

DECOMMISSIONING COST STUDY
for the
VOGTLE ELECTRIC GENERATING PLANT



prepared for

SOUTHERN NUCLEAR OPERATING COMPANY

prepared by

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REVISION LOG

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EXECUTIVE SUMMARY

This study presents estimates of the costs to promptly decommission (decontaminate and dismantle) the Vogtle Electric Generating Plant (Vogtle) following a scheduled cessation of plant operations. The estimates are designed to provide Georgia Power Company (GPC) and Southern Nuclear Operating Company (SNC) with sufficient information to assess their financial obligations as they pertain to the eventual decommissioning of the nuclear station.

The analysis relies upon the site-specific, technical information developed for an evaluation prepared in 2018,^[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 estimates 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 estimates incorporate a cooling period of approximately five years for the spent fuel that resides in the plant's storage pools when operations cease. Any residual fuel remaining in the pools after the five-year period will be relocated to an on-site, interim storage facility to await the transfer to a Department of Energy (DOE) facility. The estimates also include the dismantling of non-essential structures and limited restoration of the site.

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

The 2018 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis. Only minor changes to the plant or site over the past three years, that would impact decommissioning, were identified.

¹ "Decommissioning Cost Estimate for the Vogtle Electric Generating Plant," Document S18-1754-002, Rev. 0, TLG Services, Inc., October 2018

The costs to decommission Vogtle is tabulated at the end of this section. Costs are reported in 2021 dollars and include monies anticipated to be spent for radiological remediation, 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 unit. A sequence of significant project activities is provided in Section 4 with a timeline for each unit. Detailed cost reports used to generate the summary tables contained within this document are provided in Appendices C and E.

Consistent with the 2018 analysis, the current cost estimates assume that the shutdown of the nuclear units 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).

The analysis recognizes that spent fuel will be stored at the site in the wet storage pools and/or in an independent spent fuel storage installation (ISFSI) until such time that it can be transferred to the U.S. Department of Energy (DOE). Consequently, the estimates also include those costs to manage and subsequently decommission these interim storage facilities.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the operating licenses for the nuclear units can be terminated. The estimates also include the dismantling of site structures and non-essential facilities and the limited restoration of the site.

Alternatives and Regulations

The Nuclear Regulatory Commission (NRC) provided general decommissioning requirements in the rule adopted on June 27, 1988.^[2] In this rule the NRC set forth 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

² 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.

removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."^[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."^[4] Decommissioning is 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."^[5] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years.

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 NRC 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, for example, on engineered barriers. In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to the 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.^[6] The amendments allowed for greater public participation and better define the transition

³ Ibid. FR24022, Column 3.

⁴ Ibid.

⁵ Ibid. FR24023, Column 2.

⁶ 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

process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, further described the methods and procedures acceptable to the NRC staff for implementing the requirements of the 1996 revised rule that relate to initial activities and major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and process described in the amended regulations. The format and content of the estimate is also consistent with the recommendations of Regulatory Guide 1.202, issued in February 2005.^[7]

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.^[8] The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. These additional details are included in this analysis, including the ISFSI decommissioning estimate (Appendix E).

Decommissioning Scenario

The DECON scenario assumes that decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling buildings. 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 2078.

Methodology

The methodology used to develop the estimates described within this document follows the basic approach originally presented in the cost estimating guidelines^[9] developed by

⁷ "Standard Format and Content of Decommissioning Cost Estimates of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, U.S. Nuclear Regulatory Commission, February 2005

⁸ U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011

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

the Atomic Industrial Forum (now Nuclear Energy Institute). This reference described a unit factor method for determining decommissioning activity costs. The unit factors used in this analysis incorporate site-specific costs and the latest available information on worker productivity in decommissioning.

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 cost estimate.

The estimates also reflect lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, 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, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee, Pilgrim, Indian Point, and Fort Calhoun nuclear units have provided additional insight into the process, the regulatory aspects, and the 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 these estimates, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

The use and role of contingency within decommissioning estimates is not a safety factor issue. Safety factors provide additional security and address situations that may never occur. Contingency funds, by contrast, are expected to be fully expended throughout the

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

program. 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,^[11] and its Amendments of 1985,^[12] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to SNC. The majority of the low-level radioactive waste designated for direct disposal (Class A^[13]) can be sent to EnergySolutions’ facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon SNC’s experience with EnergySolutions. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste was assumed to be shipped to the WCS facility and disposal costs for the waste using this facility were based upon SNC experience.

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

¹¹ “Low-Level Radioactive Waste Policy Act of 1980,” Public Law 96-573, 1980

¹² “Low-Level Radioactive Waste Policy Amendments Act of 1985,” Public Law 99-240, 1986

¹³ Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55

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 only, 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 the same canisters used for spent fuel and either stored on site or shipped directly to a DOE 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 metallic waste generated during decommissioning may potentially be contaminated by radioactive materials. Rather than designating this large volume for controlled disposal, this analysis assumes that the material is sent to a licensed facility for characterization and processing. Processing is routinely used to reduce the volume, for example, by component disassembly, sorting, and compaction. The estimates reflect the savings from waste recovery/volume reduction.

High-Level Radioactive Waste Management

Congress passed the “Nuclear Waste Policy Act”^[14] (NWP) 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 NWP provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities’ spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. NWP, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level waste, as required by the NWP and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE’s partial breach of contract. To date no spent fuel has been accepted from commercial generating sites for disposal.

In 2010 the Obama 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

¹⁴ “Nuclear Waste Policy Act of 1982 and Amendments,” DOE’s Office of Civilian Radioactive Management, 1982

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]
- “[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

¹⁵ Charter of the Blue Ribbon Commission on America’s Nuclear Future, “Objectives and Scope of Activities,” 2010

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

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

- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”^[19]

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)^[20] ordering NRC to comply with federal law and resume its review of DOE’s Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE’s environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

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.^[21] SNC’s current spent fuel management plan for the Vogtle spent fuel is based in general upon: 1) a 2032 start date for DOE initiating transfer of commercial spent fuel to a federal facility (not necessarily a final repository), and 2) expectations for spent fuel receipt by the DOE for the Vogtle fuel. 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, the spent fuel is completely removed from the site by the end of 2078 for a 2049 station shutdown.

¹⁹ *Ibid.*, p.2

²⁰ U.S. Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, Aug. 2013, [http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/\\$file/11-1271-1451347.pdf](http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/$file/11-1271-1451347.pdf)

²¹ In 2008, the DOE issued a report to Congress in which it concluded that it did not have authority, under present law, to accept spent nuclear fuel for interim storage from decommissioned commercial nuclear power reactor sites. However, the Blue Ribbon Commission, in its final report, noted that: “[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first.” For planning purposes only, this estimate does not assume that Vogtle, as a permanently shutdown plant, will receive priority; the fuel removal schedule assumed in this estimate is based upon DOE acceptance of fuel according to the “Oldest Fuel First” priority ranking.

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 building's storage pool as well as at an on-site ISFSI. For purposes of this analysis, it is assumed that DOE will accept already-canistered fuel.

An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K^[23]), has been constructed to support continued plant operations. The facility is assumed to be available to support future decommissioning operations. In the six years following the decision to permanently cease operations, the fuel is packaged for interim storage at the ISFSI. Once the fuel storage pools are emptied, the reactor buildings can be prepared for removal.

For cost estimating purposes, the spent fuel scenario developed for Vogtle assumed that the DOE would initiate spent fuel receipt in the year 2032. DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. The information available on the projected rate of transfer and the backlogged national queue indicates that Vogtle fuel would not be eligible for pickup until 2040. Supplemental dry cask spent nuclear fuel storage in the form of an ISFSI is assumed to be expanded following cessation of plant operations to accommodate the assemblies in the plant's wet storage pools. By relocating the fuel to the ISFSI, the wet storage pools may be secured and decommissioning of the nuclear units may proceed. Costs are included within the estimates to expand the ISFSI to accommodate the residual spent fuel inventories after pool operations cease and for the long-term caretaking of spent fuel at the site through the year 2078.

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.

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

²³ U.S. Code of Federal Regulations, Title 10, Part 72, Subpart K, "General License for Storage of Spent Fuel at Power Reactor Sites."

This estimate assumes that some site features will remain following the decommissioning project. These include the existing electrical switchyard, which is assumed to remain functional in support of the regional electrical distribution system.

Consequently, this study assumes that site structures will be removed to a nominal depth of three feet below the local grade level wherever possible. The site will then be graded and stabilized.

Summary

The estimates to decommission Vogtle assume the removal of all contaminated and activated plant components and structural materials such that the owner 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.

The alternative evaluated in this analysis is 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 Appendix C. The major cost components are also identified in the cost summary provided at the end of this section.

The cost elements in the estimates 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 reactors' operating licenses, 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, delineated in Appendix E.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE and/or ISFSI for interim storage, as well as the 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 cost 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. Consequently, this study assumes that the site structures addressed by this analysis are removed to a depth of three feet below grade 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 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 2021 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.

COST SUMMARY
(Thousands of 2021 Dollars)

Work Activity	Unit 1	Unit 2 ^[1]	Station
Decontamination	16,543	17,952	34,495
Removal	148,905	184,355	333,260
Packaging	25,041	25,469	50,510
Transportation	16,637	18,203	34,840
Waste Disposal	76,844	80,611	157,455
Off-site Waste Processing	33,768	43,771	77,538
Program Management	321,002	349,593	670,595
Security	99,480	85,591	185,071
Spent Fuel Pool Isolation	14,827	9,885	24,712
Spent Fuel Management	115,378	106,781	222,160
Insurance and Regulatory Fees	22,464	18,439	40,902
Energy	4,852	4,918	9,769
Characterization and Licensing Surveys	31,116	27,053	58,169
Property Taxes	0	0	0
Miscellaneous Equipment	14,492	17,937	32,429
Estimate Total ^[2]	941,348	990,557	1,931,905
NRC License Termination	658,117	700,975	1,359,092
Spent Fuel Management	194,031	177,079	371,110
Site Restoration	81,025	104,328	185,353
NRC ISFSI License Termination	8,175	8,175	16,351

^[1] Decommissioning costs associated with “Common” facilities are included with Unit 2

^[2] Columns may not summarize to exact Estimate Total due to rounding

1. INTRODUCTION

This study presents estimates of the costs to promptly decommission (decontaminate and dismantle) the Vogtle Electric Generating Plant (Vogtle) following a scheduled cessation of plant operations. The estimates are designed to provide Southern Nuclear Operating Company (SNC) with the information to assess its current decommissioning liability, as it relates to Vogtle.

The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2018^[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 an engineering evaluation, but consists of estimates prepared in advance of the detailed planning required to carry out the decommissioning of the nuclear units. It may also not reflect the actual plan to decommission Vogtle; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2018 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. Changes to the plant or site over the past three years, that would impact decommissioning, were incorporated into the estimate.

1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the costs to decommission Vogtle for the scenario outlined in Section 2, to define a sequence of events, and to develop waste stream projections from the decontamination and dismantling activities.

The two units at the Vogtle site were designed and constructed concurrently. Unit 1 obtained its operating license on March 16, 1987, with Unit 2 following on March 31, 1989. For the purposes of this study, the shutdown dates were taken as 60 years after the operating license issue dates (the end of the current

* References provided in Section 7 of this study

authorized licenses), or January 16, 2047 for Unit 1 and February 9, 2049 for Unit 2. This time frame was used as input for scheduling the decommissioning.

1.2 SITE DESCRIPTION

The Vogtle site is located in Burke County, Georgia, on the west side of the Savannah River about 26 miles southeast of Augusta and 15 miles east-northeast of Waynesboro. The station is comprised of two essentially identical pressurized water reactors.

The Nuclear Steam Supply System (NSSS) consists of a pressurized water reactor and four-loop Reactor Coolant System, supplied by the Westinghouse Electric Corporation. The license rating of each of the two units is 3625 megawatts (thermal) with a corresponding generating capacity of 1150 and 1152 megawatts (electric), respectively. The reactor coolant system is comprised of the reactor vessel and four heat transfer loops, each containing a vertical U-tube type steam generator and a single stage centrifugal reactor coolant pump. In addition, the system includes a pressurizer, a pressurizer relief tank and interconnected piping. The system is housed within a containment structure, a seismic Category I reinforced-concrete structure. It consists of a steel-lined, prestressed, post-tensioned concrete cylinder with a hemispherical dome.

Heat produced in the reactor is converted to electrical energy by the steam and power conversion system. A turbine-generator system converts the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy. The plant's turbine-generators are each a General Electric 1800-rpm, tandem compound, six-flow, reheat unit with 38-inch last stage buckets. The high-pressure turbine element includes one double-flow high-pressure turbine. The low-pressure turbine elements include three double-flow low pressure turbines and four external moisture separator-reheaters with one stage reheating elements 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 Circulating Water System removes heat rejected in the main condensers. Water is withdrawn from the Savannah River by the circulating water pumps located at the intake structure, which is connected to a cooling tower by a canal. The two pump discharge lines connect to a common header, which connects to a three-section, six-flow-path condenser.

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 will include a license termination plan (LTP).

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.^[7] The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity

into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. The additional details, including a decommissioning estimate for the Independent Spent Fuel Storage Installation (ISFSI), are included in this study.

1.3.1 Nuclear Waste Policy Act

Congress passed the “Nuclear Waste Policy Act”^[8] (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 NWPA provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities' spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. NWPA, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's partial breach of contract. To date no spent fuel has been accepted from commercial generating sites for disposal.

In 2010, the Obama 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.”^[9]

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”
- “[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.”^[10]

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...”^[11] This document states:

“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.”

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)^[12] ordering NRC to comply with federal law and resume its review of DOE’s Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A

supplement to DOE's environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

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 assumes that spent fuel allocations will 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.^[13] SNC's current spent fuel management plan for the Vogtle spent fuel is based in general upon: 1) a 2032 start date for DOE initiating transfer of commercial spent fuel to a federal facility (not necessarily a final repository), and 2) expectations for spent fuel receipt by the DOE for the Vogtle fuel. The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. The information available on the projected rate of transfer and the backlogged national queue indicates that the oldest Vogtle fuel would not be eligible for pickup until 2040. Assuming a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, the spent fuel is completely removed from the site by year end 2078 for a 2049 station shutdown.

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.^[14] Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel handling building's storage pool as well as at an on-site ISFSI. For purposes of this analysis, it is assumed that DOE will accept already-canistered fuel.

An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K ^[15]), has been constructed to support continued plant operations. The ISFSI is assumed to be expanded following cessation of plant operations to accommodate the assemblies in the plant's wet storage pools. By relocating the fuel to the ISFSI, the wet storage pools may be secured and decommissioning of the nuclear units may proceed. Costs are included within the estimates to expand the ISFSI to accommodate the residual spent fuel inventories after pool operations cease and for the long-term caretaking of spent fuel at the site through the year 2078.

The SNC position is that the DOE has a contractual obligation to accept Vogtle's 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. However, including the cost of storing spent fuel in this study is appropriate to ensure the availability of sufficient decommissioning funds at the end of the station's life if the DOE has not met its obligation. The cost for the interim storage of spent fuel has been calculated and is separately presented as "Spent Fuel Management" expenditures in this study.

1.3.2 Low-Level Radioactive Waste Regulations

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,^[16] and its Amendments of 1985,^[17] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to SNC. The majority of the low-level radioactive waste designated for direct disposal (Class A^[18]) can be sent to EnergySolutions' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon SNC's current experience-based costs associated with the EnergySolutions facility. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste was assumed to be shipped to the WCS facility. Disposal costs for this waste were also based upon SNC's current experience-based costs associated with the WCS facility.

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 only, 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 the same canisters used for spent fuel and either stored on site or shipped directly to a DOE 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 metallic waste generated during decommissioning may potentially be contaminated by radioactive materials. Rather than designating this large volume for controlled disposal, this analysis assumes that the material is sent to a licensed facility for characterization and processing. Processing is routinely used to reduce the volume, for example, by component disassembly, sorting, and compaction. 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,”^[19] 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 Vogtle 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).^[20] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.^[21]

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)^[22] 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 ALTERNATIVE

Detailed cost estimates were developed to decommission Vogtle based upon the approved DECON decommissioning alternative. 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.

The operating licenses for Units 1 and 2 currently expire in January 2047 and February 2049, respectively. The DECON scenario assumes that decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling buildings. 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 2078.

The following section describes the basic activities associated with the DECON decommissioning 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 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 Vogtle 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 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.

2.1.1 Engineering and Planning

The PSDAR, required within two years of the notice to cease 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, 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 greater than Class C waste (GTCC), as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore recirculation 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 is not 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 must 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, and work packages and procedures, would be assembled to support the proposed decontamination and dismantling activities.

2.1.2 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 (1) performing detailed radiation surveys of work areas and major components (including the reactor vessel and its internals), and (2) performing contamination surveys of internal piping components levels and primary shield cores.
- Isolation of the spent fuel storage pool and fuel handling systems. This allows decommissioning operations to be performed in plant areas to the greatest extent, with minimum impact to the project schedule. The fuel will be transferred from the spent fuel pool once it decays to the point that it meets the heat load criteria of the spent fuel casks. It is therefore assumed that the fuel pool will remain operational for a minimum of five and one-half years following the cessation of plant operations.
- 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.

- Construction of an ISFSI-to-DOE transfer facility. This facility will allow the efficient transfer of spent fuel canisters from the ISFSI pad to the DOE transportation overpacks and transportation vehicle.

2.2 PERIOD 2 – DECOMMISSIONING OPERATIONS

This period includes physical decommissioning activities associated with the removal and disposal of systems and structures containing contamination and radioactivity including the successful termination of the Part 50 operating licenses, 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. This may 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 may include the upgrading of roads (on and off site) to facilitate hauling and transport. Building modifications may be required to facilitate access of large/heavy equipment. Modifications may also be required to support the segmentation of the reactor vessel internals and component extraction.
- 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 canisters, 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 the 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 core former and lower core support assembly.
- Segmentation of the reactor vessel. This requires installation of a shielded work platform. Cutting operations are performed in-air using remotely operated equipment within a contamination control envelope, with the water level maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water.
- 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 controlled disposal. Decontaminate exterior surfaces, as required, and seal-weld openings (nozzles, inspection hatches, and other penetrations). These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized. Steel shielding will be added as necessary to meet transportation limits and regulations.
- Expansion of the ISFSI and transfer of the spent fuel from the storage pools to the DOE and ISFSI pad for interim storage. Spent fuel storage operations continue throughout the active decommissioning period. Fuel transfer to the DOE is expected to begin in 2040 and to be completed by the end of the year 2078.

At least two years prior to the anticipated date of license termination, an LTP will be required. Submitted as a supplement to the Final Safety Analysis Report (FSAR), or 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 NRC. 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 building and any other contaminated facility. Radiation and contamination controls will be utilized until radiation and contamination levels are reduced such 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.
- Removal of the remaining components, equipment, and plant services in support of the area release survey(s).
- 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).^[23] This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies state-of-the-art, 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 surveys are 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 final termination of the license.

The NRC will amend the operating licenses to reduce the licensed area to the ISFSI area 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.

2.3 PERIOD 3 - SITE RESTORATION, ISFSI OPERATIONS AND DEMOLITION

2.3.1 Site Restoration

Following completion of decommissioning operations, site restoration activities may begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits may result in substantial damage to many of the structures. Although performed in a controlled and safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures, including the reactor and auxiliary buildings. Verifying that subsurface radionuclide concentrations meet NRC site release requirements may 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.

Prompt dismantling of site structures is clearly the most appropriate and cost-effective option. 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 on site is more efficient than if the process were deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public and future workers. Abandonment creates a breeding ground for vermin infestation and other biological hazards.

This cost study presumes that non-essential structures and site 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, and 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 rebar and miscellaneous embedments. The processed material is then used on site to backfill voids. Excess non-contaminated materials are trucked to an off-site area for disposal as construction debris. Removable concrete vehicle barriers are removed intact and transported off site (cost of handling and transport is included in the estimate). Disposal of the barriers is based on no cost or credit to the decommissioning project.

2.3.2 ISFSI Operations & Demolition

The ISFSI will continue to operate under a general license (10 CFR Part 50) following the amendment of the operating licenses to release the adjacent (power block) property. Assuming the DOE starts accepting spent fuel in 2032, transfer of spent fuel from Vogtle continues through the year 2078. Any delay in the transfer process, for example, due to a delay in the scheduled opening of the geologic repository, a slower acceptance rate, or a combination of a delayed start date and lower transfer rate, results in a longer on-site residence time for the spent fuel and therefore additional caretaking expenses.

At the conclusion of the spent fuel transfer process, the ISFSI is decommissioned. The NRC terminates the Part 50 license 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.

The existing ISFSI design is based upon the use of a multi-purpose canister (MPC), each with a concrete overpack. The spent fuel is placed inside the MPC, which is placed inside the concrete overpack (cylindrical concrete shielding container), and stored vertically on a storage pad. For purposes of this cost analysis, it is assumed that once the MPCs

containing the spent fuel assemblies have been removed, and any residual radioactivity removed from the concrete overpack, the license for the ISFSI will be terminated. Following license termination, the concrete overpacks will be dismantled using conventional reinforced concrete demolition techniques. The concrete storage pad will then be removed, and the area graded and landscaped to conform to the surrounding environment.

3. COST ESTIMATE

The cost estimates prepared for decommissioning Vogtle consider the unique features of the site, including the nuclear steam supply system, power generation systems, support services, site buildings, and ancillary facilities. The bases of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations and other pertinent assumptions are described in this section.

3.1 BASIS OF ESTIMATE

The current estimates are developed using the basic design information originally generated for the decommissioning analysis prepared in 1994 and subsequently updated on a periodic basis with the most recent analysis completed in 2018. The information was reviewed for the current estimates and updated, as deemed appropriate. The site-specific considerations and assumptions used in the previous estimates were also revisited. Modifications were incorporated where new information was available or where experience from ongoing decommissioning programs provided viable alternatives or improved processes.

3.2 METHODOLOGY

The methodology used to develop these cost estimates follow the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"^[24] and the DOE "Decommissioning Handbook."^[25] 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) were developed using local labor rates provided by SNC. 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.^[26]

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, provides a high level of confidence 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.

Regulatory Guide 1.184 ^[27] describes the methods and procedures that are acceptable to the NRC staff for implementing the requirements 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 the regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202. ^[28]

This estimates reflect 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, Crystal River, Vermont Yankee, Pilgrim, Indian Point, and Fort Calhoun 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 radiologically controlled areas and 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 man-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. Dismantling of the fuel pool systems and decontamination of the spent fuel pools is also dependent upon the timetable for the transfer of the spent fuel assemblies from the pools to the DOE and/or ISFSI.

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 provides a high degree of confidence in the reliability of the resulting cost estimate.

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.

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 TLG's 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.

3.3.1 Contingency

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"^[29] 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 estimate are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, a contingency factor has been applied. 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 percentage contingency in each category. It should be noted that contingency, as used in this estimate, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

The use and role of contingency within decommissioning estimates is not a "safety factor issue." Safety factors provide additional security and address situations that may never occur. Contingency funds are expected to be fully expended throughout the program. They also provide assurance that sufficient funding is available to accomplish the intended tasks. An estimate without contingency, or from which contingency has been removed, could disrupt the orderly progression of events and jeopardize a successful conclusion to the decommissioning process.

