporate A&G	-	-	-	-	-	-	702	105	807	807	-	-	-	-	-	-	-	-	-	-
2d.4.12	Site O&M	-	-	-	-	-	-	68	10	78	78	-	-	-	-	-	-	-	-	-	-
2d.4.13	Security Staff Cost	-	-	-	-	-	-	516	77	593	593	-	-	-	-	-	-	-	-	-	14,425
2d.4.14	Utility Staff Cost	-	-	-	-	-	-	7,117	1,068	8,185	8,185	-	-	-	-	-	-	-	-	-	117,454
2d.4	Subtotal Period 2d Period-Dependent Costs	66	1,527	19	3	-	42	9,301	1,664	12,620	12,545	75	-	-	851	-	-	-	17,017	28	131,880
2d.0	TOTAL PERIOD 2d COST	935	2,201	410	457	932	1,820	10,582	3,311	20,648	20,353	294	-	8,667	7,393	-	-	-	847,615	35,403	136,040
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license									a											
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	5,857	1,757	7,614	7,614	-	-	-	-	-	-	-	-	134,093	2,080
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	5,857	1,757	7,614	7,614	-	-	-	-	-	-	-	-	134,093	2,080
Period 2f Collateral Costs																					
2f.3.1	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	264	26	290	290	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	4	0	5	5	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	657	-	-	-	-	-	164	822	822	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	326	-	-	-	6,525	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	93	14	107	107	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	453	45	499	499	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	98	10	107	-	107	-	-	-	-	-	-	-	-	-
2f.4.8	Corporate A&G	-	-	-	-	-	-	531	80	610	610	-	-	-	-	-	-	-	-	-	-
2f.4.9	Site O&M	-	-	-	-	-	-	52	8	60	60	-	-	-	-	-	-	-	-	-	-
2f.4.10	Security Staff Cost	-	-	-	-	-	-	723	108	831	831	-	-	-	-	-	-	-	-	-	20,161
2f.4.11	Utility Staff Cost	-	-	-	-	-	-	5,646	847	6,493	6,493	-	-	-	-	-	-	-	-	-	88,786

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
2f.4	Subtotal Period 2f Period-Dependent Costs	-	657	7	1	-	16	7,864	1,308	9,853	9,746	107	-	-	326	-	-	-	6,525	11	108,947
2f.0	TOTAL PERIOD 2f COST	-	657	7	1	-	16	15,011	3,282	18,975	18,868	107	-	-	326	-	-	-	6,525	134,103	111,027
PERIOD 2 TOTALS		4,755	45,063	18,018	9,220	18,186	38,387	188,946	65,581	388,155	369,094	15,191	3,870	178,909	135,032	1,049	393	-	19,586,510	762,009	2,424,791
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	4,488	-	-	-	-	-	673	5,162	-	-	5,162	-	-	-	-	-	-	53,465	-
3b.1.1.2	Auxiliary Building	-	930	-	-	-	-	-	140	1,070	-	-	1,070	-	-	-	-	-	-	12,013	-
3b.1.1.3	Turbine Building	-	1,831	-	-	-	-	-	275	2,105	-	-	2,105	-	-	-	-	-	-	31,130	-
3b.1.1.4	Turbine Pedestal	-	291	-	-	-	-	-	44	335	-	-	335	-	-	-	-	-	-	3,192	-
3b.1.1.5	Fuel Building	-	712	-	-	-	-	-	107	819	-	-	819	-	-	-	-	-	-	9,163	-
3b.1.1	Totals	-	8,252	-	-	-	-	-	1,238	9,490	-	-	9,490	-	-	-	-	-	-	108,963	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	150	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,326	-	-	-	-	117	1,266	9,709	135	-	9,574	-	-	-	-	-	-	109,113	1,560
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	285	-	-	-	-	2	43	329	-	-	329	-	-	-	-	-	-	1,357	-
3b.2	Subtotal Period 3b Additional Costs	-	285	-	-	-	-	2	43	329	-	-	329	-	-	-	-	-	-	1,357	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	80	-	-	-	-	-	12	93	-	-	93	-	-	-	-	-	-	-	-
3b.3.2	Corporate A&G	-	-	-	-	-	-	1,044	157	1,200	-	-	1,200	-	-	-	-	-	-	-	-
3b.3.3	Site O&M	-	-	-	-	-	-	32	5	37	-	-	37	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	80	-	-	-	-	1,076	173	1,330	-	-	1,330	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	812	81	894	-	894	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	14	1	15	-	15	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	7,180	-	-	-	-	-	1,077	8,257	-	-	8,257	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	143	21	165	-	-	165	-	-	-	-	-	-	-	-
3b.4.5	Emergency Planning Fees	-	-	-	-	-	-	300	30	330	-	330	-	-	-	-	-	-	-	-	-
3b.4.6	Security Staff Cost	-	-	-	-	-	-	2,057	309	2,365	(0)	2,034	331	-	-	-	-	-	-	-	56,483
3b.4.7	Utility Staff Cost	-	-	-	-	-	-	10,785	1,618	12,403	0	1,488	10,914	-	-	-	-	-	-	-	174,627
3b.4	Subtotal Period 3b Period-Dependent Costs	-	7,180	-	-	-	-	14,112	3,137	24,429	0	4,762	19,667	-	-	-	-	-	-	-	231,110
3b.0	TOTAL PERIOD 3b COST	-	15,870	-	-	-	-	15,306	4,620	35,797	135	4,762	30,900	-	-	-	-	-	-	110,470	232,670
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,587	388	2,975	-	2,975	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	2,587	388	2,975	-	2,975	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.4	Emergency Planning Fees	-	-	-	-	-	-	1,342	134	1,476	-	1,476	-	-	-	-	-	-	-	-	-
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	1,342	134	1,476	-	1,476	-	-	-	-	-	-	-	-	-
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	3,929	522	4,451	-	4,451	-	-	-	-	-	-	-	-	-
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-
3d.1.1	Totals	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-

Table C-1
Oconee Nuclear Station, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3d Period-Dependent Costs																					
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	5	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	5	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.0	TOTAL PERIOD 3d COST	-	-	400	-	-	9,711	5	1,497	11,613	11,607	5	-	-	-	-	-	1,785	353,100	-	-
PERIOD 3 TOTALS		-	15,870	400	-	-	9,711	19,240	6,639	51,860	11,742	9,219	30,900	-	-	-	-	1,785	353,100	110,470	232,670
TOTAL COST TO DECOMMISSION		**7,903**	**67,258**	**18,508**	**9,966**	**18,186**	**51,727**	**292,402**	**88,093**	**554,043**	**492,612**	**25,731**	**35,700**	**178,909**	**161,621**	**1,842**	**393**	**1,785**	**20,384,320**	**931,478**	**3,546,491**

TOTAL COST TO DECOMMISSION WITH 18.91% CONTINGENCY:	**$554,043**	**thousands of 2013 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 88.91% OR:	**$492,612**	**thousands of 2013 dollars**
SPENT FUEL MANAGEMENT COST IS 4.64% OR:	**$25,731**	**thousands of 2013 dollars**
NON-NUCLEAR DEMOLITION COST IS 6.44% OR:	**$35,700**	**thousands of 2013 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**163,855**	**cubic feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**1,785**	**cubic feet**
TOTAL SCRAP METAL REMOVED:	**43,692**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**931,478**	**man-hours**

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	241	36	277	277	-	-	-	-	-	-	-	-	-	3,210
1a.1.13	Perform SER and EA	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,327
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	2,140
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	132	20	151	151	-	-	-	-	-	-	-	-	-	1,753
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	158	24	182	164	-	18	-	-	-	-	-	-	-	2,106
1a.1.17.2	Plant systems	-	-	-	-	-	-	134	20	154	139	-	15	-	-	-	-	-	-	-	1,783
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	16	2	18	18	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	228	34	262	262	-	-	-	-	-	-	-	-	-	3,039
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	209	31	240	240	-	-	-	-	-	-	-	-	-	2,782
1a.1.17.6	Biological shield	-	-	-	-	-	-	16	2	18	18	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,335
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	51	8	59	30	-	30	-	-	-	-	-	-	-	685
1a.1.17.9	Main Turbine	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	100	15	115	58	-	58	-	-	-	-	-	-	-	1,335
1a.1.17.12	Waste management	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	29	4	33	17	-	17	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,215	182	1,397	1,231	-	167	-	-	-	-	-	-	-	16,190
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	77	12	89	89	-	-	-	-	-	-	-	-	-	1,027
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,900	435	3,335	3,335	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	40	6	45	45	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	7,469	1,120	8,590	8,423	-	167	-	-	-	-	-	-	-	31,566
Period 1a Additional Costs																					
1a.2.1	Asbestos Abatement	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
1a.2	Subtotal Period 1a Additional Costs	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
Period 1a Collateral Costs																					
1a.3.1	Small tool allowance	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	881	88	969	969	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	1,963	196	2,159	2,159	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	643	-	-	-	-	-	161	804	804	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	2	-	28	-	8	51	51	-	-	-	571	-	-	-	11,419	19	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	826	83	908	908	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	129	13	142	-	142	-	-	-	-	-	-	-	-	-
1a.4.9	FEMA Fees	-	-	-	-	-	-	173	26	199	-	199	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	470	70	540	-	540	-	-	-	-	-	-	-	-	-
1a.4.11	Corporate A&G	-	-	-	-	-	-	2,132	320	2,451	2,451	-	-	-	-	-	-	-	-	-	-
1a.4.12	Site O&M	-	-	-	-	-	-	126	19	145	145	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	2,670	401	3,071	3,071	-	-	-	-	-	-	-	-	-	83,595

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1a Period-Dependent Costs (continued)																					
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	20,675	3,101	23,777	23,777	-	-	-	-	-	-	-	-	-	356,657
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,214	12	2	-	28	30,661	4,664	36,582	35,700	882	-	-	571	-	-	-	11,419	19	440,253
1a.0	TOTAL PERIOD 1a COST	-	4,637	16	321	-	2,953	38,131	7,415	53,473	52,425	882	167	-	26,026	-	-	-	342,334	38,639	471,819
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	152	23	175	157	-	17	-	-	-	-	-	-	-	2,026
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-	-	-	-	1,070
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	43	7	50	12	-	37	-	-	-	-	-	-	-	578
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	117	17	134	134	-	-	-	-	-	-	-	-	-	1,554
1b.1.1.9	Facility closeout	-	-	-	-	-	-	39	6	44	22	-	22	-	-	-	-	-	-	-	514
1b.1.1.10	Missile shields	-	-	-	-	-	-	14	2	17	17	-	-	-	-	-	-	-	-	-	193
1b.1.1.11	Biological shield	-	-	-	-	-	-	39	6	44	44	-	-	-	-	-	-	-	-	-	514
1b.1.1.12	Steam generators	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	32	5	37	18	-	18	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	50	8	58	-	-	58	-	-	-	-	-	-	-	668
1b.1.1.15	Main Condensers	-	-	-	-	-	-	50	8	58	-	-	58	-	-	-	-	-	-	-	668
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	88	13	101	91	-	10	-	-	-	-	-	-	-	1,168
1b.1.1.17	Reactor building	-	-	-	-	-	-	88	13	101	91	-	10	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,068	160	1,228	997	-	231	-	-	-	-	-	-	-	14,228
1b.1.2	Decon primary loop	646	-	-	-	-	-	-	323	969	969	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	646	-	-	-	-	-	1,068	483	2,197	1,966	-	231	-	-	-	-	-	-	1,067	14,228
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,040	1,056	8,096	8,096	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	1,192	358	1,550	1,550	-	-	-	-	-	-	-	-	8,167	3,357
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	8,233	1,414	9,646	9,646	-	-	-	-	-	-	-	-	8,167	3,357
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
1b.3.2	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	26	-	12	59	-	69	-	40	206	206	-	-	-	165	-	-	-	9,880	32	-
1b.3.4	Process decommissioning chemical flush waste	2	-	54	365	-	588	-	208	1,216	1,216	-	-	-	-	793	-	-	84,540	148	-
1b.3.5	Small tool allowance	-	1	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,500	-	-	-	-	-	-	225	1,725	1,725	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	142	21	164	-	164	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,473	1,101	65	424	-	656	1,272	971	6,963	6,800	164	-	-	165	793	-	-	94,421	181	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	29	-	-	-	-	-	-	7	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	439	44	483	483	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	807	81	888	888	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	253	-	-	-	-	-	63	317	317	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	285	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	322	-	-	-	6,449	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	615	92	707	707	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	233	23	256	256	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	65	6	71	-	71	-	-	-	-	-	-	-	-	-
1b.4.10	FEMA Fees	-	-	-	-	-	-	86	13	99	-	99	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	234	35	269	-	269	-	-	-	-	-	-	-	-	-
1b.4.12	Corporate A&G	-	-	-	-	-	-	1,299	195	1,494	1,494	-	-	-	-	-	-	-	-	-	-
1b.4.13	Site O&M	-	-	-	-	-	-	77	12	89	89	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	1,331	200	1,531	1,531	-	-	-	-	-	-	-	-	-	41,683
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	12,848	1,927	14,776	14,776	-	-	-	-	-	-	-	-	-	217,360
1b.4	Subtotal Period 1b Period-Dependent Costs	29	538	7	1	-	16	18,035	2,746	21,372	20,933	440	-	-	322	-	-	-	6,449	11	259,043

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
1b.0	TOTAL PERIOD 1b COST	3,148	1,640	73	425	-	672	28,608	5,614	40,179	39,345	603	231	-	487	793	-	-	100,870	9,425	276,628
PERIOD 1 TOTALS		3,148	6,276	89	746	-	3,625	66,739	13,029	93,652	91,770	1,485	398	-	26,513	793	-	-	443,204	48,064	748,447
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	162	163	21	39	-	417	-	234	1,036	1,036	-	-	-	1,023	-	-	-	116,897	7,013	-
2a.1.1.2	Pressurizer Relief Tank	15	12	4	8	-	74	-	31	144	144	-	-	-	188	-	-	-	20,849	612	-
2a.1.1.3	Reactor Coolant Pumps & Motors	113	77	211	230	-	2,243	-	692	3,566	3,566	-	-	-	8,012	-	-	-	807,600	4,924	100
2a.1.1.4	Pressurizer	43	47	466	105	-	986	-	342	1,989	1,989	-	-	-	3,521	-	-	-	381,437	2,569	625
2a.1.1.5	Steam Generators	145	2,064	1,702	1,298	-	5,740	-	2,388	13,336	13,336	-	-	-	20,507	-	-	-	2,803,298	11,616	1,167
2a.1.1.6	Retired Steam Generator Units	-	-	1,089	1,259	-	5,588	-	1,695	9,631	9,631	-	-	-	19,963	-	-	-	2,630,356	5,400	750
2a.1.1.7	CRDMs/ICIs/Service Structure Removal	141	104	335	107	-	523	-	277	1,488	1,488	-	-	-	5,513	-	-	-	146,613	5,070	-
2a.1.1.8	Reactor Vessel Internals	92	3,088	9,251	1,368	-	7,940	304	9,033	31,077	31,077	-	-	-	876	1,049	393	-	279,756	30,033	1,333
2a.1.1.9	Reactor Vessel	93	5,405	2,259	1,537	-	3,019	304	6,604	19,222	19,222	-	-	-	9,551	-	-	-	979,803	30,033	1,333
2a.1.1	Totals	804	10,959	15,339	5,951	-	26,531	609	21,296	81,489	81,489	-	-	-	69,154	1,049	393	-	8,166,609	97,271	5,308
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	319	331	98	564	456	-	326	2,094	2,094	-	-	3,819	2,127	-	-	-	369,734	7,674	-
2a.1.3	Main Condensers	-	956	161	64	558	497	-	473	2,709	2,709	-	-	5,044	2,107	-	-	-	366,238	23,585	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	777	-	-	-	-	-	117	893	893	-	-	-	-	-	-	-	-	9,379	-
2a.1.4.2	Auxiliary Building	-	103	-	-	-	-	-	15	119	119	-	-	-	-	-	-	-	-	1,333	-
2a.1.4.3	Turbine Building	-	160	-	-	-	-	-	24	184	184	-	-	-	-	-	-	-	-	2,697	-
2a.1.4.4	Fuel Building	-	77	-	-	-	-	-	12	88	88	-	-	-	-	-	-	-	-	961	-
2a.1.4	Totals	-	1,117	-	-	-	-	-	168	1,285	1,285	-	-	-	-	-	-	-	-	14,370	-
Disposal of Plant Systems																					
2a.1.5.1	Chemical Addition	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	821	-
2a.1.5.2	Chemical Addition RCA	-	25	0	1	22	-	-	10	57	57	-	-	222	-	-	-	-	9,016	510	-
2a.1.5.3	Condensate	-	557	-	-	-	-	-	84	640	-	-	640	-	-	-	-	-	-	15,699	-
2a.1.5.4	Condensate (Contaminated)	-	628	47	88	3,035	-	-	630	4,429	4,429	-	-	30,383	-	-	-	-	1,233,881	15,479	-
2a.1.5.5	Condenser Circulating Water	-	355	-	-	-	-	-	53	408	-	-	408	-	-	-	-	-	-	10,040	-
2a.1.5.6	Electro Hydraulic Turbine Control	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	499	-
2a.1.5.7	Feedwater & Emergency Feedwater	-	172	-	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	4,862	-
2a.1.5.8	Feedwater & Emergency Feedwater (Cont.)	-	179	8	14	487	-	-	121	809	809	-	-	4,873	-	-	-	-	197,906	4,387	-
2a.1.5.9	Feedwater & Emergency Feedwater RCA	-	262	8	14	481	-	-	140	905	905	-	-	4,815	-	-	-	-	195,560	5,622	-
2a.1.5.10	Heater Drains	-	387	-	-	-	-	-	58	445	-	-	445	-	-	-	-	-	-	11,003	-
2a.1.5.11	Heater Drains (Contaminated)	-	306	8	16	541	-	-	161	1,033	1,033	-	-	5,419	-	-	-	-	220,074	7,497	-
2a.1.5.12	Heater Vent	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,002	-
2a.1.5.13	High Pressure Extraction	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	729	-
2a.1.5.14	Hydraulic Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	75	-
2a.1.5.15	Hydrogen	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	848	-
2a.1.5.16	Hydrogen Seal Oil	-	32	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	923	-
2a.1.5.17	Low Pressure Extraction	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,096	-
2a.1.5.18	Main Steam	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,558	-
2a.1.5.19	Main Steam RCA	-	326	45	80	2,778	-	-	515	3,744	3,744	-	-	27,808	-	-	-	-	1,129,284	7,747	-
2a.1.5.20	Post Accident Monitoring	-	30	1	1	40	-	-	14	85	85	-	-	401	-	-	-	-	16,304	785	-
2a.1.5.21	Reactor Building Spray	-	95	3	6	210	-	-	56	371	371	-	-	2,105	-	-	-	-	85,488	2,170	-
2a.1.5.22	Recirc Cooling Water (Shared 1&2)	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,547	-
2a.1.5.23	Recirc Cooling Water (shared 1&2) RCA	-	135	3	5	173	-	-	61	376	376	-	-	1,727	-	-	-	-	70,146	2,938	-
2a.1.5.24	Sample Monitoring	-	117	14	15	24	146	-	73	389	389	-	-	244	618	-	-	-	50,777	3,113	-
2a.1.5.25	Stator Coolant	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,507	-
2a.1.5.26	Steam Drain	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	2,668	-
2a.1.5.27	Steam Seal	-	52	1	2	53	-	-	21	129	129	-	-	533	-	-	-	-	21,649	1,169	-
2a.1.5.28	Turbine Oil	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,518	-
2a.1.5.29	Vacuum	-	120	-	-	-	-	-	18	138	-	-	138	-	-	-	-	-	-	3,438	-
2a.1.5	Totals	-	4,499	138	241	7,846	146	-	2,154	15,022	12,327	-	2,695	78,532	618	-	-	-	3,230,084	118,250	-
2a.1.6	Scaffolding in support of decommissioning	-	484	10	2	48	9	-	132	686	686	-	-	433	38	-	-	-	22,021	14,764	-
2a.1	Subtotal Period 2a Activity Costs	804	18,335	15,979	6,356	9,016	27,638	609	24,548	103,285	100,590	-	2,695	87,829	74,043	1,049	393	-	12,154,690	275,913	5,308

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,627	488	2,115	2,115	-	-	-	-	-	-	-	-	33,315	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	1,627	488	2,115	2,115	-	-	-	-	-	-	-	-	33,315	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	53	-	24	122	-	142	-	83	424	424	-	-	-	341	-	-	-	20,442	66	-
2a.3.3	Small tool allowance	-	231	-	-	-	-	-	35	265	239	-	27	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,021	153	1,174	-	1,174	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	53	231	24	122	-	142	1,021	271	1,864	663	1,174	27	-	341	-	-	-	20,442	66	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	93	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	622	62	684	684	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,101	210	2,311	2,080	-	231	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,201	-	-	-	-	-	550	2,752	2,752	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,506	-	-	-	-	-	526	4,032	4,032	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	93	13	-	208	-	63	377	377	-	-	-	4,253	-	-	-	85,061	139	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	939	141	1,080	1,080	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	701	70	771	771	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	208	21	228	-	228	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	753	113	866	-	866	-	-	-	-	-	-	-	-	-
2a.4.11	Corporate A&G	-	-	-	-	-	-	4,096	614	4,710	4,710	-	-	-	-	-	-	-	-	-	-
2a.4.12	Site O&M	-	-	-	-	-	-	398	60	458	458	-	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	3,089	463	3,552	3,552	-	-	-	-	-	-	-	-	-	94,436
2a.4.14	Utility Staff Cost	-	-	-	-	-	-	41,618	6,243	47,861	47,861	-	-	-	-	-	-	-	-	-	685,286
2a.4	Subtotal Period 2a Period-Dependent Costs	93	5,708	93	13	-	208	54,524	9,160	69,798	68,473	1,094	231	-	4,253	-	-	-	85,061	139	779,721
2a.0	TOTAL PERIOD 2a COST	950	24,273	16,096	6,492	9,016	27,988	57,781	34,466	177,062	171,841	2,268	2,953	87,829	78,637	1,049	393	-	12,260,190	309,434	785,030
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Component Cooling	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,374	-
2b.1.1.2	Component Cooling RCA	-	129	2	4	143	-	-	54	333	333	-	-	1,430	-	-	-	-	58,079	2,726	-
2b.1.1.3	Core Flood	-	120	12	13	161	85	-	79	470	470	-	-	1,611	360	-	-	-	89,255	2,799	-
2b.1.1.4	Electrical (Clean)	-	614	-	-	-	-	-	92	706	-	-	706	-	-	-	-	-	-	16,348	-
2b.1.1.5	Electrical (Contaminated)	-	207	12	15	91	126	-	100	552	552	-	-	910	533	-	-	-	72,186	4,756	-
2b.1.1.6	Electrical (Contaminated) RCA	-	1,313	24	44	1,516	-	-	565	3,463	3,463	-	-	15,179	-	-	-	-	616,430	28,393	-
2b.1.1.7	Gaseous Waste Disposal (shared 1&2)	-	400	62	53	96	518	-	258	1,387	1,387	-	-	958	2,207	-	-	-	184,030	9,134	-
2b.1.1.8	High Pressure Injection	-	985	386	372	1,270	3,447	-	1,393	7,853	7,853	-	-	12,713	14,584	-	-	-	1,481,804	23,951	-
2b.1.1.9	Incore Instrumentation	-	17	1	0	-	4	-	5	28	28	-	-	-	18	-	-	-	1,228	466	-
2b.1.1.10	Liquid Waste Disposal (Shared 1&2)	1,379	1,702	204	188	330	1,838	-	1,672	7,313	7,313	-	-	3,300	7,834	-	-	-	648,825	68,520	-
2b.1.1.11	Low Pressure Injection	-	553	91	100	569	858	-	462	2,634	2,634	-	-	5,697	3,663	-	-	-	471,820	13,495	-
2b.1.1.12	On-Site/Off-Site Power	-	98	-	-	-	-	-	15	112	-	-	112	-	-	-	-	-	-	2,517	-
2b.1.1.13	Purge	-	162	8	14	484	-	-	116	783	783	-	-	4,842	-	-	-	-	196,641	3,632	-
2b.1.1.14	RFS Refueling Water	-	51	6	5	31	43	-	29	165	165	-	-	314	180	-	-	-	24,695	1,140	-
2b.1.1.15	Radiation Instrument Alarm	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	323	-
2b.1.1.16	Radiation Instrument Alarm RCA	-	29	0	0	6	-	-	8	44	44	-	-	63	-	-	-	-	2,565	788	-
2b.1.1.17	Reactor Building Cooling	-	362	30	54	1,873	-	-	383	2,701	2,701	-	-	18,745	-	-	-	-	761,247	8,761	-
2b.1.1.18	Reactor Coolant	-	260	32	23	51	223	-	135	723	723	-	-	510	939	-	-	-	83,034	6,528	-
2b.1.1.19	Reactor Coolant Storage	460	543	80	82	243	773	-	616	2,797	2,797	-	-	2,430	3,326	-	-	-	315,292	22,260	-
2b.1.1.20	Ventilation (Clean)	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,666	-
2b.1.1.21	Ventilation (Contaminated)	-	614	22	34	887	85	-	315	1,957	1,957	-	-	8,878	361	-	-	-	384,448	13,306	-
2b.1.1.22	Ventilation (clean) RCA	-	258	8	14	492	-	-	141	913	913	-	-	4,925	-	-	-	-	200,000	4,619	-
2b.1.1	Totals	1,838	8,670	980	1,016	8,242	8,000	-	6,477	35,225	34,115	-	1,110	82,506	34,006	-	-	-	5,591,580	241,502	-
2b.1.2	Scaffolding in support of decommissioning	-	605	13	3	60	11	-	165	857	857	-	-	542	48	-	-	-	27,527	18,455	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor Building	815	904	37	308	465	1,657	-	1,167	5,354	5,354	-	-	4,658	12,908	-	-	-	990,468	37,633	-
2b.1.3.2	Auxiliary Building	337	179	8	81	63	141	-	271	1,078	1,078	-	-	629	2,359	-	-	-	228,875	11,559	-
2b.1.3.3	Turbine Building	223	24	1	9	-	15	-	123	394	394	-	-	-	260	-	-	-	22,500	5,995	-
2b.1.3	Totals	1,375	1,107	45	397	528	1,812	-	1,561	6,826	6,826	-	-	5,286	15,526	-	-	-	1,241,843	55,187	-
2b.1	Subtotal Period 2b Activity Costs	3,213	10,383	1,039	1,417	8,831	9,824	-	8,203	42,909	41,798	-	1,110	88,333	49,580	-	-	-	6,860,950	315,144	-