For example, the most technologically challenging task in decommissioning a commercial nuclear station is the disposition of the reactor vessel and internal components, which have become highly radioactive after a lifetime of exposure to radiation produced in the core. The disposition of these highly radioactive components forms the basis for the critical path (schedule) for decommissioning operations. Cost and schedule are inter-dependent and any deviation in schedule has a significant impact on cost for performing a specific activity.

Disposition of the reactor vessel internals involves the underwater cutting of complex components that are highly radioactive. Costs are based upon optimum segmentation, handling, and packaging scenarios. The schedule is primarily dependent upon the turnaround time for the heavily shielded shipping casks, including preparation, loading, and decontamination of the containers for transport. The number of casks required is a function of the pieces generated in the segmentation activity, a value calculated on optimum performance of the tooling employed in cutting the various subassemblies. The risks and uncertainties associated with this task are that the expected optimization may not be achieved, resulting in delays and additional program costs. For this reason, contingency must be included to mitigate the consequences of the expected inefficiencies inherent in this complex

activity, along with related concerns associated with the operation of highly specialized tooling, field conditions, and water clarity.

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 range 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%
• Supplies	25%
• Engineering	15%
• Energy	15%
• Characterization and Termination Surveys	30%
• Construction	15%
• Insurance and Taxes	10%
• Staffing	15%
• NRC and Emergency Planning Fees	10%
• Spent Fuel Storage (Dry) Systems	15%
• Spent Fuel Transfer Costs	15%

- Operations and Maintenance Expenses 15%
- ISFSI Decommissioning 25%

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 Appendix C). The overall contingency, when applied this basis, results in an average value of 18.6% for Unit 1 and 18.5% for Unit 2. Appendix E, the ISFSI decommissioning calculation, uses a flat 25% contingency added at the end of the calculation.

3.3.2 Financial Risk

In addition to the routine technology-related uncertainties addressed by contingency, there is a broader level of project uncertainty that is sometimes necessary to consider when bounding decommissioning costs. 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, e.g., 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.
- Changes in the DOE's spent fuel transfer schedule and acceptance rate. Changes in these parameters affect the ISFSI size and duration of spent fuel storage and transfer.
- 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

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission Vogtle. 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 surcharge paid into the DOE's waste fund during operations. On November 19, 2013, the U.S. Court of Appeals for the D.C. Circuit ordered the Secretary of the Department of Energy to suspend collecting annual fees for nuclear waste disposal from nuclear power plant operators until the DOE has conducted a legally adequate fee assessment.

The NRC does, however, 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.

The DOE's repository program assumes that spent fuel will be accepted for disposal from the nation's commercial nuclear plants in the order (the "queue") in which it was removed from service ("oldest fuel first").^[30] Repository operations were based upon annual industry-wide receipt of 400 Metric Tons Heavy Metal (MTHM) in the first year of operation, a total of 3,800 MTHM in years 2 through 4 and 3,000 MTHM for year 5 and beyond.^[31] 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.

With the storage pools emptied, decommissioning operations can be concluded and the operating licenses terminated.

ISFSI

An ISFSI, which is operated under the plant's general license, has been constructed to support management of the spent fuel during operations. Costs are not included to re-license the ISFSI, but are included to expand the capacity of the ISFSI following final plant shutdown. The facility is assumed to be available to support spent fuel management once the units cease operation, until the DOE is able to removal all spent fuel from the site.

The ISFSI will continue to operate throughout decommissioning, and beyond the termination of the operating license in the DECON decommissioning alternative, until such time that the transfer of spent fuel to the DOE can be completed. Assuming, that DOE begins to remove spent fuel from the site in 2040, the process is expected to be completed by the year 2078.

Post-shutdown and maintenance costs for the spent fuel pools and the ISFSI are also included and address the cost for staffing the facility, as well as security, insurance, and licensing fees. Costs are provided for the final disposition of the facilities once the transfer is complete. These costs are allocated on a 50:50 basis between Units 1 and 2.

Canister and Overpack

A Holtec HI-STORM 100S Version B system is assumed for future ISFSI capacity expansions. For fuel assemblies transferred from the pools to the ISFSI after shut down, 24 assemblies for spent fuel not meeting the 10 year cooling requirement and 32 assemblies for those that meet the requirement are loaded into a canister. The cost of the concrete overpack is included in the decommissioning estimate. The cost of the MPCs is assumed to be funded from sources outside the decommissioning fund.

Canister Loading and Transfer

The estimates include the cost for the labor and equipment to transfer and load each spent fuel canister into the DOE transport cask or to the ISFSI from the wet storage pools. Since the DOE has not published details about its cask system, an SNC-provided allowance is used to estimate the cost to transfer the fuel from the ISFSI into the DOE transport cask. However, use of this allowance should not be used to infer that SNC has any detailed information on the cask system DOE will ultimately provide.

Operations and Maintenance

The estimates include the cost of operating and maintaining the spent fuel pools and the ISFSI, respectively. Pool operations are expected to continue approximately five and one half years after the cessation of operations. ISFSI operating costs are based upon a 30-year period of operations following the shutdown of Unit 2.

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 for the plan. 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) canister (MPC) with a concrete overpack is used as a basis for the cost analyses. The majority of the overpacks are assumed to be disposed of as “clean” material. As an

allowance, the inner steel liners of the remaining overpacks (total of 18) are assumed to have residual radioactivity due to some minor level of neutron-induced activation as a result of the long-term storage of the spent fuel, i.e., contain residual radioactivity. The allowance is based upon the number of modules required for the final core off-load (i.e., 193 offloaded assemblies, 24 assemblies per canister) which results in 9 overpack liners per unit. It is assumed that these are the final modules offloaded; consequently, they have the least time for radioactive decay of the neutron activation products.

No contamination or activation of the ISFSI pad is assumed. It would be expected that this assumption would be confirmed as a result of good radiological practice of surveying potentially impacted areas after each spent fuel transfer campaign. As such, only verification surveys are included for the pads in the decommissioning estimate. The estimate is limited to costs necessary to terminate the ISFSI's NRC license and meet the §20.1402 criteria for unrestricted use.

In accordance with the specific requirements of 10 CFR §72.30 for the ISFSI work scope, 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 decommissioning cost for the ISFSI is identified as a separate line item in the Unit 1 and 2 cost tables in Appendix C, and as a stand-alone table 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.^[32]

Although the material is not classified as high-level waste, federal regulations under the Act designate that disposal of this material is a federal responsibility under Section 3(b)(1)(D). However, the DOE has

not been forthcoming with an acceptance criteria or disposition schedule for this material, and numerous questions remain as to the ultimate disposal cost and waste form requirements.

As such, for purposes of this study, the GTCC has been packaged and disposed of in the same manner as high-level waste, at a cost equivalent to that envisioned for the spent fuel. The number of canisters required and the packaged volume for GTCC was based upon experience at Maine Yankee (e.g., the constraints on loading as identified in the canister's certificate of compliance), but adjusted for the increased spent fuel capacity of the current MPCs.

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 Vogtle site. GTCC costs have been segregated and included within the "License Termination" expenditures.

3.4.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented in order to meet transportation and disposal requirements. 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 well. Transportation cask specifications and transportation regulations will dictate segmentation and packaging methodology. Material is loaded into single use cask liners that are loaded into shielded and reusable transportation casks.

Intact disposal of the reactor vessel and internal components could 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. 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 Vogtle ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, and the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, as a bounding condition, the study assumes the reactor vessel requires segmentation.

3.4.3 Primary System Components

The reactor coolant system is 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 chemical waste" charge.

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, weight, and location within the containment will ultimately determine the removal strategy.

A potential method for removal (and the one used as the basis in this estimate) is the extraction of the generators through the existing equipment hatch. Sections of the steam generator cubicle walls, adjoining floor slabs, may require removal to allow for the generators to be maneuvered to the hatch.

Grating within the work area is decontaminated and removed. Next, a trolley crane is set up for removal of the generators. By setting the trolley crane first, it can be used to move portions of the steam generator cubicle walls and floor slabs from the containment to a location where they are decontaminated and transported to the material handling area.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they will be lowered onto a dolly. Once each steam generator has been placed in the horizontal position, nozzles and other openings are sealed. When this stage has been completed, each generator is moved out of containment and lowered onto a multi-wheeled transporter. The generators are relocated to an on-site storage area. The generator secondary side dome and internals are removed in order to reduce the component dimensions to permit rail transport to the disposal facility.

The secondary side (dome and internals) is reduced in volume, repackaged, and sent to the recycling facility. If required, the lower shell will have carbon steel plate welded to its outside surface for shielding during transport. The interior volume is filled with low-density cellular concrete for stabilization of the internal contamination and to satisfy burial ground packaging requirements. The pressurizer is removed using the same technique. Each component is then loaded onto a heavy-duty flatcar for rail 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) drops 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 by rail for 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 condenser is disassembled and moved to a laydown area. Material is surveyed and if free of radioactive contamination, released as scrap.

3.4.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components qualifies as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49 of the Code of Federal Regulations.^[33] The contaminated material is packaged in Industrial Packages (IP I, II, or III) 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 Part 71,^[34] as Type B. 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 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., ¹³⁷Cs, ⁹⁰Sr, 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, is 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 is based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments are designed to meet these limits.

The transport of large intact components, e.g., large heat exchangers and other oversized components, is by a combination of truck, rail, and/or multi-wheeled transporter.

Transportation costs for Class A radioactive material requiring controlled disposal are based upon the mileage to the EnergySolutions' facility in Clive, Utah. Transportation costs for the higher activity Class B and C radioactive material are based upon the mileage to the WCS facility in Andrews County, Texas. The transportation cost for the GTCC material is assumed to be contained within the disposal cost. Transportation costs for off-site waste processing are based upon the

mileage to Oak Ridge, Tennessee. Truck transport costs are developed from published tariffs from Tri-State Motor Transit.^[35]

3.4.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is treated to reduce the total volume requiring controlled disposal. The treated material, meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning 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 Appendix C, 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. Packaging efficiencies are lower for the highly-activated materials (greater than Class A waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

The estimates include an allowance for the removal and disposal of contaminated soil (see Appendix D, page 2) and disposal of contaminated tools and equipment used to support operations. Continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria, may increase this volume.

The cost to dispose of the lowest level waste and the majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at EnergySolutions

facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon SNC's current experiences with WCS for the Andrews County facility.

3.4.7 Site Conditions Following Decommissioning

The NRC terminates the site licenses (Part 50) 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, of the Part 50 facility, ends at this point. Building codes, environmental regulations and future plans for the site dictate the next step in the decommissioning process. As an example, the estimates assume that the electrical switchyard will remain operational in support of the electrical transmission and distribution system.

The large underground cooling water piping is isolated, sealed, and abandoned in place. Site utility and service piping is abandoned in place. Electrical manholes are backfilled with suitable earthen material and abandoned. Asphalt surfaces in the immediate vicinity of site buildings are broken up and the material used for backfill on site, if needed. The site access road remains. The ISFSI remains and is subsequently decommissioned as explained in Section 3.4.1.

The estimate includes an allowance for the removal and disposal of contaminated soil and contaminated concrete in the wastewater retention basin. Continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria, may increase this volume.

Structures are removed to a nominal depth of three feet below grade. Concrete rubble generated from demolition activities is processed and used as clean fill. Excess concrete waste is trucked and disposed of at a commercial landfill. The site is graded following the removal of non-essential structures to conform to the adjacent landscape, and vegetation is established to inhibit erosion.

A significant amount of the below grade piping is located around the perimeter of the power block. The estimate includes a cost to excavate this area to an average depth of six feet so as to expose the piping, duct bank,

conduit, and any near-surface grounding grid. The overburden is surveyed and stockpiled on site for future use in backfilling the below grade voids.

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 2021 dollars. Costs are not inflated, escalated, or discounted over the periods of performance.

The 2018 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. There were no changes to plant systems / structures that would impact.

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

SNC will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The licensee will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services, e.g., for preparing the activity specifications, work procedures, activation, and structural analyses, under the direction of the owner.

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

The costs associated for the transition of the operating organization to decommissioning, e.g., separation packages, retraining, severance, and incentives are not included in the estimates and were considered to be ongoing operating expenses.

The craft labor required to decontaminate and dismantle the nuclear units is acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis. Costs for site administration, operations, construction, and maintenance personnel are based upon average salary information provided by SNC.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel (in accordance with the requirements of 10 CFR Part 37, Part 72, and Part 73). Security costs include provisions for recurring expenses. Once the fuel has been transferred to the DOE in 2078, the security organization will be reduced to Part 37 requirements.

The estimates incorporate economies of scale. Examples include the reduction in the man-hours and dollars for the preparation of common engineering work packages for the two units. Staff levels are reduced for supervision and management of parallel activities. Cost sharing is also reflected within the estimates for selective and joint decommissioning activities and in the purchase of specialty decommissioning equipment.

3.5.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant was assumed to have released fission products at sufficiently low levels so that the buildup of quantities of long-lived isotopes (e.g., ¹³⁷cesium, ⁹⁰strontium, or transuranics) have 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 were derived from those listed in NUREG/CR-3474.^[36] Actual estimates were derived from the curie/gram values contained therein and adjusted for the different mass of Vogtle components, projected operating life, and different periods of decay. Additional short-lived isotopes are derived from NUREG/CR-0130^[37] and NUREG/CR-0672,^[38] and benchmarked to the long-lived values from NUREG/CR-3474.

The control elements are disposed of along with the spent fuel, i.e., there is no additional cost provided for their disposal.

Activation of the containment structure was confined to the sacrificial shield in the estimates. More extensive activation (at very low levels) of the interior structures within containment have been detected at several reactors and the owners have elected to dispose of the affected material at a controlled facility rather than reuse the material as fill on site or send it to a landfill. The ultimate disposition of the material removed depends upon the site release criteria selected and the designated end use for the site.

Contaminated Soil

The estimates include an allowance for the remediation of potentially contaminated soil at several site areas that have been identified by SNC that may contain concentrations of radionuclides in excess of NRC release limits. The areas include the refueling water storage tank missile shield and the soil around the waste oil separator. The requirements assumed for soil remediation may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

3.5.4 General

Transition Activities

Existing warehouses will be cleared of non-essential material and remain for use by SNC and its subcontractors. The warehouses may be dismantled as they become surplus to the decommissioning program. The station's operating staff will perform 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. It is assumed that these chemicals will have some value; therefore, the cost for their removal will be compensated through their subsequent sale.
- Process operating waste inventories. Disposal of operating wastes (e.g., filtration media, resins) during this initial period is not

considered a decommissioning expense. The estimates do not address the disposition of any legacy components, with the exception of the contaminated operations / maintenance tools and equipment.

Scrap and Salvage

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

It is assumed, for purposes of this estimate, 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 did not include the additional cost for size reduction and preparation to meet “furnace ready” conditions. For example, the recovery of copper from electrical cabling from a facility currently being decommissioned has required the removal and disposition of the PCB-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 was 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 such items of property owned by the utility will be removed at no cost or credit to the decommissioning project. Disposition may include relocation to other generating facilities. Spare parts will also be made available for alternative use.

The concrete debris resulting from building demolition activities is crushed on site to reduce the size of the debris. The resulting crushed

concrete is used to backfill below grade voids. The rebar removed from the concrete crushing process is disposed of as scrap steel in a similar fashion as other scrap metal as discussed previously.

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.

Emergency Planning

FEMA fees associated with emergency planning are assumed to continue for approximately 18 months following the cessation of operations. At this time, the fees are discontinued, based upon the anticipated condition of the spent fuel (i.e., the hottest spent fuel assemblies are assumed to be cool enough that no substantial Zircaloy oxidation and off-site event would occur with the loss of spent fuel pool water). State and local fees remain at operating levels until all fuel has been transferred from the pools to the ISFSI. After all spent fuel is in dry storage the state and local fees are reduced. These fees are eliminated after all spent fuel is off site.

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 provided in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning."^[39] The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

Property Taxes

The property tax during the decommissioning period is considered negligible and is not considered in these estimates.

Site Modifications

The perimeter fence and in-plant security barriers are moved, as appropriate, to conform to the site security plan in force during the various stages of the project.

Hazardous and Mixed Waste

No significant quantities of asbestos, industrial solvents, chromated water, lead, mercury or mixed waste are expected to be present on site at the time of decommissioning. Therefore, remediation costs were not included in the study.

Overhead Costs

Based upon current corporate and overhead costs provided by SNC, an allowance is included as an overhead rate on utility salaries. These costs include: site overhead costs required to support the site decommissioning staff, and an allowance for corporate costs required to continue at reduced levels during the decommissioning period.

3.6 IMPACT OF DECOMMISSIONING MULTIPLE REACTOR UNITS

In estimating the near simultaneous decommissioning of two co-located reactor units there can be opportunities to achieve economies of scale, by sharing costs between units, and coordinating the sequence of work activities. There will also be schedule constraints, particularly where there are requirements for specialty equipment and staff, or practical limitations on when final status surveys can take place. For purposes of the estimate, Units 1 and 2 are assumed to be essentially identical. Common facilities have been assigned to Unit 2. A summary of the principal impacts is listed below.

- The sequence of work generally follows the principal that the work is done at Unit 1 first, followed by similar work at Unit 2. This permits the experience gained at Unit 1 to be applied by the workforce at the second unit. It should be noted however, that the estimates do not consider productivity improvements at the second unit, since there is little documented experience with decommissioning two units simultaneously. The work associated with developing activity specifications and procedures can be considered essentially identical between the two units, therefore the second unit costs are assumed to be a fraction of the first unit (~ 43%).

- Segmenting the reactor vessel and internals will require the use of special equipment. The decommissioning project will be scheduled such that Unit 2's reactor internals and vessel are segmented after the activities at Unit 1 have been completed.
- Some program management and support costs, particularly costs associated with the more senior positions, can be avoided with two reactors undergoing decommissioning simultaneously. As a result, the estimate is based on a "lead" unit that includes these senior positions, and a "second" unit that excludes these positions.
- Unit 1, as the first unit to enter decommissioning, incurs the majority of site characterization costs.
- Unit 1, as the first unit to enter decommissioning, incurs a greater fraction of the NRC hourly charges.
- The final radiological survey schedule is affected by a two-unit decommissioning schedule. It would be considered impractical to try to complete the final status survey of Unit 1, while Unit 2 still has ongoing radiological remediation work and waste handling in process. As such, the final status surveys of Units 1 and 2 are conducted concurrently.
- The final demolition of buildings at Units 1 and 2 are considered to take place concurrently.
- Costs for operating and maintaining the ISFSI after the operating licenses are terminated are allocated equally between Units 1 and 2.
- Shared systems and common structures are generally assigned to Unit 2.
- Station costs such as emergency response fees, corporate overhead, and insurance are generally allocated on an equal basis between the two units.

3.7 COST ESTIMATE SUMMARY

Summary level costs, license termination, spent fuel and site restoration costs projected for the decommissioning of each of the two units are provided in Tables 3.1 and 3.2 (sub-parts a, b, c, and d). 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 Appendix C 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 License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). The basis for the ISFSI decommissioning cost that is included in Appendix C is provided in Appendix E.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE and/or ISFSI for interim storage, as well as the 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 cost 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.

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. While designated for disposal at the 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 2021 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 Appendix C, along with the timelines presented in Section 4.

The “Burial” column (Table 3.1 and 3.2) contains costs for the processing of low-level radioactive waste, as well as for the controlled disposal of material that cannot be recovered (released for unrestricted use). Since the following tables are often used in escalation analyses, costs associated with the disposition of GTCC have been reassigned to the “Other” column, commensurate with contractual payments for a one-time disposal service,

although the cost is still reported in the “LLRW Disposal Costs” column in Appendix C and as a “Waste Disposal” cost in the summary tables (i.e., on the table on page xix, and Table 6-1 and 6-2). “Off-site Waste Processing,” separately reported in the summary tables, has been included in the “Burial” column as well.