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2b Additional Costs																					
2b.2.1	Containment Paint Remediation	79	-	9	14	-	105	-	69	275	275	-	-	-	452	-	-	-	-	800	-
2b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,439	732	3,171	3,171	-	-	-	-	-	-	-	-	49,937	-
2b.2.3	RX Closure Head Disposal	-	117	551	795	-	785	-	400	2,647	2,647	-	-	-	3,050	-	-	-	354,825	3,761	2,000
2b.2	Subtotal Period 2b Additional Costs	79	117	560	809	-	890	2,439	1,200	6,093	6,093	-	-	-	3,501	-	-	-	354,825	54,499	2,000
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	133	-	62	316	-	367	-	212	1,090	1,090	-	-	-	881	-	-	-	52,833	172	-
2b.3.2	Process decommissioning chemical flush waste	2	-	54	363	-	584	-	207	1,209	1,209	-	-	-	789	-	-	-	84,082	148	-
2b.3.3	Small tool allowance	-	221	-	-	-	-	-	33	255	255	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,400	210	1,610	-	1,610	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	135	221	116	679	-	952	1,400	662	4,164	2,554	1,610	-	-	1,670	-	-	-	136,916	319	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	860	-	-	-	-	-	-	215	1,075	1,075	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	932	93	1,025	1,025	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	2,323	232	2,555	2,555	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,765	-	-	-	-	-	691	3,456	3,456	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	5,204	-	-	-	-	-	781	5,985	5,985	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	109	16	-	244	-	74	444	444	-	-	-	5,005	-	-	-	100,099	163	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,111	167	1,278	1,278	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,051	105	1,156	1,156	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	311	31	342	-	342	-	-	-	-	-	-	-	-	-
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,128	169	1,298	-	1,298	-	-	-	-	-	-	-	-	-
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	477	72	549	549	-	-	-	-	-	-	-	-	-	-
2b.4.12	Corporate A&G	-	-	-	-	-	-	4,418	663	5,080	5,080	-	-	-	-	-	-	-	-	-	-
2b.4.13	Site O&M	-	-	-	-	-	-	429	64	493	493	-	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	4,631	695	5,326	5,326	-	-	-	-	-	-	-	-	-	141,573
2b.4.15	Utility Staff Cost	-	-	-	-	-	-	44,192	6,629	50,821	50,821	-	-	-	-	-	-	-	-	-	739,186
2b.4	Subtotal Period 2b Period-Dependent Costs	860	7,969	109	16	-	244	61,004	10,681	80,883	79,243	1,640	-	-	5,005	-	-	-	100,099	163	880,759
2b.0	TOTAL PERIOD 2b COST	4,287	18,690	1,824	2,920	8,831	11,909	64,843	20,746	134,049	129,689	3,250	1,110	88,333	59,756	-	-	-	7,452,790	370,126	882,759
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,269	640	4,909	-	4,909	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	4,269	640	4,909	-	4,909	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	2,129	213	2,342	2,342	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	1,165	116	1,281	1,281	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	1,906	-	-	-	-	-	477	2,383	2,383	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	46	7	-	104	-	32	188	188	-	-	-	2,125	-	-	-	42,506	69	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	677	101	778	778	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	1,491	149	1,640	1,640	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	711	71	782	-	782	-	-	-	-	-	-	-	-	-
2c.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	2,577	387	2,964	-	2,964	-	-	-	-	-	-	-	-	-
2c.4.9	Corporate A&G	-	-	-	-	-	-	1,266	190	1,455	1,455	-	-	-	-	-	-	-	-	-	-
2c.4.10	Site O&M	-	-	-	-	-	-	123	18	141	141	-	-	-	-	-	-	-	-	-	-
2c.4.11	Security Staff Cost	-	-	-	-	-	-	8,165	1,225	9,390	9,390	-	-	-	-	-	-	-	-	-	243,221
2c.4.12	Utility Staff Cost	-	-	-	-	-	-	12,515	1,877	14,392	14,392	-	-	-	-	-	-	-	-	-	211,746
2c.4	Subtotal Period 2c Period-Dependent Costs	-	1,906	46	7	-	104	30,818	4,856	37,737	33,992	3,745	-	-	2,125	-	-	-	42,506	69	454,967
2c.0	TOTAL PERIOD 2c COST	-	1,906	46	7	-	104	35,087	5,496	42,646	33,992	8,655	-	-	2,125	-	-	-	42,506	69	454,967
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	335	33	156	80	-	819	-	408	1,832	1,832	-	-	-	3,470	-	-	-	229,389	956	-
Disposal of Plant Systems																					
2d.1.2.1	Spent Fuel Cooling	324	288	46	50	190	453	-	388	1,739	1,739	-	-	1,899	1,926	-	-	-	204,141	10,101	-
2d.1.2	Totals	324	288	46	50	190	453	-	388	1,739	1,739	-	-	1,899	1,926	-	-	-	204,141	10,101	-

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Building	210	234	3	9	91	18	-	183	748	748	-	-	916	202	-	-	-	53,669	10,107	-
2d.1.3	Totals	210	234	3	9	91	18	-	183	748	748	-	-	916	202	-	-	-	53,669	10,107	-
2d.1.4	Scaffolding in support of decommissioning	-	121	3	1	12	2	-	33	171	171	-	-	108	10	-	-	-	5,505	3,691	-
2d.1	Subtotal Period 2d Activity Costs	869	677	208	138	293	1,292	-	1,012	4,490	4,490	-	-	2,923	5,608	-	-	-	492,704	24,855	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	553	166	719	719	-	-	-	-	-	-	-	-	-	4,160
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	537	161	698	698	-	-	-	-	-	-	-	-	10,991	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	1,090	327	1,417	1,417	-	-	-	-	-	-	-	-	10,991	4,160
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	34	-	17	88	-	102	-	57	298	298	-	-	-	245	-	-	-	14,682	48	-
2d.3.2	Process decommissioning chemical flush waste	1	-	36	246	-	395	-	140	818	818	-	-	-	534	-	-	-	56,876	100	-
2d.3.3	Small tool allowance	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	36	664	125	-	151	1,119	1,119	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	191	29	219	-	219	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	35	24	197	369	664	622	191	380	2,481	2,262	219	-	6,000	1,307	-	-	-	376,526	236	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	66	-	-	-	-	-	-	17	83	83	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	205	21	226	226	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	385	-	-	-	-	-	96	481	481	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,145	-	-	-	-	-	172	1,317	1,317	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	19	3	-	42	-	13	76	76	-	-	-	858	-	-	-	17,161	28	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	130	20	150	150	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	195	20	215	215	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	68	7	75	-	75	-	-	-	-	-	-	-	-	-
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	210	31	241	241	-	-	-	-	-	-	-	-	-	-
2d.4.11	Corporate A&G	-	-	-	-	-	-	702	105	807	807	-	-	-	-	-	-	-	-	-	-
2d.4.12	Site O&M	-	-	-	-	-	-	68	10	78	78	-	-	-	-	-	-	-	-	-	-
2d.4.13	Security Staff Cost	-	-	-	-	-	-	516	77	593	593	-	-	-	-	-	-	-	-	-	14,425
2d.4.14	Utility Staff Cost	-	-	-	-	-	-	7,117	1,068	8,185	8,185	-	-	-	-	-	-	-	-	-	117,454
2d.4	Subtotal Period 2d Period-Dependent Costs	66	1,530	19	3	-	42	9,215	1,656	12,530	12,455	75	-	-	858	-	-	-	17,161	28	131,880
2d.0	TOTAL PERIOD 2d COST	970	2,230	424	510	957	1,956	10,495	3,375	20,918	20,623	294	-	8,923	7,773	-	-	-	886,390	36,110	136,040
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license									a											
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	5,857	1,757	7,614	7,614	-	-	-	-	-	-	-	-	134,093	2,080
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	5,857	1,757	7,614	7,614	-	-	-	-	-	-	-	-	134,093	2,080
Period 2f Collateral Costs																					
2f.3.1	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	264	26	290	290	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	4	0	5	5	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	657	-	-	-	-	-	164	822	822	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	326	-	-	-	6,525	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	93	14	107	107	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	304	30	335	335	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	98	10	107	-	107	-	-	-	-	-	-	-	-	-
2f.4.8	Corporate A&G	-	-	-	-	-	-	531	80	610	610	-	-	-	-	-	-	-	-	-	-
2f.4.9	Site O&M	-	-	-	-	-	-	52	8	60	60	-	-	-	-	-	-	-	-	-	-
2f.4.10	Security Staff Cost	-	-	-	-	-	-	723	108	831	831	-	-	-	-	-	-	-	-	-	20,161
2f.4.11	Utility Staff Cost	-	-	-	-	-	-	5,646	847	6,493	6,493	-	-	-	-	-	-	-	-	-	88,786

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
2f.4	Subtotal Period 2f Period-Dependent Costs	-	657	7	1	-	16	7,715	1,293	9,689	9,582	107	-	-	326	-	-	-	6,525	11	108,947
2f.0	TOTAL PERIOD 2f COST	-	657	7	1	-	16	14,862	3,268	18,811	18,704	107	-	-	326	-	-	-	6,525	134,103	111,027
PERIOD 2 TOTALS		6,207	47,757	18,397	9,930	18,804	41,974	183,068	67,350	393,486	374,848	14,575	4,063	185,086	148,618	1,049	393	-	20,648,400	849,841	2,369,822
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	4,488	-	-	-	-	-	673	5,162	-	-	5,162	-	-	-	-	-	-	53,465	-
3b.1.1.2	Auxiliary Building	-	930	-	-	-	-	-	140	1,070	-	-	1,070	-	-	-	-	-	-	12,013	-
3b.1.1.3	Turbine Building	-	1,569	-	-	-	-	-	235	1,805	-	-	1,805	-	-	-	-	-	-	27,989	-
3b.1.1.4	Turbine Pedestal	-	450	-	-	-	-	-	68	518	-	-	518	-	-	-	-	-	-	4,881	-
3b.1.1.5	Fuel Building	-	712	-	-	-	-	-	107	819	-	-	819	-	-	-	-	-	-	9,163	-
3b.1.1	Totals	-	8,150	-	-	-	-	-	1,223	9,373	-	-	9,373	-	-	-	-	-	-	107,510	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	150	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	668
3b.1	Subtotal Period 3b Activity Costs	-	8,223	-	-	-	-	50	1,241	9,515	58	-	9,457	-	-	-	-	-	-	107,660	668
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	281	-	-	-	-	2	42	325	-	-	325	-	-	-	-	-	-	1,340	-
3b.2	Subtotal Period 3b Additional Costs	-	281	-	-	-	-	2	42	325	-	-	325	-	-	-	-	-	-	1,340	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	80	-	-	-	-	-	12	91	-	-	91	-	-	-	-	-	-	-	-
3b.3.2	Corporate A&G	-	-	-	-	-	-	1,044	157	1,200	-	-	1,200	-	-	-	-	-	-	-	-
3b.3.3	Site O&M	-	-	-	-	-	-	32	5	37	-	-	37	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	80	-	-	-	-	1,076	173	1,329	-	-	1,329	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	812	81	894	-	894	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	14	1	15	-	15	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	7,180	-	-	-	-	-	1,077	8,257	-	-	8,257	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	143	21	165	-	-	165	-	-	-	-	-	-	-	-
3b.4.5	Emergency Planning Fees	-	-	-	-	-	-	300	30	330	-	330	-	-	-	-	-	-	-	-	-
3b.4.6	Security Staff Cost	-	-	-	-	-	-	2,057	309	2,365	(0)	2,034	331	-	-	-	-	-	-	-	56,483
3b.4.7	Utility Staff Cost	-	-	-	-	-	-	10,785	1,618	12,403	0	1,488	10,914	-	-	-	-	-	-	-	174,627
3b.4	Subtotal Period 3b Period-Dependent Costs	-	7,180	-	-	-	-	14,112	3,137	24,429	0	4,762	19,667	-	-	-	-	-	-	-	231,110
3b.0	TOTAL PERIOD 3b COST	-	15,764	-	-	-	-	15,239	4,594	35,597	58	4,762	30,777	-	-	-	-	-	-	109,000	231,778
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,587	388	2,975	-	2,975	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	2,587	388	2,975	-	2,975	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.4	Emergency Planning Fees	-	-	-	-	-	-	1,342	134	1,476	-	1,476	-	-	-	-	-	-	-	-	-
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	1,342	134	1,476	-	1,476	-	-	-	-	-	-	-	-	-
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	3,929	522	4,451	-	4,451	-	-	-	-	-	-	-	-	-
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-
3d.1.1	Totals	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-

Table C-2
Oconee Nuclear Station, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3d Period-Dependent Costs																					
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	5	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	5	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.0	TOTAL PERIOD 3d COST	-	-	400	-	-	9,711	5	1,497	11,613	11,607	5	-	-	-	-	-	1,785	353,100	-	-
PERIOD 3 TOTALS		-	15,764	400	-	-	9,711	19,173	6,613	51,661	11,665	9,219	30,777	-	-	-	-	1,785	353,100	109,000	231,778
TOTAL COST TO DECOMMISSION		**9,355**	**69,797**	**18,885**	**10,676**	**18,804**	**55,309**	**268,981**	**86,993**	**538,799**	**478,282**	**25,278**	**35,239**	**185,086**	**175,131**	**1,842**	**393**	**1,785**	**21,444,700**	**1,006,906**	**3,350,047**

TOTAL COST TO DECOMMISSION WITH 19.25% CONTINGENCY:	**$538,799**	**thousands of 2013 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 88.77% OR:	**$478,282**	**thousands of 2013 dollars**
SPENT FUEL MANAGEMENT COST IS 4.69% OR:	**$25,278**	**thousands of 2013 dollars**
NON-NUCLEAR DEMOLITION COST IS 6.54% OR:	**$35,239**	**thousands of 2013 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**177,366**	**cubic feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**1,785**	**cubic feet**
TOTAL SCRAP METAL REMOVED:	**43,838**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**1,006,906**	**man-hours**

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	241	36	277	277	-	-	-	-	-	-	-	-	-	3,210
1a.1.13	Perform SER and EA	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,327
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	2,140
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	132	20	151	151	-	-	-	-	-	-	-	-	-	1,753
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	158	24	182	164	-	18	-	-	-	-	-	-	-	2,106
1a.1.17.2	Plant systems	-	-	-	-	-	-	134	20	154	139	-	15	-	-	-	-	-	-	-	1,783
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	16	2	18	18	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	228	34	262	262	-	-	-	-	-	-	-	-	-	3,039
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	209	31	240	240	-	-	-	-	-	-	-	-	-	2,782
1a.1.17.6	Biological shield	-	-	-	-	-	-	16	2	18	18	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,335
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	51	8	59	30	-	30	-	-	-	-	-	-	-	685
1a.1.17.9	Main Turbine	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	100	15	115	58	-	58	-	-	-	-	-	-	-	1,335
1a.1.17.12	Waste management	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	29	4	33	17	-	17	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,215	182	1,397	1,231	-	167	-	-	-	-	-	-	-	16,190
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	77	12	89	89	-	-	-	-	-	-	-	-	-	1,027
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,900	435	3,335	3,335	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	40	6	45	45	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	7,469	1,120	8,590	8,423	-	167	-	-	-	-	-	-	-	31,566
Period 1a Additional Costs																					
1a.2.1	Asbestos Abatement	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
1a.2	Subtotal Period 1a Additional Costs	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
Period 1a Collateral Costs																					
1a.3.1	Small tool allowance	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
1a.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	298	45	343	-	343	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	46	-	-	-	-	298	52	396	53	343	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	881	88	969	969	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,846	285	3,130	3,130	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	643	-	-	-	-	-	161	804	804	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	2	-	28	-	8	51	51	-	-	-	571	-	-	-	11,419	19	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	632	63	695	695	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	129	13	142	-	142	-	-	-	-	-	-	-	-	-
1a.4.9	FEMA Fees	-	-	-	-	-	-	173	26	199	-	199	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	783	117	900	-	900	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	111	17	128	-	128	-	-	-	-	-	-	-	-	-

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1a Period-Dependent Costs (continued)																					
1a.4.12	Corporate A&G	-	-	-	-	-	-	2,132	320	2,451	2,451	-	-	-	-	-	-	-	-	-	-
1a.4.13	Site O&M	-	-	-	-	-	-	126	19	145	145	-	-	-	-	-	-	-	-	-	-
1a.4.14	Security Staff Cost	-	-	-	-	-	-	2,670	401	3,071	3,071	-	-	-	-	-	-	-	-	-	83,595
1a.4.15	Utility Staff Cost	-	-	-	-	-	-	20,675	3,101	23,777	23,777	-	-	-	-	-	-	-	-	-	356,657
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,214	12	2	-	28	31,775	4,797	37,828	36,458	1,370	-	-	571	-	-	-	11,419	19	440,253
1a.0	TOTAL PERIOD 1a COST	-	4,637	16	321	-	2,953	39,543	7,593	55,063	53,183	1,713	167	-	26,026	-	-	-	342,334	38,639	471,819
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	152	23	175	157	-	17	-	-	-	-	-	-	-	2,026
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-	-	-	-	1,070
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	43	7	50	12	-	37	-	-	-	-	-	-	-	578
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	117	17	134	134	-	-	-	-	-	-	-	-	-	1,554
1b.1.1.9	Facility closeout	-	-	-	-	-	-	39	6	44	22	-	22	-	-	-	-	-	-	-	514
1b.1.1.10	Missile shields	-	-	-	-	-	-	14	2	17	17	-	-	-	-	-	-	-	-	-	193
1b.1.1.11	Biological shield	-	-	-	-	-	-	39	6	44	44	-	-	-	-	-	-	-	-	-	514
1b.1.1.12	Steam generators	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	32	5	37	18	-	18	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	50	8	58	-	-	58	-	-	-	-	-	-	-	668
1b.1.1.15	Main Condensers	-	-	-	-	-	-	50	8	58	-	-	58	-	-	-	-	-	-	-	668
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	88	13	101	91	-	10	-	-	-	-	-	-	-	1,168
1b.1.1.17	Reactor building	-	-	-	-	-	-	88	13	101	91	-	10	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,068	160	1,228	997	-	231	-	-	-	-	-	-	-	14,228
1b.1.2	Decon primary loop	646	-	-	-	-	-	-	323	969	969	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	646	-	-	-	-	-	1,068	483	2,197	1,966	-	231	-	-	-	-	-	-	1,067	14,228
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,040	1,056	8,096	8,096	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	1,192	358	1,550	1,550	-	-	-	-	-	-	-	-	8,167	3,357
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	8,233	1,414	9,646	9,646	-	-	-	-	-	-	-	-	8,167	3,357
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
1b.3.2	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	26	-	12	59	-	69	-	40	206	206	-	-	-	165	-	-	-	9,880	32	-
1b.3.4	Process decommissioning chemical flush waste	2	-	54	365	-	588	-	208	1,216	1,216	-	-	-	-	793	-	-	84,540	148	-
1b.3.5	Small tool allowance	-	1	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,500	-	-	-	-	-	-	225	1,725	1,725	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	280	42	322	-	322	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,473	1,101	65	424	-	656	1,410	992	7,122	6,800	322	-	-	165	793	-	-	94,421	181	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	29	-	-	-	-	-	-	7	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	439	44	483	483	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	61	6	67	67	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	253	-	-	-	-	-	63	317	317	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	285	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	322	-	-	-	6,449	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	615	92	707	707	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	181	18	199	199	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	65	6	71	-	71	-	-	-	-	-	-	-	-	-
1b.4.10	FEMA Fees	-	-	-	-	-	-	86	13	99	-	99	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	390	59	449	-	449	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	56	8	64	-	64	-	-	-	-	-	-	-	-	-
1b.4.13	Corporate A&G	-	-	-	-	-	-	1,299	195	1,494	1,494	-	-	-	-	-	-	-	-	-	-
1b.4.14	Site O&M	-	-	-	-	-	-	77	12	89	89	-	-	-	-	-	-	-	-	-	-

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1b Period-Dependent Costs (continued)																					
1b.4.15	Security Staff Cost	-	-	-	-	-	-	1,331	200	1,531	1,531	-	-	-	-	-	-	-	-	-	41,683
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	12,848	1,927	14,776	14,776	-	-	-	-	-	-	-	-	-	217,360
1b.4	Subtotal Period 1b Period-Dependent Costs	29	538	7	1	-	16	17,449	2,698	20,738	20,055	683	-	-	322	-	-	-	6,449	11	259,043
1b.0	TOTAL PERIOD 1b COST	3,148	1,640	73	425	-	672	28,159	5,587	39,703	38,467	1,005	231	-	487	793	-	-	100,870	9,425	276,628
PERIOD 1 TOTALS		3,148	6,276	89	746	-	3,625	67,702	13,179	94,766	91,650	2,718	398	-	26,513	793	-	-	443,204	48,064	748,447
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	162	163	21	39	-	417	-	234	1,036	1,036	-	-	-	1,023	-	-	-	116,897	7,013	-
2a.1.1.2	Pressurizer Relief Tank	15	12	4	8	-	74	-	31	144	144	-	-	-	188	-	-	-	20,849	612	-
2a.1.1.3	Reactor Coolant Pumps & Motors	113	77	211	230	-	2,243	-	692	3,566	3,566	-	-	-	8,012	-	-	-	807,600	4,924	100
2a.1.1.4	Pressurizer	43	47	466	105	-	986	-	342	1,989	1,989	-	-	-	3,521	-	-	-	381,437	2,569	625
2a.1.1.5	Steam Generators	145	2,064	1,702	1,298	-	5,740	-	2,388	13,336	13,336	-	-	-	20,507	-	-	-	2,803,298	11,616	1,167
2a.1.1.6	Retired Steam Generator Units	-	-	1,089	1,259	-	5,588	-	1,695	9,631	9,631	-	-	-	19,963	-	-	-	2,630,356	5,400	750
2a.1.1.7	CRDMs/ICIs/Service Structure Removal	141	104	335	107	-	523	-	277	1,488	1,488	-	-	-	5,513	-	-	-	146,613	5,070	-
2a.1.1.8	Reactor Vessel Internals	92	3,088	9,251	1,368	-	7,941	304	9,033	31,077	31,077	-	-	-	876	1,049	393	-	279,756	30,033	1,333
2a.1.1.9	Reactor Vessel	93	5,405	2,259	1,537	-	3,019	304	6,604	19,222	19,222	-	-	-	9,551	-	-	-	979,803	30,033	1,333
2a.1.1	Totals	804	10,959	15,339	5,951	-	26,531	609	21,296	81,489	81,489	-	-	-	69,154	1,049	393	-	8,166,609	97,271	5,308
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	319	331	98	564	456	-	326	2,094	2,094	-	-	3,819	2,127	-	-	-	369,734	7,674	-
2a.1.3	Main Condensers	-	956	161	64	558	497	-	473	2,709	2,709	-	-	5,044	2,107	-	-	-	366,238	23,585	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	777	-	-	-	-	-	117	893	893	-	-	-	-	-	-	-	-	9,379	-
2a.1.4.2	Auxiliary Building	-	141	-	-	-	-	-	21	162	162	-	-	-	-	-	-	-	-	1,898	-
2a.1.4.3	Hot Machine Shop (common)	-	6	-	-	-	-	-	1	7	7	-	-	-	-	-	-	-	-	102	-
2a.1.4.4	Interim Radwaste Building (common)	-	25	-	-	-	-	-	4	29	29	-	-	-	-	-	-	-	-	441	-
2a.1.4.5	Radwaste Facility (common)	-	230	-	-	-	-	-	34	264	264	-	-	-	-	-	-	-	-	2,577	-
2a.1.4.6	Service Building (common)	-	13	-	-	-	-	-	2	15	15	-	-	-	-	-	-	-	-	226	-
2a.1.4.7	Turbine Building	-	168	-	-	-	-	-	25	193	193	-	-	-	-	-	-	-	-	2,806	-
2a.1.4.8	Fuel Building	-	102	-	-	-	-	-	15	117	117	-	-	-	-	-	-	-	-	1,250	-
2a.1.4	Totals	-	1,462	-	-	-	-	-	219	1,682	1,682	-	-	-	-	-	-	-	-	18,679	-
Disposal of Plant Systems																					
2a.1.5.1	Auxiliary Steam (shared)	-	286	-	-	-	-	-	43	329	-	-	329	-	-	-	-	-	-	8,509	-
2a.1.5.2	Auxiliary Steam (shared) RCA	-	114	2	4	124	-	-	48	292	292	-	-	1,242	-	-	-	-	50,422	2,420	-
2a.1.5.3	Carbon Dioxide (shared)	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	139	-
2a.1.5.4	Carbon Dioxide (shared) RCA	-	13	0	0	13	-	-	5	32	32	-	-	131	-	-	-	-	5,337	274	-
2a.1.5.5	Chemical Addition	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	821	-
2a.1.5.6	Chemical Addition RCA	-	25	0	1	22	-	-	10	57	57	-	-	222	-	-	-	-	9,016	510	-
2a.1.5.7	Chilled Water (shared)	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	4,175	-
2a.1.5.8	Condensate	-	557	-	-	-	-	-	84	640	-	-	640	-	-	-	-	-	-	15,699	-
2a.1.5.9	Condensate (Contaminated)	-	628	47	88	3,035	-	-	630	4,429	4,429	-	-	30,383	-	-	-	-	1,233,881	15,479	-
2a.1.5.10	Condenser Circulating Water	-	355	-	-	-	-	-	53	408	-	-	408	-	-	-	-	-	-	10,040	-
2a.1.5.11	Demineralized Water (shared)	-	143	-	-	-	-	-	21	164	-	-	164	-	-	-	-	-	-	4,267	-
2a.1.5.12	Demineralized Water (shared) RCA	-	88	1	2	81	-	-	35	207	207	-	-	808	-	-	-	-	32,815	1,821	-
2a.1.5.13	Diesel Air (shared)	-	45	-	-	-	-	-	7	52	-	-	52	-	-	-	-	-	-	1,367	-
2a.1.5.14	Diesel Jacket Water (shared)	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	96	-
2a.1.5.15	Diesel Lube Oil (shared)	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	346	-
2a.1.5.16	Electro Hydraulic Turbine Control	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	499	-
2a.1.5.17	Equipment Cooling (shared)	-	94	-	-	-	-	-	14	108	-	-	108	-	-	-	-	-	-	2,728	-
2a.1.5.18	Essential Siphon Vacuum (shared)	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,549	-
2a.1.5.19	Feedwater & Emergency Feedwater	-	172	-	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	4,862	-
2a.1.5.20	Feedwater & Emergency Feedwater (Cont.)	-	179	8	14	487	-	-	121	809	809	-	-	4,873	-	-	-	-	197,906	4,387	-
2a.1.5.21	Feedwater & Emergency Feedwater RCA	-	262	8	14	481	-	-	140	905	905	-	-	4,815	-	-	-	-	195,560	5,622	-
2a.1.5.22	Filtered Water (shared)	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	2,925	-
2a.1.5.23	Filtered Water (shared) RCA	-	80	2	3	97	-	-	35	217	217	-	-	975	-	-	-	-	39,590	1,723	-
2a.1.5.24	Heater Drains	-	1,604	64	120	4,137	-	-	1,046	6,971	6,971	-	-	41,409	-	-	-	-	1,681,649	38,456	-
2a.1.5.25	Heater Drains (Contaminated)	-	85	-	-	-	-	-	13	97	-	-	97	-	-	-	-	-	-	2,239	-
2a.1.5.26	Heater Vent	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,002	-