TABLE 3.1a
SUMMARY SCHEDULE OF ANNUAL EXPENDITURES
UNIT 1
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2047	72,596	13,314	782	37	28,929	115,658
2048	79,656	33,865	1,206	17,257	9,208	141,192
2049	75,031	36,376	775	29,782	9,883	151,846
2050	61,466	23,081	667	19,629	7,727	112,570
2051	54,487	16,240	612	14,405	6,617	92,361
2052	45,573	13,743	464	12,622	12,079	84,482
2053	7,597	345	0	6	1,202	9,150
2054	7,597	345	0	6	1,202	9,150
2055	31,646	2,337	125	23	1,432	35,562
2056	16,662	11,389	82	0	740	28,874
2057	16,617	11,358	82	0	738	28,795
2058	11,903	7,741	53	0	744	20,441
2059	2,883	402	0	0	754	4,039
2060	2,869	335	0	0	757	3,960
2061	2,883	402	0	0	754	4,039
2062	2,861	335	0	0	754	3,950
2063	2,883	402	0	0	754	4,039
2064	2,869	335	0	0	757	3,960
2065	2,883	402	0	0	754	4,039
2066	2,861	335	0	0	754	3,950
2067	2,883	402	0	0	754	4,039
2068	2,869	335	0	0	757	3,960
2069	2,883	402	0	0	754	4,039
2070	2,861	335	0	0	754	3,950
2071	2,861	335	0	0	754	3,950
2072	2,824	201	0	0	757	3,781
2073	2,995	736	0	0	754	4,486
2074	2,995	736	0	0	754	4,486
2075	3,040	870	0	0	754	4,664
2076	3,047	870	0	0	757	4,674

TABLE 3.1a (continued)
SUMMARY SCHEDULE OF ANNUAL EXPENDITURES
UNIT 1
 (Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2077	2,973	669	0	0	754	4,397
2078	3,218	2,376	0	0	14,493	20,088
2079	3,772	1,287	4	2,945	4,767	12,775
Total	543,045	182,634	4,852	96,712	114,106	941,348

TABLE 3.1b
SCHEDULE OF ANNUAL EXPENDITURES – LICENSE TERMINATION
UNIT 1
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2047	69,337	5,439	782	37	18,343	93,938
2048	72,831	18,422	1,206	17,257	7,030	116,746
2049	69,232	23,747	775	29,782	8,250	131,785
2050	57,119	15,827	667	19,629	6,094	99,336
2051	50,887	11,751	612	14,405	4,984	82,639
2052	41,479	10,329	464	12,622	11,103	75,998
2053	3,964	260	0	6	989	5,220
2054	3,964	260	0	6	989	5,220
2055	28,244	1,755	123	23	1,213	31,357
2056	85	0	0	0	310	396
2057	85	0	0	0	309	394
2058	55	0	0	0	202	257
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0

TABLE 3.1b (continued)
SCHEDULE OF ANNUAL EXPENDITURES – LICENSE TERMINATION
UNIT 1
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2077	0	0	0	0	0	0
2078	105	970	0	0	13,754	14,830
2079	695	254	3	2,945	4,279	8,175
Total	398,083	89,016	4,631	96,712	77,850	666,292

TABLE 3.1c
SCHEDULE OF ANNUAL EXPENDITURES – SPENT FUEL
UNIT 1
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2047	2,625	7,875	0	0	10,586	21,086
2048	5,136	15,407	0	0	2,178	22,721
2049	4,184	12,552	0	0	1,633	18,369
2050	2,392	7,176	0	0	1,633	11,201
2051	1,470	4,410	0	0	1,633	7,513
2052	2,736	3,363	0	0	976	7,075
2053	3,633	84	0	0	213	3,930
2054	3,633	84	0	0	213	3,930
2055	3,027	276	2	0	218	3,523
2056	2,824	204	82	0	423	3,533
2057	2,817	203	82	0	422	3,524
2058	2,905	467	53	0	538	3,963
2059	2,883	402	0	0	754	4,039
2060	2,869	335	0	0	757	3,960
2061	2,883	402	0	0	754	4,039
2062	2,861	335	0	0	754	3,950
2063	2,883	402	0	0	754	4,039
2064	2,869	335	0	0	757	3,960
2065	2,883	402	0	0	754	4,039
2066	2,861	335	0	0	754	3,950
2067	2,883	402	0	0	754	4,039
2068	2,869	335	0	0	757	3,960
2069	2,883	402	0	0	754	4,039
2070	2,861	335	0	0	754	3,950
2071	2,861	335	0	0	754	3,950
2072	2,824	201	0	0	757	3,781
2073	2,995	736	0	0	754	4,486
2074	2,995	736	0	0	754	4,486
2075	3,040	870	0	0	754	4,664
2076	3,047	870	0	0	757	4,674

TABLE 3.1c (continued)
SCHEDULE OF ANNUAL EXPENDITURES – SPENT FUEL
UNIT 1
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2077	2,973	669	0	0	754	4,397
2078	3,113	1,406	0	0	739	5,258
2079	0	0	0	0	0	0
Total	95,717	62,345	219	0	35,750	194,031

TABLE 3.1d
SCHEDULE OF ANNUAL EXPENDITURES – SITE RESTORATION
UNIT 1
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2047	634	0	0	0	0	634
2048	1,689	36	0	0	0	1,725
2049	1,615	77	0	0	0	1,692
2050	1,955	78	0	0	0	2,033
2051	2,131	78	0	0	0	2,209
2052	1,357	52	0	0	0	1,409
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	376	306	0	0	0	682
2056	13,753	11,186	0	0	7	24,945
2057	13,715	11,155	0	0	7	24,877
2058	8,943	7,274	0	0	4	16,221
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0

TABLE 3.1d (continued)
SCHEDULE OF ANNUAL EXPENDITURES – SITE RESTORATION
UNIT 1
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	3,077	1,032	1	0	489	4,600
Total	49,245	31,273	1	0	506	81,025

TABLE 3.2a
SUMMARY SCHEDULE OF ANNUAL EXPENDITURES
UNIT 2
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2049	59,147	10,782	728	34	13,899	84,591
2050	74,488	27,629	1,206	15,718	8,738	127,779
2051	74,870	33,804	775	31,046	9,699	150,194
2052	73,347	26,243	681	23,948	8,020	132,238
2053	71,936	20,810	612	18,851	6,803	119,011
2054	64,217	19,657	498	15,581	10,216	110,169
2055	42,068	6,375	197	2,349	4,383	55,370
2056	18,530	16,939	82	0	1,567	37,118
2057	18,479	16,893	82	0	1,563	37,017
2058	13,118	11,350	53	0	1,281	25,802
2059	2,883	402	0	0	754	4,039
2060	2,869	335	0	0	757	3,960
2061	2,883	402	0	0	754	4,039
2062	2,861	335	0	0	754	3,950
2063	2,883	402	0	0	754	4,039
2064	2,869	335	0	0	757	3,960
2065	2,883	402	0	0	754	4,039
2066	2,861	335	0	0	754	3,950
2067	2,883	402	0	0	754	4,039
2068	2,869	335	0	0	757	3,960
2069	2,883	402	0	0	754	4,039
2070	2,861	335	0	0	754	3,950
2071	2,861	335	0	0	754	3,950
2072	2,824	201	0	0	757	3,781
2073	2,995	736	0	0	754	4,486
2074	2,995	736	0	0	754	4,486
2075	3,040	870	0	0	754	4,664
2076	3,047	870	0	0	757	4,674
2077	2,973	669	0	0	754	4,397
2078	3,218	2,376	0	0	14,493	20,088
2079	3,772	1,287	4	2,945	4,767	12,775
Total	572,413	202,982	4,918	110,471	99,774	990,557

TABLE 3.2b
SCHEDULE OF ANNUAL EXPENDITURES – LICENSE TERMINATION
UNIT 2
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2049	56,421	3,362	728	34	12,165	72,711
2050	69,731	17,030	1,206	15,718	6,918	110,603
2051	69,539	23,911	775	31,046	8,066	133,337
2052	68,304	17,729	681	23,948	6,382	117,043
2053	67,119	13,304	612	18,851	5,170	105,056
2054	59,162	12,806	498	15,581	9,147	97,194
2055	38,222	4,376	194	2,349	4,142	49,283
2056	37	0	0	0	310	347
2057	36	0	0	0	309	346
2058	24	0	0	0	202	225
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	105	970	0	0	13,754	14,830
2079	695	254	3	2,945	4,279	8,175
Total	429,395	93,742	4,698	110,471	70,845	709,150

TABLE 3.2c
SCHEDULE OF ANNUAL EXPENDITURES – SPENT FUEL
UNIT 2
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2049	2,473	7,420	0	0	1,734	11,628
2050	3,521	10,562	0	0	1,820	15,903
2051	3,267	9,800	0	0	1,633	14,700
2052	2,808	8,425	0	0	1,637	12,870
2053	2,473	7,419	0	0	1,633	11,525
2054	3,072	6,777	0	0	1,069	10,918
2055	3,103	1,530	2	0	218	4,853
2056	2,824	204	82	0	423	3,533
2057	2,817	203	82	0	422	3,524
2058	2,905	467	53	0	538	3,963
2059	2,883	402	0	0	754	4,039
2060	2,869	335	0	0	757	3,960
2061	2,883	402	0	0	754	4,039
2062	2,861	335	0	0	754	3,950
2063	2,883	402	0	0	754	4,039
2064	2,869	335	0	0	757	3,960
2065	2,883	402	0	0	754	4,039
2066	2,861	335	0	0	754	3,950
2067	2,883	402	0	0	754	4,039
2068	2,869	335	0	0	757	3,960
2069	2,883	402	0	0	754	4,039
2070	2,861	335	0	0	754	3,950
2071	2,861	335	0	0	754	3,950
2072	2,824	201	0	0	757	3,781
2073	2,995	736	0	0	754	4,486
2074	2,995	736	0	0	754	4,486
2075	3,040	870	0	0	754	4,664
2076	3,047	870	0	0	757	4,674
2077	2,973	669	0	0	754	4,397
2078	3,113	1,406	0	0	739	5,258
2079	0	0	0	0	0	0
Total	87,598	63,051	219	0	26,212	177,079

TABLE 3.2d
SCHEDULE OF ANNUAL EXPENDITURES – SITE RESTORATION
UNIT 2
(Thousands, 2021 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2049	253	0	0	0	0	253
2050	1,236	37	0	0	0	1,273
2051	2,065	93	0	0	0	2,158
2052	2,235	89	0	0	0	2,324
2053	2,344	87	0	0	0	2,430
2054	1,983	73	0	0	0	2,057
2055	743	469	0	0	23	1,235
2056	15,669	16,736	0	0	833	33,238
2057	15,626	16,690	0	0	831	33,147
2058	10,189	10,883	0	0	542	21,614
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	3,077	1,032	1	0	489	4,600
Total	55,420	46,189	1	0	2,718	104,328

4. SCHEDULE ESTIMATE

The schedule for the decommissioning scenario considered in this study followed the sequence presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling was revised to reflect the required cooling period for the spent fuel.

A schedule or sequence of activities is presented in Figure 4.1. The schedule reflects the prompt decommissioning alternative and the start date consistent with a scheduled shutdown in 2047 for Unit 1 and 2049 for Unit 2. The sequence assumed that fuel would be removed from each units spent fuel pool within the first five years after shutdown. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the Appendix C cost table, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the “Microsoft Office Project Professional” computer software.^[40]

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule was generated using a precedence network and associated software. Activity durations were based upon the actual man-hour estimates calculated for each area. The schedule was assembled by sequencing the work areas, considering work crew availability and material access/egress. The following assumptions were made in the development of the decommissioning schedule:

- The spent fuel storage area of the fuel handling buildings are isolated until such time that all spent fuel has been discharged from the storage pools to the DOE or to the ISFSI. Decontamination and dismantling of the storage pools are initiated once the transfer of spent fuel is complete. The fuel handling buildings will continue to serve as the spent fuel storage/transfer facility until such time that all spent fuel has been removed from the spent fuel pools. The fuel handling buildings are expected to operate for approximately five and one-half years after the cessation of operations.
- All work (except vessel and internals removal activities) will be performed during an 8-hour workday, 5 days per week, with no overtime. There are eleven paid holidays per year.
- Reactor and internals removal activities will be performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.

- Multiple crews will work parallel activities to the maximum extent possible, consistent with: optimum efficiency; adequate access for cutting, removal and laydown space; and 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 were considered to determine the duration of the activity.

4.2 PROJECT SCHEDULE

The period-dependent costs presented in Appendix C were based upon the durations developed in the schedule for the decommissioning of Vogtle. Durations were established between several milestones in each project period; these durations were used to establish a critical path for the entire project. In turn, the critical path duration for each period was used as the basis for determining the period-dependent costs. A second critical path is also shown for the spent fuel cooling period, which determines the release of the reactor buildings for final decontamination.

Project timelines are shown in this section as Figure 4.2. Milestone dates were based on a 60-year plant operating life from the operating license issue date, a five-year wet storage period for the last core discharge, and continued operation of the ISFSI until the DOE can complete the transfer of spent fuel and GTCC waste from the site.

FIGURE 4.1
DECOMMISSIONING ACTIVITY SCHEDULE

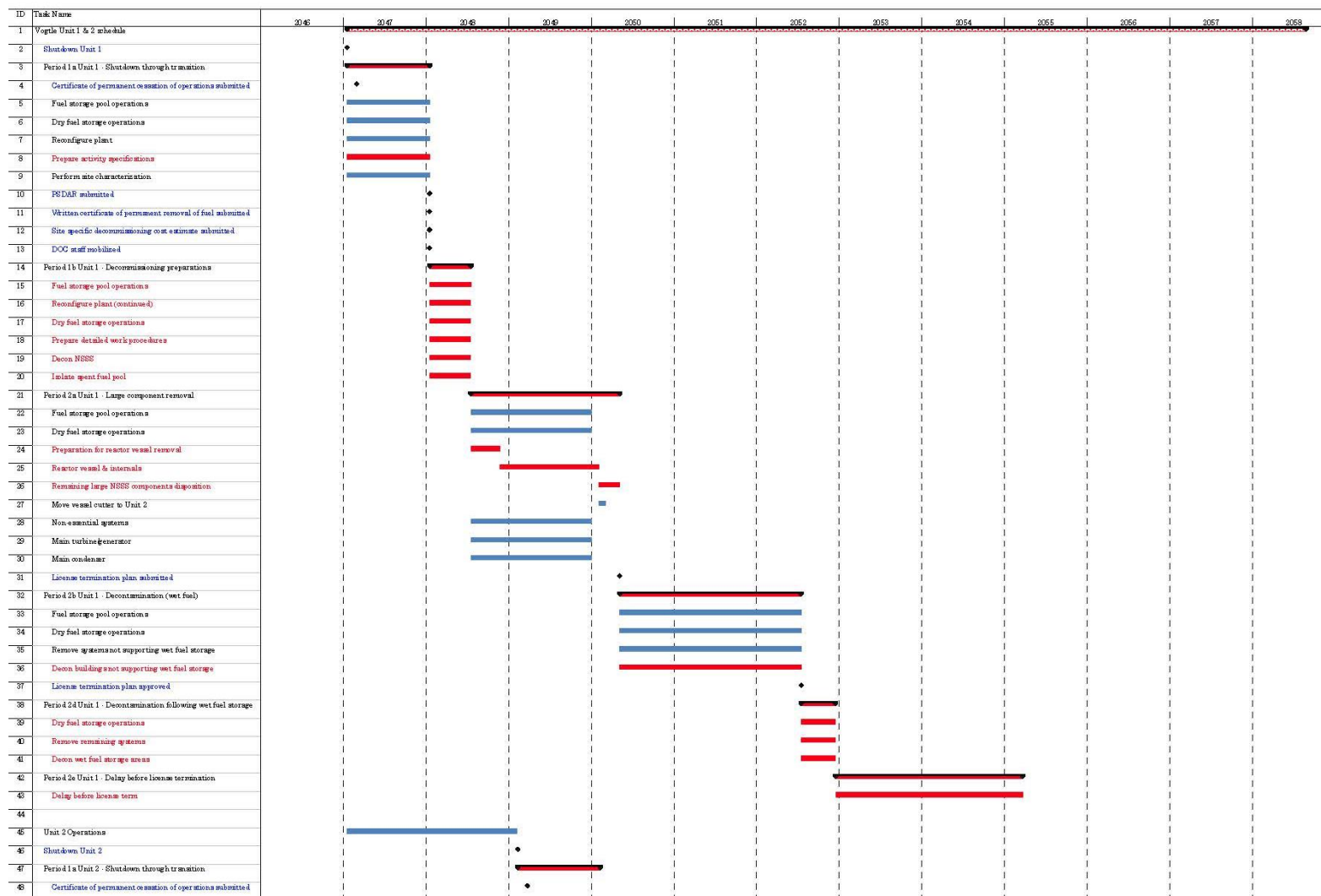


FIGURE 4.1 (continued)
DECOMMISSIONING ACTIVITY SCHEDULE

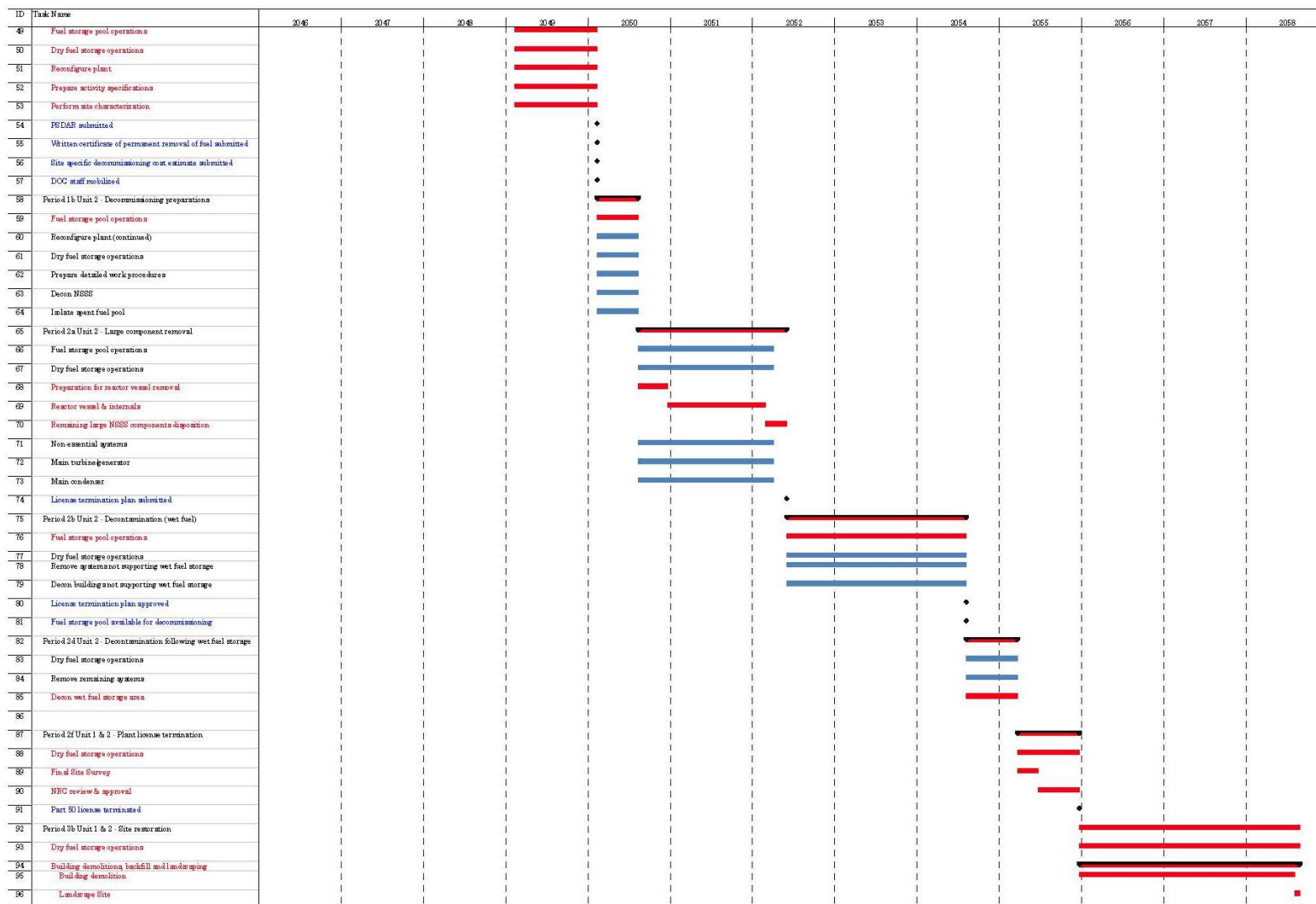
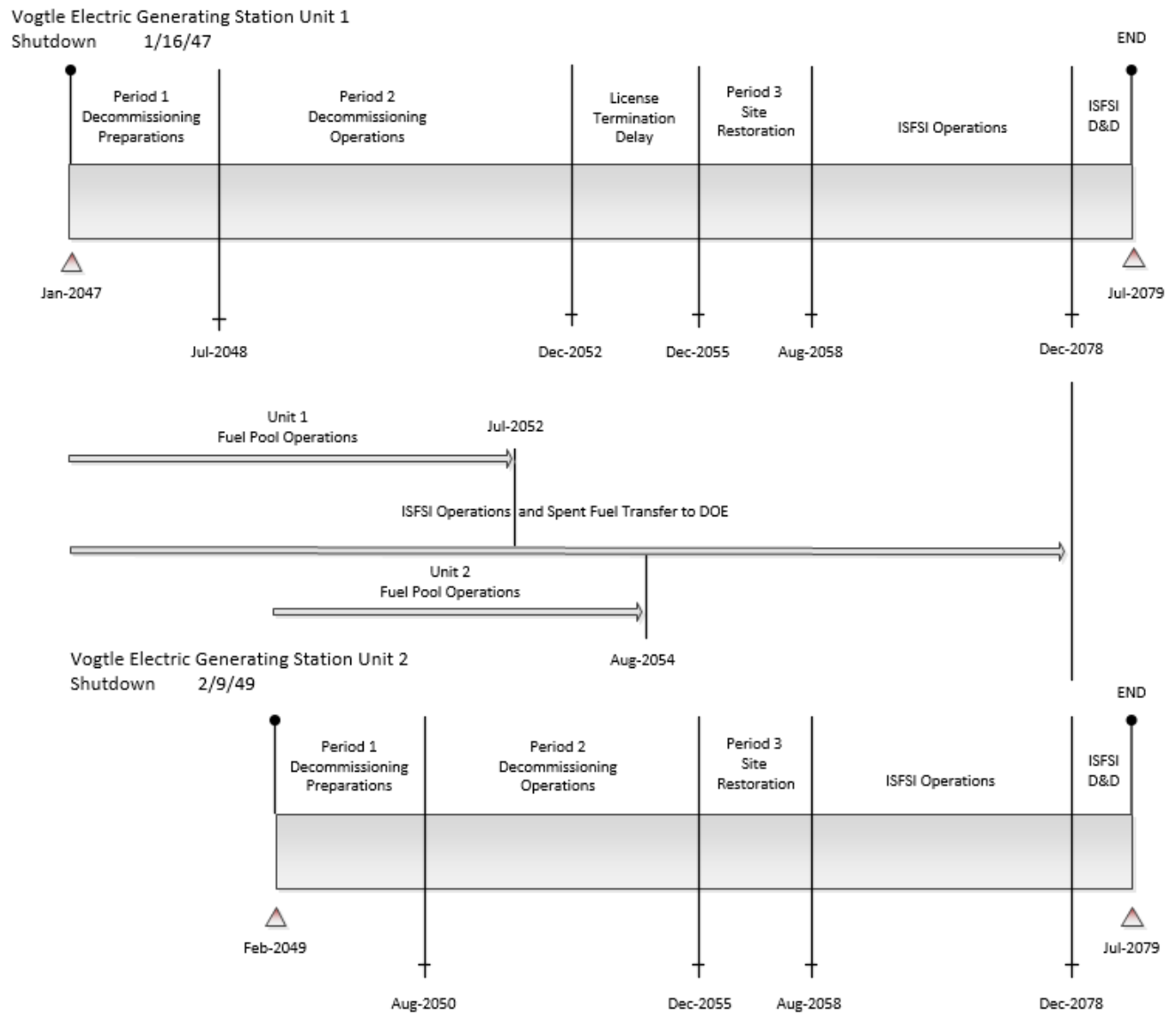


FIGURE 4.2
DECOMMISSIONING TIMELINE
(not to scale)



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(s). This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,^[41] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations (CFR) delineates the production, utilization, and disposal of radioactive materials and processes. In particular, 10 CFR Part 71 defines the requirements for packaging and transportation of radioactive material and 10 CFR Part 61 defines the criteria and procedures by which the NRC issues licenses for the disposal of radioactive waste. 10 CFR 61.55(a)(2)(iv) states that GTCC waste requires disposal in a geologic repository unless otherwise approved by the NRC.

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 Part 173.^[42] Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3). 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 of radioactive waste generated during the various decommissioning activities at the site are shown on a line-item basis in Appendix C and summarized in Tables 5.1 and 5.2. The quantified waste volume summaries shown in these tables are consistent with Part 61 classifications. The volumes were calculated based on the exterior dimensions for containerized material. The volumes were calculated 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 were applied against the liner volume and the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Class A waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

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 generated in the decontamination and dismantling of Vogtle will primarily be generated during Period 2. A significant portion of the metallic waste will be 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 will be packaged for controlled disposal at a licensed facility. Material considered potentially contaminated when removed from the radiologically controlled area will be sent to processing facilities for conditioning and disposal at an all-inclusive unit cost of \$2.52 per pound. Other contaminated components and activated materials will be routed for controlled disposal. The disposal volumes reported in the tables reflect the reductions resulting from reprocessing.

For purposes of constructing the estimate, all Class B and C wastes were assumed to be disposed of at the WCS facility in Andrews, Texas. This schedule was used to estimate the disposal fees for highly activated components, such as the reactor vessel internals (not qualifying as GTCC radioactive material), and concentrated radioactive material resulting from decontamination and water processing operations. Based on current SNC experience, an average disposal rate of \$10,296 per cubic foot was used for irradiated hardware (metallic waste). This rate includes a 32% fee applied to the base WCS rate of \$7,800 per cubic foot. Similarly, an average disposal rate of \$3,029 per cubic foot was used for Class B wastes originating from chemical decontamination. This rate also includes a 32% fee applied to the WCS base rate of \$2,295 per cubic foot.