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
2a.1.5.27	High Pressure Extraction	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	729	-
2a.1.5.28	High Pressure Service Water (shared)	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	3,016	-
2a.1.5.29	Hydraulic Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	75	-
2a.1.5.30	Hydrogen	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	848	-
2a.1.5.31	Hydrogen Seal Oil	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	899	-
2a.1.5.32	Keowee Decompressing Air (shared)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	153	-
2a.1.5.33	Low Pressure Extraction	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,096	-
2a.1.5.34	Low Pressure Service Water (shared)	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	9,404	-
2a.1.5.35	Main Steam	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,558	-
2a.1.5.36	Main Steam RCA	-	326	45	80	2,778	-	-	515	3,744	3,744	-	-	27,808	-	-	-	-	1,129,284	7,747	-
2a.1.5.37	Nitrogen (shared)	-	50	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	1,501	-
2a.1.5.38	Nitrogen (shared) RCA	-	75	1	2	53	-	-	27	158	158	-	-	534	-	-	-	-	21,704	1,492	-
2a.1.5.39	Periodic Testing (shared)	-	14	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	429	-
2a.1.5.40	Plant Heating Steam (shared)	-	227	-	-	-	-	-	34	261	-	-	261	-	-	-	-	-	-	6,722	-
2a.1.5.41	Post Accident Monitoring	-	30	1	1	40	-	-	14	85	85	-	-	401	-	-	-	-	16,304	785	-
2a.1.5.42	Protected Water System (shared)	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,366	-
2a.1.5.43	Reactor Building Spray	-	95	3	6	210	-	-	56	371	371	-	-	2,105	-	-	-	-	85,488	2,170	-
2a.1.5.44	Recirc Cooling Water	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,547	-
2a.1.5.45	Recirc Cooling Water RCA	-	135	3	5	173	-	-	61	376	376	-	-	1,727	-	-	-	-	70,146	2,938	-
2a.1.5.46	Sample Monitoring	-	117	14	15	24	146	-	73	389	389	-	-	244	618	-	-	-	50,777	3,113	-
2a.1.5.47	Second Side Cool Trtment Pond (shared)	-	39	-	-	-	-	-	6	45	-	-	45	-	-	-	-	-	-	1,108	-
2a.1.5.48	Service Air (shared)	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	1,254	-
2a.1.5.49	Standby Shutdown Facility (shared)	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	841	-
2a.1.5.50	Stator Coolant	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,507	-
2a.1.5.51	Steam Drain	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	2,668	-
2a.1.5.52	Steam Seal	-	52	1	2	53	-	-	21	129	129	-	-	533	-	-	-	-	21,649	1,169	-
2a.1.5.53	Turbine Oil	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,518	-
2a.1.5.54	Vacuum	-	120	-	-	-	-	-	18	138	-	-	138	-	-	-	-	-	-	3,438	-
2a.1.5	Totals	-	7,669	199	356	11,810	146	-	3,414	23,593	19,169	-	4,423	118,213	618	-	-	-	4,841,527	201,044	-
2a.1.6	Scaffolding in support of decommissioning	-	767	18	4	85	16	-	211	1,102	1,102	-	-	771	68	-	-	-	39,175	23,141	-
2a.1	Subtotal Period 2a Activity Costs	804	22,133	16,049	6,473	13,017	27,646	609	25,939	112,669	108,246	-	4,423	127,847	74,073	1,049	393	-	13,783,280	371,393	5,308
Period 2a Additional Costs																					
2a.2.1	Misc. Waste Disposal	-	-	36	239	-	1,716	-	468	2,460	2,460	-	-	-	17,591	-	-	-	487,058	1,076	-
2a.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,627	488	2,115	2,115	-	-	-	-	-	-	-	-	33,315	-
2a.2	Subtotal Period 2a Additional Costs	-	-	36	239	-	1,716	1,627	957	4,575	4,575	-	-	-	17,591	-	-	-	487,058	34,391	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	58	-	26	133	-	155	-	90	462	462	-	-	-	371	-	-	-	22,260	72	-
2a.3.3	Small tool allowance	-	292	-	-	-	-	-	44	335	302	-	34	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,035	155	1,190	-	1,190	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	58	292	26	133	-	155	1,035	289	1,988	764	1,190	34	-	371	-	-	-	22,260	72	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	93	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	622	62	684	684	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,098	210	2,308	2,077	-	231	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,645	-	-	-	-	-	661	3,306	3,306	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,506	-	-	-	-	-	526	4,032	4,032	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	110	16	-	247	-	75	448	448	-	-	-	5,057	-	-	-	101,134	165	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	939	141	1,080	1,080	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	558	56	614	614	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	208	21	228	-	228	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,254	188	1,443	-	1,443	-	-	-	-	-	-	-	-	-
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	179	27	206	-	206	-	-	-	-	-	-	-	-	-
2a.4.12	Corporate A&G	-	-	-	-	-	-	4,146	622	4,767	4,767	-	-	-	-	-	-	-	-	-	-
2a.4.13	Site O&M	-	-	-	-	-	-	403	60	463	463	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	3,089	463	3,552	3,552	-	-	-	-	-	-	-	-	-	94,436
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	42,286	6,343	48,629	48,629	-	-	-	-	-	-	-	-	-	693,643
2a.4	Subtotal Period 2a Period-Dependent Costs	93	6,151	110	16	-	247	55,781	9,478	71,877	69,770	1,876	231	-	5,057	-	-	-	101,134	165	788,079
2a.0	TOTAL PERIOD 2a COST	955	28,576	16,222	6,861	13,017	29,763	59,053	36,663	191,109	183,354	3,067	4,688	127,847	97,092	1,049	393	-	14,393,740	406,021	793,387

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Auxiliary Instrument Air (shared)	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	725	-
2b.1.1.2	Auxiliary Instrument Air (shared) RCA	-	32	0	1	24	-	-	12	69	69	-	-	240	-	-	-	-	9,761	632	-
2b.1.1.3	Breathing Air (shared)	-	872	12	21	719	-	-	330	1,953	1,953	-	-	7,197	-	-	-	-	292,274	17,058	-
2b.1.1.4	Chilled Water (shared) RCA	-	124	2	4	138	-	-	53	321	321	-	-	1,379	-	-	-	-	55,993	2,656	-
2b.1.1.5	Component Cooling	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,374	-
2b.1.1.6	Component Cooling RCA	-	129	2	4	143	-	-	54	333	333	-	-	1,430	-	-	-	-	58,079	2,726	-
2b.1.1.7	Compressed Air (Shared)	-	41	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	1,226	-
2b.1.1.8	Compressed Air (shared) RCA	-	303	4	7	245	-	-	114	673	673	-	-	2,455	-	-	-	-	99,688	6,181	-
2b.1.1.9	Core Flood	-	120	12	13	161	85	-	79	470	470	-	-	1,611	360	-	-	-	89,255	2,799	-
2b.1.1.10	Electrical (Clean)	-	1,101	-	-	-	-	-	165	1,266	-	-	1,266	-	-	-	-	-	-	29,289	-
2b.1.1.11	Electrical (Contaminated)	-	258	16	19	116	157	-	126	692	692	-	-	1,163	666	-	-	-	91,262	5,928	-
2b.1.1.12	Electrical (Contaminated) RCA	-	1,629	31	55	1,905	-	-	704	4,324	4,324	-	-	19,069	-	-	-	-	774,395	35,254	-
2b.1.1.13	Fuel Oil (shared)	-	56	-	-	-	-	-	8	65	-	-	65	-	-	-	-	-	-	1,583	-
2b.1.1.14	Fuel Oil (shared) RCA	-	13	0	0	11	-	-	5	30	30	-	-	111	-	-	-	-	4,488	277	-
2b.1.1.15	Gaseous Waste Disposal	-	400	62	53	96	518	-	258	1,387	1,387	-	-	958	2,207	-	-	-	184,030	9,134	-
2b.1.1.16	High Pressure Injection	-	985	386	372	1,270	3,447	-	1,393	7,853	7,853	-	-	12,713	14,584	-	-	-	1,481,804	23,951	-
2b.1.1.17	High Pressure Service Water (shared) RCA	-	1,020	24	44	1,510	-	-	491	3,089	3,089	-	-	15,119	-	-	-	-	613,994	21,776	-
2b.1.1.18	Incore Instrument Piping	-	17	1	0	-	4	-	5	28	28	-	-	-	18	-	-	-	1,228	466	-
2b.1.1.19	Instrument Air (shared)	-	98	-	-	-	-	-	15	113	-	-	113	-	-	-	-	-	-	2,835	-
2b.1.1.20	Instrument Air (shared) RCA	-	160	3	5	182	-	-	68	419	419	-	-	1,822	-	-	-	-	73,998	3,510	-
2b.1.1.21	Leak Test Rate (shared)	-	59	-	-	-	-	-	9	68	-	-	68	-	-	-	-	-	-	1,678	-
2b.1.1.22	Liquid Waste (shared)	1,047	1,304	172	162	261	1,585	-	1,326	5,857	5,857	-	-	2,611	6,741	-	-	-	550,054	50,683	-
2b.1.1.23	Liquid Waste Disposal	1,379	1,702	204	188	330	1,838	-	1,672	7,313	7,313	-	-	3,300	7,834	-	-	-	648,825	68,520	-
2b.1.1.24	Low Pressure Injection	-	553	91	100	569	858	-	462	2,634	2,634	-	-	5,697	3,663	-	-	-	471,820	13,495	-
2b.1.1.25	Low Pressure Service Water (shared) RCA	-	1,507	40	73	2,520	-	-	770	4,911	4,911	-	-	25,228	-	-	-	-	1,024,540	32,558	-
2b.1.1.26	On-Site/Off-Site Power	-	98	-	-	-	-	-	15	112	-	-	112	-	-	-	-	-	-	2,517	-
2b.1.1.27	Plant Drinking Water (shared)	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	4,204	-
2b.1.1.28	Plant Heating Steam (shared) RCA	-	122	2	3	100	-	-	46	273	273	-	-	1,005	-	-	-	-	40,799	2,528	-
2b.1.1.29	Purge	-	162	8	14	484	-	-	116	783	783	-	-	4,842	-	-	-	-	196,641	3,632	-
2b.1.1.30	RFS Refueling Water	-	51	6	5	31	43	-	29	165	165	-	-	314	180	-	-	-	24,695	1,140	-
2b.1.1.31	Radiation Instrument Alarm	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	323	-
2b.1.1.32	Radiation Instrument Alarm RCA	-	29	0	0	6	-	-	8	44	44	-	-	63	-	-	-	-	2,565	788	-
2b.1.1.33	Reactor Building Cooling	-	362	30	54	1,873	-	-	383	2,701	2,701	-	-	18,745	-	-	-	-	761,247	8,761	-
2b.1.1.34	Reactor Coolant	-	260	32	23	51	223	-	135	723	723	-	-	510	939	-	-	-	83,034	6,528	-
2b.1.1.35	Reactor Coolant Storage	460	543	80	82	243	773	-	616	2,797	2,797	-	-	2,430	3,326	-	-	-	315,292	22,260	-
2b.1.1.36	Reactor Coolant Treatment (shared)	153	170	24	20	43	189	-	178	778	778	-	-	434	809	-	-	-	70,654	7,353	-
2b.1.1.37	Resin Recovery (shared)	-	592	92	96	227	915	-	434	2,356	2,356	-	-	2,275	3,916	-	-	-	348,737	14,240	-
2b.1.1.38	Sanitary Waste (shared)	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	2,135	-
2b.1.1.39	Sanitary Waste (shared) RCA	-	37	1	1	32	-	-	14	84	84	-	-	320	-	-	-	-	12,994	781	-
2b.1.1.40	Service Air (shared) RCA	-	86	1	2	66	-	-	32	187	187	-	-	662	-	-	-	-	26,884	1,672	-
2b.1.1.41	Solidification (shared)	887	1,053	169	158	249	1,552	-	1,173	5,241	5,241	-	-	2,490	6,587	-	-	-	535,775	41,600	-
2b.1.1.42	Vehicle Fuel	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	303	-
2b.1.1.43	Ventilation (clean)	-	209	-	-	-	-	-	31	240	-	-	240	-	-	-	-	-	-	6,216	-
2b.1.1.44	Ventilation (clean) RCA	-	194	6	11	369	-	-	106	685	685	-	-	3,694	-	-	-	-	150,000	3,464	-
2b.1.1.45	Ventilation (contaminated)	-	617	22	34	888	88	-	317	1,966	1,966	-	-	8,891	371	-	-	-	385,590	13,389	-
2b.1.1	Totals	3,925	17,376	1,534	1,624	14,863	12,275	-	11,805	63,403	61,137	-	2,266	148,777	52,203	-	-	-	9,480,395	480,149	-
2b.1.2	Scaffolding in support of decommissioning	-	959	23	5	107	20	-	264	1,378	1,378	-	-	963	85	-	-	-	48,969	28,926	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor Building	815	904	37	308	465	1,657	-	1,167	5,354	5,354	-	-	4,658	12,908	-	-	-	990,468	37,633	-
2b.1.3.2	Auxiliary Building	389	202	9	92	71	160	-	310	1,232	1,232	-	-	707	2,685	-	-	-	260,397	13,225	-
2b.1.3.3	Contaminated Misc. Structures (common)	16	7	0	4	-	7	-	12	46	46	-	-	-	113	-	-	-	9,792	519	-
2b.1.3.4	Hot Machine Shop (common)	54	33	1	13	19	24	-	46	191	191	-	-	187	386	-	-	-	40,786	1,947	-
2b.1.3.5	Interim Radwaste Building (common)	110	55	2	26	17	46	-	87	344	344	-	-	169	775	-	-	-	73,666	3,713	-
2b.1.3.6	Radwaste Facility (common)	392	334	11	79	238	143	-	364	1,563	1,563	-	-	2,386	2,200	-	-	-	285,208	16,141	-
2b.1.3.7	Retired Steam Gen Storage Fac (common)	91	12	0	4	2	6	-	51	166	166	-	-	18	103	-	-	-	9,693	2,488	-
2b.1.3.8	Turbine Building	237	24	1	9	-	15	-	129	415	415	-	-	-	260	-	-	-	22,500	6,327	-
2b.1.3	Totals	2,104	1,572	62	535	812	2,057	-	2,167	9,309	9,309	-	-	8,125	19,430	-	-	-	1,692,509	81,994	-
2b.1	Subtotal Period 2b Activity Costs	6,030	19,907	1,619	2,164	15,781	14,353	-	14,236	74,090	71,824	-	2,266	157,865	71,718	-	-	-	11,221,870	591,069	-

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2b Additional Costs																					
2b.2.1	Containment Paint Remediation	79	-	9	14	-	105	-	69	275	275	-	-	-	452	-	-	-	-	800	-
2b.2.2	Landfill and Firing Range Closure	-	-	-	-	-	-	645	64	709	-	-	709	-	-	-	-	-	-	-	-
2b.2.3	Underground Services Excavation	-	882	-	-	-	-	508	209	1,599	-	-	1,599	-	-	-	-	-	-	10,000	-
2b.2.4	Pond Closures	-	-	-	-	-	-	1,068	160	1,228	-	-	1,228	-	-	-	-	-	-	2,572	-
2b.2.5	Remedial Action Surveys	-	-	-	-	-	-	2,439	732	3,171	3,171	-	-	-	-	-	-	-	-	49,937	-
2b.2.6	RX Closure Head Disposal	-	117	521	784	-	724	-	380	2,526	2,526	-	-	-	2,815	-	-	-	340,201	3,761	2,000
2b.2	Subtotal Period 2b Additional Costs	79	999	530	798	-	828	4,660	1,613	9,508	5,972	-	3,536	-	3,267	-	-	-	340,201	67,071	2,000
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	199	-	93	472	-	549	-	317	1,630	1,630	-	-	-	1,316	-	-	-	78,984	257	-
2b.3.2	Process decommissioning chemical flush waste	4	-	140	950	-	1,529	-	541	3,163	3,163	-	-	-	2,064	-	-	-	219,951	386	-
2b.3.3	Small tool allowance	-	411	-	-	-	-	-	62	473	473	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,255	188	1,443	-	1,443	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	203	411	233	1,421	-	2,078	1,255	1,108	6,710	5,266	1,443	-	-	3,381	-	-	-	298,935	643	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,306	-	-	-	-	-	-	327	1,633	1,633	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	932	93	1,025	1,025	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	2,461	246	2,707	2,707	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	4,178	-	-	-	-	-	1,044	5,222	5,222	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	5,204	-	-	-	-	-	781	5,985	5,985	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	179	26	-	402	-	122	729	729	-	-	-	8,230	-	-	-	164,594	268	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,111	167	1,278	1,278	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	837	84	920	920	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	311	31	342	-	342	-	-	-	-	-	-	-	-	-
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,881	282	2,163	-	2,163	-	-	-	-	-	-	-	-	-
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	477	72	549	549	-	-	-	-	-	-	-	-	-	-
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	268	40	308	-	308	-	-	-	-	-	-	-	-	-
2b.4.13	Corporate A&G	-	-	-	-	-	-	5,945	892	6,837	6,837	-	-	-	-	-	-	-	-	-	-
2b.4.14	Site O&M	-	-	-	-	-	-	578	87	665	665	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	4,631	695	5,326	5,326	-	-	-	-	-	-	-	-	-	141,573
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	60,753	9,113	69,866	69,866	-	-	-	-	-	-	-	-	-	994,769
2b.4	Subtotal Period 2b Period-Dependent Costs	1,306	9,382	179	26	-	402	80,185	14,075	105,555	102,742	2,813	-	-	8,230	-	-	-	164,594	268	1,136,341
2b.0	TOTAL PERIOD 2b COST	7,618	30,699	2,562	4,409	15,781	17,660	86,100	31,032	195,862	185,804	4,256	5,802	157,865	86,594	-	-	-	12,025,600	659,052	1,138,341
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Landfill Post Closure Maintenance	-	-	-	-	-	-	153	15	169	-	-	169	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	153	15	169	-	-	169	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	3,964	595	4,559	-	4,559	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	3,964	595	4,559	-	4,559	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	1,825	183	2,008	2,008	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	1,299	130	1,429	1,429	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	1,712	-	-	-	-	-	428	2,139	2,139	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	42	6	-	95	-	29	172	172	-	-	-	1,941	-	-	-	38,816	63	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	580	87	667	667	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	1,216	122	1,338	1,338	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	609	61	670	-	670	-	-	-	-	-	-	-	-	-
2c.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	3,682	552	4,234	-	4,234	-	-	-	-	-	-	-	-	-
2c.4.9	ISFSI Operating Costs	-	-	-	-	-	-	524	79	603	-	603	-	-	-	-	-	-	-	-	-
2c.4.10	Corporate A&G	-	-	-	-	-	-	2,316	347	2,664	2,664	-	-	-	-	-	-	-	-	-	-
2c.4.11	Site O&M	-	-	-	-	-	-	225	34	259	259	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	6,999	1,050	8,049	8,049	-	-	-	-	-	-	-	-	-	208,493
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	23,777	3,567	27,344	27,344	-	-	-	-	-	-	-	-	-	387,551
2c.4	Subtotal Period 2c Period-Dependent Costs	-	1,712	42	6	-	95	43,054	6,667	51,576	46,068	5,507	-	-	1,941	-	-	-	38,816	63	596,044
2c.0	TOTAL PERIOD 2c COST	-	1,712	42	6	-	95	47,171	7,277	56,303	46,068	10,067	169	-	1,941	-	-	-	38,816	63	596,044

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	211	21	98	50	-	515	-	257	1,152	1,152	-	-	-	2,182	-	-	-	144,242	601	-
Disposal of Plant Systems																					
2d.1.2.1	Spent Fuel Cooling	621	556	86	92	354	843	-	736	3,288	3,288	-	-	3,543	3,582	-	-	-	380,068	19,815	-
2d.1.2	Totals	621	556	86	92	354	843	-	736	3,288	3,288	-	-	3,543	3,582	-	-	-	380,068	19,815	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Building	270	309	4	11	129	24	-	240	987	987	-	-	1,293	260	-	-	-	73,485	13,187	-
2d.1.3	Totals	270	309	4	11	129	24	-	240	987	987	-	-	1,293	260	-	-	-	73,485	13,187	-
2d.1.4	Scaffolding in support of decommissioning	-	192	5	1	21	4	-	53	276	276	-	-	193	17	-	-	-	9,794	5,785	-
2d.1	Subtotal Period 2d Activity Costs	1,102	1,077	193	155	504	1,386	-	1,285	5,702	5,702	-	-	5,029	6,042	-	-	-	607,588	39,388	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	553	166	719	719	-	-	-	-	-	-	-	-	-	4,160
2d.2.2	Landfill Post Closure Maintenance	-	-	-	-	-	-	17	2	19	-	-	19	-	-	-	-	-	-	-	-
2d.2.3	Remedial Action Surveys	-	-	-	-	-	-	537	161	698	698	-	-	-	-	-	-	-	-	10,991	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	1,107	329	1,436	1,417	-	19	-	-	-	-	-	-	10,991	4,160
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	43	-	22	112	-	130	-	73	380	380	-	-	-	311	-	-	-	18,682	61	-
2d.3.2	Process decommissioning chemical flush waste	2	-	66	449	-	724	-	256	1,497	1,497	-	-	-	977	-	-	-	104,109	183	-
2d.3.3	Small tool allowance	-	32	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	36	664	125	-	151	1,119	1,119	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	191	29	219	-	219	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	45	32	232	597	664	978	191	513	3,252	3,033	219	-	6,000	1,817	-	-	-	427,758	332	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	76	-	-	-	-	-	-	19	95	95	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	205	21	226	226	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	451	-	-	-	-	-	113	564	564	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,145	-	-	-	-	-	172	1,317	1,317	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	27	4	-	61	-	19	111	111	-	-	-	1,258	-	-	-	25,159	41	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	130	20	150	150	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	157	16	173	173	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	68	7	75	-	75	-	-	-	-	-	-	-	-	-
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	210	31	241	241	-	-	-	-	-	-	-	-	-	-
2d.4.11	ISFSI Operating Costs	-	-	-	-	-	-	59	9	68	-	68	-	-	-	-	-	-	-	-	-
2d.4.12	Corporate A&G	-	-	-	-	-	-	702	105	807	807	-	-	-	-	-	-	-	-	-	-
2d.4.13	Site O&M	-	-	-	-	-	-	68	10	78	78	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	516	77	593	593	-	-	-	-	-	-	-	-	-	14,425
2d.4.15	Utility Staff Cost	-	-	-	-	-	-	7,117	1,068	8,185	8,185	-	-	-	-	-	-	-	-	-	117,454
2d.4	Subtotal Period 2d Period-Dependent Costs	76	1,597	27	4	-	61	9,236	1,686	12,688	12,544	143	-	-	1,258	-	-	-	25,159	41	131,880
2d.0	TOTAL PERIOD 2d COST	1,224	2,706	452	755	1,169	2,425	10,534	3,813	23,077	22,696	362	19	11,029	9,117	-	-	-	1,060,506	50,752	136,040
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license									a											
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,316	2,195	9,511	9,511	-	-	-	-	-	-	-	-	169,458	2,080
2f.2.2	Landfill Post Closure Maintenance	-	-	-	-	-	-	25	2	27	-	-	27	-	-	-	-	-	-	-	-
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,341	2,197	9,538	9,511	-	27	-	-	-	-	-	-	169,458	2,080
Period 2f Collateral Costs																					
2f.3.1	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	264	26	290	290	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	4	0	5	5	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	756	-	-	-	-	-	189	944	944	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	326	-	-	-	6,525	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	93	14	107	107	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	238	24	262	262	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	98	10	107	-	107	-	-	-	-	-	-	-	-	-
2f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	84	13	97	-	97	-	-	-	-	-	-	-	-	-
2f.4.9	Corporate A&G	-	-	-	-	-	-	531	80	610	610	-	-	-	-	-	-	-	-	-	-
2f.4.10	Site O&M	-	-	-	-	-	-	52	8	60	60	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	723	108	831	831	-	-	-	-	-	-	-	-	-	20,161
2f.4.12	Utility Staff Cost	-	-	-	-	-	-	5,646	847	6,493	6,493	-	-	-	-	-	-	-	-	-	88,786
2f.4	Subtotal Period 2f Period-Dependent Costs	-	756	7	1	-	16	7,732	1,323	9,835	9,631	204	-	-	326	-	-	-	6,525	11	108,947
2f.0	TOTAL PERIOD 2f COST	-	756	7	1	-	16	16,364	3,738	20,882	20,651	204	27	-	326	-	-	-	6,525	169,469	111,027
PERIOD 2 TOTALS		9,796	64,448	19,285	12,033	29,967	49,959	219,221	82,523	487,233	458,573	17,956	10,704	296,741	195,070	1,049	393	-	27,525,190	1,285,356	2,774,839
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	4,488	-	-	-	-	-	673	5,162	-	-	5,162	-	-	-	-	-	-	53,465	-
3b.1.1.2	Administration Building (common)	-	131	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,539	-
3b.1.1.3	Auxiliary Building	-	1,269	-	-	-	-	-	190	1,459	-	-	1,459	-	-	-	-	-	-	17,079	-
3b.1.1.4	Clean Misc. Site Structures (common)	-	6,964	-	-	-	-	-	1,045	8,008	-	-	8,008	-	-	-	-	-	-	85,550	-
3b.1.1.5	Condenser Discharge Structure (common)	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	2,541	-
3b.1.1.6	Contaminated Misc. Structures (common)	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	467	-
3b.1.1.7	Contract Services Building (common)	-	163	-	-	-	-	-	24	187	-	-	187	-	-	-	-	-	-	3,048	-
3b.1.1.8	Essential Siphon Vacuum Bldg. (common)	-	34	-	-	-	-	-	5	39	-	-	39	-	-	-	-	-	-	604	-
3b.1.1.9	Hot Machine Shop (common)	-	122	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	1,935	-
3b.1.1.10	Intake Structure (common)	-	3,503	-	-	-	-	-	525	4,029	-	-	4,029	-	-	-	-	-	-	45,036	-
3b.1.1.11	Interim Radwaste Building (common)	-	500	-	-	-	-	-	75	575	-	-	575	-	-	-	-	-	-	9,013	-
3b.1.1.12	Maintenance Support Building (common)	-	148	-	-	-	-	-	22	171	-	-	171	-	-	-	-	-	-	2,583	-
3b.1.1.13	Miscellaneous Site Foundations (common)	-	880	-	-	-	-	-	132	1,012	-	-	1,012	-	-	-	-	-	-	9,881	-
3b.1.1.14	PSW Building	-	109	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	1,682	-
3b.1.1.15	Radwaste Facility (common)	-	2,069	-	-	-	-	-	310	2,379	-	-	2,379	-	-	-	-	-	-	23,191	-
3b.1.1.16	Retired Steam Gen Storage Fac (common)	-	741	-	-	-	-	-	111	852	-	-	852	-	-	-	-	-	-	11,110	-
3b.1.1.17	Service Building (common)	-	311	-	-	-	-	-	47	357	-	-	357	-	-	-	-	-	-	6,113	-
3b.1.1.18	Standby Shutdown Facility (common)	-	546	-	-	-	-	-	82	628	-	-	628	-	-	-	-	-	-	6,550	-
3b.1.1.19	Switchgear Enclosure (common)	-	127	-	-	-	-	-	19	146	-	-	146	-	-	-	-	-	-	1,911	-
3b.1.1.20	Switchgear House (common)	-	64	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	819	-
3b.1.1.21	Technical Support Building (common)	-	55	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	1,034	-
3b.1.1.22	Turbine Building	-	1,633	-	-	-	-	-	245	1,879	-	-	1,879	-	-	-	-	-	-	28,771	-
3b.1.1.23	Turbine Pedestal	-	461	-	-	-	-	-	69	530	-	-	530	-	-	-	-	-	-	5,015	-
3b.1.1.24	Fuel Building	-	955	-	-	-	-	-	143	1,098	-	-	1,098	-	-	-	-	-	-	12,284	-
3b.1.1	Totals	-	25,615	-	-	-	-	-	3,842	29,457	-	-	29,457	-	-	-	-	-	-	332,220	-
Site Closeout Activities																					
3b.1.2	BackFill Site	-	4,891	-	-	-	-	-	734	5,624	-	-	5,624	-	-	-	-	-	-	8,346	-
3b.1.3	Grade & landscape site	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	297	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	668
3b.1	Subtotal Period 3b Activity Costs	-	30,612	-	-	-	-	50	4,599	35,262	58	-	35,204	-	-	-	-	-	-	340,862	668
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	892	-	-	-	-	6	135	1,032	-	-	1,032	-	-	-	-	-	-	4,251	-
3b.2.2	Landfill Post Closure Maintenance	-	-	-	-	-	-	76	8	83	-	-	83	-	-	-	-	-	-	-	-
3b.2	Subtotal Period 3b Additional Costs	-	892	-	-	-	-	81	142	1,115	-	-	1,115	-	-	-	-	-	-	4,251	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	252	-	-	-	-	-	38	290	-	-	290	-	-	-	-	-	-	-	-
3b.3.2	Corporate A&G	-	-	-	-	-	-	1,044	157	1,200	-	-	1,200	-	-	-	-	-	-	-	-
3b.3.3	Site O&M	-	-	-	-	-	-	32	5	37	-	-	37	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	252	-	-	-	-	1,076	199	1,527	-	-	1,527	-	-	-	-	-	-	-	-