Class A resins shipped in a cask are disposed of at a cost of \$47,881 per cask (includes state taxes). The remaining Class A radioactive waste, including contaminated metallic and concrete debris, will be disposed of at the *EnergySolutions* facility. This includes lower activity material such as miscellaneous steel, metal siding, scaffolding, structural steel, and large components (including heat exchangers and sections of the reactor vessel). The disposal costs for this material are as follows (includes state taxes):

- \$339.13 per cubic foot for large components that are to be disposed of in their entirety
- \$267.78 per cubic foot for materials that meets *EnergySolutions*' "containerized waste" criteria

- \$60.13 per cubic foot for disposal of material that meets Energy*Solutions*' "debris" criteria, and
- \$2.50 per pound (\$50.40 per cubic foot) for disposal of Dry Active Waste (DAW)

FIGURE 5.1
RADIOACTIVE WASTE DISPOSITION

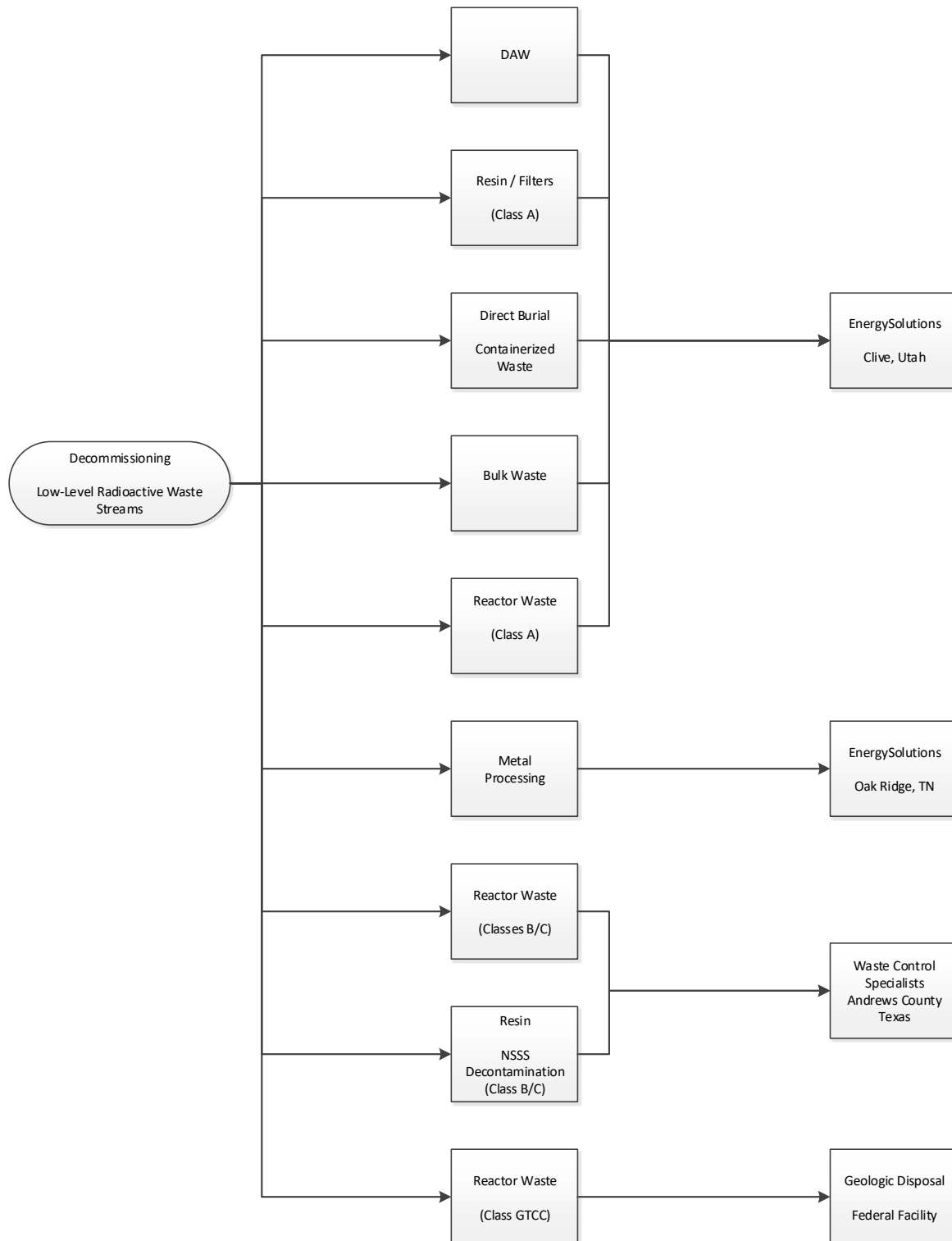
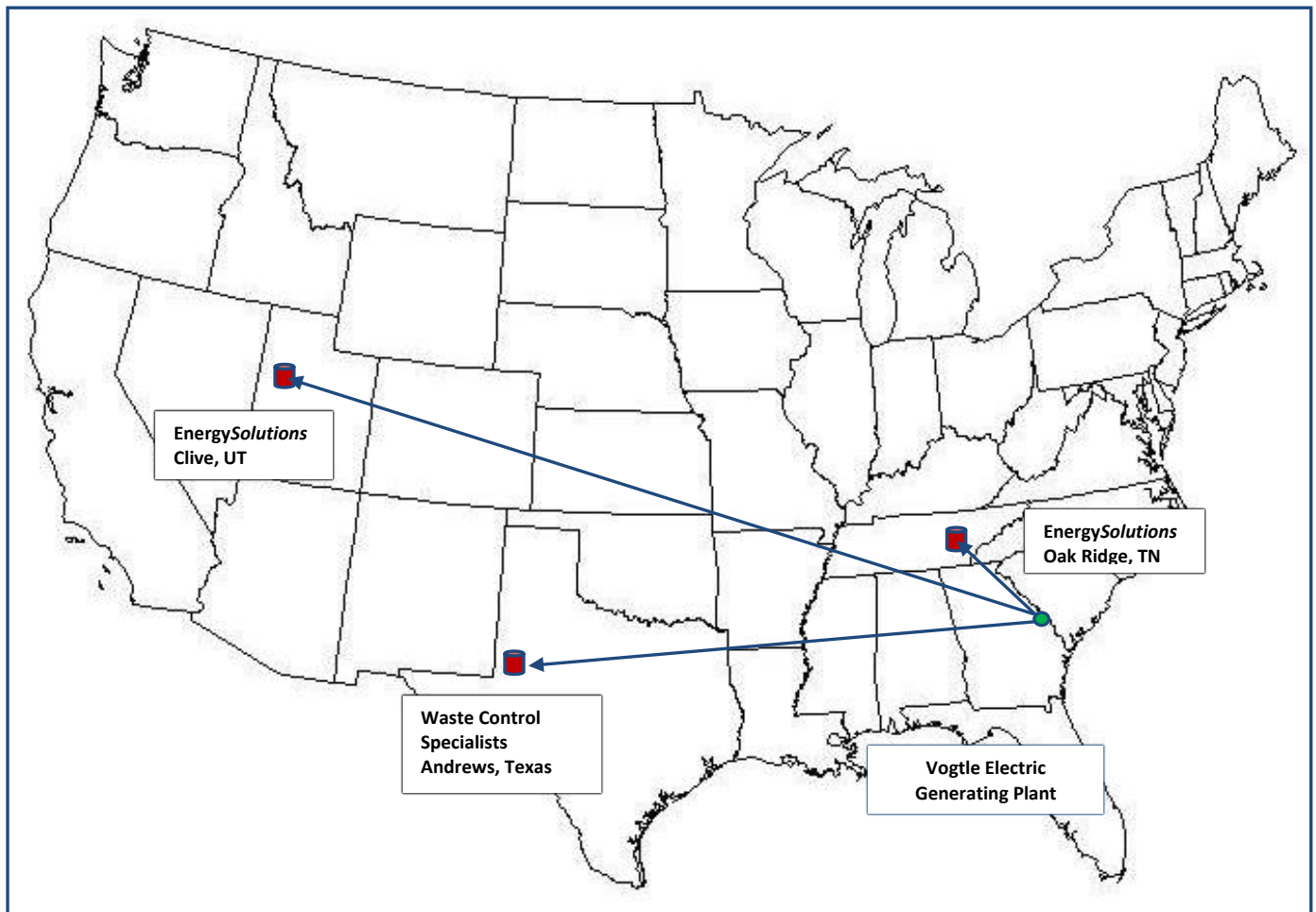


FIGURE 5.2
DECOMMISSIONING WASTE DESTINATIONS
RADIOLOGICAL



The figure indicates the destinations for the low-level radioactive waste designated for direct disposal (Clive, Utah and Andrews County, Texas) and processing/recovery (Oak Ridge, Tennessee).

Disposal of GTCC is expected to be disposed of in the same location as spent fuel.

TABLE 5.1
DECOMMISSIONING WASTE SUMMARY
UNIT 1

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	89,951	6,794,285
	EnergySolutions Bulk	A	80,162	3,631,707
	Waste Control Specialists	B	1,810	197,903
	Waste Control Specialists	C	393	47,411
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	2,061	410,142
Total [2]			174,378	11,081,448
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	295,829	11,597,740
Scrap Metal				129,500,000

[1] Waste is classified according to the requirements as delineated in Part 61.55

[2] Columns may not summarize to exact Estimate Total due to rounding

TABLE 5.2
DECOMMISSIONING WASTE SUMMARY
UNIT 2

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	98,418	7,350,630
	EnergySolutions Bulk	A	91,185	4,358,978
	Waste Control Specialists	B	1,810	197,903
	Waste Control Specialists	C	393	47,411
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	2,061	410,142
Total ^[2]			193,867	12,365,064
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	380,734	15,045,790
Scrap Metal				158,830,000

^[1] Waste is classified according to the requirements as delineated in Part 61.55

^[2] Columns may not summarize to exact Estimate Total due to rounding

6. RESULTS

Costs were developed to decommission Vogtle following a scheduled cessation of plant operations. The analyses relied upon the site-specific, technical information developed from a previous analyses, the most recent previous analysis performed in 2018 supplemented with updated information supplied by SNC, to reflect current plant design conditions and operating assumptions. While not an engineering study, the estimates do provide sufficient information to assess the financial obligations as they pertain to the eventual decommissioning of the nuclear station.

The estimates described in this study were based on numerous fundamental assumptions, including a 60-year operating life, regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenario assumed continued operation of the plant's spent fuel pools for approximately five and one half years following the cessation of operations for continued cooling of the assemblies. The ISFSI will be expanded to allow transfer of all fuel from the spent fuel pools and the orderly progression of decommissioning activities. The ISFSI will be decontaminated and demolished once the DOE completes the transfer of the assemblies and the GTCC material to its repository.

The costs projected to promptly decommission Vogtle are estimated to be \$941.3 million for Unit 1 and \$990.5 million for Unit 2. The majority of the \$1,931.9 million cost (approximately 70.4%) is associated with the physical decontamination and dismantling of the nuclear units, so that the operating licenses can be terminated. Caretaking and handling of the spent fuel and termination of the ISFSI license, constitutes an additional 20.1% of the cost. The remaining 10.4% is for the demolition of the remaining structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 and 6.2, are either labor-related, ISFSI 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 and the duration of the program. It was assumed, for purposes of this analysis, that the utility would oversee the decommissioning program, managing the decommissioning labor force and the associated subcontractors. The size and composition of the management organization will vary with the decommissioning phase and associated site activities. However, once the operating licenses have been terminated, the staff will reduce substantially for the conventional demolition and restoration of the site, and for the long-term care of the spent fuel.

As described in this study, the spent fuel pools will remain operational for approximately five and one half years following the cessation of plant operations. The pools will be isolated and independent spent fuel islands created. This will allow decommissioning operations to proceed in and around the reactor buildings. Over the five and one half-year period, the spent fuel will be packaged into transportable steel canisters for loading into a DOE-provided transport cask. The canisters will be transferred directly to the DOE or stored in concrete overpacks at the ISFSI until the DOE is able to receive them.

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.

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, disposal of the lower level radioactive material will be at the *EnergySolutions* facility. Selective reactor vessel components and processed liquid waste (Class B) will be sent to the WCS facility in Andrews County, Texas. Highly radioactive reactor vessel internal components (GTCC waste), requiring additional isolation from the environment, will be packaged for geologic disposal. The cost of geologic disposal was based upon a weight-cost equivalent for spent fuel.

Removal costs reflect the labor-intensive nature of the decommissioning process and 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 could be more cost-effective than deferral, due to the ultimate deterioration of facilities (and therefore the working conditions).

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, and the general

expense, e.g., labor and fuel, of transporting material to the destinations identified in this study. For purposes of this estimate, material will be primarily shipped to the waste disposal facilities by truck.

Decontamination will be used to reduce the plants radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area will be sent to an off-site processing center, i.e., this estimate did not assume that contaminated plant components and equipment could be economically decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more efficient means of handling the large volumes of material produced in the dismantling of a nuclear unit.

License termination survey costs were 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, and 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 at a basic functional and regulatory level.

A description of events that resulted in the release of radioactive material that needed to be recorded to assist in future decommissioning activities is provided in Appendix D.

TABLE 6.1
SUMMARY OF DECOMMISSIONING COST ELEMENTS
UNIT 1

Work Category	Cost 2021 \$s (thousands)	Percent of Total Costs
Decontamination	16,543	1.8
Removal	148,905	15.8
Packaging	25,041	2.7
Transportation	16,637	1.8
Waste Disposal	76,844	8.2
Off-site Waste Processing	33,768	3.6
Program Management	321,002	34.1
Site Security	99,480	10.6
Spent Fuel Pool Isolation	14,827	1.6
Spent Fuel Management	115,378	12.3
Insurance and Regulatory Fees	22,464	2.4
Energy	4,852	0.5
Characterization and Licensing Surveys	31,116	3.3
Property Taxes	0	0
Miscellaneous Equipment	14,492	1.5
Estimate Total	941,348	100.0

NOTE: Columns may not summarize to exact Estimate Total due to rounding

TABLE 6.2
SUMMARY OF DECOMMISSIONING COST ELEMENTS
UNIT 2

Work Category	Cost 2021 \$s (thousands)	Percent of Total Costs
Decontamination	17,952	1.8
Removal	184,355	18.6
Packaging	25,469	2.6
Transportation	18,203	1.8
Waste Disposal	80,611	8.1
Off-site Waste Processing	43,771	4.4
Program Management	349,593	35.3
Site Security	85,591	8.6
Spent Fuel Pool Isolation	9,885	1.0
Spent Fuel Management	106,781	10.8
Insurance and Regulatory Fees	18,439	1.9
Energy	4,918	0.5
Characterization and Licensing Surveys	27,053	2.7
Property Taxes	0	0
Miscellaneous Equipment	17,937	1.8
Estimate Total	990,557	100.0

NOTE: Columns may not summarize to exact Estimate Total due to rounding

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30. DOE/RW-0351, "Civilian Radioactive Waste Management System Waste Acceptance System Requirements Document," Revision 5, May 31, 2007 [\[Open\]](#)

7. REFERENCES

(continued)

31. "Civilian Radioactive Waste Management System Requirements Document, DOE/RW-0406, Revision 8, September 2007 [\[Open\]](#)
32. "Strategy for Management and Disposal of Greater-Than-Class C Low-Level Radioactive Waste," Federal Register Volume 60, Number 48 (p 13424 et seq.), March 1995 [\[Open\]](#)
33. U.S. Department of Transportation, Section 49 of the Code of Federal Regulations, "Transportation," Parts 173 through 178 [\[Open\]](#)
34. U.S. Code of Federal Regulations, Title 10, Part 71, "Packaging and Transportation of Radioactive Material" [\[Open\]](#)
35. Tri-State Motor Transit Company, published tariffs, as amended
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37. R.I. Smith, G.J. Konzek, W.E. Kennedy, Jr., "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," NUREG/CR-0130 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1978 [\[Open Main Report\]](#) [\[Open Appendices\]](#)
38. H.D. Oak, et al., "Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," NUREG/CR-0672 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1980 [\[Open Main Report\]](#) [\[Open Appendices\]](#)
39. SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," June 2000 [\[Open\]](#)
40. "Microsoft Office Project Professional 2013," Microsoft Corporation
41. "Atomic Energy Act of 1954," (68 Stat. 919) [\[Open\]](#)
42. 49 CFR Part 173 – Shippers – General Requirements for Shipments and Packages [\[Open\]](#)

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	Critical Duration*
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 in plastic, send to the waste processing area	<u>60</u>	<u>60</u>
	Totals (Activity/Critical)	355	255

Duration adjustment(s):

+ Respiratory protection adjustment (50% of critical duration)	128
+ Radiation/ALARA adjustment (37.1% of critical duration)	<u>95</u>

Adjusted work duration	478
+ Protective clothing adjustment (30% of adjusted duration)	<u>143</u>

Productive work duration	621
+ Work break adjustment (8.33 % of productive duration)	<u>52</u>

Total work duration min	673 min
-------------------------	---------

***** Total duration = 11.217 hr *****

* *Note: (alpha designation) indicates activities that can be performed in parallel with corresponding Act ID (within critical duration)*

**APPENDIX A
(continued)**

3. LABOR REQUIRED

Crew	Number	Duration (hr)	Rate (\$/hr)	Cost
<hr/>				
Laborers	3.00	11.217	25.94	872.91
Craftsmen	2.00	11.217	53.56	1,201.57
Foreman	1.00	11.217	57.73	647.56
General Foreman	0.25	11.217	60.44	169.49
Fire Watch	0.05	11.217	25.94	14.55
Health Physics Technician	1.00	11.217	61.93	694.67
Total labor cost				\$3,600.75

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
-Gas torch consumables 1 @ \$20.88/hr x 1 hr {1}	\$20.88
-Blotting paper 50 @ \$0.63/sq ft {2}	\$31.50
-Tarpaulin 50 @ \$0.49/sq ft {3}	\$24.50
Subtotal cost of equipment and materials	\$76.88
Overhead & sales tax on equipment and materials @ 17.00 %	\$13.07
Total costs, equipment & material	\$89.95
TOTAL COST:	
Removal of contaminated heat exchanger <3000 pounds:	\$ 3,690.70
Total labor cost:	\$3,600.75
Total equipment/material costs:	\$89.95
Total craft labor man-hours required per unit:	81.884

5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum (AIF) (now Nuclear Energy Institute) 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. R.S. Means (2021) Line Number 01 54 33 40-6360, page 734
 2. www.mcmaster.com online catalog, McMaster Carr Spill Control (7193T88)
 3. R.S. Means (2021) Division 01 56, Section 13.60-0600, page 23
- Material and consumable costs were adjusted using the regional indices for Augusta, Georgia.

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	0.34
Removal of clean pipe 0.25 to 2 inches diameter, \$/linear foot	3.42
Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	5.20
Removal of clean pipe >4 to 8 inches diameter, \$/linear foot	11.14
Removal of clean pipe >8 to 14 inches diameter, \$/linear foot	20.49
Removal of clean pipe >14 to 20 inches diameter, \$/linear foot	26.82
Removal of clean pipe >20 to 36 inches diameter, \$/linear foot	39.42
Removal of clean pipe >36 inches diameter, \$/linear foot	46.76
Removal of clean valve >2 to 4 inches	72.68
Removal of clean valve >4 to 8 inches	111.43
Removal of clean valve >8 to 14 inches	204.94
Removal of clean valve >14 to 20 inches	268.21
Removal of clean valve >20 to 36 inches	394.18
Removal of clean valve >36 inches	467.57
Removal of clean pipe hanger for small bore piping	25.79
Removal of clean pipe hanger for large bore piping	82.38
Removal of clean pump, <300 pound	191.56
Removal of clean pump, 300-1000 pound	550.79
Removal of clean pump, 1000-10,000 pound	2,117.85
Removal of clean pump, >10,000 pound	4,108.12
Removal of clean pump motor, 300-1000 pound	228.06
Removal of clean pump motor, 1000-10,000 pound	876.94
Removal of clean pump motor, >10,000 pound	1,973.09
Removal of clean heat exchanger <3000 pound	1,147.00
Removal of clean heat exchanger >3000 pound	2,904.30
Removal of clean feedwater heater/deaerator	8,118.13
Removal of clean moisture separator/reheater	16,598.16
Removal of clean tank, <300 gallons	245.99

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit (\$)
Removal of clean tank, 300-3000 gallon	768.85
Removal of clean tank, >3000 gallons, \$/square foot surface area	6.81
Removal of clean electrical equipment, <300 pound	101.72
Removal of clean electrical equipment, 300-1000 pound	371.29
Removal of clean electrical equipment, 1000-10,000 pound	742.60
Removal of clean electrical equipment, >10,000 pound	1,808.35
Removal of clean electrical transformer < 30 tons	1,255.87
Removal of clean electrical transformer > 30 tons	3,616.71
Removal of clean standby diesel generator, <100 kW	1,282.76
Removal of clean standby diesel generator, 100 kW to 1 MW	2,863.23
Removal of clean standby diesel generator, >1 MW	5,927.46
Removal of clean electrical cable tray, \$/linear foot	9.71
Removal of clean electrical conduit, \$/linear foot	4.25
Removal of clean mechanical equipment, <300 pound	101.72
Removal of clean mechanical equipment, 300-1000 pound	371.29
Removal of clean mechanical equipment, 1000-10,000 pound	742.60
Removal of clean mechanical equipment, >10,000 pound	1,808.35
Removal of clean HVAC equipment, <300 pound	123.00
Removal of clean HVAC equipment, 300-1000 pound	446.14
Removal of clean HVAC equipment, 1000-10,000 pound	889.17
Removal of clean HVAC equipment, >10,000 pound	1,808.35
Removal of clean HVAC ductwork, \$/pound	0.36
Removal of contaminated instrument and sampling tubing, \$/linear foot	1.29
Removal of contaminated pipe 0.25 to 2 inches diameter, \$/linear foot	18.92
Removal of contaminated pipe >2 to 4 inches diameter, \$/linear foot	31.18
Removal of contaminated pipe >4 to 8 inches diameter, \$/linear foot	52.92
Removal of contaminated pipe >8 to 14 inches diameter, \$/linear foot	98.02

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit (\$)
Removal of contaminated pipe >14 to 20 inches diameter, \$/linear foot	116.91
Removal of contaminated pipe >20 to 36 inches diameter, \$/linear foot	159.86
Removal of contaminated pipe >36 inches diameter, \$/linear foot	187.95
Removal of contaminated valve >2 to 4 inches	391.08
Removal of contaminated valve >4 to 8 inches	468.58
Removal of contaminated valve >8 to 14 inches	914.72
Removal of contaminated valve >14 to 20 inches	1,157.46
Removal of contaminated valve >20 to 36 inches	1,533.04
Removal of contaminated valve >36 inches	1,813.98
Removal of contaminated pipe hanger for small bore piping	127.37
Removal of contaminated pipe hanger for large bore piping	391.95
Removal of contaminated pump, <300 pound	841.29
Removal of contaminated pump, 300-1000 pound	1,962.26
Removal of contaminated pump, 1000-10,000 pound	5,989.65
Removal of contaminated pump, >10,000 pound	14,586.12
Removal of contaminated pump motor, 300-1000 pound	860.11
Removal of contaminated pump motor, 1000-10,000 pound	2,466.42
Removal of contaminated pump motor, >10,000 pound	5,537.67
Removal of contaminated heat exchanger <3000 pound	3,690.70
Removal of contaminated heat exchanger >3000 pound	10,784.57
Removal of contaminated tank, <300 gallons	1,404.53
Removal of contaminated tank, >300 gallons, \$/square foot	27.09
Removal of contaminated electrical equipment, <300 pound	639.36
Removal of contaminated electrical equipment, 300-1000 pound	1,584.18
Removal of contaminated electrical equipment, 1000-10,000 pound	3,052.82
Removal of contaminated electrical equipment, >10,000 pound	6,064.23
Removal of contaminated electrical cable tray, \$/linear foot	30.92
Removal of contaminated electrical conduit, \$/linear foot	16.05

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit (\$)
Removal of contaminated mechanical equipment, <300 pound	710.67
Removal of contaminated mechanical equipment, 300-1000 pound	1,747.35
Removal of contaminated mechanical equipment, 1000-10,000 pound	3,361.64
Removal of contaminated mechanical equipment, >10,000 pound	6,064.23
Removal of contaminated HVAC equipment, <300 pound	710.67
Removal of contaminated HVAC equipment, 300-1000 pound	1,747.35
Removal of contaminated HVAC equipment, 1000-10,000 pound	3,361.64
Removal of contaminated HVAC equipment, >10,000 pound	6,064.23
Removal of contaminated HVAC ductwork, \$/pound	1.93
Removal/plasma arc cut of contaminated thin metal components, \$/linear in.	3.35
Additional decontamination of surface by washing, \$/square foot	6.52
Additional decontamination of surfaces by hydrolasing, \$/square foot	34.01
Decontamination rig hook up and flush, \$/ 250 foot length	5,947.20
Chemical flush of components/systems, \$/gallon	21.56
Removal of clean standard reinforced concrete, \$/cubic yard	69.34
Removal of grade slab concrete, \$/cubic yard	78.82
Removal of clean concrete floors, \$/cubic yard	350.32
Removal of sections of clean concrete floors, \$/cubic yard	1,015.20
Removal of clean heavily rein concrete w/#9 rebar, \$/cubic yard	99.92
Removal of contaminated heavily rein concrete w/#9 rebar, \$/cubic yard	1,998.04
Removal of clean heavily rein concrete w/#18 rebar, \$/cubic yard	135.41
Removal of contaminated heavily rein concrete w/#18 rebar, \$/cubic yard	2,640.53
Removal heavily rein concrete w/#18 rebar & steel embedments, \$/cubic yard	420.93
Removal of below-grade suspended floors, \$/cubic yard	189.76
Removal of clean monolithic concrete structures, \$/cubic yard	831.54
Removal of contaminated monolithic concrete structures, \$/cubic yard	1,979.86
Removal of clean foundation concrete, \$/cubic yard	656.69

APPENDIX B (continued)

Unit Cost Factor	Cost/Unit (\$)
Removal of contaminated foundation concrete, \$/cubic yard	1,845.26
Explosive demolition of bulk concrete, \$/cubic yard	47.72
Removal of clean hollow masonry block wall, \$/cubic yard	24.77
Removal of contaminated hollow masonry block wall, \$/cubic yard	65.64
Removal of clean solid masonry block wall, \$/cubic yard	24.77
Removal of contaminated solid masonry block wall, \$/cubic yard	65.64
Backfill of below-grade voids, \$/cubic yard	41.62
Removal of subterranean tunnels/voids, \$/linear foot	92.76
Placement of concrete for below-grade voids, \$/cubic yard	135.63
Excavation of clean material, \$/cubic yard	3.00
Excavation of contaminated material, \$/cubic yard	41.91
Removal of clean concrete rubble (tipping fee included), \$/cubic yard	24.83
Removal of contaminated concrete rubble, \$/cubic yard	24.39
Removal of building by volume, \$/cubic foot	0.27
Removal of clean building metal siding, \$/square foot	1.03
Removal of contaminated building metal siding, \$/square foot	4.02
Removal of standard asphalt roofing, \$/square foot	1.59
Removal of transite panels, \$/square foot	1.95
Scarifying contaminated concrete surfaces (drill & spall), \$/square foot	11.86
Scabbling contaminated concrete floors, \$/square foot	6.85
Scabbling contaminated concrete walls, \$/square foot	17.82
Scabbling contaminated ceilings, \$/square foot	60.88
Scabbling structural steel, \$/square foot	5.73
Removal of clean overhead crane/monorail < 10 ton capacity	550.81
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,689.29
Removal of clean overhead crane/monorail >10-50 ton capacity	1,321.95
Removal of contaminated overhead crane/monorail >10-50 ton capacity	4,053.61
Removal of polar crane > 50 ton capacity	5,621.07

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit (\$)
Removal of gantry crane > 50 ton capacity	20,193.26
Removal of structural steel, \$/pound	0.17
Removal of clean steel floor grating, \$/square foot	4.49
Removal of contaminated steel floor grating, \$/square foot	13.53
Removal of clean free standing steel liner, \$/square foot	10.21
Removal of contaminated free standing steel liner, \$/square foot	31.57
Removal of clean concrete-anchored steel liner, \$/square foot	5.10
Removal of contaminated concrete-anchored steel liner, \$/square foot	36.82
Placement of scaffolding in clean areas, \$/square foot	14.02
Placement of scaffolding in contaminated areas, \$/square foot	22.72
Landscaping with topsoil, \$/acre	24,549.94
Cost of CPC B-88 LSA box & preparation for use	2,006.90
Cost of CPC B-25 LSA box & preparation for use	1,716.69
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,548.51
Cost of CPC B-144 LSA box & preparation for use	10,057.60
Cost of LSA drum & preparation for use	213.91
Cost of cask liner for CNSI 8 120A cask (resins)	11,952.84
Cost of cask liner for CNSI 8 120A cask (filters)	8,498.70
Decontamination of surfaces with vacuuming, \$/square foot	0.67

APPENDIX C
DETAILED COST ANALYSES

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Vogtle Electric Generating Plant, Unit 1	C-2
Vogtle Electric Generating Plant, Unit 2	C-11

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	254	38	292	292	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	585	88	673	673	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	954	143	1,097	1,097	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	394	59	453	453	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	954	143	1,097	1,097	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	636	95	731	731	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	626	94	719	648	-	72	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	530	79	609	548	-	61	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	903	135	1,038	1,038	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	827	124	951	951	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	397	60	456	456	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	203	31	234	117	-	117	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	51	8	58	-	-	58	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	51	8	58	-	-	58	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	397	60	456	228	-	228	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	585	88	673	673	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	114	17	132	66	-	66	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,810	722	5,532	4,871	-	661	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,600	540	4,140	4,140	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/tooling/etc.	-	-	-	-	-	-	2,400	360	2,760	2,760	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	156	23	180	180	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	15,938	2,391	18,329	17,668	-	661	-	-	-	-	-	-	-	78,157
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	12,893	1,934	14,827	14,827	-	-	-	-	-	-	-	-	-	-
1a.2.2	ISFSI to DOE Transfer Facility	-	-	-	-	-	-	7,911	1,187	9,098	-	9,098	-	-	-	-	-	-	-	-	-
1a.2.3	Site Characterization	-	-	-	-	-	-	6,567	1,970	8,537	8,537	-	-	-	-	-	-	-	-	30,500	10,852
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	27,371	5,091	32,462	23,364	9,098	-	-	-	-	-	-	-	30,500	10,852
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,522	1,428	10,950	-	10,950	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	9,522	1,428	10,950	-	10,950	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,689	269	2,958	2,958	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	614	-	-	-	-	-	153	767	767	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	756	-	-	-	-	-	113	869	869	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	4	-	31	-	9	56	56	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	709	106	816	816	-	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs (continued)																					

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.4.7	NRC Fees	-	-	-	-	-	-	1,217	122	1,339	1,339	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	814	81	896	-	896	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	853	128	981	-	981	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	57	9	65	-	65	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	6,282	942	7,225	7,225	-	-	-	-	-	-	-	-	-	123,760
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	37,306	5,596	42,902	42,902	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,370	12	4	-	31	49,927	7,529	58,873	56,932	1,942	-	-	610	-	-	-	12,190	20	546,000
1a.0	TOTAL PERIOD 1a COST	-	1,370	12	4	-	31	102,759	16,439	120,615	97,964	21,990	661	-	610	-	-	-	12,190	30,520	635,009
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	602	90	692	623	-	69	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	318	48	366	366	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	172	26	197	49	-	148	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	462	69	531	531	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	153	23	175	88	-	88	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	585	88	673	673	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	127	19	146	73	-	73	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	198	30	228	-	-	228	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	198	30	228	-	-	228	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	347	52	399	359	-	40	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	347	52	399	359	-	40	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	4,227	634	4,861	3,947	-	914	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	778	-	-	-	-	-	-	389	1,166	1,166	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	778	-	-	-	-	-	4,227	1,023	6,028	5,114	-	914	-	-	-	-	-	-	1,067	33,243
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	1,073	-	-	-	-	-	-	161	1,234	1,234	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,406	211	1,617	1,617	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	76	-	46	128	-	186	-	108	544	544	-	-	-	467	-	-	-	27,990	91	-
1b.3.4	Process decommissioning chemical flush waste	2	-	81	356	-	2,569	-	705	3,712	3,712	-	-	-	-	848	-	-	90,351	159	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	2,106	-	-	-	-	-	-	316	2,422	2,422	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	10,734	1,610	12,344	-	12,344	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	3,257	1,202	128	484	-	2,755	12,140	3,291	23,256	10,912	12,344	-	-	467	848	-	-	118,341	250	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	38	-	-	-	-	-	-	10	48	48	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	1,341	134	1,475	1,475	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	344	-	-	-	-	-	86	430	430	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	377	-	-	-	-	-	57	434	434	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	18	-	6	33	33	-	-	-	356	-	-	-	7,122	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	707	106	813	813	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	354	35	390	390	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	406	41	447	-	447	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	425	64	489	-	489	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	28	4	33	-	33	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	3,132	470	3,602	3,602	-	-	-	-	-	-	-	-	-	61,710
Period 1b Period-Dependent Costs (continued)																					
1b.4.13	DOC Staff Cost	-	-	-	-	-	-	6,032	905	6,936	6,936	-	-	-	-	-	-	-	-	-	63,266

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 Dollars)

Activity Index		Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
							Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	-	18,709	2,806	21,516	21,516	-	-	-	-	-	-	-	-	211,579	
1b.4	Subtotal Period 1b Period-Dependent Costs	38	721	7	2	-	18	31,135	4,723	36,644	35,676	968	-	-	-	356	-	-	-	7,122	12	336,555
1b.0	TOTAL PERIOD 1b COST	4,073	1,923	134	486	-	2,773	47,503	9,037	65,929	51,702	13,312	914	-	823	848	-	-	125,463	1,328	369,798	
PERIOD 1 TOTALS		4,073	3,293	146	490	-	2,803	150,262	25,476	186,544	149,666	35,302	1,575	-	1,432	848	-	-	137,654	31,848	1,004,807	
PERIOD 2a - Large Component Removal																						
Period 2a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
2a.1.1.1	Reactor Coolant Piping	137	106	33	104	-	529	-	246	1,155	1,155	-	-	-	1,839	-	-	-	128,296	4,820	-	
2a.1.1.2	Pressurizer Relief Tank	25	20	9	27	-	138	-	57	276	276	-	-	-	479	-	-	-	33,443	893	-	
2a.1.1.3	Reactor Coolant Pumps & Motors	88	85	181	247	-	1,739	-	555	2,895	2,895	-	-	-	5,127	-	-	-	805,200	4,121	100	
2a.1.1.4	Pressurizer	-	54	441	114	-	1,031	-	332	1,971	1,971	-	-	-	3,039	-	-	-	251,899	1,666	938	
2a.1.1.5	Steam Generators	-	3,569	2,789	3,703	3,082	7,581	-	4,084	24,807	24,807	-	-	39,095	22,354	-	-	-	3,324,617	23,227	2,875	
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	156	269	233	127	-	630	-	345	1,760	1,760	-	-	-	3,965	-	-	-	152,894	8,248	-	
2a.1.1.7	Reactor Vessel Internals	136	5,736	10,963	1,592	-	14,686	412	14,914	48,439	48,439	-	-	-	1,878	963	393	-	329,968	34,590	1,542	
2a.1.1.8	Reactor Vessel	114	7,283	3,094	1,701	-	4,737	412	9,148	26,487	26,487	-	-	-	13,584	-	-	-	974,049	34,590	1,542	
2a.1.1	Totals	656	17,122	17,743	7,614	3,082	31,069	823	29,681	107,791	107,791	-	-	39,095	52,266	963	393	-	6,000,365	112,155	6,997	
Removal of Major Equipment																						
2a.1.2	Main Turbine/Generator	-	142	-	-	-	-	-	21	163	-	-	-	163	-	-	-	-	-	3,130	-	
2a.1.3	Main Condensers	-	536	-	-	-	-	-	80	617	-	-	-	617	-	-	-	-	-	11,923	-	
Cascading Costs from Clean Building Demolition																						
2a.1.4.1	*Reactor	-	440	-	-	-	-	-	66	506	506	-	-	-	-	-	-	-	-	4,916	-	
2a.1.4.2	Auxiliary Building	-	329	-	-	-	-	-	49	378	378	-	-	-	-	-	-	-	-	2,323	-	
2a.1.4.3	Fuel Handling Building	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	413	-	
2a.1.4	Totals	-	815	-	-	-	-	-	122	937	937	-	-	-	-	-	-	-	-	7,653	-	
Disposal of Plant Systems																						
2a.1.5.1	Auxiliary Feedwater	-	62	-	-	-	-	-	9	71	-	-	-	71	-	-	-	-	-	1,671	-	
2a.1.5.2	Auxiliary Gas	-	12	-	-	-	-	-	2	14	-	-	-	14	-	-	-	-	-	356	-	
2a.1.5.3	Auxiliary Gas - RCA	-	10	0	0	7	-	-	4	22	22	-	-	-	72	-	-	-	2,923	175	-	
2a.1.5.4	Auxiliary Steam	-	24	-	-	-	-	-	4	27	-	-	-	27	-	-	-	-	-	689	-	
2a.1.5.5	Auxiliary Steam - RCA	-	24	0	1	23	-	-	10	59	59	-	-	-	228	-	-	-	9,264	427	-	
2a.1.5.6	Circulating Water	-	241	-	-	-	-	-	36	277	-	-	-	277	-	-	-	-	-	6,512	-	
2a.1.5.7	Circulating Water Chemical Injection	-	9	-	-	-	-	-	1	11	-	-	-	11	-	-	-	-	-	251	-	
2a.1.5.8	Condensate & Feedwater	-	367	-	-	-	-	-	55	423	-	-	-	423	-	-	-	-	-	9,524	-	
2a.1.5.9	Condensate & Feedwater - RCA	-	312	19	63	1,023	-	-	243	1,659	1,659	-	-	-	9,999	-	-	-	406,077	6,405	-	
2a.1.5.10	Condensate Chemical Injection	-	36	-	-	-	-	-	5	42	-	-	-	42	-	-	-	-	-	1,081	-	
2a.1.5.11	Condensate Filter Demineralizer	-	57	-	-	-	-	-	9	66	-	-	-	66	-	-	-	-	-	1,470	-	
2a.1.5.12	Condenser Air Ejection	-	39	-	-	-	-	-	6	44	-	-	-	44	-	-	-	-	-	1,026	-	
2a.1.5.13	Condenser Tube Cleaning	-	12	-	-	-	-	-	2	14	-	-	-	14	-	-	-	-	-	320	-	
2a.1.5.14	Containment Spray - RCA	-	198	6	22	350	-	-	106	682	682	-	-	-	3,420	-	-	-	138,886	3,867	-	
2a.1.5.15	Electrohydraulic Control	-	3	-	-	-	-	-	1	4	-	-	-	4	-	-	-	-	-	87	-	
2a.1.5.16	Eng Safety Feature Room Coolers - RCA	-	50	1	3	52	-	-	21	126	126	-	-	-	505	-	-	-	20,521	1,056	-	
2a.1.5.17	Extraction Steam	-	96	-	-	-	-	-	14	110	-	-	-	110	-	-	-	-	-	2,629	-	
2a.1.5.18	Feedwater Heater Drain	-	177	-	-	-	-	-	27	204	-	-	-	204	-	-	-	-	-	4,759	-	
2a.1.5.19	Feedwater Heater Vent	-	73	-	-	-	-	-	11	84	-	-	-	84	-	-	-	-	-	2,027	-	
2a.1.5.20	Heater Ventilation	-	11	-	-	-	-	-	2	13	-	-	-	13	-	-	-	-	-	297	-	
2a.1.5.21	Main Steam	-	251	-	-	-	-	-	38	289	-	-	-	289	-	-	-	-	-	6,650	-	
2a.1.5.22	Main Steam - RCA	-	574	43	147	2,386	-	-	528	3,678	3,678	-	-	-	23,319	-	-	-	946,992	11,824	-	
2a.1.5.23	Miscellaneous Leak Detection	-	22	1	3	8	17	-	12	63	63	-	-	-	78	67	-	-	7,406	423	-	
2a.1.5.24	Miscellaneous Piping	-	4	-	-	-	-	-	1	5	-	-	-	5	-	-	-	-	-	105	-	
2a.1.5.25	NSCW Chemical Injection	-	6	-	-	-	-	-	1	7	-	-	-	7	-	-	-	-	-	177	-	
2a.1.5.26	Plant Make-Up Water Treatment	-	7	-	-	-	-	-	1	8	-	-	-	8	-	-	-	-	-	179	-	
2a.1.5.27	Post Accident Sampling - RCA	-	22	0	2	27	-	-	10	61	61	-	-	-	260	-	-	-	10,575	398	-	
Disposal of Plant Systems (continued)																						
2a.1.5.28	River Intake Chlorination	-	21	-	-	-	-	-	3	25	-	-	-	25	-	-	-	-	-	583	-	
2a.1.5.29	Safety Injection - RCA	-	281	9	32	512	-	-	153	986	986	-	-	-	5,000	-	-	-	203,054	5,329	-	

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
2a.1.5.30	Steam Generator Blowdown	-	323	18	36	136	223	-	164	899	899	-	-	1,328	852	-	-	-	108,039	6,760	-
2a.1.5.31	Turbine Drive Steam	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	1,211	-
2a.1.5.32	Turbine Generator Gas	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	205	-
2a.1.5.33	Turbine Generator Hydrogen Seal Oil	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	212	-
2a.1.5.34	Turbine Generator Stator Cooling	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	325	-
2a.1.5.35	Turbine Lube Oil Storage & Filtration	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	1,637	-
2a.1.5.36	Turbine Plant Closed Cooling Water	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	925	-
2a.1.5.37	Turbine Plant Cooling Water	-	225	-	-	-	-	-	34	258	-	-	258	-	-	-	-	-	-	6,020	-
2a.1.5.38	Turbine Plant Sampling	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,250	-
2a.1.5.39	Waste Water - RCA	-	6	0	1	15	-	-	4	27	27	-	-	149	-	-	-	-	6,033	122	-
2a.1.5	Totals	-	3,772	99	309	4,540	240	-	1,545	10,506	8,263	-	2,243	44,358	919	-	-	-	1,859,769	88,967	-
2a.1.6	Scaffolding in support of decommissioning	-	3,526	27	13	145	29	-	915	4,655	4,655	-	-	1,276	113	-	-	-	64,568	38,848	-
2a.1	Subtotal Period 2a Activity Costs	656	25,913	17,869	7,936	7,766	31,339	823	32,366	124,668	121,645	-	3,023	84,729	53,297	963	393	-	7,924,702	262,676	6,997
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	133	-	83	229	-	333	-	193	971	971	-	-	-	835	-	-	-	50,120	163	-
2a.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2a.3.3	Small tool allowance	-	240	-	-	-	-	-	36	276	249	-	28	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	26,235	3,935	30,171	-	30,171	-	-	-	-	-	-	-	-	-
2a.3.5	On-site survey and release of 120.6 tons clean metall	-	-	-	-	-	-	121	12	133	133	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	133	240	83	229	-	333	26,356	4,176	31,551	1,353	30,171	28	-	835	-	-	-	50,120	163	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	138	-	-	-	-	-	-	35	173	173	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,014	101	1,116	1,116	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,627	-	-	-	-	-	657	3,284	3,284	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	4,532	-	-	-	-	-	680	5,212	5,212	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	94	34	-	249	-	77	454	454	-	-	-	4,939	-	-	-	98,776	161	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,215	182	1,397	1,397	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	1,177	118	1,294	1,294	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	962	96	1,058	-	1,058	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,537	231	1,768	-	1,768	-	-	-	-	-	-	-	-	-
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	118	-	118	-	-	-	-	-	-	-	-	-
2a.4.12	Remedial Actions Surveys	-	-	-	-	-	-	2,321	348	2,669	2,669	-	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	10,526	1,579	12,104	12,104	-	-	-	-	-	-	-	-	-	202,484
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	26,520	3,978	30,498	30,498	-	-	-	-	-	-	-	-	-	284,977
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	49,023	7,354	56,377	56,377	-	-	-	-	-	-	-	-	-	530,582
2a.4	Subtotal Period 2a Period-Dependent Costs	138	7,160	94	34	-	249	94,396	15,450	117,521	114,577	2,944	-	-	4,939	-	-	-	98,776	161	1,018,043
2a.0	TOTAL PERIOD 2a COST	927	33,313	18,046	8,199	7,766	31,922	121,575	51,991	273,739	237,575	33,114	3,050	84,729	59,071	963	393	-	8,073,598	263,000	1,025,040
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Additional Systems - RCA	-	249	8	28	461	-	-	137	884	884	-	-	4,508	-	-	-	-	183,071	4,785	-
2b.1.1.2	Aux Component Cooling Water - RCA	-	341	19	64	1,035	-	-	252	1,710	1,710	-	-	10,109	-	-	-	-	410,550	6,608	-
2b.1.1.3	Auxiliary Bldg & Misc Drains	-	629	35	67	128	479	-	310	1,647	1,647	-	-	1,252	1,829	-	-	-	167,009	13,017	-
2b.1.1.4	Auxiliary Bldg HVAC	-	808	25	76	1,019	106	-	395	2,429	2,429	-	-	9,956	405	-	-	-	430,019	15,241	-
2b.1.1.5	Backflushable Filter - RCA	-	34	1	2	35	-	-	14	85	85	-	-	339	-	-	-	-	13,747	616	-
2b.1.1.6	Boron Recycle	182	163	13	27	145	145	-	195	870	870	-	-	1,421	554	-	-	-	92,910	6,732	-
2b.1.1.7	Chemical & Volume Control	592	674	53	102	223	715	-	697	3,056	3,056	-	-	2,178	2,732	-	-	-	262,012	23,642	-
2b.1.1.8	Chilled Water	-	99	-	-	-	-	-	15	114	-	-	114	-	-	-	-	-	-	2,693	-
2b.1.1.9	Chilled Water - RCA	-	118	2	8	125	-	-	50	302	302	-	-	1,223	-	-	-	-	49,671	2,137	-
2b.1.1.10	Component Cooling Water - RCA	-	331	41	137	2,229	-	-	442	3,180	3,180	-	-	21,783	-	-	-	-	884,608	6,961	-
Disposal of Plant Systems (continued)																					
2b.1.1.11	Containment & Aux Bldg Drains	-	220	15	27	19	210	-	116	607	607	-	-	183	802	-	-	-	58,394	4,576	-
2b.1.1.12	Containment Air Purification & Cleanup	-	73	12	29	216	125	-	87	542	542	-	-	2,108	478	-	-	-	116,006	1,596	-
2b.1.1.13	Containment Cooling	-	826	25	75	1,001	108	-	398	2,434	2,434	-	-	9,784	414	-	-	-	423,659	15,547	-