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	812	81	894	-	894	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	14	1	15	-	15	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	7,180	-	-	-	-	-	1,077	8,257	-	-	8,257	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	143	21	165	-	-	165	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	603	60	663	-	663	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	300	30	330	-	330	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	259	39	298	-	298	-	-	-	-	-	-	-	-	-
3b.4.8	Security Staff Cost	-	-	-	-	-	-	2,057	309	2,365	(0)	2,034	331	-	-	-	-	-	-	-	56,483
3b.4.9	Utility Staff Cost	-	-	-	-	-	-	10,785	1,618	12,403	0	1,488	10,914	-	-	-	-	-	-	-	174,627
3b.4	Subtotal Period 3b Period-Dependent Costs	-	7,180	-	-	-	-	14,973	3,236	25,390	0	5,723	19,667	-	-	-	-	-	-	-	231,110
3b.0	TOTAL PERIOD 3b COST	-	38,936	-	-	-	-	16,181	8,177	63,294	58	5,723	57,513	-	-	-	-	-	-	345,113	231,778
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Additional Costs																					
3c.2.1	Landfill Post Closure Maintenance	-	-	-	-	-	-	382	38	420	-	-	420	-	-	-	-	-	-	-	-
3c.2	Subtotal Period 3c Additional Costs	-	-	-	-	-	-	382	38	420	-	-	420	-	-	-	-	-	-	-	-
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,587	388	2,975	-	2,975	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	2,587	388	2,975	-	2,975	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	3,630	363	3,993	-	3,993	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	62	6	68	-	68	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	3,802	380	4,182	-	4,182	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,342	134	1,476	-	1,476	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,156	173	1,329	-	1,329	-	-	-	-	-	-	-	-	-
3c.4.7	Corporate A&G	-	-	-	-	-	-	872	131	1,003	-	1,003	-	-	-	-	-	-	-	-	-
3c.4.8	Site O&M	-	-	-	-	-	-	21	3	24	-	24	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	7,454	1,118	8,572	-	8,572	-	-	-	-	-	-	-	-	194,606
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	9,176	1,376	10,553	-	10,553	-	-	-	-	-	-	-	-	145,954
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	27,515	3,685	31,200	-	31,200	-	-	-	-	-	-	-	-	340,560
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	30,483	4,112	34,595	-	34,175	420	-	-	-	-	-	-	-	340,560
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-
3d.1.1	Totals	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	400	-	-	9,711	-	1,497	11,607	11,607	-	-	-	-	-	-	1,785	353,100	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	13	1	15	-	15	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	0	0	0	-	0	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	10	1	11	-	11	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	5	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.6	ISFSI Operating Costs	-	-	-	-	-	-	4	1	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.7	Corporate A&G	-	-	-	-	-	-	3	0	4	-	4	-	-	-	-	-	-	-	-	-
3d.4.8	Security Staff Cost	-	-	-	-	-	-	83	12	95	-	95	-	-	-	-	-	-	-	-	2,160
3d.4.9	Utility Staff Cost	-	-	-	-	-	-	34	5	39	-	39	-	-	-	-	-	-	-	-	540
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	153	21	174	-	174	-	-	-	-	-	-	-	-	2,700
3d.0	TOTAL PERIOD 3d COST	-	-	400	-	-	9,711	153	1,518	11,781	11,607	174	-	-	-	-	-	1,785	353,100	-	2,700
PERIOD 3e - ISFSI Decontamination																					
Period 3e Additional Costs																					
3e.2.1	Decommissioning of ISFSI	-	191	9	1,663	-	3,093	2,148	1,776	8,880	8,880	-	-	-	44,708	-	-	-	6,580,725	25,919	2,088
3e.2	Subtotal Period 3e Additional Costs	-	191	9	1,663	-	3,093	2,148	1,776	8,880	8,880	-	-	-	44,708	-	-	-	6,580,725	25,919	2,088

Table C-3
Oconee Nuclear Station, Unit 3
DECON Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	117	29	146	146	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	2	1	3	3	-	-	-	-	-	-	-	-	-	-
3e.4.3	Heavy equipment rental	-	288	-	-	-	-	-	72	360	360	-	-	-	-	-	-	-	-	-	-
3e.4.4	Plant energy budget	-	-	-	-	-	-	21	5	26	26	-	-	-	-	-	-	-	-	-	-
3e.4.5	Corporate A&G	-	-	-	-	-	-	23	6	29	29	-	-	-	-	-	-	-	-	-	-
3e.4.6	Site O&M	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
3e.4.7	Security Staff Cost	-	-	-	-	-	-	198	50	248	248	-	-	-	-	-	-	-	-	-	5,096
3e.4.8	Utility Staff Cost	-	-	-	-	-	-	246	61	307	307	-	-	-	-	-	-	-	-	-	3,866
3e.4	Subtotal Period 3e Period-Dependent Costs	-	288	-	-	-	-	607	224	1,119	1,119	-	-	-	-	-	-	-	-	-	8,961
3e.0	TOTAL PERIOD 3e COST	-	479	9	1,663	-	3,093	2,756	2,000	10,000	10,000	-	-	-	44,708	-	-	-	6,580,725	25,919	11,049
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition of ISFSI	-	1,812	-	-	-	-	47	279	2,137	-	-	2,137	-	-	-	-	-	-	10,243	160
3f.2	Subtotal Period 3f Additional Costs	-	1,812	-	-	-	-	47	279	2,137	-	-	2,137	-	-	-	-	-	-	10,243	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	58	6	64	-	-	64	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	1	0	1	-	-	1	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	115	-	-	-	-	-	17	133	-	-	133	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-
3f.4.5	Corporate A&G	-	-	-	-	-	-	9	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.6	Security Staff Cost	-	-	-	-	-	-	98	15	113	-	-	113	-	-	-	-	-	-	-	2,527
3f.4.7	Utility Staff Cost	-	-	-	-	-	-	103	15	118	-	-	118	-	-	-	-	-	-	-	1,569
3f.4	Subtotal Period 3f Period-Dependent Costs	-	115	-	-	-	-	280	56	451	-	-	451	-	-	-	-	-	-	-	4,096
3f.0	TOTAL PERIOD 3f COST	-	1,939	-	-	-	-	326	337	2,603	-	-	2,603	-	-	-	-	-	-	10,243	4,256
PERIOD 3 TOTALS		-	41,354	409	1,663	-	12,803	49,899	16,144	122,272	21,664	40,072	60,536	-	44,708	-	-	1,785	6,933,825	381,275	590,343
TOTAL COST TO DECOMMISSION		**12,944**	**112,078**	**19,782**	**14,442**	**29,967**	**66,388**	**336,823**	**111,846**	**704,271**	**571,887**	**60,746**	**71,638**	**296,741**	**266,291**	**1,842**	**393**	**1,785**	**34,902,210**	**1,714,696**	**4,113,629**

TOTAL COST TO DECOMMISSION WITH 18.88% CONTINGENCY:	**$704,271**	**thousands of 2013 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 81.2% OR:	**$571,887**	**thousands of 2013 dollars**
SPENT FUEL MANAGEMENT COST IS 8.69% OR:	**$60,746**	**thousands of 2013 dollars**
NON-NUCLEAR DEMOLITION COST IS 10.11% OR:	**$71,638**	**thousands of 2013 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**268,526**	**cubic feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**1,785**	**cubic feet**
TOTAL SCRAP METAL REMOVED:	**66,542**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**1,714,696**	**man-hours**

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

APPENDIX D

DETAILED COST ANALYSIS

SAFSTOR

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Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	380	114	494	494	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	98	15	112	112	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	150	23	173	173	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	98	15	112	112	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	113	17	129	129	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	233	35	268	268	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	375	56	432	432	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	369	55	425	425	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	313	47	360	360	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	234	35	269	269	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	150	23	173	173	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	150	23	173	173	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	1,216	182	1,399	1,399	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	89	13	102	102	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	90	14	104	104	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	179	27	206	206	-	-	-	-	-	-	-	-	-	2,383
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	8	1	9	9	-	-	-	-	-	-	-	-	-	100
1a.1.19	Drain/de-energize non-cont. systems									a											
1a.1.20	Drain & dry NSSS									a											
1a.1.21	Drain/de-energize contaminated systems									a											
1a.1.22	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	3,074	518	3,592	3,592	-	-	-	-	-	-	-	-	-	35,890
Period 1a Additional Costs																					
1a.2.1	Asbestos Abatement	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
1a.2	Subtotal Period 1a Additional Costs	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
Period 1a Collateral Costs																					
1a.3.1	Small tool allowance	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	881	88	969	969	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	1,963	196	2,159	2,159	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	672	-	-	-	-	-	168	840	840	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	2	-	30	-	9	55	55	-	-	-	616	-	-	-	12,311	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,164	116	1,280	1,280	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	129	13	142	-	142	-	-	-	-	-	-	-	-	-
1a.4.9	FEMA Fees	-	-	-	-	-	-	171	26	197	-	197	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	470	70	540	-	540	-	-	-	-	-	-	-	-	-
1a.4.11	Corporate A&G	-	-	-	-	-	-	2,593	389	2,982	2,982	-	-	-	-	-	-	-	-	-	-
1a.4.12	Site O&M	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	1,405	211	1,615	1,615	-	-	-	-	-	-	-	-	-	46,678
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,614	3,842	29,456	29,456	-	-	-	-	-	-	-	-	-	433,829
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,243	13	2	-	30	35,171	5,332	41,791	40,911	880	-	-	616	-	-	-	12,311	20	480,507
1a.0	TOTAL PERIOD 1a COST	-	4,666	17	321	-	2,955	38,245	7,480	53,685	52,805	880	-	-	26,071	-	-	-	343,226	38,641	516,397

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor Building	803	-	-	-	-	-	-	402	1,205	1,205	-	-	-	-	-	-	-	-	19,093	-
1b.1.1.2	Auxiliary Building	317	-	-	-	-	-	-	159	476	476	-	-	-	-	-	-	-	-	7,865	-
1b.1.1.3	Turbine Building	237	-	-	-	-	-	-	119	356	356	-	-	-	-	-	-	-	-	5,893	-
1b.1.1.4	Fuel Building	208	-	-	-	-	-	-	104	312	312	-	-	-	-	-	-	-	-	4,427	-
1b.1.1	Totals	1,565	-	-	-	-	-	-	783	2,348	2,348	-	-	-	-	-	-	-	-	37,277	-
1b.1	Subtotal Period 1b Activity Costs	1,565	-	-	-	-	-	-	783	2,348	2,348	-	-	-	-	-	-	-	-	37,277	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	10,561	1,584	12,145	12,145	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	10,561	1,584	12,145	12,145	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	94	-	42	213	-	247	-	145	741	741	-	-	-	593	-	-	-	35,603	116	-
1b.3.4	Small tool allowance	-	26	-	-	-	-	-	4	30	30	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,040	26	42	213	-	247	-	291	1,859	1,859	-	-	-	593	-	-	-	35,603	116	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	729	-	-	-	-	-	-	182	911	911	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	222	22	244	244	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	495	49	544	544	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	296	-	-	-	-	-	74	369	369	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	144	-	-	-	-	-	22	166	166	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	12	2	-	27	-	8	49	49	-	-	-	557	-	-	-	11,133	18	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	33	3	36	-	36	-	-	-	-	-	-	-	-	-
1b.4.10	FEMA Fees	-	-	-	-	-	-	43	6	50	-	50	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	118	18	136	-	136	-	-	-	-	-	-	-	-	-
1b.4.12	Corporate A&G	-	-	-	-	-	-	654	98	752	752	-	-	-	-	-	-	-	-	-	-
1b.4.13	Site O&M	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	11,765
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	6,456	968	7,424	7,424	-	-	-	-	-	-	-	-	-	109,349
1b.4	Subtotal Period 1b Period-Dependent Costs	729	439	12	2	-	27	8,745	1,552	11,506	11,284	222	-	-	557	-	-	-	11,133	18	121,114
1b.0	TOTAL PERIOD 1b COST	3,334	466	54	214	-	275	19,305	4,209	27,858	27,636	222	-	-	1,150	-	-	-	46,735	37,411	121,114
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	418	-	-	-	-	-	63	480	480	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	33	-	-	-	-	-	5	38	38	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	14,124	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	44	7	50	50	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	451	-	-	-	-	777	294	1,521	1,521	-	-	-	-	-	-	-	-	17,824	583
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	110	-	49	249	-	289	-	169	866	866	-	-	-	694	-	-	-	41,619	135	-
1c.3.3	Small tool allowance	-	3	-	-	-	-	-	0	4	4	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	110	3	49	249	-	289	-	170	870	870	-	-	-	694	-	-	-	41,619	135	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	222	22	244	244	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	495	49	544	544	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	207	-	-	-	-	-	52	259	259	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	144	-	-	-	-	-	22	166	166	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	0	-	8	-	2	14	14	-	-	-	155	-	-	-	3,103	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	-

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1c Period-Dependent Costs (continued)																					
1c.4.7	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	33	3	36	-	36	-	-	-	-	-	-	-	-	-
1c.4.9	FEMA Fees	-	-	-	-	-	-	43	6	50	-	50	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	118	18	136	-	136	-	-	-	-	-	-	-	-	-
1c.4.11	Corporate A&G	-	-	-	-	-	-	654	98	752	752	-	-	-	-	-	-	-	-	-	-
1c.4.12	Site O&M	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	11,765
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	6,456	968	7,424	7,424	-	-	-	-	-	-	-	-	-	109,349
1c.4	Subtotal Period 1c Period-Dependent Costs	-	351	3	0	-	8	8,745	1,341	10,448	10,227	222	-	-	155	-	-	-	3,103	5	121,114
1c.0	TOTAL PERIOD 1c COST	110	805	52	249	-	297	9,521	1,805	12,839	12,617	222	-	-	849	-	-	-	44,722	17,965	121,697
PERIOD 1 TOTALS		3,444	5,936	124	785	-	3,527	67,072	13,495	94,381	93,058	1,323	-	-	28,069	-	-	-	434,683	94,017	759,208
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	332	50	382	382	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	1,400	350	1,750	1,750	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	1,732	400	2,132	2,132	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,833	1,025	7,858	-	7,858	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	6,833	1,025	7,858	-	7,858	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	3,938	394	4,332	3,782	550	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	6,708	671	7,379	66	7,312	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	2,004	-	-	-	-	-	501	2,505	2,505	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	51	7	-	114	-	35	207	207	-	-	-	2,335	-	-	-	46,709	76	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,252	188	1,439	720	720	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	2,992	299	3,291	3,291	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,314	131	1,446	-	1,446	-	-	-	-	-	-	-	-	-
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	4,767	715	5,482	-	5,482	-	-	-	-	-	-	-	-	-
2a.4.9	Corporate A&G	-	-	-	-	-	-	4,998	750	5,748	1,273	4,475	-	-	-	-	-	-	-	-	-
2a.4.10	Site O&M	-	-	-	-	-	-	603	90	693	154	540	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	15,104	2,266	17,369	4,560	12,809	-	-	-	-	-	-	-	-	449,893
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	51,307	7,696	59,003	12,032	46,971	-	-	-	-	-	-	-	-	836,271
2a.4	Subtotal Period 2a Period-Dependent Costs	-	2,004	51	7	-	114	92,982	13,735	108,894	28,591	80,303	-	-	2,335	-	-	-	46,709	76	1,286,164
2a.0	TOTAL PERIOD 2a COST	-	2,004	51	7	-	114	101,547	15,160	118,884	30,723	88,161	-	-	2,335	-	-	-	46,709	76	1,286,164
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	459	69	528	528	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	1,932	483	2,415	2,415	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	2,391	552	2,942	2,942	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,777	417	3,194	-	3,194	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	2,777	417	3,194	-	3,194	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	4,905	490	5,395	5,220	175	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	83	8	92	92	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	1,254	-	-	-	-	-	313	1,567	1,567	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	31	4	-	69	-	21	125	125	-	-	-	1,413	-	-	-	28,265	46	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	864	130	993	993	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	3,946	395	4,340	4,340	-	-	-	-	-	-	-	-	-	-

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2b Period-Dependent Costs (continued)																					
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,814	181	1,995	-	1,995	-	-	-	-	-	-	-	-	-
2b.4.8	Corporate A&G	-	-	-	-	-	-	1,397	210	1,606	-	1,606	-	-	-	-	-	-	-	-	-
2b.4.9	Site O&M	-	-	-	-	-	-	168	25	193	-	193	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	10,072	1,511	11,582	6,293	5,289	-	-	-	-	-	-	-	-	262,954
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	13,314	1,997	15,311	-	15,311	-	-	-	-	-	-	-	-	233,737
2b.4	Subtotal Period 2b Period-Dependent Costs	-	1,254	31	4	-	69	36,562	5,281	43,201	18,630	24,570	-	-	1,413	-	-	-	28,265	46	496,691
2b.0	TOTAL PERIOD 2b COST	-	1,254	31	4	-	69	41,730	6,250	49,337	21,573	27,764	-	-	1,413	-	-	-	28,265	46	496,691
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection									a											
2c.1.2	Semi-annual environmental survey									a											
2c.1.3	Prepare reports									a											
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	881	132	1,014	1,014	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	3,711	928	4,639	4,639	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	4,593	1,060	5,653	5,653	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	9,117	912	10,028	10,028	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	160	16	176	176	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,424	-	-	-	-	-	606	3,030	3,030	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	60	9	-	134	-	41	243	243	-	-	-	2,739	-	-	-	54,788	89	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	1,659	249	1,908	1,908	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	6,995	700	7,695	7,695	-	-	-	-	-	-	-	-	-	-
2c.4.7	Corporate A&G	-	-	-	-	-	-	2,935	440	3,376	3,376	-	-	-	-	-	-	-	-	-	-
2c.4.8	Site O&M	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	-
2c.4.9	Security Staff Cost	-	-	-	-	-	-	10,513	1,577	12,090	12,090	-	-	-	-	-	-	-	-	-	280,657
2c.4.10	Utility Staff Cost	-	-	-	-	-	-	27,740	4,161	31,901	31,901	-	-	-	-	-	-	-	-	-	491,150
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,424	60	9	-	134	59,474	8,754	70,855	70,855	-	-	-	2,739	-	-	-	54,788	89	771,807
2c.0	TOTAL PERIOD 2c COST	-	2,424	60	9	-	134	64,067	9,814	76,508	76,508	-	-	-	2,739	-	-	-	54,788	89	771,807
PERIOD 2 TOTALS		-	5,682	141	20	-	317	207,344	31,224	244,728	128,803	115,925	-	-	6,488	-	-	-	129,761	212	2,554,663
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	98	15	112	112	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	345	52	397	397	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	98	15	112	112	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	563	84	647	647	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	233	35	268	268	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	375	56	432	432	-	-	-	-	-	-	-	-	-	5,000
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	307	46	354	354	-	-	-	-	-	-	-	-	-	4,096
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	553	83	636	573	-	64	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	313	47	360	324	-	36	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	533	80	613	613	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	488	73	561	561	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	38	6	43	43	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	234	35	269	269	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	120	18	138	69	-	69	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	30	5	35	-	-	35	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	30	5	35	-	-	35	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	234	35	269	135	-	135	-	-	-	-	-	-	-	3,120
3a.1.11.11	Waste management	-	-	-	-	-	-	345	52	397	397	-	-	-	-	-	-	-	-	-	4,600
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	68	10	78	39	-	39	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	2,986	448	3,433	3,022	-	411	-	-	-	-	-	-	-	39,777

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	180	27	207	207	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,900	435	3,335	3,335	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-	-	-	-	1,400
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	92	14	106	106	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	10,557	1,584	12,141	11,729	-	411	-	-	-	-	-	-	-	72,703
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	2,788	837	3,625	3,625	-	-	-	-	-	-	-	-	19,100	7,852
3a.2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	2,788	837	3,625	3,625	-	-	-	-	-	-	-	-	19,100	7,852
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	339	34	373	373	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	430	-	-	-	-	-	108	538	538	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	11	2	-	25	-	8	46	46	-	-	-	514	-	-	-	10,287	17	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	381	38	419	419	-	-	-	-	-	-	-	-	-	-
3a.4.8	Corporate A&G	-	-	-	-	-	-	1,546	232	1,778	1,778	-	-	-	-	-	-	-	-	-	-
3a.4.9	Site O&M	-	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-	-	-	-	-
3a.4.10	Security Staff Cost	-	-	-	-	-	-	665	100	765	765	-	-	-	-	-	-	-	-	-	25,905
3a.4.11	Utility Staff Cost	-	-	-	-	-	-	15,285	2,293	17,578	17,578	-	-	-	-	-	-	-	-	-	258,629
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,001	11	2	-	25	18,943	3,006	22,989	22,989	-	-	-	514	-	-	-	10,287	17	284,533
3a.0	TOTAL PERIOD 3a COST	-	1,001	11	2	-	25	32,289	5,426	38,754	38,343	-	411	-	514	-	-	-	10,287	19,117	365,088
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	467	70	537	483	-	54	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	133	20	153	38	-	115	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	99	15	113	113	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	99	15	113	113	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	99	15	113	113	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	358	54	412	412	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	118	18	136	68	-	68	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	44	7	51	51	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	454	68	522	522	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	99	15	113	57	-	57	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	154	23	177	-	-	177	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	154	23	177	-	-	177	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	269	40	310	279	-	31	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	269	40	310	279	-	31	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,182	477	3,659	2,950	-	710	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,182	477	3,659	2,950	-	710	-	-	-	-	-	-	-	32,243
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
3b.3.2	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	946	1,100	-	-	-	-	1,130	476	3,652	3,652	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	29	-	-	-	-	-	-	7	37	37	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	198	20	217	217	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	238	-	-	-	-	-	60	298	298	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	291	-	-	-	-	-	44	335	335	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	1	-	14	-	4	26	26	-	-	-	292	-	-	-	5,831	10	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	314	47	361	361	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	194	19	214	214	-	-	-	-	-	-	-	-	-	-

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3b Period-Dependent Costs (continued)																					
3b.4.9	Corporate A&G	-	-	-	-	-	-	1,093	164	1,256	1,256	-	-	-	-	-	-	-	-	-	-
3b.4.10	Site O&M	-	-	-	-	-	-	74	11	85	85	-	-	-	-	-	-	-	-	-	-
3b.4.11	Security Staff Cost	-	-	-	-	-	-	339	51	390	390	-	-	-	-	-	-	-	-	-	13,201
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	11,080	1,662	12,742	12,742	-	-	-	-	-	-	-	-	-	182,811
3b.4	Subtotal Period 3b Period-Dependent Costs	29	529	6	1	-	14	13,295	2,089	15,964	15,964	-	-	-	292	-	-	-	5,831	10	196,012
3b.0	TOTAL PERIOD 3b COST	975	1,629	6	1	-	14	17,607	3,043	23,276	22,566	-	710	-	292	-	-	-	5,831	10	228,255
PERIOD 3 TOTALS		975	2,631	18	3	-	39	49,896	8,469	62,030	60,909	-	1,121	-	806	-	-	-	16,119	19,126	593,343
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	31	151	21	18	132	209	-	130	691	691	-	-	483	511	-	-	-	112,096	4,014	-
4a.1.1.2	Pressurizer Relief Tank	3	11	4	3	26	37	-	18	102	102	-	-	94	94	-	-	-	20,849	340	-
4a.1.1.3	Reactor Coolant Pumps & Motors	21	68	73	190	-	1,766	-	505	2,623	2,623	-	-	-	6,309	-	-	-	780,400	2,811	80
4a.1.1.4	Pressurizer	8	47	312	96	-	986	-	308	1,756	1,756	-	-	-	3,521	-	-	-	337,377	1,546	500
4a.1.1.5	Steam Generators	28	2,064	1,073	1,259	-	5,588	-	2,223	12,235	12,235	-	-	-	19,963	-	-	-	2,630,356	10,254	750
4a.1.1.6	Retired Steam Generator Units	-	-	1,073	1,259	-	5,588	-	1,693	9,614	9,614	-	-	-	19,963	-	-	-	2,630,356	5,400	750
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	27	99	324	73	166	245	-	168	1,102	1,102	-	-	1,823	3,253	-	-	-	136,066	2,687	-
4a.1.1.8	Reactor Vessel Internals	61	2,495	7,055	755	-	4,398	222	6,086	21,072	21,072	-	-	-	1,263	1,002	393	-	278,133	20,983	971
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	9,711	-	1,457	11,167	11,167	-	-	-	-	-	-	1,785	353,100	-	-
4a.1.1.10	Reactor Vessel	-	4,812	1,405	488	-	2,695	222	5,463	15,084	15,084	-	-	-	9,626	-	-	-	979,948	20,983	971
4a.1.1	Totals	178	9,746	11,340	4,142	324	31,221	444	18,050	75,445	75,445	-	-	2,400	64,505	1,002	393	1,785	8,258,682	69,018	4,023
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	282	224	34	593	-	-	187	1,320	1,320	-	-	4,020	-	-	-	-	241,216	6,768	-
4a.1.3	Main Condensers	-	858	116	17	588	-	-	317	1,895	1,895	-	-	5,310	-	-	-	-	238,934	21,071	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor Building	-	777	-	-	-	-	-	117	893	893	-	-	-	-	-	-	-	-	9,379	-
4a.1.4.2	Auxiliary Building	-	103	-	-	-	-	-	15	119	119	-	-	-	-	-	-	-	-	1,333	-
4a.1.4.3	Turbine Building	-	189	-	-	-	-	-	28	217	217	-	-	-	-	-	-	-	-	3,027	-
4a.1.4.4	Fuel Building	-	77	-	-	-	-	-	12	88	88	-	-	-	-	-	-	-	-	961	-
4a.1.4	Totals	-	1,146	-	-	-	-	-	172	1,318	1,318	-	-	-	-	-	-	-	-	14,700	-
Disposal of Plant Systems																					
4a.1.5.1	Chemical Addition	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	821	-
4a.1.5.2	Chemical Addition RCA	-	25	0	1	22	-	-	10	57	57	-	-	222	-	-	-	-	9,016	510	-
4a.1.5.3	Condensate	-	557	-	-	-	-	-	84	640	-	-	640	-	-	-	-	-	-	15,699	-
4a.1.5.4	Condensate (Contaminated)	-	564	47	88	3,035	-	-	614	4,349	4,349	-	-	30,383	-	-	-	-	1,233,881	13,824	-
4a.1.5.5	Condenser Circulating Water	-	355	-	-	-	-	-	53	408	-	-	408	-	-	-	-	-	-	10,040	-
4a.1.5.6	Electro Hydraulic Turbine Control	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	499	-
4a.1.5.7	Feedwater & Emergency Feedwater	-	172	-	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	4,862	-
4a.1.5.8	Feedwater & Emergency Feedwater (Cont.)	-	160	8	14	487	-	-	116	784	784	-	-	4,873	-	-	-	-	197,906	3,878	-
4a.1.5.9	Feedwater & Emergency Feedwater RCA	-	262	8	14	481	-	-	140	905	905	-	-	4,815	-	-	-	-	195,560	5,622	-
4a.1.5.10	Heater Drains	-	387	-	-	-	-	-	58	445	-	-	445	-	-	-	-	-	-	11,003	-
4a.1.5.11	Heater Drains (Contaminated)	-	273	8	16	541	-	-	153	991	991	-	-	5,419	-	-	-	-	220,074	6,646	-
4a.1.5.12	Heater Vent	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,002	-
4a.1.5.13	High Pressure Extraction	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	729	-
4a.1.5.14	Hydraulic Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	75	-
4a.1.5.15	Hydrogen	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	848	-
4a.1.5.16	Hydrogen Seal Oil	-	32	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	923	-
4a.1.5.17	Low Pressure Extraction	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,096	-
4a.1.5.18	Main Steam	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,558	-
4a.1.5.19	Main Steam RCA	-	326	45	80	2,778	-	-	515	3,744	3,744	-	-	27,808	-	-	-	-	1,129,284	7,747	-
4a.1.5.20	Moisture Separator Reheater Drains	-	6	0	0	6	-	-	3	16	16	-	-	65	-	-	-	-	2,629	147	-
4a.1.5.21	Post Accident Monitoring	-	30	1	1	40	-	-	14	85	85	-	-	401	-	-	-	-	16,304	785	-
4a.1.5.22	Reactor Building Spray	-	95	3	6	210	-	-	56	371	371	-	-	2,105	-	-	-	-	85,488	2,170	-
4a.1.5.23	Sample Monitoring	-	105	11	12	49	105	-	62	343	343	-	-	489	443	-	-	-	49,133	2,802	-
4a.1.5.24	Stator Coolant	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,507	-
4a.1.5.25	Steam Drain	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	2,668	-
4a.1.5.26	Steam Seal	-	52	1	2	53	-	-	21	129	129	-	-	533	-	-	-	-	21,649	1,169	-
4a.1.5.27	Turbine Oil	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,518	-