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
2b.1.1.14	Containment Heat Removal	-	961	50	125	1,180	423	-	546	3,284	3,284	-	-	11,526	1,615	-	-	-	570,676	18,345	-
2b.1.1.15	Control Building Drains	-	77	-	-	-	-	-	12	88	-	-	88	-	-	-	-	-	-	1,996	-
2b.1.1.16	Control Building HVAC	-	111	-	-	-	-	-	17	127	-	-	127	-	-	-	-	-	-	3,272	-
2b.1.1.17	Diesel Generator	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	904	-
2b.1.1.18	Diesel Generator Bldg HVAC	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	898	-
2b.1.1.19	Electric Chase Tunnel Drains	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	444	-
2b.1.1.20	Electric Tunnel Ventilation	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	44	-
2b.1.1.21	Electrical - Clean	-	2,935	-	-	-	-	-	440	3,375	-	-	3,375	-	-	-	-	-	-	71,727	-
2b.1.1.22	Electrical - Contaminated	-	1,006	18	54	734	71	-	389	2,271	2,271	-	-	7,168	270	-	-	-	308,256	19,558	-
2b.1.1.23	Electrical - RCA	-	5,774	111	374	6,077	-	-	2,422	14,758	14,758	-	-	59,377	-	-	-	-	2,411,337	104,474	-
2b.1.1.24	Fire Protection - RCA	-	548	14	48	784	-	-	263	1,658	1,658	-	-	7,657	-	-	-	-	310,967	10,413	-
2b.1.1.25	Instrument Air	-	45	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	1,319	-
2b.1.1.26	Instrument Air - RCA	-	186	3	9	139	-	-	69	406	406	-	-	1,363	-	-	-	-	55,343	3,231	-
2b.1.1.27	Miscellaneous HVAC	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	2,042	-
2b.1.1.28	Miscellaneous Reactor Coolant	78	102	7	12	10	94	-	92	394	394	-	-	102	358	-	-	-	26,902	3,546	-
2b.1.1.29	Nuclear Sampling - Gaseous	-	11	1	1	3	7	-	5	28	28	-	-	32	26	-	-	-	2,951	228	-
2b.1.1.30	Nuclear Sampling - Liquid	-	29	1	3	7	19	-	14	73	73	-	-	73	71	-	-	-	7,464	609	-
2b.1.1.31	Nuclear Service Cooling Water	-	126	-	-	-	-	-	19	145	-	-	145	-	-	-	-	-	-	3,292	-
2b.1.1.32	Nuclear Service Cooling Water - RCA	-	920	32	108	1,752	-	-	512	3,325	3,325	-	-	17,124	-	-	-	-	695,434	17,571	-
2b.1.1.33	Plant Demineralized Water	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	425	-
2b.1.1.34	Plant Demineralized Water - RCA	-	20	0	1	15	-	-	7	44	44	-	-	147	-	-	-	-	5,964	347	-
2b.1.1.35	Potable Water	-	3	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	98	-
2b.1.1.36	Potable Water - RCA	-	4	0	0	5	-	-	2	12	12	-	-	51	-	-	-	-	2,065	76	-
2b.1.1.37	Radwaste Solidification & Vol Reduction	-	24	1	3	2	20	-	12	61	61	-	-	21	75	-	-	-	5,607	465	-
2b.1.1.38	Reactor M/U Wtr Storage Tank & Degas	-	127	7	14	38	91	-	63	340	340	-	-	373	348	-	-	-	37,248	2,582	-
2b.1.1.39	Residual Heat Removal	233	189	23	45	118	310	-	268	1,188	1,188	-	-	1,155	1,184	-	-	-	122,089	5,079	-
2b.1.1.40	Service Air	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	1,179	-
2b.1.1.41	Service Air - RCA	-	146	2	7	121	-	-	56	332	332	-	-	1,178	-	-	-	-	47,856	2,625	-
2b.1.1.42	Solidification Building Drains	17	19	2	3	2	22	-	19	83	83	-	-	21	82	-	-	-	6,084	673	-
2b.1.1.43	Turbine Bldg HVAC	-	461	-	-	-	-	-	69	530	-	-	530	-	-	-	-	-	-	13,857	-
2b.1.1.44	Turbine Building Drain	-	154	-	-	-	-	-	23	178	-	-	178	-	-	-	-	-	-	4,169	-
2b.1.1.45	Utility Water - RCA	-	31	0	1	23	-	-	11	67	67	-	-	223	-	-	-	-	9,066	535	-
2b.1.1.46	Waste Evaporator Steam Supply - RCA	-	10	0	1	12	-	-	4	28	28	-	-	122	-	-	-	-	4,946	182	-
2b.1.1.47	Waste Processing - Gas	-	185	12	28	222	117	-	114	679	679	-	-	2,165	448	-	-	-	116,399	3,754	-
2b.1.1.48	Waste Processing - Liquid	440	451	36	72	261	453	-	499	2,211	2,211	-	-	2,546	1,731	-	-	-	213,362	16,708	-
2b.1.1	Totals	1,541	19,431	569	1,550	18,141	3,513	-	9,095	53,840	48,987	-	4,853	177,267	13,423	-	-	-	8,051,672	420,820	-
2b.1.2	Scaffolding in support of decommissioning	-	4,408	33	16	181	37	-	1,144	5,818	5,818	-	-	1,595	141	-	-	-	80,710	48,560	-
Decontamination of Site Buildings																					
2b.1.3.1	*Reactor	1,181	1,089	64	469	699	1,728	-	1,476	6,705	6,705	-	-	6,829	17,499	-	-	-	1,037,885	45,279	-
2b.1.3.2	Auxiliary Building	955	524	39	348	203	385	-	791	3,245	3,245	-	-	1,984	11,469	-	-	-	623,109	30,690	-
2b.1.3	Totals	2,136	1,612	103	817	902	2,113	-	2,268	9,950	9,950	-	-	8,813	28,968	-	-	-	1,660,994	75,969	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	521	78	599	599	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	3,677	25,451	704	2,382	19,224	5,663	521	12,585	70,208	65,355	-	4,853	187,676	42,532	-	-	-	9,793,376	545,348	4,096
Period 2b Additional Costs																					
2b.2.1	Excavation of Underground Services	-	1,477	-	-	-	-	408	431	2,316	2,316	-	-	-	-	-	-	-	-	8,893	-
2b.2.2	Operational Tools & Equipment	-	-	10	31	370	-	-	61	473	473	-	-	5,880	-	-	-	-	147,000	16	-
2b.2	Subtotal Period 2b Additional Costs	-	1,477	10	31	370	-	408	492	2,789	2,789	-	-	5,880	-	-	-	-	147,000	8,908	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	188	-	121	333	-	484	-	277	1,403	1,403	-	-	-	1,213	-	-	-	72,755	236	-
2b.3.2	Process decommissioning chemical flush waste	3	-	105	459	-	776	-	275	1,617	1,617	-	-	-	1,094	-	-	-	116,621	205	-
2b.3.3	Small tool allowance	-	399	-	-	-	-	-	60	459	459	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs (continued)																					
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	11,235	1,685	12,921	-	12,921	-	-	-	-	-	-	-	-	-
2b.3.5	On-site survey and release of 22.53 tons clean metall	-	-	-	-	-	-	23	2	25	25	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	191	399	225	792	-	1,259	11,258	2,299	16,424	3,503	12,921	-	-	2,307	-	-	-	189,375	441	-

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,719	-	-	-	-	-	-	430	2,149	2,149	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,236	124	1,360	1,360	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	4,385	-	-	-	-	-	1,096	5,481	5,481	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	5,670	-	-	-	-	-	851	6,521	6,521	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	141	51	-	372	-	115	678	678	-	-	-	7,374	-	-	-	147,487	241	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,169	175	1,344	1,344	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,434	143	1,578	1,578	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,172	117	1,289	-	1,289	-	-	-	-	-	-	-	-	-
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,874	281	2,155	-	2,155	-	-	-	-	-	-	-	-	-
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	125	19	144	-	144	-	-	-	-	-	-	-	-	-
2b.4.13	Remedial Actions Surveys	-	-	-	-	-	-	2,828	424	3,253	3,253	-	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	12,829	1,924	14,753	14,753	-	-	-	-	-	-	-	-	-	246,796
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	22,025	3,304	25,329	25,329	-	-	-	-	-	-	-	-	-	246,796
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	40,824	6,124	46,947	46,947	-	-	-	-	-	-	-	-	-	459,315
2b.4	Subtotal Period 2b Period-Dependent Costs	1,719	10,055	141	51	-	372	85,987	15,197	113,521	109,933	3,588	-	-	7,374	-	-	-	147,487	241	952,908
2b.0	TOTAL PERIOD 2b COST	5,588	37,382	1,080	3,256	19,595	7,294	98,174	30,573	202,941	181,580	16,508	4,853	193,556	52,213	-	-	-	10,277,240	554,938	957,004
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	470	49	179	146	-	1,187	-	584	2,615	2,615	-	-	-	4,536	-	-	-	288,188	1,249	-
Disposal of Plant Systems																					
2d.1.2.1	Aux Bldg Flood Alarms & Drains	-	131	7	14	25	101	-	65	343	343	-	-	245	385	-	-	-	34,415	2,737	-
2d.1.2.2	Electrical Fuel Bldg.	-	642	13	43	696	-	-	273	1,666	1,666	-	-	6,799	-	-	-	-	276,099	11,617	-
2d.1.2.3	Fire Protection	-	156	-	-	-	-	-	23	180	-	-	180	-	-	-	-	-	-	4,115	-
2d.1.2.4	Sewage Treatment	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	16	-
2d.1.2.5	Spent Fuel Cooling & Purification	-	272	27	53	143	360	-	190	1,046	1,046	-	-	1,400	1,376	-	-	-	144,282	5,730	-
2d.1.2.6	Utility Water	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	872	-
2d.1.2.7	Waste Water	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	186	-
2d.1.2	Totals	-	1,239	47	110	864	461	-	556	3,278	3,055	-	223	8,444	1,761	-	-	-	454,796	25,274	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling Building	752	776	14	71	285	86	-	647	2,631	2,631	-	-	2,782	1,899	-	-	-	204,527	30,405	-
2d.1.3	Totals	752	776	14	71	285	86	-	647	2,631	2,631	-	-	2,782	1,899	-	-	-	204,527	30,405	-
2d.1.4	Scaffolding in support of decommissioning	-	882	7	3	36	7	-	229	1,164	1,164	-	-	319	28	-	-	-	16,142	9,712	-
2d.1	Subtotal Period 2d Activity Costs	1,222	2,946	246	331	1,185	1,742	-	2,016	9,687	9,465	-	223	11,545	8,225	-	-	-	963,653	66,640	-
Period 2d Additional Costs																					
2d.2.1	SFP non-fuel cleanout	-	-	-	-	-	-	4,900	1,470	6,370	6,370	-	-	-	-	-	-	-	-	-	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	4,900	1,470	6,370	6,370	-	-	-	-	-	-	-	-	-	-
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	84	-	54	149	-	217	-	124	629	629	-	-	-	544	-	-	-	32,648	106	-
2d.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2d.3.3	Small tool allowance	-	58	-	-	-	-	-	9	67	67	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	125	66	680	138	-	159	1,169	1,169	-	-	6,000	529	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,148	172	1,321	-	1,321	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	84	58	179	215	680	356	1,148	464	3,185	1,864	1,321	-	6,000	1,073	-	-	-	336,255	253	-

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	231	-	-	-	-	-	-	58	288	288	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	234	23	258	258	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	593	-	-	-	-	-	148	741	741	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,075	-	-	-	-	-	161	1,236	1,236	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	36	13	-	96	-	30	175	175	-	-	-	1,902	-	-	-	38,040	62	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	260	26	286	286	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	56	6	61	-	61	-	-	-	-	-	-	-	-	-
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	179	27	205	205	-	-	-	-	-	-	-	-	-	-
2d.4.11	ISFSI Operating Costs	-	-	-	-	-	-	24	4	27	-	27	-	-	-	-	-	-	-	-	-
2d.4.12	Remedial Actions Surveys	-	-	-	-	-	-	536	80	616	616	-	-	-	-	-	-	-	-	-	-
2d.4.13	Security Staff Cost	-	-	-	-	-	-	2,431	365	2,796	1,611	1,186	-	-	-	-	-	-	-	-	46,774
2d.4.14	DOC Staff Cost	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	31,616
2d.4.15	Utility Staff Cost	-	-	-	-	-	-	4,475	671	5,146	4,894	252	-	-	-	-	-	-	-	-	52,405
2d.4	Subtotal Period 2d Period-Dependent Costs	231	1,668	36	13	-	96	11,112	2,036	15,191	13,665	1,526	-	-	1,902	-	-	-	38,040	62	130,795
2d.0	TOTAL PERIOD 2d COST	1,537	4,672	462	559	1,865	2,193	17,161	5,986	34,434	31,364	2,847	223	17,545	11,200	-	-	-	1,337,949	66,955	130,795
PERIOD 2e - Delay before License Termination																					
Period 2e Direct Decommissioning Activities																					
Period 2e Additional Costs																					
2e.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,249	375	1,624	1,624	-	-	-	-	-	-	-	-	-	6,240
2e.2	Subtotal Period 2e Additional Costs	-	-	-	-	-	-	1,249	375	1,624	1,624	-	-	-	-	-	-	-	-	-	6,240
Period 2e Collateral Costs																					
2e.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	221	33	254	-	254	-	-	-	-	-	-	-	-	-
2e.3	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	221	33	254	-	254	-	-	-	-	-	-	-	-	-
Period 2e Period-Dependent Costs																					
2e.4.1	Insurance	-	-	-	-	-	-	1,276	128	1,404	1,404	-	-	-	-	-	-	-	-	-	-
2e.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2e.4.3	Health physics supplies	-	251	-	-	-	-	-	63	314	314	-	-	-	-	-	-	-	-	-	-
2e.4.4	Disposal of DAW generated	-	-	4	2	-	11	-	4	21	21	-	-	-	226	-	-	-	4,523	7	-
2e.4.5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2e.4.6	NRC Fees	-	-	-	-	-	-	762	76	838	838	-	-	-	-	-	-	-	-	-	-
2e.4.7	Emergency Planning Fees	-	-	-	-	-	-	304	30	334	-	334	-	-	-	-	-	-	-	-	-
2e.4.8	ISFSI Operating Costs	-	-	-	-	-	-	129	19	149	-	149	-	-	-	-	-	-	-	-	-
2e.4.9	Security Staff Cost	-	-	-	-	-	-	10,843	1,626	12,470	4,527	7,943	-	-	-	-	-	-	-	-	210,562
2e.4.10	Utility Staff Cost	-	-	-	-	-	-	2,912	437	3,349	3,114	234	-	-	-	-	-	-	-	-	33,029
2e.4	Subtotal Period 2e Period-Dependent Costs	-	251	4	2	-	11	16,226	2,383	18,877	10,217	8,660	-	-	226	-	-	-	4,523	7	243,591
2e.0	TOTAL PERIOD 2e COST	-	251	4	2	-	11	17,697	2,791	20,756	11,842	8,914	-	-	226	-	-	-	4,523	7	249,831
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	174	52	226	226	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	174	52	226	226	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	10,916	3,275	14,191	14,191	-	-	-	-	-	-	-	-	211,975	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	10,916	3,275	14,191	14,191	-	-	-	-	-	-	-	-	211,975	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,406	211	1,617	1,617	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	292	44	336	-	336	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,699	255	1,953	1,617	336	-	-	-	-	-	-	-	-	-

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	424	42	466	466	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	1,099	-	-	-	-	-	275	1,373	1,373	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	6	2	-	17	-	5	31	31	-	-	-	337	-	-	-	6,734	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	107	16	123	123	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	472	47	519	519	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	101	10	111	-	111	-	-	-	-	-	-	-	-	-
2f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	43	6	49	-	49	-	-	-	-	-	-	-	-	-
2f.4.9	Security Staff Cost	-	-	-	-	-	-	1,464	220	1,683	252	1,431	-	-	-	-	-	-	-	-	30,559
2f.4.10	DOC Staff Cost	-	-	-	-	-	-	4,370	656	5,026	5,026	-	-	-	-	-	-	-	-	-	46,622
2f.4.11	Utility Staff Cost	-	-	-	-	-	-	6,101	915	7,016	6,378	638	-	-	-	-	-	-	-	-	59,942
2f.4	Subtotal Period 2f Period-Dependent Costs	-	1,099	6	2	-	17	13,081	2,192	16,397	14,168	2,229	-	-	337	-	-	-	6,734	11	137,123
2f.0	TOTAL PERIOD 2f COST	-	1,099	6	2	-	17	25,869	5,774	32,768	30,202	2,566	-	-	337	-	-	-	6,734	211,986	140,243
PERIOD 2 TOTALS		8,052	76,716	19,599	12,018	29,226	41,438	280,475	97,115	564,638	492,563	63,949	8,126	295,829	123,047	963	393	-	19,700,040	1,096,886	2,502,913
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	*Reactor	-	2,522	-	-	-	-	-	378	2,901	-	-	2,901	-	-	-	-	-	-	28,377	-
3b.1.1.2	Auxiliary Building	-	4,917	-	-	-	-	-	738	5,654	-	-	5,654	-	-	-	-	-	-	25,553	-
3b.1.1.3	Circulating Water Intake Canal	-	541	-	-	-	-	-	81	622	-	-	622	-	-	-	-	-	-	7,985	-
3b.1.1.4	Control Building	-	2,542	-	-	-	-	-	381	2,923	-	-	2,923	-	-	-	-	-	-	16,818	-
3b.1.1.5	Cooling Tower Foundation	-	2,761	-	-	-	-	-	414	3,176	-	-	3,176	-	-	-	-	-	-	40,191	-
3b.1.1.6	Diesel Generator Building	-	397	-	-	-	-	-	60	457	-	-	457	-	-	-	-	-	-	2,431	-
3b.1.1.7	Misc. Buildings and Tanks	-	564	-	-	-	-	-	85	648	-	-	648	-	-	-	-	-	-	4,685	-
3b.1.1.8	Nuclear Service Cooling Tower Facilities	-	755	-	-	-	-	-	113	868	-	-	868	-	-	-	-	-	-	4,620	-
3b.1.1.9	Station Tunnels	-	274	-	-	-	-	-	41	315	-	-	315	-	-	-	-	-	-	2,572	-
3b.1.1.10	Turbine Building	-	1,497	-	-	-	-	-	224	1,721	-	-	1,721	-	-	-	-	-	-	22,933	-
3b.1.1.11	Turbine Pedestal	-	460	-	-	-	-	-	69	528	-	-	528	-	-	-	-	-	-	2,695	-
3b.1.1.12	Fuel Handling Building	-	1,054	-	-	-	-	-	158	1,213	-	-	1,213	-	-	-	-	-	-	5,242	-
3b.1.1	Totals	-	18,283	-	-	-	-	-	2,742	21,025	-	-	21,025	-	-	-	-	-	-	164,102	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	1,669	-	-	-	-	-	250	1,920	-	-	1,920	-	-	-	-	-	-	3,577	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	198	30	228	228	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	19,952	-	-	-	-	198	3,023	23,173	228	-	22,945	-	-	-	-	-	-	167,679	1,560
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	1,086	-	-	-	-	5	164	1,255	-	-	1,255	-	-	-	-	-	-	4,978	-
3b.2.2	Hyperbolic Cooling Tower Demolition	-	4,756	-	-	-	-	-	713	5,470	-	-	5,470	-	-	-	-	-	-	21,229	-
3b.2.3	Construction Debris	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-
3b.2	Subtotal Period 3b Additional Costs	-	5,843	-	-	-	-	15	879	6,737	-	-	6,737	-	-	-	-	-	-	26,207	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	159	-	-	-	-	-	24	183	-	-	183	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	632	95	726	-	726	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	159	-	-	-	-	632	119	909	-	726	183	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	754	75	830	830	-	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	9,119	-	-	-	-	-	1,368	10,487	-	-	10,487	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	190	29	219	-	219	-	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	511	51	562	-	562	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	359	36	395	-	395	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs (continued)																					
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	153	23	176	-	176	-	-	-	-	-	-	-	-	-

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 Dollars)

Activity		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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Index	Activity Description														Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
3b.4.8	Security Staff Cost	-	-	-	-	-	-	5,210	782	5,992	(0)	5,093	899	-	-	-	-	-	-	-	108,790
3b.4.9	DOC Staff Cost	-	-	-	-	-	-	14,414	2,162	16,576	-	-	16,576	-	-	-	-	-	-	-	147,842
3b.4.10	Utility Staff Cost	-	-	-	-	-	-	9,721	1,458	11,180	(0)	2,281	8,899	-	-	-	-	-	-	-	94,145
3b.4	Subtotal Period 3b Period-Dependent Costs	-	9,119	-	-	-	-	31,312	5,983	46,415	830	8,724	36,860	-	-	-	-	-	-	-	350,777
3b.0	TOTAL PERIOD 3b COST	-	35,072	-	-	-	-	32,158	10,003	77,233	1,058	9,451	66,725	-	-	-	-	-	-	193,886	352,337
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,264	1,840	14,104	-	14,104	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	12,264	1,840	14,104	-	14,104	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	5,717	572	6,289	-	6,289	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,293	429	4,722	-	4,722	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	2,720	272	2,992	-	2,992	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,157	174	1,330	-	1,330	-	-	-	-	-	-	-	-	-
3c.4.7	Security Staff Cost	-	-	-	-	-	-	33,549	5,032	38,581	-	38,581	-	-	-	-	-	-	-	-	612,950
3c.4.8	Utility Staff Cost	-	-	-	-	-	-	15,040	2,256	17,296	-	17,296	-	-	-	-	-	-	-	-	142,670
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	62,476	8,735	71,211	-	71,211	-	-	-	-	-	-	-	-	755,620
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	74,740	10,575	85,315	-	85,315	-	-	-	-	-	-	-	-	755,620
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	776	-	-	11,950	-	1,987	14,713	14,713	-	-	-	-	-	-	2,061	410,142	-	-
3d.1.1	Totals	-	-	776	-	-	11,950	-	1,987	14,713	14,713	-	-	-	-	-	-	2,061	410,142	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	776	-	-	11,950	-	1,987	14,713	14,713	-	-	-	-	-	-	2,061	410,142	-	-
Period 3d Collateral Costs																					
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	11	1	12	12	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3d.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	5	1	6	-	6	-	-	-	-	-	-	-	-	-
3d.4.6	ISFSI Operating Costs	-	-	-	-	-	-	2	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.7	Security Staff Cost	-	-	-	-	-	-	63	9	73	73	-	-	-	-	-	-	-	-	-	1,157
3d.4.8	Utility Staff Cost	-	-	-	-	-	-	28	4	33	33	-	-	-	-	-	-	-	-	-	269
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	115	16	131	117	14	-	-	-	-	-	-	-	-	1,426
3d.0	TOTAL PERIOD 3d COST	-	-	776	-	-	11,950	115	2,003	14,843	14,830	14	-	-	-	-	-	2,061	410,142	-	1,426
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	-	250	194	1,538	-	2,356	1,841	1,545	7,725	7,725	-	-	-	45,635	-	-	-	2,431,346	11,914	1,233
3e.2	Subtotal Period 3e Additional Costs	-	250	194	1,538	-	2,356	1,841	1,545	7,725	7,725	-	-	-	45,635	-	-	-	2,431,346	11,914	1,233