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4a.1.5.28	Vacuum	-	120	-	-	-	-	-	18	138	-	-	138	-	-	-	-	-	-	3,438	-
4a.1.5	Totals	-	4,049	132	233	7,704	105	-	2,027	14,249	11,775	-	2,474	77,114	443	-	-	-	3,160,923	106,586	-
4a.1.6	Scaffolding in support of decommissioning	-	428	10	2	48	9	-	118	615	615	-	-	433	38	-	-	-	22,021	13,013	-
4a.1	Subtotal Period 4a Activity Costs	178	16,509	11,822	4,428	9,257	31,335	444	20,870	94,842	92,368	-	2,474	89,277	64,985	1,002	393	1,785	11,921,780	231,156	4,023
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,257	377	1,634	1,634	-	-	-	-	-	-	-	-	25,741	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,257	377	1,634	1,634	-	-	-	-	-	-	-	-	25,741	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	3	-	3	16	-	18	-	9	49	49	-	-	-	44	-	-	-	2,642	9	-
4a.3.3	Small tool allowance	-	185	-	-	-	-	-	28	213	191	-	21	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	3	185	3	16	-	18	-	36	261	240	-	21	-	44	-	-	-	2,642	9	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	71	-	-	-	-	-	-	18	89	89	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	480	48	529	529	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	7	1	8	7	-	1	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,761	-	-	-	-	-	440	2,202	2,202	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,709	-	-	-	-	-	406	3,116	3,116	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	70	10	-	157	-	48	286	286	-	-	-	3,227	-	-	-	64,532	105	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	725	109	834	834	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	744	74	819	819	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	492	74	565	565	-	-	-	-	-	-	-	-	-	-
4a.4.10	Corporate A&G	-	-	-	-	-	-	2,825	424	3,249	3,249	-	-	-	-	-	-	-	-	-	-
4a.4.11	Site O&M	-	-	-	-	-	-	287	43	330	330	-	-	-	-	-	-	-	-	-	-
4a.4.12	Security Staff Cost	-	-	-	-	-	-	1,061	159	1,220	1,220	-	-	-	-	-	-	-	-	-	45,407
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	28,617	4,293	32,910	32,910	-	-	-	-	-	-	-	-	-	472,663
4a.4	Subtotal Period 4a Period-Dependent Costs	71	4,471	70	10	-	157	35,239	6,137	46,156	46,155	-	1	-	3,227	-	-	-	64,532	105	518,070
4a.0	TOTAL PERIOD 4a COST	252	21,164	11,896	4,454	9,257	31,511	36,940	27,421	142,894	140,398	-	2,497	89,277	68,256	1,002	393	1,785	11,988,950	257,011	522,092
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	305	33	156	80	-	819	-	393	1,787	1,787	-	-	-	3,470	-	-	-	229,389	956	-
Disposal of Plant Systems																					
4b.1.2.1	Component Cooling	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,374	-
4b.1.2.2	Component Cooling RCA	-	129	2	4	143	-	-	54	333	333	-	-	1,430	-	-	-	-	58,079	2,726	-
4b.1.2.3	Core Flood	-	109	3	6	211	-	-	60	390	390	-	-	2,110	-	-	-	-	85,669	2,499	-
4b.1.2.4	Electrical (Clean)	-	614	-	-	-	-	-	92	706	-	-	706	-	-	-	-	-	-	16,347	-
4b.1.2.5	Electrical (Contaminated)	-	188	4	6	157	14	-	75	444	444	-	-	1,571	59	-	-	-	67,733	4,239	-
4b.1.2.6	Electrical (Contaminated) RCA	-	1,313	24	44	1,516	-	-	565	3,463	3,463	-	-	15,179	-	-	-	-	616,410	28,392	-
4b.1.2.7	High Pressure Injection	-	895	169	197	2,540	1,275	-	970	6,046	6,046	-	-	25,429	5,398	-	-	-	1,389,890	21,082	-
4b.1.2.8	Incore Instrumentation	-	15	1	0	-	4	-	5	26	26	-	-	-	18	-	-	-	1,228	421	-
4b.1.2.9	Low Pressure Injection	-	500	54	65	827	426	-	371	2,243	2,243	-	-	8,280	1,809	-	-	-	455,552	12,024	-
4b.1.2.10	On-Site/Off-Site Power	-	98	-	-	-	-	-	15	112	-	-	112	-	-	-	-	-	-	2,517	-
4b.1.2.11	Purge	-	162	8	14	484	-	-	116	783	783	-	-	4,842	-	-	-	-	196,641	3,632	-
4b.1.2.12	RFS Refueling Water	-	47	1	2	56	-	-	20	126	126	-	-	562	-	-	-	-	22,826	1,017	-
4b.1.2.13	Radiation Instrument Alarm	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	323	-
4b.1.2.14	Radiation Instrument Alarm RCA	-	29	0	0	6	-	-	8	44	44	-	-	63	-	-	-	-	2,565	788	-
4b.1.2.15	Reactor Building Cooling	-	362	30	54	1,873	-	-	383	2,701	2,701	-	-	18,745	-	-	-	-	761,247	8,761	-
4b.1.2.16	Reactor Coolant	-	231	27	20	72	186	-	121	656	656	-	-	723	783	-	-	-	81,371	5,766	-
4b.1.2.17	Reactor Coolant Storage	-	493	60	64	384	539	-	331	1,872	1,872	-	-	3,848	2,309	-	-	-	307,351	11,619	-
4b.1.2.18	Spent Fuel Cooling	-	243	26	30	259	230	-	164	952	952	-	-	2,592	976	-	-	-	169,772	5,723	-
4b.1.2.19	Ventilation (Clean)	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,666	-
4b.1.2.20	Ventilation (Contaminated)	-	558	15	27	937	-	-	286	1,823	1,823	-	-	9,382	-	-	-	-	381,013	11,588	-
4b.1.2.21	Ventilation (clean) RCA	-	258	8	14	492	-	-	141	913	913	-	-	4,925	-	-	-	-	200,000	4,619	-
4b.1.2	Totals	-	6,496	431	548	9,958	2,675	-	3,815	23,924	22,814	-	1,110	99,682	11,353	-	-	-	4,797,347	151,124	-
4b.1.3	Scaffolding in support of decommissioning	-	642	16	3	72	14	-	177	923	923	-	-	650	57	-	-	-	33,032	19,519	-

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Decontamination of Site Buildings																					
4b.1.4.1	Reactor Building	734	723	32	283	465	499	-	788	3,523	3,523	-	-	4,658	8,080	-	-	-	885,053	31,783	-
4b.1.4.2	Auxiliary Building	298	97	5	41	63	73	-	207	784	784	-	-	629	1,194	-	-	-	127,973	9,019	-
4b.1.4.3	Turbine Building	221	21	1	9	-	15	-	121	388	388	-	-	-	260	-	-	-	22,500	5,790	-
4b.1.4.4	Fuel Building	188	202	3	6	91	13	-	162	665	665	-	-	916	120	-	-	-	46,577	8,869	-
4b.1.4	Totals	1,441	1,043	40	339	620	600	-	1,279	5,361	5,361	-	-	6,202	9,654	-	-	-	1,082,103	55,460	-
4b.1	Subtotal Period 4b Activity Costs	1,746	8,214	643	970	10,650	4,107	-	5,664	31,994	30,884	-	1,110	106,534	24,534	-	-	-	6,141,870	227,059	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	553	166	719	719	-	-	-	-	-	-	-	-	-	4,160
4b.2.2	Containment Paint Remediation	79	-	9	14	-	105	-	69	275	275	-	-	-	452	-	-	-	-	800	-
4b.2.3	Remedial Action Surveys	-	-	-	-	-	-	1,513	454	1,967	1,967	-	-	-	-	-	-	-	-	30,980	-
4b.2.4	RX Closure Head Disposal	-	117	551	795	-	785	-	400	2,647	2,647	-	-	-	3,050	-	-	-	354,825	3,761	2,000
4b.2	Subtotal Period 4b Additional Costs	79	117	560	809	-	890	2,066	1,088	5,609	5,609	-	-	-	3,501	-	-	-	354,825	35,542	6,160
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	7	-	8	43	-	50	-	23	132	132	-	-	-	120	-	-	-	7,180	23	-
4b.3.3	Small tool allowance	-	165	-	-	-	-	-	25	190	190	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	144	36	664	125	-	151	1,119	1,119	-	-	6,000	529	-	-	-	304,968	88	-
4b.3	Subtotal Period 4b Collateral Costs	7	165	152	78	664	175	-	199	1,441	1,441	-	-	6,000	649	-	-	-	312,147	111	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	801	-	-	-	-	-	-	200	1,001	1,001	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	578	58	636	636	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	9	1	10	10	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,839	-	-	-	-	-	460	2,299	2,299	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	3,228	-	-	-	-	-	484	3,712	3,712	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	78	11	-	175	-	53	318	318	-	-	-	3,587	-	-	-	71,745	117	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	689	103	793	793	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	896	90	985	985	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	592	89	681	681	-	-	-	-	-	-	-	-	-	-
4b.4.10	Corporate A&G	-	-	-	-	-	-	2,304	346	2,649	2,649	-	-	-	-	-	-	-	-	-	-
4b.4.11	Site O&M	-	-	-	-	-	-	234	35	269	269	-	-	-	-	-	-	-	-	-	-
4b.4.12	Security Staff Cost	-	-	-	-	-	-	1,277	191	1,468	1,468	-	-	-	-	-	-	-	-	-	54,649
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	22,764	3,415	26,179	26,179	-	-	-	-	-	-	-	-	-	385,463
4b.4	Subtotal Period 4b Period-Dependent Costs	801	5,067	78	11	-	175	29,342	5,525	40,999	40,999	-	-	-	3,587	-	-	-	71,745	117	440,112
4b.0	TOTAL PERIOD 4b COST	2,633	13,563	1,433	1,869	11,314	5,347	31,409	12,476	80,043	78,932	-	1,110	112,534	32,271	-	-	-	6,880,587	262,830	446,272
PERIOD 4e - Delay before License Termination																					
Period 4e Period-Dependent Costs																					
4e.4.2	Property taxes	-	-	-	-	-	-	15	1	16	16	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	219	-	-	-	-	-	55	274	274	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	5	1	-	12	-	4	22	22	-	-	-	247	-	-	-	4,932	8	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	643	64	707	707	-	-	-	-	-	-	-	-	-	-
4e.4.7	Corporate A&G	-	-	-	-	-	-	216	32	248	248	-	-	-	-	-	-	-	-	-	-
4e.4.8	Site O&M	-	-	-	-	-	-	22	3	25	25	-	-	-	-	-	-	-	-	-	-
4e.4.9	Security Staff Cost	-	-	-	-	-	-	13	2	15	15	-	-	-	-	-	-	-	-	-	10,320
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	1,902	285	2,187	2,187	-	-	-	-	-	-	-	-	-	36,120
4e.4	Subtotal Period 4e Period-Dependent Costs	-	219	5	1	-	12	3,115	493	3,846	3,846	-	-	-	247	-	-	-	4,932	8	46,440
4e.0	TOTAL PERIOD 4e COST	-	219	5	1	-	12	3,115	493	3,846	3,846	-	-	-	247	-	-	-	4,932	8	46,440
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license									a											
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	5,857	1,757	7,614	7,614	-	-	-	-	-	-	-	-	134,093	2,080
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	5,857	1,757	7,614	7,614	-	-	-	-	-	-	-	-	134,093	2,080

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 4f Collateral Costs																					
4f.3.1	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.2	Property taxes	-	-	-	-	-	-	4	0	5	5	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	656	-	-	-	-	-	164	821	821	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	325	-	-	-	6,501	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	93	14	107	107	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	453	45	499	499	-	-	-	-	-	-	-	-	-	-
4f.4.7	Corporate A&G	-	-	-	-	-	-	518	78	596	596	-	-	-	-	-	-	-	-	-	-
4f.4.8	Site O&M	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	-
4f.4.9	Security Staff Cost	-	-	-	-	-	-	253	38	291	291	-	-	-	-	-	-	-	-	-	9,429
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	5,517	828	6,345	6,345	-	-	-	-	-	-	-	-	-	86,696
4f.4	Subtotal Period 4f Period-Dependent Costs	-	656	7	1	-	16	6,892	1,180	8,752	8,752	-	-	-	325	-	-	-	6,501	11	96,124
4f.0	TOTAL PERIOD 4f COST	-	656	7	1	-	16	14,039	3,155	17,874	17,874	-	-	-	325	-	-	-	6,501	134,103	98,204
PERIOD 4 TOTALS		2,885	35,604	13,341	6,324	20,571	36,885	85,503	43,544	244,657	241,050	-	3,607	201,811	101,099	1,002	393	1,785	18,880,970	653,952	1,113,008
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor Building	-	4,488	-	-	-	-	-	673	5,162	-	-	5,162	-	-	-	-	-	-	53,465	-
5b.1.1.2	Auxiliary Building	-	930	-	-	-	-	-	140	1,070	-	-	1,070	-	-	-	-	-	-	12,013	-
5b.1.1.3	Turbine Building	-	1,831	-	-	-	-	-	275	2,105	-	-	2,105	-	-	-	-	-	-	31,130	-
5b.1.1.4	Turbine Pedestal	-	291	-	-	-	-	-	44	335	-	-	335	-	-	-	-	-	-	3,192	-
5b.1.1.5	Fuel Building	-	712	-	-	-	-	-	107	819	-	-	819	-	-	-	-	-	-	9,163	-
5b.1.1	Totals	-	8,252	-	-	-	-	-	1,238	9,490	-	-	9,490	-	-	-	-	-	-	108,963	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	150	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	154	23	177	177	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	8,326	-	-	-	-	154	1,272	9,752	177	-	9,574	-	-	-	-	-	-	109,113	1,560
Period 5b Additional Costs																					
5b.2.1	Concrete Crushing	-	285	-	-	-	-	2	43	329	-	-	329	-	-	-	-	-	-	1,357	-
5b.2	Subtotal Period 5b Additional Costs	-	285	-	-	-	-	2	43	329	-	-	329	-	-	-	-	-	-	1,357	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	80	-	-	-	-	-	12	93	-	-	93	-	-	-	-	-	-	-	-
5b.3.2	Corporate A&G	-	-	-	-	-	-	979	147	1,125	-	-	1,125	-	-	-	-	-	-	-	-
5b.3.3	Site O&M	-	-	-	-	-	-	32	5	37	-	-	37	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	80	-	-	-	-	1,011	164	1,255	-	-	1,255	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	14	1	15	-	-	15	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	7,180	-	-	-	-	-	1,077	8,257	-	-	8,257	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	143	21	165	-	-	165	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	678	102	780	-	-	780	-	-	-	-	-	-	-	23,377
5b.4.6	Utility Staff Cost	-	-	-	-	-	-	10,100	1,515	11,615	-	-	11,615	-	-	-	-	-	-	-	163,737
5b.4	Subtotal Period 5b Period-Dependent Costs	-	7,180	-	-	-	-	10,934	2,716	20,830	-	-	20,830	-	-	-	-	-	-	-	187,114
5b.0	TOTAL PERIOD 5b COST	-	15,870	-	-	-	-	12,101	4,195	32,166	177	-	31,989	-	-	-	-	-	-	110,470	188,674
PERIOD 5 TOTALS		-	15,870	-	-	-	-	12,101	4,195	32,166	177	-	31,989	-	-	-	-	-	-	110,470	188,674
TOTAL COST TO DECOMMISSION		**7,304**	**65,722**	**13,623**	**7,133**	**20,571**	**40,768**	**421,915**	**100,927**	**677,963**	**523,998**	**117,249**	**36,717**	**201,811**	**136,462**	**1,002**	**393**	**1,785**	**19,461,530**	**877,776**	**5,208,896**

Table D-1
Oconee Nuclear Station, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours

TOTAL COST TO DECOMMISSION WITH 17.49% CONTINGENCY:	$677,963	thousands of 2013 dollars
TOTAL NRC LICENSE TERMINATION COST IS 77.29% OR:	$523,998	thousands of 2013 dollars
SPENT FUEL MANAGEMENT COST IS 17.29% OR:	$117,249	thousands of 2013 dollars
NON-NUCLEAR DEMOLITION COST IS 5.42% OR:	$36,717	thousands of 2013 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	137,856	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,785	cubic feet
TOTAL SCRAP METAL REMOVED:	43,839	tons
TOTAL CRAFT LABOR REQUIREMENTS:	877,776	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	380	114	494	494	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	48	7	55	55	-	-	-	-	-	-	-	-	-	642
1a.1.13	Define major work sequence	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,327
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	2,140
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	158	24	182	182	-	-	-	-	-	-	-	-	-	2,106
1a.1.16.2	Plant systems	-	-	-	-	-	-	134	20	154	154	-	-	-	-	-	-	-	-	-	1,783
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,335
1a.1.16.4	Waste management	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.16	Total	-	-	-	-	-	-	521	78	599	599	-	-	-	-	-	-	-	-	-	6,936
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	38	6	44	44	-	-	-	-	-	-	-	-	-	506
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	39	6	44	44	-	-	-	-	-	-	-	-	-	514
1a.1.17	Total	-	-	-	-	-	-	77	11	88	88	-	-	-	-	-	-	-	-	-	1,020
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	3	0	4	4	-	-	-	-	-	-	-	-	-	43
1a.1.19	Drain/de-energize non-cont. systems									a											
1a.1.20	Drain & dry NSSS									a											
1a.1.21	Drain/de-energize contaminated systems									a											
1a.1.22	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	1,533	287	1,820	1,820	-	-	-	-	-	-	-	-	-	15,361
Period 1a Additional Costs																					
1a.2.1	Asbestos Abatement	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
1a.2	Subtotal Period 1a Additional Costs	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
Period 1a Collateral Costs																					
1a.3.1	Small tool allowance	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	881	88	969	969	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	1,963	196	2,159	2,159	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	643	-	-	-	-	-	161	804	804	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	2	-	28	-	8	51	51	-	-	-	571	-	-	-	11,419	19	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	826	83	908	908	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	129	13	142	-	142	-	-	-	-	-	-	-	-	-
1a.4.9	FEMA Fees	-	-	-	-	-	-	171	26	197	-	197	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	470	70	540	-	540	-	-	-	-	-	-	-	-	-
1a.4.11	Corporate A&G	-	-	-	-	-	-	2,132	320	2,451	2,451	-	-	-	-	-	-	-	-	-	-
1a.4.12	Site O&M	-	-	-	-	-	-	136	20	156	156	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	2,670	401	3,071	3,071	-	-	-	-	-	-	-	-	-	83,595
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	20,675	3,101	23,777	23,777	-	-	-	-	-	-	-	-	-	356,657
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,214	12	2	-	28	30,670	4,665	36,591	35,712	880	-	-	571	-	-	-	11,419	19	440,253
1a.0	TOTAL PERIOD 1a COST	-	4,637	16	321	-	2,953	32,203	6,583	46,713	45,833	880	-	-	26,026	-	-	-	342,334	38,639	455,613

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor Building	803	-	-	-	-	-	-	402	1,205	1,205	-	-	-	-	-	-	-	-	19,093	-
1b.1.1.2	Auxiliary Building	317	-	-	-	-	-	-	159	476	476	-	-	-	-	-	-	-	-	7,865	-
1b.1.1.3	Turbine Building	218	-	-	-	-	-	-	109	326	326	-	-	-	-	-	-	-	-	5,402	-
1b.1.1.4	Fuel Building	208	-	-	-	-	-	-	104	312	312	-	-	-	-	-	-	-	-	4,427	-
1b.1.1	Totals	1,546	-	-	-	-	-	-	773	2,319	2,319	-	-	-	-	-	-	-	-	36,787	-
1b.1	Subtotal Period 1b Activity Costs	1,546	-	-	-	-	-	-	773	2,319	2,319	-	-	-	-	-	-	-	-	36,787	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,040	1,056	8,096	8,096	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	7,040	1,056	8,096	8,096	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	94	-	42	212	-	247	-	144	739	739	-	-	-	591	-	-	-	35,489	115	-
1b.3.4	Small tool allowance	-	26	-	-	-	-	-	4	30	30	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7	1	9	-	9	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,039	26	42	212	-	247	7	291	1,865	1,856	9	-	-	591	-	-	-	35,489	115	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	725	-	-	-	-	-	-	181	906	906	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	222	22	244	244	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	495	49	544	544	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	286	-	-	-	-	-	71	357	357	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	144	-	-	-	-	-	22	166	166	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	12	2	-	26	-	8	48	48	-	-	-	539	-	-	-	10,771	18	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	118	12	129	129	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	33	3	36	-	36	-	-	-	-	-	-	-	-	-
1b.4.10	FEMA Fees	-	-	-	-	-	-	43	6	50	-	50	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	118	18	136	-	136	-	-	-	-	-	-	-	-	-
1b.4.12	Corporate A&G	-	-	-	-	-	-	537	81	618	618	-	-	-	-	-	-	-	-	-	-
1b.4.13	Site O&M	-	-	-	-	-	-	34	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	673	101	774	774	-	-	-	-	-	-	-	-	-	21,071
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	5,211	782	5,993	5,993	-	-	-	-	-	-	-	-	-	89,897
1b.4	Subtotal Period 1b Period-Dependent Costs	725	430	12	2	-	26	7,640	1,385	10,219	9,998	222	-	-	539	-	-	-	10,771	18	110,968
1b.0	TOTAL PERIOD 1b COST	3,310	456	54	214	-	273	14,688	3,505	22,499	22,269	230	-	-	1,130	-	-	-	46,260	36,920	110,968
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	418	-	-	-	-	-	63	480	480	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	33	-	-	-	-	-	5	38	38	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	14,124	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	250
1c.1	Subtotal Period 1c Activity Costs	-	451	-	-	-	-	752	290	1,492	1,492	-	-	-	-	-	-	-	-	17,824	250
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	110	-	49	249	-	289	-	169	866	866	-	-	-	694	-	-	-	41,619	135	-
1c.3.3	Small tool allowance	-	3	-	-	-	-	-	0	4	4	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	138	21	158	-	158	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	110	3	49	249	-	289	138	190	1,028	870	158	-	-	694	-	-	-	41,619	135	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	222	22	244	244	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	330	33	364	364	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	200	-	-	-	-	-	50	249	249	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	144	-	-	-	-	-	22	166	166	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	0	-	7	-	2	13	13	-	-	-	144	-	-	-	2,878	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	118	12	129	129	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	33	3	36	-	36	-	-	-	-	-	-	-	-	-
1c.4.9	FEMA Fees	-	-	-	-	-	-	43	6	50	-	50	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	118	18	136	-	136	-	-	-	-	-	-	-	-	-
1c.4.11	Corporate A&G	-	-	-	-	-	-	537	81	618	618	-	-	-	-	-	-	-	-	-	-

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1c Period-Dependent Costs (continued)																					
1c.4.12	Site O&M	-	-	-	-	-	-	34	5	39	39	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	673	101	774	774	-	-	-	-	-	-	-	-	-	21,071
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	5,211	782	5,993	5,993	-	-	-	-	-	-	-	-	-	89,897
1c.4	Subtotal Period 1c Period-Dependent Costs	-	344	3	0	-	7	7,476	1,160	8,989	8,768	222	-	-	144	-	-	-	2,878	5	110,968
1c.0	TOTAL PERIOD 1c COST	110	797	52	249	-	296	8,365	1,641	11,510	11,130	380	-	-	838	-	-	-	44,497	17,964	111,217
PERIOD 1 TOTALS		3,420	5,890	122	784	-	3,522	55,255	11,729	80,722	79,232	1,490	-	-	27,994	-	-	-	433,092	93,524	677,799
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	291	44	334	334	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	1,308	327	1,636	1,636	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	1,599	371	1,970	1,970	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,687	1,003	7,691	-	7,691	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	6,687	1,003	7,691	-	7,691	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	3,681	368	4,049	3,535	514	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	5,581	558	6,140	62	6,078	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	1,717	-	-	-	-	-	429	2,146	2,146	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	42	6	-	95	-	29	172	172	-	-	-	1,943	-	-	-	38,858	63	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,170	175	1,345	673	673	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	2,578	258	2,836	2,836	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,228	123	1,351	-	1,351	-	-	-	-	-	-	-	-	-
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	4,456	668	5,124	-	5,124	-	-	-	-	-	-	-	-	-
2a.4.9	Corporate A&G	-	-	-	-	-	-	2,188	328	2,516	544	1,972	-	-	-	-	-	-	-	-	-
2a.4.10	Site O&M	-	-	-	-	-	-	264	40	304	66	238	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	14,117	2,118	16,235	4,262	11,972	-	-	-	-	-	-	-	-	420,507
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	21,637	3,246	24,882	4,799	20,083	-	-	-	-	-	-	-	-	366,089
2a.4	Subtotal Period 2a Period-Dependent Costs	-	1,717	42	6	-	95	56,901	8,340	67,100	19,095	48,005	-	-	1,943	-	-	-	38,858	63	786,596
2a.0	TOTAL PERIOD 2a COST	-	1,717	42	6	-	95	65,187	9,714	76,761	21,065	55,696	-	-	1,943	-	-	-	38,858	63	786,596
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	429	64	494	494	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	1,932	483	2,415	2,415	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	2,361	547	2,909	2,909	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,777	417	3,194	-	3,194	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	2,777	417	3,194	-	3,194	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	4,905	490	5,395	5,220	175	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	83	8	92	92	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	1,254	-	-	-	-	-	313	1,567	1,567	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	31	4	-	69	-	21	125	125	-	-	-	1,413	-	-	-	28,265	46	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	864	130	993	993	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	3,669	367	4,036	4,036	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,814	181	1,995	-	1,995	-	-	-	-	-	-	-	-	-
2b.4.8	Corporate A&G	-	-	-	-	-	-	1,397	210	1,606	803	803	-	-	-	-	-	-	-	-	-
2b.4.9	Site O&M	-	-	-	-	-	-	168	25	193	97	96	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	10,072	1,511	11,582	6,293	5,289	-	-	-	-	-	-	-	-	262,954
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	13,314	1,997	15,311	7,085	8,226	-	-	-	-	-	-	-	-	233,737
2b.4	Subtotal Period 2b Period-Dependent Costs	-	1,254	31	4	-	69	36,286	5,254	42,897	26,312	16,585	-	-	1,413	-	-	-	28,265	46	496,691
2b.0	TOTAL PERIOD 2b COST	-	1,254	31	4	-	69	41,424	6,218	48,999	29,221	19,779	-	-	1,413	-	-	-	28,265	46	496,691