Table C-1
Vogtle Electric Generating Plant Unit 1
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3e Collateral Costs																					
3e.3	Subtotal Period 3e Collateral Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	43	11	54	54	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3e.4.3	Plant energy budget	-	-	-	-	-	-	2	1	3	3	-	-	-	-	-	-	-	-	-	-
3e.4.4	Security Staff Cost	-	-	-	-	-	-	110	28	138	138	-	-	-	-	-	-	-	-	-	2,520
3e.4.5	Utility Staff Cost	-	-	-	-	-	-	204	51	255	255	-	-	-	-	-	-	-	-	-	1,912
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	360	90	451	451	-	-	-	-	-	-	-	-	-	4,432
3e.0	TOTAL PERIOD 3e COST	-	250	194	1,538	-	2,356	2,202	1,635	8,175	8,175	-	-	-	45,635	-	-	-	2,431,346	11,914	5,665
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Site Restoration ISFSI	-	3,328	-	-	-	-	425	563	4,316	-	-	4,316	-	-	-	-	-	-	36,592	80
3f.2	Subtotal Period 3f Additional Costs	-	3,328	-	-	-	-	425	563	4,316	-	-	4,316	-	-	-	-	-	-	36,592	80
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	1	0	1	-	-	1	-	-	-	-	-	-	-	-
3f.4.5	Security Staff Cost	-	-	-	-	-	-	54	8	62	-	-	62	-	-	-	-	-	-	-	1,239
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	90	13	103	-	-	103	-	-	-	-	-	-	-	769
3f.4	Subtotal Period 3f Period-Dependent Costs	-	57	-	-	-	-	145	30	232	-	-	232	-	-	-	-	-	-	-	2,009
3f.0	TOTAL PERIOD 3f COST	-	3,429	-	-	-	-	570	600	4,600	-	-	4,600	-	-	-	-	-	-	36,592	2,089
PERIOD 3 TOTALS		-	38,752	970	1,538	-	14,306	109,784	24,816	190,167	24,063	94,779	71,324	-	45,635	-	-	2,061	2,841,488	242,392	1,117,136
TOTAL COST TO DECOMMISSION		12,124	118,761	20,715	14,046	29,226	58,547	540,522	147,406	941,348	666,292	194,031	81,025	295,829	170,114	1,810	393	2,061	22,679,180	1,371,126	4,624,857

TOTAL COST TO DECOMMISSION WITH 18.57% CONTINGENCY:	\$941,348	thousands of 2021	dollars
TOTAL NRC LICENSE TERMINATION COST IS 70.78% OR:	\$666,292	thousands of 2021	dollars
SPENT FUEL MANAGEMENT COST IS 20.61% OR:	\$194,031	thousands of 2021	dollars
NON-NUCLEAR DEMOLITION COST IS 8.61% OR:	\$81,025	thousands of 2021	dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	172,316	Cubic Feet	
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	2,061	Cubic Feet	
TOTAL SCRAP METAL REMOVED:	64,750	Tons	
TOTAL CRAFT LABOR REQUIREMENTS:	1,371,126	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
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
PERIOD 1a - Shutdown through Transition																						
Period 1a Direct Decommissioning Activities																						
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	109	16	125	125	-	-	-	-	-	-	-	-	-	856	
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969	
1a.1.8	Perform detailed rad survey									a												
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428	
1a.1.10	End product description	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428	
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	556	
1a.1.12	Define major work sequence	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	3,210	
1a.1.13	Perform SER and EA	-	-	-	-	-	-	169	25	194	194	-	-	-	-	-	-	-	-	-	1,327	
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	3,210	
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	2,140	
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428	
Activity Specifications																						
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	268	40	308	277	-	31	-	-	-	-	-	-	-	2,106	
1a.1.17.2	Plant systems	-	-	-	-	-	-	227	34	261	235	-	26	-	-	-	-	-	-	-	1,783	
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	27	4	31	31	-	-	-	-	-	-	-	-	-	214	
1a.1.17.4	Reactor internals	-	-	-	-	-	-	386	58	444	444	-	-	-	-	-	-	-	-	-	3,039	
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	2,782	
1a.1.17.6	Biological shield	-	-	-	-	-	-	27	4	31	31	-	-	-	-	-	-	-	-	-	214	
1a.1.17.7	Steam generators	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,335	
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	87	13	100	50	-	50	-	-	-	-	-	-	-	685	
1a.1.17.9	Main Turbine	-	-	-	-	-	-	22	3	25	-	-	25	-	-	-	-	-	-	-	171	
1a.1.17.10	Main Condensers	-	-	-	-	-	-	22	3	25	-	-	25	-	-	-	-	-	-	-	171	
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	170	25	195	98	-	98	-	-	-	-	-	-	-	1,335	
1a.1.17.12	Waste management	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969	
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	49	7	56	28	-	28	-	-	-	-	-	-	-	385	
1a.1.17	Total	-	-	-	-	-	-	2,059	309	2,368	2,085	-	283	-	-	-	-	-	-	-	16,190	
Planning & Site Preparations																						
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,027	
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,600	540	4,140	4,140	-	-	-	-	-	-	-	-	-	-	
1a.1.20	Design water clean-up system	-	-	-	-	-	-	76	11	88	88	-	-	-	-	-	-	-	-	-	599	
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,400	360	2,760	2,760	-	-	-	-	-	-	-	-	-	-	
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	526	
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	10,254	1,538	11,792	11,509	-	283	-	-	-	-	-	-	-	33,451	
Period 1a Additional Costs																						
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	8,596	1,289	9,885	9,885	-	-	-	-	-	-	-	-	-	-	
1a.2.2	Site Characterization	-	-	-	-	-	-	2,808	842	3,650	3,650	-	-	-	-	-	-	-	-	13,042	4,640	
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	11,403	2,132	13,535	13,535	-	-	-	-	-	-	-	-	13,042	4,640	
Period 1a Collateral Costs																						
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,632	1,445	11,077	-	11,077	-	-	-	-	-	-	-	-	-	
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	9,632	1,445	11,077	-	11,077	-	-	-	-	-	-	-	-	-	
Period 1a Period-Dependent Costs																						
1a.4.1	Insurance	-	-	-	-	-	-	2,689	269	2,958	2,958	-	-	-	-	-	-	-	-	-	-	
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1a.4.3	Health physics supplies	-	614	-	-	-	-	-	153	767	767	-	-	-	-	-	-	-	-	-	-	
1a.4.4	Heavy equipment rental	-	756	-	-	-	-	-	113	869	869	-	-	-	-	-	-	-	-	-	-	
1a.4.5	Disposal of DAW generated	-	-	12	4	-	31	-	9	56	56	-	-	-	610	-	-	-	12,190	20	-	
1a.4.6	Plant energy budget	-	-	-	-	-	-	709	106	816	816	-	-	-	-	-	-	-	-	-	-	
1a.4.7	NRC Fees	-	-	-	-	-	-	702	70	772	772	-	-	-	-	-	-	-	-	-	-	

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1a Period-Dependent Costs (continued)																					
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	814	81	896	-	896	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	853	128	981	-	981	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	57	9	65	-	65	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	6,282	942	7,225	7,225	-	-	-	-	-	-	-	-	-	123,760
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	37,306	5,596	42,902	42,902	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,370	12	4	-	31	49,412	7,478	58,307	56,365	1,942	-	-	610	-	-	-	12,190	20	546,000
1a.0	TOTAL PERIOD 1a COST	-	1,370	12	4	-	31	80,702	12,593	94,711	81,409	13,019	283	-	610	-	-	-	12,190	13,061	584,091
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	258	39	296	267	-	30	-	-	-	-	-	-	-	2,026
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	136	20	156	156	-	-	-	-	-	-	-	-	-	1,070
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	73	11	84	21	-	63	-	-	-	-	-	-	-	578
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	198	30	227	227	-	-	-	-	-	-	-	-	-	1,554
1b.1.1.9	Facility closeout	-	-	-	-	-	-	65	10	75	38	-	38	-	-	-	-	-	-	-	514
1b.1.1.10	Missile shields	-	-	-	-	-	-	24	4	28	28	-	-	-	-	-	-	-	-	-	193
1b.1.1.11	Biological shield	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	514
1b.1.1.12	Steam generators	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	54	8	63	31	-	31	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	85	13	98	-	-	98	-	-	-	-	-	-	-	668
1b.1.1.15	Main Condensers	-	-	-	-	-	-	85	13	98	-	-	98	-	-	-	-	-	-	-	668
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	149	22	171	154	-	17	-	-	-	-	-	-	-	1,168
1b.1.1.17	Reactor building	-	-	-	-	-	-	149	22	171	154	-	17	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,809	271	2,081	1,689	-	391	-	-	-	-	-	-	-	14,228
1b.1.2	Decon primary loop	778	-	-	-	-	-	-	389	1,166	1,166	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	778	-	-	-	-	-	1,809	660	3,247	2,856	-	391	-	-	-	-	-	-	1,067	14,228
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	1,073	-	-	-	-	-	-	161	1,234	1,234	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,406	211	1,617	1,617	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	76	-	46	128	-	186	-	108	544	544	-	-	-	467	-	-	-	27,990	91	-
1b.3.4	Process decommissioning chemical flush waste	2	-	81	356	-	2,569	-	705	3,712	3,712	-	-	-	-	848	-	-	90,351	159	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	2,106	-	-	-	-	-	-	316	2,422	2,422	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,734	1,010	7,744	-	7,744	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	3,257	1,202	128	484	-	2,755	8,140	2,691	18,656	10,912	7,744	-	-	467	848	-	-	118,341	250	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	38	-	-	-	-	-	-	10	48	48	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	1,341	134	1,475	1,475	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	344	-	-	-	-	-	86	430	430	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	377	-	-	-	-	-	57	434	434	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	18	-	6	33	33	-	-	-	356	-	-	-	7,122	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	707	106	813	813	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	224	22	246	246	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	406	41	447	-	447	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	425	64	489	-	489	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	28	4	33	-	33	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	3,132	470	3,602	3,602	-	-	-	-	-	-	-	-	-	61,710
1b.4.13	DOC Staff Cost	-	-	-	-	-	-	6,032	905	6,936	6,936	-	-	-	-	-	-	-	-	-	63,266

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 1b Period-Dependent Costs (continued)																						
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	18,709	2,806	21,516	21,516	-	-	-	-	-	-	-	-	-	211,579	
1b.4	Subtotal Period 1b Period-Dependent Costs	38	721	7	2	-	18	31,005	4,710	36,501	35,533	968	-	-	356	-	-	-	7,122	12	336,555	
1b.0	TOTAL PERIOD 1b COST	4,073	1,923	134	486	-	2,773	40,954	8,061	58,404	49,301	8,712	391	-	823	848	-	-	125,463	1,328	350,783	
PERIOD 1 TOTALS		4,073	3,293	146	490	-	2,803	121,656	20,654	153,115	130,710	21,731	674	-	1,432	848	-	-	137,654	14,389	934,875	
PERIOD 2a - Large Component Removal																						
Period 2a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
2a.1.1.1	Reactor Coolant Piping	137	106	33	104	-	529	-	246	1,155	1,155	-	-	-	1,839	-	-	-	128,296	4,820	-	
2a.1.1.2	Pressurizer Relief Tank	25	20	9	27	-	138	-	57	276	276	-	-	-	479	-	-	-	33,443	893	-	
2a.1.1.3	Reactor Coolant Pumps & Motors	88	85	181	247	-	1,739	-	555	2,895	2,895	-	-	-	5,127	-	-	-	805,200	4,121	100	
2a.1.1.4	Pressurizer	-	54	441	114	-	1,031	-	332	1,971	1,971	-	-	-	3,039	-	-	-	251,899	1,666	938	
2a.1.1.5	Steam Generators	-	3,569	2,789	3,703	3,082	7,581	-	4,084	24,807	24,807	-	-	39,095	22,354	-	-	-	3,324,617	23,227	2,875	
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	156	269	233	127	-	630	-	345	1,760	1,760	-	-	-	3,965	-	-	-	152,894	8,248	-	
2a.1.1.7	Reactor Vessel Internals	136	5,736	10,963	1,592	-	14,686	412	14,914	48,439	48,439	-	-	-	1,878	963	393	-	329,968	34,590	1,542	
2a.1.1.8	Reactor Vessel	114	7,283	3,094	1,701	-	4,737	412	9,148	26,487	26,487	-	-	-	13,584	-	-	-	974,049	34,590	1,542	
2a.1.1	Totals	656	17,122	17,743	7,614	3,082	31,069	823	29,681	107,791	107,791	-	-	39,095	52,266	963	393	-	6,000,365	112,155	6,997	
Removal of Major Equipment																						
2a.1.2	Main Turbine/Generator	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	3,130	-	
2a.1.3	Main Condensers	-	536	-	-	-	-	-	80	617	-	-	617	-	-	-	-	-	-	11,923	-	
Cascading Costs from Clean Building Demolition																						
2a.1.4.1	*Reactor	-	440	-	-	-	-	-	66	506	506	-	-	-	-	-	-	-	-	4,916	-	
2a.1.4.2	Auxiliary Building	-	329	-	-	-	-	-	49	378	378	-	-	-	-	-	-	-	-	2,323	-	
2a.1.4.3	Fuel Handling Building	-	46	-	-	-	-	-	7	53	53	-	-	-	-	-	-	-	-	413	-	
2a.1.4	Totals	-	815	-	-	-	-	-	122	937	937	-	-	-	-	-	-	-	-	7,653	-	
Disposal of Plant Systems																						
2a.1.5.1	Auxiliary Feedwater	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,910	-	
2a.1.5.2	Auxiliary Gas	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	1,383	-	
2a.1.5.3	Auxiliary Gas - RCA	-	40	1	2	29	-	-	15	86	86	-	-	286	-	-	-	-	11,631	684	-	
2a.1.5.4	Auxiliary Steam	-	49	-	-	-	-	-	7	56	-	-	56	-	-	-	-	-	-	1,354	-	
2a.1.5.5	Auxiliary Steam - RCA	-	40	1	3	48	-	-	18	109	109	-	-	467	-	-	-	-	18,976	739	-	
2a.1.5.6	Circulating Water	-	226	-	-	-	-	-	34	260	-	-	260	-	-	-	-	-	-	6,082	-	
2a.1.5.7	Circulating Water Chemical Injection	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	506	-	
2a.1.5.8	Condensate & Feedwater	-	391	-	-	-	-	-	59	450	-	-	450	-	-	-	-	-	-	10,136	-	
2a.1.5.9	Condensate & Feedwater - RCA	-	337	22	75	1,216	-	-	280	1,930	1,930	-	-	11,879	-	-	-	-	482,405	7,039	-	
2a.1.5.10	Condensate Chemical Injection	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	1,242	-	
2a.1.5.11	Condensate Filter Demineralizer	-	91	-	-	-	-	-	14	105	-	-	105	-	-	-	-	-	-	2,342	-	
2a.1.5.12	Condenser Air Ejection	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	1,166	-	
2a.1.5.13	Condenser Tube Cleaning	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	348	-	
2a.1.5.14	Construction Water	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	93	-	
2a.1.5.15	Containment Spray - RCA	-	201	6	21	349	-	-	106	684	684	-	-	3,409	-	-	-	-	138,422	3,905	-	
2a.1.5.16	Electrohydraulic Control	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	97	-	
2a.1.5.17	Eng Safety Feature Room Coolers - RCA	-	45	1	3	47	-	-	19	114	114	-	-	460	-	-	-	-	18,695	961	-	
2a.1.5.18	Extraction Steam	-	99	-	-	-	-	-	15	114	-	-	114	-	-	-	-	-	-	2,717	-	
2a.1.5.19	Feedwater Heater Drain	-	179	-	-	-	-	-	27	206	-	-	206	-	-	-	-	-	-	4,821	-	
2a.1.5.20	Feedwater Heater Vent	-	65	-	-	-	-	-	10	75	-	-	75	-	-	-	-	-	-	1,787	-	
2a.1.5.21	Heater Ventilation	-	25	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	658	-	
2a.1.5.22	Main Steam	-	253	-	-	-	-	-	38	291	-	-	291	-	-	-	-	-	-	6,683	-	
2a.1.5.23	Main Steam - RCA	-	575	44	149	2,418	-	-	533	3,719	3,719	-	-	23,626	-	-	-	-	959,449	11,946	-	
2a.1.5.24	Miscellaneous Leak Detection	-	25	2	3	10	20	-	13	73	73	-	-	100	77	-	-	-	8,960	482	-	
2a.1.5.25	Miscellaneous Piping	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	783	-	
2a.1.5.26	NSCW Chemical Injection	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	192	-	
2a.1.5.27	Plant Make-Up Water Treatment	-	341	-	-	-	-	-	51	393	-	-	393	-	-	-	-	-	-	8,520	-	
2a.1.5.28	Post Accident Sampling - RCA	-	22	0	1	18	-	-	9	50	50	-	-	176	-	-	-	-	7,158	392	-	

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Disposal of Plant Systems (continued)																						
2a.1.5.29	River Intake Chlorination	-	220	-	-	-	-	-	33	253	-	-	253	-	-	-	-	-	-	5,837	-	
2a.1.5.30	Safety Injection - RCA	-	374	13	45	726	-	-	210	1,368	1,368	-	-	7,094	-	-	-	-	288,093	7,215	-	
2a.1.5.31	Steam Generator Blowdown	-	332	17	35	140	216	-	165	905	905	-	-	1,366	825	-	-	-	107,911	6,931	-	
2a.1.5.32	Turbine Drive Steam	-	49	-	-	-	-	-	7	56	-	-	56	-	-	-	-	-	-	1,239	-	
2a.1.5.33	Turbine Generator Gas	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	241	-	
2a.1.5.34	Turbine Generator Hydrogen Seal Oil	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	217	-	
2a.1.5.35	Turbine Generator Stator Cooling	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	325	-	
2a.1.5.36	Turbine Lube Oil Storage & Filtration	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	1,941	-	
2a.1.5.37	Turbine Plant Closed Cooling Water	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	867	-	
2a.1.5.38	Turbine Plant Cooling Water	-	225	-	-	-	-	-	34	258	-	-	258	-	-	-	-	-	-	6,016	-	
2a.1.5.39	Turbine Plant Sampling	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	1,433	-	
2a.1.5.40	Waste Water - RCA	-	433	30	102	1,659	-	-	376	2,600	2,600	-	-	16,213	-	-	-	-	658,421	8,935	-	
2a.1.5	Totals	-	5,111	137	439	6,660	236	-	2,147	14,731	11,639	-	3,092	65,077	902	-	-	-	2,700,120	120,167	-	
2a.1.6	Scaffolding in support of decommissioning	-	3,526	27	13	145	29	-	915	4,655	4,655	-	-	1,276	113	-	-	-	64,568	38,848	-	
2a.1	Subtotal Period 2a Activity Costs	656	27,252	17,907	8,066	9,887	31,335	823	32,967	128,893	125,021	-	3,871	105,447	53,281	963	393	-	8,765,053	293,875	6,997	
Period 2a Collateral Costs																						
2a.3.1	Process decommissioning water waste	135	-	84	232	-	337	-	195	982	982	-	-	-	845	-	-	-	50,672	165	-	
2a.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2a.3.3	Small tool allowance	-	262	-	-	-	-	-	39	301	271	-	30	-	-	-	-	-	-	-	-	
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	20,546	3,082	23,628	-	23,628	-	-	-	-	-	-	-	-	-	
2a.3.5	On-site survey and release of 115.8 tons clean metall	-	-	-	-	-	-	116	12	127	127	-	-	-	-	-	-	-	-	-	-	
2a.3	Subtotal Period 2a Collateral Costs	135	262	84	232	-	337	20,662	3,327	25,038	1,380	23,628	30	-	845	-	-	-	50,672	165	-	
Period 2a Period-Dependent Costs																						
2a.4.1	Decon supplies	139	-	-	-	-	-	-	35	173	173	-	-	-	-	-	-	-	-	-	-	
2a.4.2	Insurance	-	-	-	-	-	-	1,017	102	1,119	1,119	-	-	-	-	-	-	-	-	-	-	
2a.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2a.4.4	Health physics supplies	-	2,808	-	-	-	-	-	702	3,510	3,510	-	-	-	-	-	-	-	-	-	-	
2a.4.5	Heavy equipment rental	-	4,546	-	-	-	-	-	682	5,228	5,228	-	-	-	-	-	-	-	-	-	-	
2a.4.6	Disposal of DAW generated	-	-	97	35	-	258	-	79	470	470	-	-	-	5,115	-	-	-	102,306	167	-	
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,218	183	1,401	1,401	-	-	-	-	-	-	-	-	-	-	
2a.4.8	NRC Fees	-	-	-	-	-	-	767	77	843	843	-	-	-	-	-	-	-	-	-	-	
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	965	96	1,061	-	1,061	-	-	-	-	-	-	-	-	-	
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,542	231	1,773	-	1,773	-	-	-	-	-	-	-	-	-	
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	118	-	118	-	-	-	-	-	-	-	-	-	
2a.4.12	Remedial Actions Surveys	-	-	-	-	-	-	2,328	349	2,677	2,677	-	-	-	-	-	-	-	-	-	-	
2a.4.13	Security Staff Cost	-	-	-	-	-	-	10,558	1,584	12,141	12,141	-	-	-	-	-	-	-	-	-	203,099	
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	26,600	3,990	30,590	30,590	-	-	-	-	-	-	-	-	-	285,843	
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	49,172	7,376	56,548	56,548	-	-	-	-	-	-	-	-	-	532,195	
2a.4	Subtotal Period 2a Period-Dependent Costs	139	7,354	97	35	-	258	94,269	15,501	117,654	114,701	2,953	-	-	5,115	-	-	-	102,306	167	1,021,138	
2a.0	TOTAL PERIOD 2a COST	929	34,868	18,089	8,333	9,887	31,930	115,754	51,795	271,585	241,103	26,580	3,901	105,447	59,240	963	393	-	8,918,032	294,207	1,028,135	
PERIOD 2b - Site Decontamination																						
Period 2b Direct Decommissioning Activities																						
Disposal of Plant Systems																						
2b.1.1.1	Additional Systems - RCA	-	249	8	28	461	-	-	137	884	884	-	-	4,508	-	-	-	-	183,071	4,785	-	
2b.1.1.2	Aux Bldg & Misc Drains	-	802	44	85	196	589	-	394	2,110	2,110	-	-	1,918	2,251	-	-	-	220,876	16,599	-	
2b.1.1.3	Aux Component Cooling Water - RCA	-	395	22	73	1,193	-	-	291	1,973	1,973	-	-	11,654	-	-	-	-	473,273	7,685	-	
2b.1.1.4	Auxiliary Bldg HVAC	-	878	29	84	1,083	144	-	434	2,652	2,652	-	-	10,582	551	-	-	-	464,762	16,746	-	
2b.1.1.5	Backflushable Filter - RCA	-	44	1	3	42	-	-	18	107	107	-	-	410	-	-	-	-	16,664	785	-	
2b.1.1.6	Boron Recycle	317	346	25	50	181	315	-	361	1,594	1,594	-	-	1,765	1,204	-	-	-	148,167	12,878	-	
2b.1.1.7	Chemical & Volume Control	588	714	55	105	236	732	-	712	3,141	3,141	-	-	2,309	2,796	-	-	-	271,397	24,529	-	
2b.1.1.8	Chilled Water	-	168	-	-	-	-	-	25	193	-	-	193	-	-	-	-	-	-	4,545	-	
2b.1.1.9	Chilled Water - RCA	-	187	4	14	229	-	-	84	518	518	-	-	2,239	-	-	-	-	90,929	3,461	-	
2b.1.1.10	Component Cooling Water - RCA	-	357	42	141	2,283	-	-	457	3,279	3,279	-	-	22,306	-	-	-	-	905,870	7,486	-	