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection									a											
2c.1.2	Semi-annual environmental survey									a											
2c.1.3	Prepare reports									a											
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	863	129	992	992	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	3,882	970	4,852	4,852	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	4,745	1,100	5,844	5,844	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	9,535	954	10,489	10,489	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	168	17	184	184	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,431	-	-	-	-	-	608	3,038	3,038	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	59	9	-	132	-	40	240	240	-	-	-	2,704	-	-	-	54,082	88	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	1,735	260	1,996	1,996	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	7,112	711	7,823	7,823	-	-	-	-	-	-	-	-	-	-
2c.4.7	Corporate A&G	-	-	-	-	-	-	1,404	211	1,614	1,614	-	-	-	-	-	-	-	-	-	-
2c.4.8	Site O&M	-	-	-	-	-	-	169	25	194	194	-	-	-	-	-	-	-	-	-	-
2c.4.9	Security Staff Cost	-	-	-	-	-	-	10,996	1,649	12,645	12,645	-	-	-	-	-	-	-	-	-	293,543
2c.4.10	Utility Staff Cost	-	-	-	-	-	-	12,380	1,857	14,237	14,237	-	-	-	-	-	-	-	-	-	234,834
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,431	59	9	-	132	43,499	6,332	52,461	52,461	-	-	-	2,704	-	-	-	54,082	88	528,377
2c.0	TOTAL PERIOD 2c COST	-	2,431	59	9	-	132	48,243	7,432	58,305	58,305	-	-	-	2,704	-	-	-	54,082	88	528,377
PERIOD 2 TOTALS		-	5,401	132	19	-	296	154,855	23,363	184,066	108,591	75,475	-	-	6,060	-	-	-	121,205	198	1,811,664
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	241	36	277	277	-	-	-	-	-	-	-	-	-	3,210
3a.1.7	Perform SER and EA	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,327
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	2,140
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	132	20	151	151	-	-	-	-	-	-	-	-	-	1,753
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	237	36	272	245	-	27	-	-	-	-	-	-	-	3,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	134	20	154	139	-	15	-	-	-	-	-	-	-	1,783
3a.1.11.3	Reactor internals	-	-	-	-	-	-	228	34	262	262	-	-	-	-	-	-	-	-	-	3,039
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	209	31	240	240	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	16	2	18	18	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,335
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	51	8	59	30	-	30	-	-	-	-	-	-	-	685
3a.1.11.8	Main Turbine	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	100	15	115	58	-	58	-	-	-	-	-	-	-	1,335
3a.1.11.11	Waste management	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	29	4	33	17	-	17	-	-	-	-	-	-	-	385
3a.1.11	Total	-	-	-	-	-	-	1,278	192	1,470	1,294	-	176	-	-	-	-	-	-	-	17,024
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	77	12	89	89	-	-	-	-	-	-	-	-	-	1,027
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,900	435	3,335	3,335	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	599
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	40	6	45	45	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	7,436	1,115	8,551	8,375	-	176	-	-	-	-	-	-	-	31,117
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	1,192	358	1,550	1,550	-	-	-	-	-	-	-	-	8,167	3,357
3a.2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	1,192	358	1,550	1,550	-	-	-	-	-	-	-	-	8,167	3,357
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	339	34	373	373	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3a Period-Dependent Costs (continued)																					
3a.4.3	Health physics supplies	-	408	-	-	-	-	-	102	510	510	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	10	2	-	23	-	7	43	43	-	-	-	481	-	-	-	9,613	16	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	337	34	370	370	-	-	-	-	-	-	-	-	-	-
3a.4.8	Corporate A&G	-	-	-	-	-	-	1,197	180	1,376	1,376	-	-	-	-	-	-	-	-	-	-
3a.4.9	Site O&M	-	-	-	-	-	-	82	12	94	94	-	-	-	-	-	-	-	-	-	-
3a.4.10	Security Staff Cost	-	-	-	-	-	-	665	100	765	765	-	-	-	-	-	-	-	-	-	25,905
3a.4.11	Utility Staff Cost	-	-	-	-	-	-	11,431	1,715	13,146	13,146	-	-	-	-	-	-	-	-	-	200,229
3a.4	Subtotal Period 3a Period-Dependent Costs	-	979	10	2	-	23	14,673	2,362	18,049	18,049	-	-	-	481	-	-	-	9,613	16	226,133
3a.0	TOTAL PERIOD 3a COST	-	979	10	2	-	23	23,301	3,835	28,150	27,974	-	176	-	481	-	-	-	9,613	8,183	260,607
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	200	30	230	207	-	23	-	-	-	-	-	-	-	2,026
3b.1.1.2	Reactor internals	-	-	-	-	-	-	106	16	121	121	-	-	-	-	-	-	-	-	-	1,070
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	57	9	66	16	-	49	-	-	-	-	-	-	-	578
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	42	6	49	49	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	42	6	49	49	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	42	6	49	49	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,554
3b.1.1.8	Facility closeout	-	-	-	-	-	-	51	8	58	29	-	29	-	-	-	-	-	-	-	514
3b.1.1.9	Missile shields	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	193
3b.1.1.10	Biological shield	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	514
3b.1.1.11	Steam generators	-	-	-	-	-	-	194	29	223	223	-	-	-	-	-	-	-	-	-	1,969
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	42	6	49	24	-	24	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	66	10	76	-	-	76	-	-	-	-	-	-	-	668
3b.1.1.14	Main Condensers	-	-	-	-	-	-	66	10	76	-	-	76	-	-	-	-	-	-	-	668
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	115	17	133	119	-	13	-	-	-	-	-	-	-	1,168
3b.1.1.16	Reactor building	-	-	-	-	-	-	115	17	133	119	-	13	-	-	-	-	-	-	-	1,168
3b.1.1	Total	-	-	-	-	-	-	1,362	204	1,566	1,263	-	304	-	-	-	-	-	-	-	13,800
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,362	204	1,566	1,263	-	304	-	-	-	-	-	-	-	13,800
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
3b.3.2	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	946	1,100	-	-	-	-	1,130	476	3,652	3,652	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	29	-	-	-	-	-	-	7	37	37	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	198	20	217	217	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	222	-	-	-	-	-	55	277	277	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	291	-	-	-	-	-	44	335	335	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	1	-	13	-	4	24	24	-	-	-	266	-	-	-	5,328	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	314	47	361	361	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	172	17	189	189	-	-	-	-	-	-	-	-	-	-
3b.4.9	Corporate A&G	-	-	-	-	-	-	832	125	957	957	-	-	-	-	-	-	-	-	-	-
3b.4.10	Site O&M	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	-
3b.4.11	Security Staff Cost	-	-	-	-	-	-	339	51	390	390	-	-	-	-	-	-	-	-	-	13,201
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	8,207	1,231	9,438	9,438	-	-	-	-	-	-	-	-	-	139,234
3b.4	Subtotal Period 3b Period-Dependent Costs	29	513	6	1	-	13	10,122	1,610	12,294	12,294	-	-	-	266	-	-	-	5,328	9	152,435
3b.0	TOTAL PERIOD 3b COST	975	1,613	6	1	-	13	12,614	2,291	17,512	17,208	-	304	-	266	-	-	-	5,328	9	166,235
PERIOD 3 TOTALS		975	2,592	16	2	-	36	35,914	6,125	45,662	45,183	-	480	-	747	-	-	-	14,941	8,191	426,842

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	31	151	21	18	132	209	-	130	691	691	-	-	483	511	-	-	-	112,096	4,014	-
4a.1.1.2	Pressurizer Relief Tank	3	11	4	3	26	37	-	18	102	102	-	-	94	94	-	-	-	20,849	340	-
4a.1.1.3	Reactor Coolant Pumps & Motors	24	68	75	197	-	2,243	-	627	3,233	3,233	-	-	-	8,012	-	-	-	807,600	2,883	80
4a.1.1.4	Pressurizer	8	47	312	96	-	986	-	308	1,756	1,756	-	-	-	3,521	-	-	-	337,377	1,546	500
4a.1.1.5	Steam Generators	28	2,064	1,073	1,259	-	5,588	-	2,223	12,235	12,235	-	-	-	19,963	-	-	-	2,630,356	10,254	750
4a.1.1.6	Retired Steam Generator Units	-	-	1,073	1,259	-	5,588	-	1,693	9,614	9,614	-	-	-	19,963	-	-	-	2,630,356	5,400	750
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	27	99	324	73	166	245	-	168	1,102	1,102	-	-	1,823	3,253	-	-	-	136,066	2,687	-
4a.1.1.8	Reactor Vessel Internals	61	2,495	7,055	755	-	4,410	222	6,092	21,090	21,090	-	-	-	1,263	1,002	393	-	278,133	20,983	971
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	9,711	-	1,457	11,167	11,167	-	-	-	-	-	-	1,785	353,100	-	-
4a.1.1.10	Reactor Vessel	-	4,812	1,405	488	-	2,695	222	5,463	15,084	15,084	-	-	-	9,626	-	-	-	979,948	20,983	971
4a.1.1	Totals	181	9,746	11,343	4,148	324	31,710	444	18,178	76,073	76,073	-	-	2,400	66,207	1,002	393	1,785	8,285,882	69,090	4,023
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	282	224	34	593	-	-	187	1,320	1,320	-	-	4,020	-	-	-	-	241,216	6,768	-
4a.1.3	Main Condensers	-	858	116	17	588	-	-	317	1,895	1,895	-	-	5,310	-	-	-	-	238,934	21,071	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor Building	-	777	-	-	-	-	-	117	893	893	-	-	-	-	-	-	-	-	9,379	-
4a.1.4.2	Auxiliary Building	-	103	-	-	-	-	-	15	119	119	-	-	-	-	-	-	-	-	1,333	-
4a.1.4.3	Turbine Building	-	160	-	-	-	-	-	24	184	184	-	-	-	-	-	-	-	-	2,697	-
4a.1.4.4	Fuel Building	-	77	-	-	-	-	-	12	88	88	-	-	-	-	-	-	-	-	961	-
4a.1.4	Totals	-	1,117	-	-	-	-	-	168	1,285	1,285	-	-	-	-	-	-	-	-	14,370	-
Disposal of Plant Systems																					
4a.1.5.1	Chemical Addition	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	821	-
4a.1.5.2	Chemical Addition RCA	-	25	0	1	22	-	-	10	57	57	-	-	222	-	-	-	-	9,016	510	-
4a.1.5.3	Condensate	-	557	-	-	-	-	-	84	640	-	-	640	-	-	-	-	-	-	15,699	-
4a.1.5.4	Condensate (Contaminated)	-	564	47	88	3,035	-	-	614	4,349	4,349	-	-	30,383	-	-	-	-	1,233,881	13,824	-
4a.1.5.5	Condenser Circulating Water	-	355	-	-	-	-	-	53	408	-	-	408	-	-	-	-	-	-	10,040	-
4a.1.5.6	Electro Hydraulic Turbine Control	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	499	-
4a.1.5.7	Feedwater & Emergency Feedwater	-	172	-	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	4,862	-
4a.1.5.8	Feedwater & Emergency Feedwater (Cont.)	-	160	8	14	487	-	-	116	784	784	-	-	4,873	-	-	-	-	197,906	3,878	-
4a.1.5.9	Feedwater & Emergency Feedwater RCA	-	262	8	14	481	-	-	140	905	905	-	-	4,815	-	-	-	-	195,560	5,622	-
4a.1.5.10	Heater Drains	-	387	-	-	-	-	-	58	445	-	-	445	-	-	-	-	-	-	11,003	-
4a.1.5.11	Heater Drains (Contaminated)	-	273	8	16	541	-	-	153	991	991	-	-	5,419	-	-	-	-	220,074	6,646	-
4a.1.5.12	Heater Vent	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,002	-
4a.1.5.13	High Pressure Extraction	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	729	-
4a.1.5.14	Hydraulic Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	75	-
4a.1.5.15	Hydrogen	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	848	-
4a.1.5.16	Hydrogen Seal Oil	-	32	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	923	-
4a.1.5.17	Low Pressure Extraction	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,096	-
4a.1.5.18	Main Steam	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,558	-
4a.1.5.19	Main Steam RCA	-	326	45	80	2,778	-	-	515	3,744	3,744	-	-	27,808	-	-	-	-	1,129,284	7,747	-
4a.1.5.20	Post Accident Monitoring	-	30	1	1	40	-	-	14	85	85	-	-	401	-	-	-	-	16,304	785	-
4a.1.5.21	Reactor Building Spray	-	95	3	6	210	-	-	56	371	371	-	-	2,105	-	-	-	-	85,488	2,170	-
4a.1.5.22	Recirc Cooling Water (Shared 1&2)	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,547	-
4a.1.5.23	Recirc Cooling Water (shared 1&2) RCA	-	135	3	5	173	-	-	61	376	376	-	-	1,727	-	-	-	-	70,146	2,938	-
4a.1.5.24	Sample Monitoring	-	105	11	12	49	105	-	62	343	343	-	-	489	443	-	-	-	49,133	2,802	-
4a.1.5.25	Stator Coolant	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,507	-
4a.1.5.26	Steam Drain	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	2,668	-
4a.1.5.27	Steam Seal	-	52	1	2	53	-	-	21	129	129	-	-	533	-	-	-	-	21,649	1,169	-
4a.1.5.28	Turbine Oil	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,518	-
4a.1.5.29	Vacuum	-	120	-	-	-	-	-	18	138	-	-	138	-	-	-	-	-	-	3,438	-
4a.1.5	Totals	-	4,370	134	238	7,870	105	-	2,114	14,830	12,135	-	2,695	78,777	443	-	-	-	3,228,440	114,924	-
4a.1.6	Scaffolding in support of decommissioning	-	448	10	2	48	9	-	123	640	640	-	-	433	38	-	-	-	22,021	13,672	-
4a.1	Subtotal Period 4a Activity Costs	181	16,821	11,827	4,439	9,423	31,824	444	21,086	96,043	93,348	-	2,695	90,939	66,688	1,002	393	1,785	12,016,490	239,895	4,023
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,257	377	1,634	1,634	-	-	-	-	-	-	-	-	25,741	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,257	377	1,634	1,634	-	-	-	-	-	-	-	-	25,741	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	3	-	3	16	-	18	-	9	49	49	-	-	-	44	-	-	-	2,655	9	-
4a.3.3	Small tool allowance	-	190	-	-	-	-	-	29	219	197	-	22	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	3	190	3	16	-	18	-	37	268	246	-	22	-	44	-	-	-	2,655	9	-

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Oconee Nuclear Station, Unit 2
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(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	71	-	-	-	-	-	-	18	89	89	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	480	48	529	529	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	7	1	8	7	-	1	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,801	-	-	-	-	-	450	2,252	2,252	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,709	-	-	-	-	-	406	3,116	3,116	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	71	10	-	159	-	49	289	289	-	-	-	3,266	-	-	-	65,312	107	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	725	109	834	834	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	521	52	573	573	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	492	74	565	565	-	-	-	-	-	-	-	-	-	-
4a.4.10	Corporate A&G	-	-	-	-	-	-	2,825	424	3,249	3,249	-	-	-	-	-	-	-	-	-	-
4a.4.11	Site O&M	-	-	-	-	-	-	287	43	330	330	-	-	-	-	-	-	-	-	-	-
4a.4.12	Security Staff Cost	-	-	-	-	-	-	1,061	159	1,220	1,220	-	-	-	-	-	-	-	-	-	45,407
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	28,617	4,293	32,910	32,910	-	-	-	-	-	-	-	-	-	472,663
4a.4	Subtotal Period 4a Period-Dependent Costs	71	4,510	71	10	-	159	35,016	6,125	45,964	45,963	-	1	-	3,266	-	-	-	65,312	107	518,070
4a.0	TOTAL PERIOD 4a COST	255	21,522	11,901	4,466	9,423	32,001	36,717	27,625	143,909	141,191	-	2,718	90,939	69,998	1,002	393	1,785	12,084,460	265,751	522,092
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	305	33	156	80	-	819	-	393	1,787	1,787	-	-	-	3,470	-	-	-	229,389	956	-
Disposal of Plant Systems																					
4b.1.2.1	Component Cooling	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,374	-
4b.1.2.2	Component Cooling RCA	-	129	2	4	143	-	-	54	333	333	-	-	1,430	-	-	-	-	58,079	2,726	-
4b.1.2.3	Core Flood	-	109	3	6	211	-	-	60	390	390	-	-	2,110	-	-	-	-	85,669	2,499	-
4b.1.2.4	Electrical (Clean)	-	614	-	-	-	-	-	92	706	-	-	706	-	-	-	-	-	-	16,348	-
4b.1.2.5	Electrical (Contaminated)	-	188	4	6	157	14	-	75	444	444	-	-	1,572	59	-	-	-	67,736	4,240	-
4b.1.2.6	Electrical (Contaminated) RCA	-	1,313	24	44	1,516	-	-	565	3,463	3,463	-	-	15,179	-	-	-	-	616,430	28,393	-
4b.1.2.7	Gaseous Waste Disposal (shared 1&2)	-	367	51	44	164	404	-	229	1,259	1,259	-	-	1,638	1,717	-	-	-	179,777	8,192	-
4b.1.2.8	High Pressure Injection	-	895	169	197	2,540	1,275	-	970	6,046	6,046	-	-	25,429	5,398	-	-	-	1,389,890	21,082	-
4b.1.2.9	Incore Instrumentation	-	15	1	0	-	4	-	5	26	26	-	-	-	18	-	-	-	1,228	421	-
4b.1.2.10	Liquid Waste Disposal (Shared 1&2)	-	1,553	170	159	550	1,470	-	879	4,781	4,781	-	-	5,503	6,248	-	-	-	635,335	35,692	-
4b.1.2.11	Low Pressure Injection	-	500	54	65	827	426	-	371	2,243	2,243	-	-	8,280	1,809	-	-	-	455,552	12,024	-
4b.1.2.12	On-Site/Off-Site Power	-	98	-	-	-	-	-	15	112	-	-	112	-	-	-	-	-	-	2,517	-
4b.1.2.13	Purge	-	162	8	14	484	-	-	116	783	783	-	-	4,842	-	-	-	-	196,641	3,632	-
4b.1.2.14	RFS Refueling Water	-	47	1	2	56	-	-	20	126	126	-	-	562	-	-	-	-	22,826	1,017	-
4b.1.2.15	Radiation Instrument Alarm	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	323	-
4b.1.2.16	Radiation Instrument Alarm RCA	-	29	0	0	6	-	-	8	44	44	-	-	63	-	-	-	-	2,565	788	-
4b.1.2.17	Reactor Building Cooling	-	362	30	54	1,873	-	-	383	2,701	2,701	-	-	18,745	-	-	-	-	761,247	8,761	-
4b.1.2.18	Reactor Coolant	-	231	27	20	72	186	-	121	656	656	-	-	723	783	-	-	-	81,371	5,766	-
4b.1.2.19	Reactor Coolant Storage	-	493	60	64	384	539	-	331	1,872	1,872	-	-	3,848	2,309	-	-	-	307,351	11,619	-
4b.1.2.20	Spent Fuel Cooling	-	261	30	35	300	267	-	185	1,077	1,077	-	-	3,003	1,133	-	-	-	196,811	6,177	-
4b.1.2.21	Ventilation (Clean)	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,666	-
4b.1.2.22	Ventilation (Contaminated)	-	558	15	27	937	-	-	286	1,823	1,823	-	-	9,382	-	-	-	-	381,013	11,588	-
4b.1.2.23	Ventilation (clean) RCA	-	258	8	14	492	-	-	141	913	913	-	-	4,925	-	-	-	-	200,000	4,619	-
4b.1.2	Totals	-	8,435	655	756	10,713	4,586	-	4,944	30,089	28,979	-	1,110	107,235	19,474	-	-	-	5,639,521	195,463	-
4b.1.3	Scaffolding in support of decommissioning	-	671	16	3	72	14	-	184	960	960	-	-	650	57	-	-	-	33,032	20,508	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor Building	734	723	32	283	465	499	-	788	3,523	3,523	-	-	4,658	8,080	-	-	-	885,053	31,783	-
4b.1.4.2	Auxiliary Building	298	97	5	41	63	73	-	207	784	784	-	-	629	1,194	-	-	-	127,973	9,019	-
4b.1.4.3	Turbine Building	203	21	1	9	-	15	-	112	361	361	-	-	-	260	-	-	-	22,500	5,351	-
4b.1.4.4	Fuel Building	188	202	3	6	91	13	-	162	665	665	-	-	916	120	-	-	-	46,577	8,869	-
4b.1.4	Totals	1,423	1,043	40	339	620	600	-	1,270	5,334	5,334	-	-	6,202	9,654	-	-	-	1,082,103	55,022	-
4b.1	Subtotal Period 4b Activity Costs	1,728	10,182	867	1,178	11,405	6,019	-	6,792	38,170	37,059	-	1,110	114,087	32,656	-	-	-	6,984,045	271,948	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	553	166	719	719	-	-	-	-	-	-	-	-	-	4,160
4b.2.2	Containment Paint Remediation	79	-	9	14	-	105	-	69	275	275	-	-	-	452	-	-	-	-	800	-
4b.2.3	Remedial Action Surveys	-	-	-	-	-	-	1,513	454	1,967	1,967	-	-	-	-	-	-	-	-	30,980	-
4b.2.4	RX Closure Head Disposal	-	117	551	795	-	785	-	400	2,647	2,647	-	-	-	3,050	-	-	-	354,825	3,761	2,000
4b.2	Subtotal Period 4b Additional Costs	79	117	560	809	-	890	2,066	1,088	5,609	5,609	-	-	-	3,501	-	-	-	354,825	35,542	6,160
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	7	-	9	43	-	50	-	24	133	133	-	-	-	121	-	-	-	7,261	24	-
4b.3.3	Small tool allowance	-	195	-	-	-	-	-	29	224	224	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	144	36	664	125	-	151	1,119	1,119	-	-	6,000	529	-	-	-	304,968	88	-
4b.3	Subtotal Period 4b Collateral Costs	7	195	152	79	664	175	-	203	1,476	1,476	-	-	6,000	650	-	-	-	312,228	112	-

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	797	-	-	-	-	-	-	199	996	996	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	578	58	636	636	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	9	1	10	10	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,044	-	-	-	-	-	511	2,555	2,555	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	3,228	-	-	-	-	-	484	3,712	3,712	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	92	13	-	205	-	62	372	372	-	-	-	4,197	-	-	-	83,931	137	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	689	103	793	793	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	627	63	690	690	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	592	89	681	681	-	-	-	-	-	-	-	-	-	-
4b.4.10	Corporate A&G	-	-	-	-	-	-	2,304	346	2,649	2,649	-	-	-	-	-	-	-	-	-	-
4b.4.11	Site O&M	-	-	-	-	-	-	234	35	269	269	-	-	-	-	-	-	-	-	-	-
4b.4.12	Security Staff Cost	-	-	-	-	-	-	1,277	191	1,468	1,468	-	-	-	-	-	-	-	-	-	54,649
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	22,764	3,415	26,179	26,179	-	-	-	-	-	-	-	-	-	385,463
4b.4	Subtotal Period 4b Period-Dependent Costs	797	5,272	92	13	-	205	29,074	5,557	41,009	41,009	-	-	-	4,197	-	-	-	83,931	137	440,112
4b.0	TOTAL PERIOD 4b COST	2,611	15,766	1,670	2,079	12,069	7,288	31,140	13,640	86,263	85,153	-	1,110	120,087	41,004	-	-	-	7,735,029	307,739	446,272
PERIOD 4e - Delay before License Termination																					
Period 4e Period-Dependent Costs																					
4e.4.2	Property taxes	-	-	-	-	-	-	7	1	8	8	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	106	-	-	-	-	-	27	133	133	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	3	0	-	6	-	2	10	10	-	-	-	118	-	-	-	2,364	4	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	313	31	344	344	-	-	-	-	-	-	-	-	-	-
4e.4.7	Corporate A&G	-	-	-	-	-	-	54	8	62	62	-	-	-	-	-	-	-	-	-	-
4e.4.8	Site O&M	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	-
4e.4.9	Security Staff Cost	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	5,166
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	476	71	547	547	-	-	-	-	-	-	-	-	-	9,040
4e.4	Subtotal Period 4e Period-Dependent Costs	-	106	3	0	-	6	1,014	165	1,294	1,294	-	-	-	118	-	-	-	2,364	4	14,206
4e.0	TOTAL PERIOD 4e COST	-	106	3	0	-	6	1,014	165	1,294	1,294	-	-	-	118	-	-	-	2,364	4	14,206
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license									a											
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	5,719	1,716	7,434	7,434	-	-	-	-	-	-	-	-	130,733	2,080
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	5,719	1,716	7,434	7,434	-	-	-	-	-	-	-	-	130,733	2,080
Period 4f Collateral Costs																					
4f.3.1	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.2	Property taxes	-	-	-	-	-	-	4	0	5	5	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	647	-	-	-	-	-	162	809	809	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	325	-	-	-	6,501	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	93	14	107	107	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	304	30	335	335	-	-	-	-	-	-	-	-	-	-
4f.4.7	Corporate A&G	-	-	-	-	-	-	518	78	596	596	-	-	-	-	-	-	-	-	-	-
4f.4.8	Site O&M	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	-
4f.4.9	Security Staff Cost	-	-	-	-	-	-	253	38	291	291	-	-	-	-	-	-	-	-	-	9,429
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	5,517	828	6,345	6,345	-	-	-	-	-	-	-	-	-	86,696
4f.4	Subtotal Period 4f Period-Dependent Costs	-	647	7	1	-	16	6,743	1,163	8,576	8,576	-	-	-	325	-	-	-	6,501	11	96,124
4f.0	TOTAL PERIOD 4f COST	-	647	7	1	-	16	13,752	3,096	17,519	17,519	-	-	-	325	-	-	-	6,501	130,743	98,204
PERIOD 4 TOTALS		2,866	38,041	13,581	6,546	21,491	39,311	82,623	44,526	248,986	245,157	-	3,828	211,026	111,445	1,002	393	1,785	19,828,350	704,238	1,080,774

Table D-2
Oconee Nuclear Station, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor Building	-	4,488	-	-	-	-	-	673	5,162	-	-	5,162	-	-	-	-	-	-	53,465	-
5b.1.1.2	Auxiliary Building	-	930	-	-	-	-	-	140	1,070	-	-	1,070	-	-	-	-	-	-	12,013	-
5b.1.1.3	Turbine Building	-	1,569	-	-	-	-	-	235	1,805	-	-	1,805	-	-	-	-	-	-	27,989	-
5b.1.1.4	Turbine Pedestal	-	450	-	-	-	-	-	68	518	-	-	518	-	-	-	-	-	-	4,881	-
5b.1.1.5	Fuel Building	-	712	-	-	-	-	-	107	819	-	-	819	-	-	-	-	-	-	9,163	-
5b.1.1	Totals	-	8,150	-	-	-	-	-	1,223	9,373	-	-	9,373	-	-	-	-	-	-	107,510	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	150	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	668
5b.1	Subtotal Period 5b Activity Costs	-	8,223	-	-	-	-	66	1,243	9,533	76	-	9,457	-	-	-	-	-	-	107,660	668
Period 5b Additional Costs																					
5b.2.1	Concrete Crushing	-	281	-	-	-	-	2	42	325	-	-	325	-	-	-	-	-	-	1,340	-
5b.2	Subtotal Period 5b Additional Costs	-	281	-	-	-	-	2	42	325	-	-	325	-	-	-	-	-	-	1,340	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	80	-	-	-	-	-	12	91	-	-	91	-	-	-	-	-	-	-	-
5b.3.2	Corporate A&G	-	-	-	-	-	-	979	147	1,125	-	-	1,125	-	-	-	-	-	-	-	-
5b.3.3	Site O&M	-	-	-	-	-	-	32	5	37	-	-	37	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	80	-	-	-	-	1,011	164	1,254	-	-	1,254	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	14	1	15	-	-	15	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	7,180	-	-	-	-	-	1,077	8,257	-	-	8,257	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	143	21	165	-	-	165	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	678	102	780	-	-	780	-	-	-	-	-	-	-	23,377
5b.4.6	Utility Staff Cost	-	-	-	-	-	-	10,100	1,515	11,615	-	-	11,615	-	-	-	-	-	-	-	163,737
5b.4	Subtotal Period 5b Period-Dependent Costs	-	7,180	-	-	-	-	10,934	2,716	20,830	-	-	20,830	-	-	-	-	-	-	-	187,114
5b.0	TOTAL PERIOD 5b COST	-	15,764	-	-	-	-	12,013	4,166	31,942	76	-	31,866	-	-	-	-	-	-	109,000	187,782
PERIOD 5 TOTALS		-	15,764	-	-	-	-	12,013	4,166	31,942	76	-	31,866	-	-	-	-	-	-	109,000	187,782
TOTAL COST TO DECOMMISSION		**7,260**	**67,687**	**13,852**	**7,351**	**21,491**	**43,166**	**340,661**	**89,909**	**591,377**	**478,238**	**76,965**	**36,174**	**211,026**	**146,246**	**1,002**	**393**	**1,785**	**20,397,590**	**915,150**	**4,184,860**

TOTAL COST TO DECOMMISSION WITH 17.93% CONTINGENCY:	**$591,377**	**thousands of 2013 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 80.87% OR:	**$478,238**	**thousands of 2013 dollars**
SPENT FUEL MANAGEMENT COST IS 13.01% OR:	**$76,965**	**thousands of 2013 dollars**
NON-NUCLEAR DEMOLITION COST IS 6.12% OR:	**$36,174**	**thousands of 2013 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**147,640**	**cubic feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**1,785**	**cubic feet**
TOTAL SCRAP METAL REMOVED:	**43,985**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**915,150**	**man-hours**

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	380	114	494	494	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	48	7	55	55	-	-	-	-	-	-	-	-	-	642
1a.1.13	Define major work sequence	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,327
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	2,140
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	158	24	182	182	-	-	-	-	-	-	-	-	-	2,106
1a.1.16.2	Plant systems	-	-	-	-	-	-	134	20	154	154	-	-	-	-	-	-	-	-	-	1,783
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,335
1a.1.16.4	Waste management	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	856
1a.1.16	Total	-	-	-	-	-	-	521	78	599	599	-	-	-	-	-	-	-	-	-	6,936
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	38	6	44	44	-	-	-	-	-	-	-	-	-	506
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	39	6	44	44	-	-	-	-	-	-	-	-	-	514
1a.1.17	Total	-	-	-	-	-	-	77	11	88	88	-	-	-	-	-	-	-	-	-	1,020
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	3	0	4	4	-	-	-	-	-	-	-	-	-	43
1a.1.19	Drain/de-energize non-cont. systems									a											
1a.1.20	Drain & dry NSSS									a											
1a.1.21	Drain/de-energize contaminated systems									a											
1a.1.22	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	1,533	287	1,820	1,820	-	-	-	-	-	-	-	-	-	15,361
Period 1a Additional Costs																					
1a.2.1	Asbestos Abatement	-	3,376	4	319	-	2,925	-	1,624	8,249	8,249	-	-	-	25,455	-	-	-	330,915	38,621	-
1a.2.2	Landfill and Firing Range Closure	-	-	-	-	-	-	645	64	709	-	-	709	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	3,376	4	319	-	2,925	645	1,688	8,958	8,249	-	709	-	25,455	-	-	-	330,915	38,621	-
Period 1a Collateral Costs																					
1a.3.1	Small tool allowance	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	-	-
1a.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	298	45	343	-	343	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	46	-	-	-	-	298	52	396	53	343	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	881	88	969	969	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	1,960	196	2,156	2,156	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	643	-	-	-	-	-	161	804	804	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	2	-	28	-	8	51	51	-	-	-	571	-	-	-	11,419	19	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	632	63	695	695	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	129	13	142	-	142	-	-	-	-	-	-	-	-	-
1a.4.9	FEMA Fees	-	-	-	-	-	-	171	26	197	-	197	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	783	117	900	-	900	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	111	17	128	-	128	-	-	-	-	-	-	-	-	-
1a.4.12	Corporate A&G	-	-	-	-	-	-	2,132	320	2,451	2,451	-	-	-	-	-	-	-	-	-	-
1a.4.13	Site O&M	-	-	-	-	-	-	136	20	156	156	-	-	-	-	-	-	-	-	-	-
1a.4.14	Security Staff Cost	-	-	-	-	-	-	2,670	401	3,071	3,071	-	-	-	-	-	-	-	-	-	83,595
1a.4.15	Utility Staff Cost	-	-	-	-	-	-	20,675	3,101	23,777	23,777	-	-	-	-	-	-	-	-	-	356,657

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,214	12	2	-	28	30,898	4,709	36,863	35,495	1,368	-	-	571	-	-	-	11,419	19	440,253
1a.0	TOTAL PERIOD 1a COST	-	4,637	16	321	-	2,953	33,373	6,736	48,037	45,617	1,711	709	-	26,026	-	-	-	342,334	38,639	455,613
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor Building	803	-	-	-	-	-	-	402	1,205	1,205	-	-	-	-	-	-	-	-	19,093	-
1b.1.1.2	Auxiliary Building	366	-	-	-	-	-	-	183	549	549	-	-	-	-	-	-	-	-	9,084	-
1b.1.1.3	Contaminated Misc. Structures(common)	15	-	-	-	-	-	-	8	23	23	-	-	-	-	-	-	-	-	379	-
1b.1.1.4	Hot Machine Shop(common)	51	-	-	-	-	-	-	26	77	77	-	-	-	-	-	-	-	-	1,267	-
1b.1.1.5	Interim Radwaste Building(common)	103	-	-	-	-	-	-	52	155	155	-	-	-	-	-	-	-	-	2,570	-
1b.1.1.6	Radwaste Facility(common)	374	-	-	-	-	-	-	187	562	562	-	-	-	-	-	-	-	-	8,941	-
1b.1.1.7	Retired Steam Gen Storage Fac.(common)	81	-	-	-	-	-	-	40	121	121	-	-	-	-	-	-	-	-	1,942	-
1b.1.1.8	Turbine Building	210	-	-	-	-	-	-	105	316	316	-	-	-	-	-	-	-	-	5,127	-
1b.1.1.9	Fuel Building	241	-	-	-	-	-	-	120	361	361	-	-	-	-	-	-	-	-	5,111	-
1b.1.1	Totals	2,245	-	-	-	-	-	-	1,123	3,368	3,368	-	-	-	-	-	-	-	-	53,513	-
1b.1	Subtotal Period 1b Activity Costs	2,245	-	-	-	-	-	-	1,123	3,368	3,368	-	-	-	-	-	-	-	-	53,513	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,040	1,056	8,096	8,096	-	-	-	-	-	-	-	-	-	-
1b.2.2	Misc. Waste Disposal	-	-	36	239	-	1,716	-	468	2,460	2,460	-	-	-	17,591	-	-	-	487,058	1,076	-
1b.2.3	Landfill Post Closure Maintenance	-	-	-	-	-	-	8	1	9	-	-	9	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	36	239	-	1,716	7,049	1,525	10,565	10,556	-	9	-	17,591	-	-	-	487,058	1,076	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	106	-	48	241	-	280	-	164	839	839	-	-	-	672	-	-	-	40,318	131	-
1b.3.4	Small tool allowance	-	37	-	-	-	-	-	6	43	43	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	138	21	158	-	158	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,052	37	48	241	-	280	138	332	2,128	1,970	158	-	-	672	-	-	-	40,318	131	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	1,133	-	-	-	-	-	-	283	1,416	1,416	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	222	22	244	244	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	494	49	543	543	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	367	-	-	-	-	-	92	459	459	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	144	-	-	-	-	-	22	166	166	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	16	2	-	36	-	11	65	65	-	-	-	736	-	-	-	14,720	24	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	91	9	101	101	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	33	3	36	-	36	-	-	-	-	-	-	-	-	-
1b.4.10	FEMA Fees	-	-	-	-	-	-	43	6	50	-	50	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	197	30	227	-	227	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	28	4	32	-	32	-	-	-	-	-	-	-	-	-
1b.4.13	Corporate A&G	-	-	-	-	-	-	537	81	618	618	-	-	-	-	-	-	-	-	-	-
1b.4.14	Site O&M	-	-	-	-	-	-	34	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.4.15	Security Staff Cost	-	-	-	-	-	-	673	101	774	774	-	-	-	-	-	-	-	-	-	21,071
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	5,211	782	5,993	5,993	-	-	-	-	-	-	-	-	-	89,897
1b.4	Subtotal Period 1b Period-Dependent Costs	1,133	511	16	2	-	36	7,720	1,523	10,941	10,597	345	-	-	736	-	-	-	14,720	24	110,968
1b.0	TOTAL PERIOD 1b COST	4,430	549	100	482	-	2,032	14,906	4,504	27,003	26,490	503	9	-	18,999	-	-	-	542,096	54,743	110,968
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	418	-	-	-	-	-	63	480	480	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	33	-	-	-	-	-	5	38	38	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	14,124	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	250
1c.1	Subtotal Period 1c Activity Costs	-	451	-	-	-	-	752	290	1,492	1,492	-	-	-	-	-	-	-	-	17,824	250

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1c Additional Costs																					
1c.2.1	Landfill Post Closure Maintenance	-	-	-	-	-	-	8	1	9	-	-	9	-	-	-	-	-	-	-	-
1c.2	Subtotal Period 1c Additional Costs	-	-	-	-	-	-	8	1	9	-	-	9	-	-	-	-	-	-	-	-
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	126	-	56	285	-	332	-	194	994	994	-	-	-	796	-	-	-	47,780	155	-
1c.3.3	Small tool allowance	-	3	-	-	-	-	-	0	4	4	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	146	22	168	-	168	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	126	3	56	285	-	332	146	217	1,166	998	168	-	-	796	-	-	-	47,780	155	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	222	22	244	244	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	460	46	506	506	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	200	-	-	-	-	-	50	250	250	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	144	-	-	-	-	-	22	166	166	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	0	-	7	-	2	13	13	-	-	-	144	-	-	-	2,878	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	91	9	101	101	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	33	3	36	-	36	-	-	-	-	-	-	-	-	-
1c.4.9	FEMA Fees	-	-	-	-	-	-	43	6	50	-	50	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	197	30	227	-	227	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	28	4	32	-	32	-	-	-	-	-	-	-	-	-
1c.4.12	Corporate A&G	-	-	-	-	-	-	537	81	618	618	-	-	-	-	-	-	-	-	-	-
1c.4.13	Site O&M	-	-	-	-	-	-	34	5	39	39	-	-	-	-	-	-	-	-	-	-
1c.4.14	Security Staff Cost	-	-	-	-	-	-	673	101	774	774	-	-	-	-	-	-	-	-	-	21,071
1c.4.15	Utility Staff Cost	-	-	-	-	-	-	5,211	782	5,993	5,993	-	-	-	-	-	-	-	-	-	89,897
1c.4	Subtotal Period 1c Period-Dependent Costs	-	344	3	0	-	7	7,686	1,186	9,226	8,882	345	-	-	144	-	-	-	2,878	5	110,968
1c.0	TOTAL PERIOD 1c COST	126	797	59	286	-	339	8,592	1,694	11,894	11,372	513	9	-	940	-	-	-	50,659	17,984	111,217
PERIOD 1 TOTALS		4,556	5,983	176	1,089	-	5,324	56,871	12,934	86,933	83,479	2,727	727	-	45,965	-	-	-	935,089	111,367	677,799
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	711	107	817	817	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	1,200	300	1,500	1,500	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	1,911	407	2,318	2,318	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a.2.1	Landfill Post Closure Maintenance	-	-	-	-	-	-	284	28	312	-	-	312	-	-	-	-	-	-	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	284	28	312	-	-	312	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,251	938	7,188	-	7,188	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	6,251	938	7,188	-	7,188	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	3,377	338	3,715	3,243	471	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	5,851	585	6,436	57	6,379	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	1,575	-	-	-	-	-	394	1,969	1,969	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	39	6	-	87	-	26	158	158	-	-	-	1,782	-	-	-	35,649	58	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,073	161	1,234	617	617	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	2,250	225	2,475	2,475	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,127	113	1,240	-	1,240	-	-	-	-	-	-	-	-	-
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	6,813	1,022	7,835	-	7,835	-	-	-	-	-	-	-	-	-
2a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	970	146	1,116	-	1,116	-	-	-	-	-	-	-	-	-
2a.4.10	Corporate A&G	-	-	-	-	-	-	2,007	301	2,308	499	1,809	-	-	-	-	-	-	-	-	-
2a.4.11	Site O&M	-	-	-	-	-	-	242	36	278	60	218	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	12,951	1,943	14,894	3,910	10,984	-	-	-	-	-	-	-	-	385,779
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	19,850	2,977	22,827	4,403	18,425	-	-	-	-	-	-	-	-	335,854
2a.4	Subtotal Period 2a Period-Dependent Costs	-	1,575	39	6	-	87	56,512	8,267	66,485	17,391	49,093	-	-	1,782	-	-	-	35,649	58	721,633
2a.0	TOTAL PERIOD 2a COST	-	1,575	39	6	-	87	64,958	9,639	76,304	19,709	56,282	312	-	1,782	-	-	-	35,649	58	721,633

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	1,144	172	1,316	1,316	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	1,932	483	2,415	2,415	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	3,076	655	3,730	3,730	-	-	-	-	-	-	-	-	-	-
Period 2b Additional Costs																					
2b.2.1	Landfill Post Closure Maintenance	-	-	-	-	-	-	352	35	388	-	-	388	-	-	-	-	-	-	-	-
2b.2	Subtotal Period 2b Additional Costs	-	-	-	-	-	-	352	35	388	-	-	388	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,777	417	3,194	-	3,194	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	2,777	417	3,194	-	3,194	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	4,905	490	5,395	5,220	175	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	83	8	92	92	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	1,254	-	-	-	-	-	313	1,567	1,567	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	31	4	-	69	-	21	125	125	-	-	-	1,413	-	-	-	28,265	46	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	864	130	993	993	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	3,519	352	3,870	3,870	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,814	181	1,995	-	1,995	-	-	-	-	-	-	-	-	-
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	1,562	234	1,796	-	1,796	-	-	-	-	-	-	-	-	-
2b.4.9	Corporate A&G	-	-	-	-	-	-	1,397	210	1,606	803	803	-	-	-	-	-	-	-	-	-
2b.4.10	Site O&M	-	-	-	-	-	-	168	25	193	97	96	-	-	-	-	-	-	-	-	-
2b.4.11	Security Staff Cost	-	-	-	-	-	-	10,072	1,511	11,582	6,293	5,289	-	-	-	-	-	-	-	-	262,954
2b.4.12	Utility Staff Cost	-	-	-	-	-	-	13,314	1,997	15,311	7,085	8,226	-	-	-	-	-	-	-	-	233,737
2b.4	Subtotal Period 2b Period-Dependent Costs	-	1,254	31	4	-	69	37,696	5,473	44,527	26,146	18,381	-	-	1,413	-	-	-	28,265	46	496,691
2b.0	TOTAL PERIOD 2b COST	-	1,254	31	4	-	69	43,902	6,579	51,839	29,876	21,575	388	-	1,413	-	-	-	28,265	46	496,691
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection									a											
2c.1.2	Semi-annual environmental survey									a											
2c.1.3	Prepare reports									a											
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	2,400	360	2,760	2,760	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	4,053	1,013	5,066	5,066	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	6,452	1,373	7,825	7,825	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	9,955	995	10,950	10,950	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	175	17	192	192	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,538	-	-	-	-	-	634	3,172	3,172	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	62	9	-	138	-	42	250	250	-	-	-	2,823	-	-	-	56,462	92	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	1,812	272	2,084	2,084	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	7,264	726	7,991	7,991	-	-	-	-	-	-	-	-	-	-
2c.4.7	Corporate A&G	-	-	-	-	-	-	1,465	220	1,685	1,685	-	-	-	-	-	-	-	-	-	-
2c.4.8	Site O&M	-	-	-	-	-	-	177	27	204	204	-	-	-	-	-	-	-	-	-	-
2c.4.9	Security Staff Cost	-	-	-	-	-	-	11,480	1,722	13,202	13,202	-	-	-	-	-	-	-	-	-	306,457
2c.4.10	Utility Staff Cost	-	-	-	-	-	-	12,925	1,939	14,864	14,864	-	-	-	-	-	-	-	-	-	245,166
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,538	62	9	-	138	45,252	6,594	54,593	54,593	-	-	-	2,823	-	-	-	56,462	92	551,623
2c.0	TOTAL PERIOD 2c COST	-	2,538	62	9	-	138	51,705	7,968	62,418	62,418	-	-	-	2,823	-	-	-	56,462	92	551,623
PERIOD 2 TOTALS		-	5,366	131	19	-	294	160,564	24,186	190,561	112,004	77,857	700	-	6,019	-	-	-	120,375	196	1,769,947

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	32	5	37	37	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	241	36	277	277	-	-	-	-	-	-	-	-	-	3,210
3a.1.7	Perform SER and EA	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,327
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	2,140
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	132	20	151	151	-	-	-	-	-	-	-	-	-	1,753
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	237	36	272	245	-	27	-	-	-	-	-	-	-	3,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	134	20	154	139	-	15	-	-	-	-	-	-	-	1,783
3a.1.11.3	Reactor internals	-	-	-	-	-	-	228	34	262	262	-	-	-	-	-	-	-	-	-	3,039
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	209	31	240	240	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	16	2	18	18	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	1,335
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	51	8	59	30	-	30	-	-	-	-	-	-	-	685
3a.1.11.8	Main Turbine	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	100	15	115	58	-	58	-	-	-	-	-	-	-	1,335
3a.1.11.11	Waste management	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,969
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	29	4	33	17	-	17	-	-	-	-	-	-	-	385
3a.1.11	Total	-	-	-	-	-	-	1,278	192	1,470	1,294	-	176	-	-	-	-	-	-	-	17,024
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	77	12	89	89	-	-	-	-	-	-	-	-	-	1,027
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,900	435	3,335	3,335	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	599
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	40	6	45	45	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	7,436	1,115	8,551	8,375	-	176	-	-	-	-	-	-	-	31,117
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	1,192	358	1,550	1,550	-	-	-	-	-	-	-	-	8,167	3,357
3a.2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	1,192	358	1,550	1,550	-	-	-	-	-	-	-	-	8,167	3,357
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	339	34	373	373	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	408	-	-	-	-	-	102	510	510	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	571	-	-	-	-	-	86	657	657	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	10	2	-	23	-	7	43	43	-	-	-	481	-	-	-	9,613	16	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	617	92	709	709	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	307	31	338	338	-	-	-	-	-	-	-	-	-	-
3a.4.8	Corporate A&G	-	-	-	-	-	-	1,197	180	1,376	1,376	-	-	-	-	-	-	-	-	-	-
3a.4.9	Site O&M	-	-	-	-	-	-	82	12	94	94	-	-	-	-	-	-	-	-	-	-
3a.4.10	Security Staff Cost	-	-	-	-	-	-	665	100	765	765	-	-	-	-	-	-	-	-	-	25,905
3a.4.11	Utility Staff Cost	-	-	-	-	-	-	11,431	1,715	13,146	13,146	-	-	-	-	-	-	-	-	-	200,229
3a.4	Subtotal Period 3a Period-Dependent Costs	-	979	10	2	-	23	14,643	2,359	18,017	18,017	-	-	-	481	-	-	-	9,613	16	226,133
3a.0	TOTAL PERIOD 3a COST	-	979	10	2	-	23	23,271	3,832	28,118	27,942	-	176	-	481	-	-	-	9,613	8,183	260,607

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	200	30	230	207	-	23	-	-	-	-	-	-	-	2,026
3b.1.1.2	Reactor internals	-	-	-	-	-	-	106	16	121	121	-	-	-	-	-	-	-	-	-	1,070
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	57	9	66	16	-	49	-	-	-	-	-	-	-	578
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	42	6	49	49	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	42	6	49	49	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	42	6	49	49	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,554
3b.1.1.8	Facility closeout	-	-	-	-	-	-	51	8	58	29	-	29	-	-	-	-	-	-	-	514
3b.1.1.9	Missile shields	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	193
3b.1.1.10	Biological shield	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	514
3b.1.1.11	Steam generators	-	-	-	-	-	-	194	29	223	223	-	-	-	-	-	-	-	-	-	1,969
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	42	6	49	24	-	24	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	66	10	76	-	-	76	-	-	-	-	-	-	-	668
3b.1.1.14	Main Condensers	-	-	-	-	-	-	66	10	76	-	-	76	-	-	-	-	-	-	-	668
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	115	17	133	119	-	13	-	-	-	-	-	-	-	1,168
3b.1.1.16	Reactor building	-	-	-	-	-	-	115	17	133	119	-	13	-	-	-	-	-	-	-	1,168
3b.1.1	Total	-	-	-	-	-	-	1,362	204	1,566	1,263	-	304	-	-	-	-	-	-	-	13,800
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,362	204	1,566	1,263	-	304	-	-	-	-	-	-	-	13,800
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	946	-	-	-	-	-	-	142	1,087	1,087	-	-	-	-	-	-	-	-	-	-
3b.3.2	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	946	1,100	-	-	-	-	1,130	476	3,652	3,652	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	29	-	-	-	-	-	-	7	37	37	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	198	20	217	217	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	222	-	-	-	-	-	55	277	277	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	291	-	-	-	-	-	44	335	335	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	1	-	13	-	4	24	24	-	-	-	266	-	-	-	5,328	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	314	47	361	361	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	157	16	172	172	-	-	-	-	-	-	-	-	-	-
3b.4.9	Corporate A&G	-	-	-	-	-	-	832	125	957	957	-	-	-	-	-	-	-	-	-	-
3b.4.10	Site O&M	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	-
3b.4.11	Security Staff Cost	-	-	-	-	-	-	339	51	390	390	-	-	-	-	-	-	-	-	-	13,201
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	8,207	1,231	9,438	9,438	-	-	-	-	-	-	-	-	-	139,234
3b.4	Subtotal Period 3b Period-Dependent Costs	29	513	6	1	-	13	10,107	1,609	12,278	12,278	-	-	-	266	-	-	-	5,328	9	152,435
3b.0	TOTAL PERIOD 3b COST	975	1,613	6	1	-	13	12,599	2,289	17,496	17,192	-	304	-	266	-	-	-	5,328	9	166,235
PERIOD 3 TOTALS		975	2,592	16	2	-	36	35,870	6,121	45,613	45,134	-	480	-	747	-	-	-	14,941	8,191	426,842
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	31	151	21	18	132	209	-	130	691	691	-	-	483	511	-	-	-	112,096	4,014	-
4a.1.1.2	Pressurizer Relief Tank	3	11	4	3	26	37	-	18	102	102	-	-	94	94	-	-	-	20,849	340	-
4a.1.1.3	Reactor Coolant Pumps & Motors	24	68	75	197	-	2,243	-	627	3,233	3,233	-	-	-	8,012	-	-	-	807,600	2,883	80
4a.1.1.4	Pressurizer	8	47	312	96	-	986	-	308	1,756	1,756	-	-	-	3,521	-	-	-	337,377	1,546	500
4a.1.1.5	Steam Generators	28	2,064	1,073	1,259	-	5,588	-	2,223	12,235	12,235	-	-	-	19,963	-	-	-	2,630,356	10,254	750
4a.1.1.6	Retired Steam Generator Units	-	-	1,073	1,259	-	5,588	-	1,693	9,614	9,614	-	-	-	19,963	-	-	-	2,630,356	5,400	750
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	27	99	324	73	166	245	-	168	1,102	1,102	-	-	1,823	3,253	-	-	-	136,066	2,687	-
4a.1.1.8	Reactor Vessel Internals	61	2,495	7,055	755	-	4,412	222	6,093	21,092	21,092	-	-	-	1,263	1,002	393	-	278,133	20,983	971
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	9,711	-	1,457	11,167	11,167	-	-	-	-	-	-	1,785	353,100	-	-
4a.1.1.10	Reactor Vessel	-	4,812	1,405	488	-	2,695	222	5,463	15,084	15,084	-	-	-	9,626	-	-	-	979,948	20,983	971
4a.1.1	Totals	181	9,746	11,343	4,148	324	31,711	444	18,179	76,075	76,075	-	-	2,400	66,207	1,002	393	1,785	8,285,882	69,090	4,023

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	282	224	34	593	-	-	187	1,320	1,320	-	-	4,020	-	-	-	-	241,216	6,768	-
4a.1.3	Main Condensers	-	858	116	17	588	-	-	317	1,895	1,895	-	-	5,310	-	-	-	-	238,934	21,071	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor Building	-	777	-	-	-	-	-	117	893	893	-	-	-	-	-	-	-	-	9,379	-
4a.1.4.2	Auxiliary Building	-	141	-	-	-	-	-	21	162	162	-	-	-	-	-	-	-	-	1,898	-
4a.1.4.3	Hot Machine Shop(common)	-	6	-	-	-	-	-	1	7	7	-	-	-	-	-	-	-	-	102	-
4a.1.4.4	Interim Radwaste Building(common)	-	25	-	-	-	-	-	4	29	29	-	-	-	-	-	-	-	-	441	-
4a.1.4.5	Radwaste Facility(common)	-	230	-	-	-	-	-	34	264	264	-	-	-	-	-	-	-	-	2,577	-
4a.1.4.6	Service Building(common)	-	13	-	-	-	-	-	2	15	15	-	-	-	-	-	-	-	-	226	-
4a.1.4.7	Turbine Building	-	168	-	-	-	-	-	25	193	193	-	-	-	-	-	-	-	-	2,806	-
4a.1.4.8	Fuel Building	-	102	-	-	-	-	-	15	117	117	-	-	-	-	-	-	-	-	1,250	-
4a.1.4	Totals	-	1,462	-	-	-	-	-	219	1,682	1,682	-	-	-	-	-	-	-	-	18,679	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Steam (shared)	-	286	-	-	-	-	-	43	329	-	-	329	-	-	-	-	-	-	8,509	-
4a.1.5.2	Auxiliary Steam (shared) RCA	-	114	2	4	124	-	-	48	292	292	-	-	1,242	-	-	-	-	50,422	2,420	-
4a.1.5.3	Carbon Dioxide (shared)	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	139	-
4a.1.5.4	Carbon Dioxide (shared) RCA	-	13	0	0	13	-	-	5	32	32	-	-	131	-	-	-	-	5,337	274	-
4a.1.5.5	Chemical Addition	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	821	-
4a.1.5.6	Chemical Addition RCA	-	25	0	1	22	-	-	10	57	57	-	-	222	-	-	-	-	9,016	510	-
4a.1.5.7	Chilled Water (shared)	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	4,175	-
4a.1.5.8	Condensate	-	557	-	-	-	-	-	84	640	-	-	640	-	-	-	-	-	-	15,699	-
4a.1.5.9	Condensate (Contaminated)	-	564	47	88	3,035	-	-	614	4,349	4,349	-	-	30,383	-	-	-	-	1,233,881	13,824	-
4a.1.5.10	Condenser Circulating Water	-	355	-	-	-	-	-	53	408	-	-	408	-	-	-	-	-	-	10,040	-
4a.1.5.11	Demineralized Water (shared)	-	143	-	-	-	-	-	21	164	-	-	164	-	-	-	-	-	-	4,267	-
4a.1.5.12	Demineralized Water (shared) RCA	-	88	1	2	81	-	-	35	207	207	-	-	808	-	-	-	-	32,815	1,821	-
4a.1.5.13	Diesel Air (shared)	-	45	-	-	-	-	-	7	52	-	-	52	-	-	-	-	-	-	1,367	-
4a.1.5.14	Diesel Jacket Water (shared)	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	96	-
4a.1.5.15	Diesel Lube Oil (shared)	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	346	-
4a.1.5.16	Electro Hydraulic Turbine Control	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	499	-
4a.1.5.17	Equipment Cooling (shared)	-	94	-	-	-	-	-	14	108	-	-	108	-	-	-	-	-	-	2,728	-
4a.1.5.18	Essential Siphon Vacuum (shared)	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,549	-
4a.1.5.19	Feedwater & Emergency Feedwater	-	172	-	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	4,862	-
4a.1.5.20	Feedwater & Emergency Feedwater (Cont.)	-	160	8	14	487	-	-	116	784	784	-	-	4,873	-	-	-	-	197,906	3,878	-
4a.1.5.21	Feedwater & Emergency Feedwater RCA	-	262	8	14	481	-	-	140	905	905	-	-	4,815	-	-	-	-	195,560	5,622	-
4a.1.5.22	Filtered Water (shared)	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	2,925	-
4a.1.5.23	Filtered Water (shared) RCA	-	80	2	3	97	-	-	35	217	217	-	-	975	-	-	-	-	39,590	1,723	-
4a.1.5.24	Heater Drains	-	1,454	64	120	4,137	-	-	1,008	6,784	6,784	-	-	41,409	-	-	-	-	1,681,649	34,373	-
4a.1.5.25	Heater Drains (Contaminated)	-	85	-	-	-	-	-	13	97	-	-	97	-	-	-	-	-	-	2,239	-
4a.1.5.26	Heater Vent	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,002	-
4a.1.5.27	High Pressure Extraction	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	729	-
4a.1.5.28	High Pressure Service Water (shared)	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	3,016	-
4a.1.5.29	Hydraulic Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	75	-
4a.1.5.30	Hydrogen	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	848	-
4a.1.5.31	Hydrogen Seal Oil	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	899	-
4a.1.5.32	Keowee Decompressing Air (shared)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	153	-
4a.1.5.33	Low Pressure Extraction	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,096	-
4a.1.5.34	Low Pressure Service Water (shared)	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	9,404	-
4a.1.5.35	Main Steam	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,558	-
4a.1.5.36	Main Steam RCA	-	326	45	80	2,778	-	-	515	3,744	3,744	-	-	27,808	-	-	-	-	1,129,284	7,747	-
4a.1.5.37	Nitrogen (shared)	-	50	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	1,501	-
4a.1.5.38	Nitrogen (shared) RCA	-	75	1	2	53	-	-	27	158	158	-	-	534	-	-	-	-	21,704	1,492	-
4a.1.5.39	Periodic Testing (shared)	-	14	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	429	-
4a.1.5.40	Plant Heating Steam (shared)	-	227	-	-	-	-	-	34	261	-	-	261	-	-	-	-	-	-	6,722	-
4a.1.5.41	Post Accident Monitoring	-	30	1	1	40	-	-	14	85	85	-	-	401	-	-	-	-	16,304	785	-
4a.1.5.42	Protected Water System (shared)	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,366	-
4a.1.5.43	Reactor Building Spray	-	95	3	6	210	-	-	56	371	371	-	-	2,105	-	-	-	-	85,488	2,170	-
4a.1.5.44	Recirc Cooling Water	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,547	-
4a.1.5.45	Recirc Cooling Water RCA	-	135	3	5	173	-	-	61	376	376	-	-	1,727	-	-	-	-	70,146	2,938	-
4a.1.5.46	Sample Monitoring	-	105	11	12	49	105	-	62	343	343	-	-	489	443	-	-	-	49,133	2,802	-
4a.1.5.47	Second Side Cool Trtment Pond (shared)	-	39	-	-	-	-	-	6	45	-	-	45	-	-	-	-	-	-	1,108	-
4a.1.5.48	Service Air (shared)	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	1,254	-
4a.1.5.49	Standby Shutdown Facility (shared)	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	841	-
4a.1.5.50	Stator Coolant	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,507	-
4a.1.5.51	Steam Drain	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	2,668	-

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4a.1.5.52	Steam Seal	-	52	1	2	53	-	-	21	129	129	-	-	533	-	-	-	-	21,649	1,169	-
4a.1.5.53	Turbine Oil	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,518	-
4a.1.5.54	Vacuum	-	120	-	-	-	-	-	18	138	-	-	138	-	-	-	-	-	-	3,438	-
4a.1.5	Totals	-	7,423	196	352	11,834	105	-	3,345	23,255	18,832	-	4,423	118,457	443	-	-	-	4,839,883	194,486	-
4a.1.6	Scaffolding in support of decommissioning	-	702	18	4	85	16	-	195	1,020	1,020	-	-	771	68	-	-	-	39,175	21,199	-
4a.1	Subtotal Period 4a Activity Costs	181	20,473	11,897	4,556	13,424	31,832	444	22,441	105,247	100,824	-	4,423	130,957	66,718	1,002	393	1,785	13,645,090	331,293	4,023
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,257	377	1,634	1,634	-	-	-	-	-	-	-	-	25,741	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,257	377	1,634	1,634	-	-	-	-	-	-	-	-	25,741	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	3	-	3	17	-	20	-	9	53	53	-	-	-	48	-	-	-	2,890	9	-
4a.3.3	Small tool allowance	-	249	-	-	-	-	-	37	286	257	-	29	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	3	249	3	17	-	20	-	47	339	310	-	29	-	48	-	-	-	2,890	9	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	71	-	-	-	-	-	-	18	89	89	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	480	48	529	529	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	7	1	8	7	-	1	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	2,218	-	-	-	-	-	554	2,772	2,772	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,709	-	-	-	-	-	406	3,116	3,116	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	87	13	-	195	-	59	354	354	-	-	-	3,989	-	-	-	79,789	130	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	725	109	834	834	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	416	42	458	458	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	492	74	565	565	-	-	-	-	-	-	-	-	-	-
4a.4.10	Corporate A&G	-	-	-	-	-	-	2,825	424	3,249	3,249	-	-	-	-	-	-	-	-	-	-
4a.4.11	Site O&M	-	-	-	-	-	-	287	43	330	330	-	-	-	-	-	-	-	-	-	-
4a.4.12	Security Staff Cost	-	-	-	-	-	-	1,061	159	1,220	1,220	-	-	-	-	-	-	-	-	-	45,407
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	28,617	4,293	32,910	32,910	-	-	-	-	-	-	-	-	-	472,663
4a.4	Subtotal Period 4a Period-Dependent Costs	71	4,927	87	13	-	195	34,911	6,229	46,433	46,433	-	1	-	3,989	-	-	-	79,789	130	518,070
4a.0	TOTAL PERIOD 4a COST	255	25,649	11,987	4,586	13,424	32,047	36,612	29,095	153,654	149,201	-	4,453	130,957	70,755	1,002	393	1,785	13,727,770	357,173	522,092
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	192	21	98	50	-	515	-	247	1,124	1,124	-	-	-	2,182	-	-	-	144,242	601	-
Disposal of Plant Systems																					
4b.1.2.1	Auxiliary Instrument Air (shared)	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	725	-
4b.1.2.2	Auxiliary Instrument Air (shared) RCA	-	32	0	1	24	-	-	12	69	69	-	-	240	-	-	-	-	9,761	632	-
4b.1.2.3	Breathing Air (shared)	-	872	12	21	719	-	-	330	1,953	1,953	-	-	7,197	-	-	-	-	292,274	17,058	-
4b.1.2.4	Chilled Water (shared) RCA	-	124	2	4	138	-	-	53	321	321	-	-	1,379	-	-	-	-	55,993	2,656	-
4b.1.2.5	Component Cooling	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,374	-
4b.1.2.6	Component Cooling RCA	-	129	2	4	143	-	-	54	333	333	-	-	1,430	-	-	-	-	58,079	2,726	-
4b.1.2.7	Compressed Air (Shared)	-	41	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	1,226	-
4b.1.2.8	Compressed Air (shared) RCA	-	303	4	7	245	-	-	114	673	673	-	-	2,455	-	-	-	-	99,688	6,181	-
4b.1.2.9	Core Flood	-	109	3	6	211	-	-	60	390	390	-	-	2,110	-	-	-	-	85,669	2,499	-
4b.1.2.10	Electrical (Clean)	-	1,101	-	-	-	-	-	165	1,266	-	-	1,266	-	-	-	-	-	-	29,289	-
4b.1.2.11	Electrical (Contaminated)	-	234	5	7	199	18	-	94	557	557	-	-	1,989	75	-	-	-	85,708	5,283	-
4b.1.2.12	Electrical (Contaminated) RCA	-	1,629	31	55	1,905	-	-	704	4,324	4,324	-	-	19,069	-	-	-	-	774,395	35,254	-
4b.1.2.13	Fuel Oil (shared)	-	56	-	-	-	-	-	8	65	-	-	65	-	-	-	-	-	-	1,583	-
4b.1.2.14	Fuel Oil (shared) RCA	-	13	0	0	11	-	-	5	30	30	-	-	111	-	-	-	-	4,488	277	-
4b.1.2.15	Gaseous Waste Disposal	-	367	51	44	164	404	-	229	1,259	1,259	-	-	1,638	1,717	-	-	-	179,777	8,192	-
4b.1.2.16	High Pressure Injection	-	895	169	197	2,540	1,275	-	970	6,046	6,046	-	-	25,429	5,398	-	-	-	1,389,890	21,082	-
4b.1.2.17	High Pressure Service Water (shared) RCA	-	1,020	24	44	1,510	-	-	491	3,089	3,089	-	-	15,119	-	-	-	-	613,994	21,776	-
4b.1.2.18	Incore Instrument Piping	-	15	1	0	-	4	-	5	26	26	-	-	-	18	-	-	-	1,228	421	-
4b.1.2.19	Instrument Air (shared)	-	98	-	-	-	-	-	15	113	-	-	113	-	-	-	-	-	-	2,835	-
4b.1.2.20	Instrument Air (shared) RCA	-	160	3	5	182	-	-	68	419	419	-	-	1,822	-	-	-	-	73,998	3,510	-
4b.1.2.21	Leak Test Rate (shared)	-	59	-	-	-	-	-	9	68	-	-	68	-	-	-	-	-	-	1,678	-
4b.1.2.22	Liquid Waste (shared)	-	1,189	143	136	451	1,266	-	716	3,901	3,901	-	-	4,513	5,373	-	-	-	537,862	27,381	-
4b.1.2.23	Liquid Waste Disposal	-	1,553	170	159	550	1,470	-	879	4,781	4,781	-	-	5,503	6,248	-	-	-	635,335	35,692	-
4b.1.2.24	Low Pressure Injection	-	500	54	65	827	426	-	371	2,243	2,243	-	-	8,280	1,809	-	-	-	455,552	12,024	-

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4b.1.2.25	Low Pressure Service Water (shared) RCA	-	1,507	40	73	2,520	-	-	770	4,911	4,911	-	-	25,228	-	-	-	-	1,024,540	32,558	-
4b.1.2.26	On-Site/Off-Site Power	-	98	-	-	-	-	-	15	112	-	-	112	-	-	-	-	-	-	2,517	-
4b.1.2.27	Plant Drinking Water (shared)	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	4,204	-
4b.1.2.28	Plant Heating Steam (shared) RCA	-	122	2	3	100	-	-	46	273	273	-	-	1,005	-	-	-	-	40,799	2,528	-
4b.1.2.29	Purge	-	162	8	14	484	-	-	116	783	783	-	-	4,842	-	-	-	-	196,641	3,632	-
4b.1.2.30	RFS Refueling Water	-	47	1	2	56	-	-	20	126	126	-	-	562	-	-	-	-	22,826	1,017	-
4b.1.2.31	Radiation Instrument Alarm	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	323	-
4b.1.2.32	Radiation Instrument Alarm RCA	-	29	0	0	6	-	-	8	44	44	-	-	63	-	-	-	-	2,565	788	-
4b.1.2.33	Reactor Building Cooling	-	362	30	54	1,873	-	-	383	2,701	2,701	-	-	18,745	-	-	-	-	761,247	8,761	-
4b.1.2.34	Reactor Coolant	-	231	27	20	72	186	-	121	656	656	-	-	723	783	-	-	-	81,371	5,766	-
4b.1.2.35	Reactor Coolant Storage	-	493	60	64	384	539	-	331	1,872	1,872	-	-	3,848	2,309	-	-	-	307,351	11,619	-
4b.1.2.36	Reactor Coolant Treatment (shared)	-	156	19	16	71	144	-	90	495	495	-	-	709	611	-	-	-	69,008	3,463	-
4b.1.2.37	Resin Recovery (shared)	-	537	71	76	372	675	-	377	2,109	2,109	-	-	3,720	2,880	-	-	-	340,242	12,717	-
4b.1.2.38	Sanitary Waste (shared)	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	2,135	-
4b.1.2.39	Sanitary Waste (shared) RCA	-	37	1	1	32	-	-	14	84	84	-	-	320	-	-	-	-	12,994	781	-
4b.1.2.40	Service Air (shared) RCA	-	86	1	2	66	-	-	32	187	187	-	-	662	-	-	-	-	26,884	1,672	-
4b.1.2.41	Solidification (shared)	-	963	139	132	445	1,220	-	646	3,546	3,546	-	-	4,455	5,173	-	-	-	522,785	21,887	-
4b.1.2.42	Spent Fuel Cooling	-	503	55	65	559	497	-	349	2,028	2,028	-	-	5,595	2,108	-	-	-	366,462	11,891	-
4b.1.2.43	Vehicle Fuel	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	303	-
4b.1.2.44	Ventilation (clean)	-	209	-	-	-	-	-	31	240	-	-	240	-	-	-	-	-	-	6,216	-
4b.1.2.45	Ventilation (clean) RCA	-	194	6	11	369	-	-	106	685	685	-	-	3,694	-	-	-	-	150,000	3,464	-
4b.1.2.46	Ventilation (contaminated)	-	561	22	34	888	88	-	303	1,896	1,896	-	-	8,891	371	-	-	-	385,590	11,672	-
4b.1.2	Totals	-	17,103	1,155	1,323	18,117	8,213	-	9,163	55,074	52,808	-	2,266	181,346	34,873	-	-	-	9,664,996	391,269	-
4b.1.3	Scaffolding in support of decommissioning	-	1,053	28	6	128	24	-	292	1,531	1,531	-	-	1,156	102	-	-	-	58,763	31,798	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor Building	734	723	32	283	465	499	-	788	3,523	3,523	-	-	4,658	8,080	-	-	-	885,053	31,783	-
4b.1.4.2	Auxiliary Building	344	108	5	47	71	83	-	238	896	896	-	-	707	1,358	-	-	-	145,407	10,324	-
4b.1.4.3	Contaminated Misc. Structures(common)	14	3	0	2	-	3	-	9	32	32	-	-	-	57	-	-	-	4,908	401	-
4b.1.4.4	Hot Machine Shop(common)	48	19	1	7	19	13	-	36	142	142	-	-	187	197	-	-	-	24,435	1,527	-
4b.1.4.5	Interim Radwaste Building(common)	97	29	1	14	17	24	-	66	248	248	-	-	169	392	-	-	-	40,478	2,888	-
4b.1.4.6	Radwaste Facility(common)	348	239	9	44	238	82	-	297	1,257	1,257	-	-	2,386	1,147	-	-	-	193,952	13,191	-
4b.1.4.7	Retired Steam Gen Storage Fac.(common)	82	7	0	2	2	3	-	44	139	139	-	-	18	52	-	-	-	5,247	2,107	-
4b.1.4.8	Turbine Building	216	21	1	9	-	15	-	118	380	380	-	-	-	260	-	-	-	22,500	5,648	-
4b.1.4.9	Fuel Building	242	266	4	8	129	18	-	213	879	879	-	-	1,293	158	-	-	-	64,622	11,574	-
4b.1.4	Totals	2,124	1,416	53	414	941	739	-	1,810	7,497	7,497	-	-	9,418	11,700	-	-	-	1,386,601	79,442	-
4b.1	Subtotal Period 4b Activity Costs	2,316	19,593	1,334	1,793	19,186	9,491	-	11,512	65,225	62,960	-	2,266	191,920	48,857	-	-	-	11,254,600	503,110	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	553	166	719	719	-	-	-	-	-	-	-	-	-	4,160
4b.2.2	Containment Paint Remediation	79	-	9	14	-	105	-	69	275	275	-	-	-	452	-	-	-	-	800	-
4b.2.3	Underground Services Excavation	-	882	-	-	-	-	508	209	1,599	-	-	1,599	-	-	-	-	-	-	10,000	-
4b.2.4	Pond Closures	-	-	-	-	-	-	1,068	160	1,228	-	-	1,228	-	-	-	-	-	-	2,572	-
4b.2.5	Remedial Action Surveys	-	-	-	-	-	-	1,513	454	1,967	1,967	-	-	-	-	-	-	-	-	30,980	-
4b.2.6	RX Closure Head Disposal	-	117	521	784	-	724	-	380	2,526	2,526	-	-	-	2,815	-	-	-	340,201	3,761	2,000
4b.2.7	Decommissioning of ISFSI	-	479	9	1,663	-	3,093	2,756	2,000	10,000	10,000	-	-	-	44,708	-	-	-	6,580,725	25,919	11,049
4b.2	Subtotal Period 4b Additional Costs	79	1,478	539	2,462	-	3,921	6,398	3,437	18,314	15,487	-	2,827	-	47,974	-	-	-	6,920,926	74,033	17,209
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	9	-	10	51	-	59	-	28	156	156	-	-	-	142	-	-	-	8,501	28	-
4b.3.3	Small tool allowance	-	352	-	-	-	-	-	53	405	405	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	144	36	664	125	-	151	1,119	1,119	-	-	6,000	529	-	-	-	304,968	88	-
4b.3	Subtotal Period 4b Collateral Costs	9	352	154	86	664	184	-	231	1,680	1,680	-	-	6,000	671	-	-	-	313,469	116	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	1,204	-	-	-	-	-	-	301	1,505	1,505	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	578	58	636	636	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	9	1	10	10	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	3,263	-	-	-	-	-	816	4,078	4,078	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	3,228	-	-	-	-	-	484	3,712	3,712	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	157	23	-	351	-	107	637	637	-	-	-	7,186	-	-	-	143,723	234	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	689	103	793	793	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	501	50	551	551	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	592	89	681	681	-	-	-	-	-	-	-	-	-	-

Table D-3
Oconee Nuclear Station, Unit 3
SAFSTOR Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 4b Period-Dependent Costs (continued)																					
4b.4.10	Corporate A&G	-	-	-	-	-	-	3,233	485	3,718	3,718	-	-	-	-	-	-	-	-	-	-
4b.4.11	Site O&M	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
4b.4.12	Security Staff Cost	-	-	-	-	-	-	1,277	191	1,468	1,468	-	-	-	-	-	-	-	-	-	54,649
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	32,939	4,941	37,879	37,879	-	-	-	-	-	-	-	-	-	540,891
4b.4	Subtotal Period 4b Period-Dependent Costs	1,204	6,491	157	23	-	351	40,146	7,675	56,046	56,046	-	-	-	7,186	-	-	-	143,723	234	595,540
4b.0	TOTAL PERIOD 4b COST	3,608	27,914	2,183	4,364	19,850	13,947	46,544	22,856	141,264	136,172	-	5,093	197,920	104,688	-	-	-	18,632,720	577,493	612,750
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license									a											
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	161	48	209	209	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	376	113	489	489	-	-	-	-	-	-	-	-	829	2,080
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	376	113	489	489	-	-	-	-	-	-	-	-	829	2,080
Period 4f Collateral Costs																					
4f.3.1	Staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.2	Property taxes	-	-	-	-	-	-	4	0	5	5	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	286	-	-	-	-	-	71	357	357	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	1	-	16	-	5	29	29	-	-	-	325	-	-	-	6,501	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	93	14	107	107	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	238	24	262	262	-	-	-	-	-	-	-	-	-	-
4f.4.7	Corporate A&G	-	-	-	-	-	-	518	78	596	596	-	-	-	-	-	-	-	-	-	-
4f.4.8	Site O&M	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	-
4f.4.9	Security Staff Cost	-	-	-	-	-	-	253	38	291	291	-	-	-	-	-	-	-	-	-	9,429
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	5,517	828	6,345	6,345	-	-	-	-	-	-	-	-	-	86,696
4f.4	Subtotal Period 4f Period-Dependent Costs	-	286	7	1	-	16	6,676	1,066	8,052	8,052	-	-	-	325	-	-	-	6,501	11	96,124
4f.0	TOTAL PERIOD 4f COST	-	286	7	1	-	16	8,343	1,396	10,049	10,049	-	-	-	325	-	-	-	6,501	840	98,204
PERIOD 4 TOTALS		3,863	53,849	14,177	8,950	33,274	46,009	91,498	53,346	304,967	295,422	-	9,545	328,877	175,768	1,002	393	1,785	32,366,990	935,506	1,233,046
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor Building	-	4,488	-	-	-	-	-	673	5,162	-	-	5,162	-	-	-	-	-	-	53,465	-
5b.1.1.2	Administration Building(common)	-	131	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,539	-
5b.1.1.3	Auxiliary Building	-	1,269	-	-	-	-	-	190	1,459	-	-	1,459	-	-	-	-	-	-	17,079	-
5b.1.1.4	Clean Misc. Site Structures(common)	-	6,964	-	-	-	-	-	1,045	8,008	-	-	8,008	-	-	-	-	-	-	85,550	-
5b.1.1.5	Condenser Discharge Structure(common)	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	2,541	-
5b.1.1.6	Contaminated Misc. Structures(common)	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	467	-
5b.1.1.7	Contract Services Building(common)	-	163	-	-	-	-	-	24	187	-	-	187	-	-	-	-	-	-	3,048	-
5b.1.1.8	Essential Siphon Vacuum Bldg.(common)	-	34	-	-	-	-	-	5	39	-	-	39	-	-	-	-	-	-	604	-
5b.1.1.9	Hot Machine Shop(common)	-	122	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	1,935	-
5b.1.1.10	Intake Structure(common)	-	3,503	-	-	-	-	-	525	4,029	-	-	4,029	-	-	-	-	-	-	45,036	-
5b.1.1.11	Interim Radwaste Building(common)	-	500	-	-	-	-	-	75	575	-	-	575	-	-	-	-	-	-	9,013	-
5b.1.1.12	Maintenance Support Building(common)	-	148	-	-	-	-	-	22	171	-	-	171	-	-	-	-	-	-	2,583	-
5b.1.1.13	Miscellaneous Site Foundations(common)	-	880	-	-	-	-	-	132	1,012	-	-	1,012	-	-	-	-	-	-	9,881	-
5b.1.1.14	PSW Building	-	109	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	1,682	-
5b.1.1.15	Radwaste Facility(common)	-	2,069	-	-	-	-	-	310	2,379	-	-	2,379	-	-	-	-	-	-	23,191	-
5b.1.1.16	Retired Steam Gen Storage Fac.(common)	-	741	-	-	-	-	-	111	852	-	-	852	-	-	-	-	-	-	11,110	-
5b.1.1.17	Service Building(common)	-	311	-	-	-	-	-	47	357	-	-	357	-	-	-	-	-	-	6,113	-
5b.1.1.18	Standby Shutdown Facility(common)	-	546	-	-	-	-	-	82	628	-	-	628	-	-	-	-	-	-	6,550	-
5b.1.1.19	Switchgear Enclosure(common)	-	127	-	-	-	-	-	19	146	-	-	146	-	-	-	-	-	-	1,911	-
5b.1.1.20	Switchgear House(common)	-	64	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	819	-
5b.1.1.21	Technical Support Building(common)	-	55	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	1,034	-
5b.1.1.22	Turbine Building	-	1,633	-	-	-	-	-	245	1,879	-	-	1,879	-	-	-	-	-	-	28,771	-

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Oconee Nuclear Station, Unit 3
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(thousands of 2013 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Demolition of Remaining Site Buildings (continued)																					
5b.1.1.23	Turbine Pedestal	-	461	-	-	-	-	-	69	530	-	-	530	-	-	-	-	-	-	5,015	-
5b.1.1.24	Fuel Building	-	955	-	-	-	-	-	143	1,098	-	-	1,098	-	-	-	-	-	-	12,284	-
5b.1.1	Totals	-	25,615	-	-	-	-	-	3,842	29,457	-	-	29,457	-	-	-	-	-	-	332,220	-
Site Closeout Activities																					
5b.1.2	BackFill Site	-	4,891	-	-	-	-	-	734	5,624	-	-	5,624	-	-	-	-	-	-	8,346	-
5b.1.3	Grade & landscape site	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	297	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	668
5b.1	Subtotal Period 5b Activity Costs	-	30,612	-	-	-	-	66	4,602	35,280	76	-	35,204	-	-	-	-	-	-	340,862	668
Period 5b Additional Costs																					
5b.2.1	Concrete Crushing	-	892	-	-	-	-	6	135	1,032	-	-	1,032	-	-	-	-	-	-	4,251	-
5b.2.2	Demolition of ISFSI	-	1,812	-	-	-	-	47	279	2,137	-	-	2,137	-	-	-	-	-	-	10,243	160
5b.2	Subtotal Period 5b Additional Costs	-	2,703	-	-	-	-	53	413	3,169	-	-	3,169	-	-	-	-	-	-	14,494	160
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	262	-	-	-	-	-	39	302	-	-	302	-	-	-	-	-	-	-	-
5b.3.2	Corporate A&G	-	-	-	-	-	-	979	147	1,125	-	-	1,125	-	-	-	-	-	-	-	-
5b.3.3	Site O&M	-	-	-	-	-	-	32	5	37	-	-	37	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	262	-	-	-	-	1,011	191	1,464	-	-	1,464	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	14	1	15	-	-	15	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	7,180	-	-	-	-	-	1,077	8,257	-	-	8,257	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	143	21	165	-	-	165	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	678	102	780	-	-	780	-	-	-	-	-	-	-	23,377
5b.4.6	Utility Staff Cost	-	-	-	-	-	-	10,100	1,515	11,615	-	-	11,615	-	-	-	-	-	-	-	163,737
5b.4	Subtotal Period 5b Period-Dependent Costs	-	7,180	-	-	-	-	10,934	2,716	20,830	-	-	20,830	-	-	-	-	-	-	-	187,114
5b.0	TOTAL PERIOD 5b COST	-	40,758	-	-	-	-	12,063	7,923	60,744	76	-	60,668	-	-	-	-	-	-	355,356	187,942
PERIOD 5 TOTALS		-	40,758	-	-	-	-	12,063	7,923	60,744	76	-	60,668	-	-	-	-	-	-	355,356	187,942
TOTAL COST TO DECOMMISSION		**9,394**	**108,548**	**14,500**	**10,061**	**33,274**	**51,664**	**356,867**	**104,510**	**688,818**	**536,114**	**80,584**	**72,120**	**328,877**	**228,499**	**1,002**	**393**	**1,785**	**33,437,400**	**1,410,617**	**4,295,576**

TOTAL COST TO DECOMMISSION WITH 17.89% CONTINGENCY:	**$688,818**	**thousands of 2013 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 77.83% OR:	**$536,114**	**thousands of 2013 dollars**
SPENT FUEL MANAGEMENT COST IS 11.7% OR:	**$80,584**	**thousands of 2013 dollars**
NON-NUCLEAR DEMOLITION COST IS 10.47% OR:	**$72,120**	**thousands of 2013 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**229,894**	**cubic feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**1,785**	**cubic feet**
TOTAL SCRAP METAL REMOVED:	**66,689**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**1,410,617**	**man-hours**

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

APPENDIX E

ISFSI DECOMMISSIONING COST SUMMARY

Table E
Oconee Nuclear Station
ISFSI Decommissioning Cost Estimate
(thousands of 2013 dollars)

Activity Description	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours Hours
Decommissioning Contractor									
Planning (characterization, specs and procedures)	-	-	-	-	200.0	200.0	-	-	1,312
Decontamination (activated HSM disposition)	191.2	8.5	1,663.5	3,092.7	-	4,955.9	44,708	10,815	-
License Termination (radiological surveys)	-	-	-	-	1,542.8	1,542.8	-	15,104	-
NRC and NRC Contractor Fees and Costs	-	-	-	-	405.5	405.5		-	776
Subtotal	**191.2**	**8.5**	**1,663.5**	**3,092.7**	**2,148.3**	**7,104.2**	**44,708**	**25,919**	**2,088**
Supporting Costs									
Insurance	-	-	-	-	116.5	116.5			
Property taxes	-	-	-	-	2.0	2.0			
Heavy equipment rental	288.1	-	-	-	-	288.1			
Plant energy budget	-	-	-	-	20.8	20.8			
Corporate A&G	-	-	-	-	23.1	23.1			
Site O&M	-	-	-	-	1.0	1.0			
Security Staff Cost	-	-	-	-	198.3	198.3			5,096
Oversight Staff Cost	-	-	-	-	245.8	245.8			3,866
Subtotal	**288.1**	**-**	**-**	**-**	**607.4**	**895.5**	**-**	**-**	**8,961**
Total (w/o contingency)	479.3	8.5	1,663.5	3,092.7	2,755.7	7,999.7	**44,708**	**25,919**	**11,049**
Total (w/25% contingency)	**599.1**	**10.6**	**2,079.4**	**3,865.9**	**3,444.7**	**9,999.6**			