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(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Disposal of Plant Systems (continued)																						
2b.1.1.11	Containment & Aux Bldg Drains	-	281	19	34	24	267	-	147	772	772	-	-	236	1,019	-	-	-	74,316	5,802	-	
2b.1.1.12	Containment Air Purification & Cleanup	-	81	9	20	153	89	-	70	422	422	-	-	1,494	341	-	-	-	82,375	1,798	-	
2b.1.1.13	Containment Cooling	-	824	25	75	999	108	-	397	2,428	2,428	-	-	9,762	414	-	-	-	422,736	15,503	-	
2b.1.1.14	Containment Heat Removal	-	961	50	125	1,180	423	-	547	3,284	3,284	-	-	11,526	1,615	-	-	-	570,687	18,350	-	
2b.1.1.15	Control Building Drains	-	79	-	-	-	-	-	12	91	-	-	91	-	-	-	-	-	-	2,051	-	
2b.1.1.16	Control Building HVAC	-	174	-	-	-	-	-	26	200	-	-	200	-	-	-	-	-	-	5,035	-	
2b.1.1.17	Diesel Generator	-	60	-	-	-	-	-	9	69	-	-	69	-	-	-	-	-	-	1,490	-	
2b.1.1.18	Diesel Generator Bldg HVAC	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	886	-	
2b.1.1.19	Electric Chase Tunnel Drains	-	18	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	456	-	
2b.1.1.20	Electric Tunnel Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	32	-	
2b.1.1.21	Electrical - Clean	-	2,960	-	-	-	-	-	444	3,404	-	-	3,404	-	-	-	-	-	-	72,409	-	
2b.1.1.22	Electrical - Contaminated	-	1,026	17	53	718	69	-	391	2,275	2,275	-	-	7,020	265	-	-	-	301,891	19,990	-	
2b.1.1.23	Electrical - RCA	-	5,892	111	376	6,111	-	-	2,457	14,948	14,948	-	-	59,716	-	-	-	-	2,425,099	106,964	-	
2b.1.1.24	Fire Protection - RCA	-	1,854	63	212	3,438	-	-	1,017	6,583	6,583	-	-	33,592	-	-	-	-	1,364,187	36,537	-	
2b.1.1.25	HP Bldg HVAC	-	12	0	1	12	2	-	6	33	33	-	-	115	9	-	-	-	5,232	233	-	
2b.1.1.26	Instrument Air	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	2,298	-	
2b.1.1.27	Instrument Air - RCA	-	324	5	15	251	-	-	121	716	716	-	-	2,448	-	-	-	-	99,412	5,582	-	
2b.1.1.28	Miscellaneous HVAC	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	2,679	-	
2b.1.1.29	Miscellaneous Reactor Coolant	58	79	5	10	9	73	-	71	305	305	-	-	90	278	-	-	-	21,351	2,700	-	
2b.1.1.30	Nuclear Sampling - Gaseous	-	37	2	4	9	25	-	17	93	93	-	-	90	94	-	-	-	9,592	706	-	
2b.1.1.31	Nuclear Sampling - Liquid	-	45	2	4	9	31	-	21	114	114	-	-	92	118	-	-	-	11,241	906	-	
2b.1.1.32	Nuclear Service Cooling Water	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	3,633	-	
2b.1.1.33	Nuclear Service Cooling Water - RCA	-	1,068	39	133	2,158	-	-	615	4,014	4,014	-	-	21,090	-	-	-	-	856,487	20,482	-	
2b.1.1.34	Piping Penetration Filtration & Exhaust	-	13	1	3	30	9	-	11	67	67	-	-	297	36	-	-	-	14,362	278	-	
2b.1.1.35	Plant Demineralized Water	-	69	-	-	-	-	-	10	79	-	-	79	-	-	-	-	-	-	1,897	-	
2b.1.1.36	Plant Demineralized Water - RCA	-	89	2	6	91	-	-	37	224	224	-	-	886	-	-	-	-	35,990	1,594	-	
2b.1.1.37	Potable Water	-	95	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	2,488	-	
2b.1.1.38	Potable Water - RCA	-	205	4	14	233	-	-	89	545	545	-	-	2,280	-	-	-	-	92,588	3,682	-	
2b.1.1.39	Radwaste Pump Seal Water - RCA	-	9	0	1	15	-	-	5	31	31	-	-	151	-	-	-	-	6,117	167	-	
2b.1.1.40	Radwaste Solid Bldg Cooling Wtr - RCA	-	48	1	3	41	-	-	19	111	111	-	-	402	-	-	-	-	16,313	900	-	
2b.1.1.41	Radwaste Solidification & Vol Reduction	-	516	39	74	147	526	-	297	1,599	1,599	-	-	1,441	2,008	-	-	-	186,084	10,190	-	
2b.1.1.42	Radwaste Solidification Bldg HVAC	-	736	25	70	834	151	-	360	2,175	2,175	-	-	8,147	575	-	-	-	367,387	14,027	-	
2b.1.1.43	Radwaste Transfer Bldg HVAC	-	141	4	13	167	18	-	67	410	410	-	-	1,634	70	-	-	-	70,769	2,678	-	
2b.1.1.44	Reactor M/U Wtr Storage Tank & Degas	-	169	9	17	43	116	-	81	435	435	-	-	424	443	-	-	-	45,376	3,419	-	
2b.1.1.45	Residual Heat Removal	246	226	31	60	161	409	-	318	1,452	1,452	-	-	1,572	1,563	-	-	-	163,114	6,033	-	
2b.1.1.46	Service Air	-	69	-	-	-	-	-	10	79	-	-	79	-	-	-	-	-	-	1,954	-	
2b.1.1.47	Service Air - RCA	-	241	3	11	186	-	-	90	532	532	-	-	1,822	-	-	-	-	74,000	4,237	-	
2b.1.1.48	Solidification Building Drains	263	311	21	39	48	294	-	298	1,275	1,275	-	-	471	1,124	-	-	-	90,519	10,837	-	
2b.1.1.49	Turbine Bldg HVAC	-	461	-	-	-	-	-	69	530	-	-	530	-	-	-	-	-	-	13,860	-	
2b.1.1.50	Turbine Building Drain	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	3,680	-	
2b.1.1.51	Utility Water - RCA	-	119	2	6	95	-	-	45	266	266	-	-	923	-	-	-	-	37,503	2,154	-	
2b.1.1.52	Waste Evaporator Steam Supply - RCA	-	132	3	10	169	-	-	60	374	374	-	-	1,652	-	-	-	-	67,106	2,422	-	
2b.1.1.53	Waste Processing - Gas	-	259	13	31	228	134	-	139	804	804	-	-	2,231	514	-	-	-	123,250	5,184	-	
2b.1.1.54	Waste Processing - Liquid	869	952	71	136	319	947	-	985	4,279	4,279	-	-	3,117	3,620	-	-	-	356,517	34,759	-	
2b.1.1	Totals	2,341	25,253	805	2,138	23,785	5,472	-	12,358	72,152	66,825	-	5,327	232,413	20,907	-	-	-	10,766,610	552,459	-	
2b.1.2	Scaffolding in support of decommissioning	-	4,408	33	16	181	37	-	1,144	5,818	5,818	-	-	1,595	141	-	-	-	80,710	48,560	-	
Decontamination of Site Buildings																						
2b.1.3.1	*Reactor	1,181	1,113	67	476	699	1,736	-	1,486	6,759	6,759	-	-	6,829	17,690	-	-	-	1,050,608	45,686	-	
2b.1.3.2	Auxiliary Building	955	524	39	348	203	385	-	791	3,245	3,245	-	-	1,984	11,469	-	-	-	623,109	30,690	-	
2b.1.3.3	Radwaste Processing Facility	34	28	2	13	24	15	-	34	149	149	-	-	231	403	-	-	-	28,434	1,266	-	
2b.1.3.4	Radwaste Solidification Building	14	80	4	13	130	18	-	53	312	312	-	-	1,267	214	-	-	-	62,299	1,664	-	
2b.1.3.5	Radwaste Transfer & Alternate Buildings	18	1	0	1	-	1	-	10	32	32	-	-	-	41	-	-	-	1,950	447	-	
2b.1.3	Totals	2,203	1,746	112	852	1,055	2,156	-	2,374	10,498	10,498	-	-	10,311	29,817	-	-	-	1,766,400	79,753	-	
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	223	33	256	256	-	-	-	-	-	-	-	-	-	1,753	
2b.1.5	Receive NRC approval of termination plan									a												
2b.1	Subtotal Period 2b Activity Costs	4,543	31,407	950	3,006	25,021	7,665	223	15,909	88,724	83,397	-	5,327	244,319	50,865	-	-	-	12,613,720	680,772	1,753	

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2b Additional Costs																						
2b.2.1	Excavation of Underground Services	-	1,477	-	-	-	-	408	431	2,316	2,316	-	-	-	-	-	-	-	-	8,893	-	
2b.2.2	Operational Tools & Equipment	-	-	10	31	370	-	-	61	473	473	-	-	5,880	-	-	-	-	147,000	16	-	
2b.2	Subtotal Period 2b Additional Costs	-	1,477	10	31	370	-	408	492	2,789	2,789	-	-	5,880	-	-	-	-	147,000	8,908	-	
Period 2b Collateral Costs																						
2b.3.1	Process decommissioning water waste	189	-	121	334	-	486	-	279	1,410	1,410	-	-	-	1,219	-	-	-	73,133	238	-	
2b.3.2	Process decommissioning chemical flush waste	4	-	147	643	-	1,087	-	385	2,266	2,266	-	-	-	1,534	-	-	-	163,436	287	-	
2b.3.3	Small tool allowance	-	495	-	-	-	-	-	74	569	569	-	-	-	-	-	-	-	-	-	-	
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	18,854	2,828	21,683	-	21,683	-	-	-	-	-	-	-	-	-	
2b.3.5	On-site survey and release of 36.76 tons clean metall	-	-	-	-	-	-	37	4	40	40	-	-	-	-	-	-	-	-	-	-	
2b.3	Subtotal Period 2b Collateral Costs	193	495	268	978	-	1,573	18,891	3,570	25,968	4,285	21,683	-	-	2,753	-	-	-	236,569	525	-	
Period 2b Period-Dependent Costs																						
2b.4.1	Decon supplies	1,789	-	-	-	-	-	-	447	2,236	2,236	-	-	-	-	-	-	-	-	-	-	
2b.4.2	Insurance	-	-	-	-	-	-	1,233	123	1,356	1,356	-	-	-	-	-	-	-	-	-	-	
2b.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2b.4.4	Health physics supplies	-	5,268	-	-	-	-	-	1,317	6,585	6,585	-	-	-	-	-	-	-	-	-	-	
2b.4.5	Heavy equipment rental	-	5,656	-	-	-	-	-	848	6,505	6,505	-	-	-	-	-	-	-	-	-	-	
2b.4.6	Disposal of DAW generated	-	-	172	62	-	455	-	140	830	830	-	-	-	9,038	-	-	-	180,750	295	-	
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,166	175	1,341	1,341	-	-	-	-	-	-	-	-	-	-	
2b.4.8	NRC Fees	-	-	-	-	-	-	929	93	1,022	1,022	-	-	-	-	-	-	-	-	-	-	
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,169	117	1,286	-	1,286	-	-	-	-	-	-	-	-	-	
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,869	280	2,149	-	2,149	-	-	-	-	-	-	-	-	-	
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	-	-	
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	125	19	143	-	143	-	-	-	-	-	-	-	-	-	
2b.4.13	Remedial Actions Surveys	-	-	-	-	-	-	2,821	423	3,244	3,244	-	-	-	-	-	-	-	-	-	-	
2b.4.14	Security Staff Cost	-	-	-	-	-	-	12,797	1,920	14,717	14,717	-	-	-	-	-	-	-	-	-	246,181	
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	31,033	4,655	35,688	35,688	-	-	-	-	-	-	-	-	-	332,800	
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	57,151	8,573	65,723	65,723	-	-	-	-	-	-	-	-	-	617,732	
2b.4	Subtotal Period 2b Period-Dependent Costs	1,789	10,924	172	62	-	455	110,763	19,201	143,366	139,787	3,579	-	-	9,038	-	-	-	180,750	295	1,196,712	
2b.0	TOTAL PERIOD 2b COST	6,525	44,304	1,401	4,077	25,391	9,693	130,285	39,171	260,847	230,259	25,261	5,327	250,199	62,655	-	-	-	13,178,040	690,500	1,198,465	
PERIOD 2d - Decontamination Following Wet Fuel Storage																						
Period 2d Direct Decommissioning Activities																						
2d.1.1	Remove spent fuel racks	470	49	179	146	-	1,187	-	584	2,615	2,615	-	-	-	4,536	-	-	-	288,188	1,249	-	
Disposal of Plant Systems																						
2d.1.2.1	Aux Bldg Flood Alarms & Drains	-	161	9	17	32	119	-	78	415	415	-	-	316	453	-	-	-	41,607	3,349	-	
2d.1.2.2	Electrical Fuel Bldg.	-	653	12	42	675	-	-	272	1,655	1,655	-	-	6,600	-	-	-	-	268,042	11,861	-	
2d.1.2.3	Fire Protection	-	480	-	-	-	-	-	72	552	-	-	552	-	-	-	-	-	-	12,783	-	
2d.1.2.4	Fuel Handling Bldg HVAC	-	648	20	60	794	88	-	314	1,923	1,923	-	-	7,757	335	-	-	-	336,290	12,218	-	
2d.1.2.5	Sewage Treatment	-	3	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	88	-	
2d.1.2.6	Spent Fuel Cooling & Purification	-	269	28	55	127	381	-	193	1,054	1,054	-	-	1,244	1,456	-	-	-	142,983	5,703	-	
2d.1.2.7	Utility Water	-	115	-	-	-	-	-	17	133	-	-	133	-	-	-	-	-	-	3,321	-	
2d.1.2.8	Waste Water	-	200	-	-	-	-	-	30	230	-	-	230	-	-	-	-	-	-	5,385	-	
2d.1.2	Totals	-	2,530	69	173	1,629	587	-	977	5,965	5,047	-	918	15,917	2,244	-	-	-	788,922	54,708	-	
Decontamination of Site Buildings																						
2d.1.3.1	Fuel Handling Building	752	780	14	72	292	87	-	649	2,646	2,646	-	-	2,852	1,904	-	-	-	207,551	30,486	-	
2d.1.3	Totals	752	780	14	72	292	87	-	649	2,646	2,646	-	-	2,852	1,904	-	-	-	207,551	30,486	-	
2d.1.4	Scaffolding in support of decommissioning	-	882	7	3	36	7	-	229	1,164	1,164	-	-	319	28	-	-	-	16,142	9,712	-	
2d.1	Subtotal Period 2d Activity Costs	1,222	4,241	269	394	1,957	1,869	-	2,438	12,390	11,471	-	918	19,088	8,712	-	-	-	1,300,803	96,155	-	
Period 2d Additional Costs																						
2d.2.1	Soil Remediation	-	43	3	345	-	476	-	182	1,048	1,048	-	-	-	8,304	-	-	-	647,704	683	-	
2d.2.2	License Termination Survey Planning	-	-	-	-	-	-	1,249	375	1,624	1,624	-	-	-	-	-	-	-	-	-	6,240	
2d.2.3	Solid Waste Landfill #2 Closure/Post-closure	-	-	-	-	-	-	3,316	497	3,813	3,813	-	-	-	-	-	-	-	-	-	-	

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2d Additional Costs (continued)																						
2d.2.4	SFP non-fuel cleanout	-	-	-	-	-	-	4,900	1,470	6,370	6,370	-	-	-	-	-	-	-	-	-	-	
2d.2	Subtotal Period 2d Additional Costs	-	43	3	345	-	476	9,465	2,524	12,856	12,856	-	-	-	8,304	-	-	-	-	647,704	683	6,240
Period 2d Collateral Costs																						
2d.3.1	Process decommissioning water waste	83	-	54	148	-	216	-	123	624	624	-	-	-	541	-	-	-	-	32,437	105	-
2d.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2d.3.3	Small tool allowance	-	79	-	-	-	-	-	12	90	90	-	-	-	-	-	-	-	-	-	-	
2d.3.4	Decommissioning Equipment Disposition	-	-	125	66	680	138	-	159	1,169	1,169	-	-	6,000	529	-	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,148	622	4,770	-	4,770	-	-	-	-	-	-	-	-	-	
2d.3	Subtotal Period 2d Collateral Costs	83	79	179	214	680	354	4,148	916	6,653	1,883	4,770	-	6,000	1,070	-	-	-	-	336,045	252	-
Period 2d Period-Dependent Costs																						
2d.4.1	Decon supplies	246	-	-	-	-	-	-	61	307	307	-	-	-	-	-	-	-	-	-	-	
2d.4.2	Insurance	-	-	-	-	-	-	347	35	381	381	-	-	-	-	-	-	-	-	-	-	
2d.4.3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2d.4.4	Health physics supplies	-	896	-	-	-	-	-	224	1,120	1,120	-	-	-	-	-	-	-	-	-	-	
2d.4.5	Heavy equipment rental	-	1,591	-	-	-	-	-	239	1,829	1,829	-	-	-	-	-	-	-	-	-	-	
2d.4.6	Disposal of DAW generated	-	-	42	15	-	112	-	34	204	204	-	-	-	2,218	-	-	-	-	44,354	72	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	175	26	201	201	-	-	-	-	-	-	-	-	-	-	
2d.4.8	NRC Fees	-	-	-	-	-	-	252	25	278	278	-	-	-	-	-	-	-	-	-	-	
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	83	8	91	-	91	-	-	-	-	-	-	-	-	-	
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	264	40	304	304	-	-	-	-	-	-	-	-	-	-	
2d.4.11	ISFSI Operating Costs	-	-	-	-	-	-	35	5	40	-	40	-	-	-	-	-	-	-	-	-	
2d.4.12	Remedial Actions Surveys	-	-	-	-	-	-	793	119	913	913	-	-	-	-	-	-	-	-	-	-	
2d.4.13	Security Staff Cost	-	-	-	-	-	-	1,197	180	1,377	793	584	-	-	-	-	-	-	-	-	25,003	
2d.4.14	DOC Staff Cost	-	-	-	-	-	-	5,976	896	6,872	6,872	-	-	-	-	-	-	-	-	-	64,110	
2d.4.15	Utility Staff Cost	-	-	-	-	-	-	12,022	1,803	13,825	13,148	677	-	-	-	-	-	-	-	-	122,449	
2d.4	Subtotal Period 2d Period-Dependent Costs	246	2,487	42	15	-	112	21,145	3,696	27,743	26,350	1,392	-	-	2,218	-	-	-	-	44,354	72	211,562
2d.0	TOTAL PERIOD 2d COST	1,551	6,849	493	968	2,637	2,810	34,758	9,574	59,642	52,561	6,162	918	25,088	20,303	-	-	-	-	2,328,905	97,163	217,802
PERIOD 2f - License Termination																						
Period 2f Direct Decommissioning Activities																						
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	174	52	226	226	-	-	-	-	-	-	-	-	-	-	
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	174	52	226	226	-	-	-	-	-	-	-	-	-	-	
Period 2f Additional Costs																						
2f.2.1	License Termination Survey	-	-	-	-	-	-	11,322	3,397	14,719	14,719	-	-	-	-	-	-	-	-	220,508	3,120	
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	11,322	3,397	14,719	14,719	-	-	-	-	-	-	-	-	220,508	3,120	
Period 2f Collateral Costs																						
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,406	211	1,617	1,617	-	-	-	-	-	-	-	-	-	-	
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	292	44	336	-	336	-	-	-	-	-	-	-	-	-	
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,699	255	1,953	1,617	336	-	-	-	-	-	-	-	-	-	
Period 2f Period-Dependent Costs																						
2f.4.1	Insurance	-	-	-	-	-	-	424	42	466	466	-	-	-	-	-	-	-	-	-	-	
2f.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2f.4.3	Health physics supplies	-	1,128	-	-	-	-	-	282	1,410	1,410	-	-	-	-	-	-	-	-	-	-	
2f.4.4	Disposal of DAW generated	-	-	6	2	-	17	-	5	31	31	-	-	-	337	-	-	-	-	6,734	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	107	16	123	123	-	-	-	-	-	-	-	-	-	-	
2f.4.6	NRC Fees	-	-	-	-	-	-	306	31	337	337	-	-	-	-	-	-	-	-	-	-	
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	101	10	111	-	111	-	-	-	-	-	-	-	-	-	
2f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	43	6	49	-	49	-	-	-	-	-	-	-	-	-	
2f.4.9	Security Staff Cost	-	-	-	-	-	-	1,464	220	1,683	252	1,431	-	-	-	-	-	-	-	-	30,559	
2f.4.10	DOC Staff Cost	-	-	-	-	-	-	4,370	656	5,026	5,026	-	-	-	-	-	-	-	-	-	46,622	
2f.4.11	Utility Staff Cost	-	-	-	-	-	-	6,101	915	7,016	6,378	638	-	-	-	-	-	-	-	-	59,942	
2f.4	Subtotal Period 2f Period-Dependent Costs	-	1,128	6	2	-	17	12,915	2,183	16,252	14,023	2,229	-	-	337	-	-	-	-	6,734	11	137,123

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed	Burial Volumes				Burial /	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contractor Manhours
2f.0	TOTAL PERIOD 2f COST	-	1,128	6	2	-	17	26,110	5,887	33,150	30,585	2,566	-	-	337	-	-	-	6,734	220,519	140,243
PERIOD 2 TOTALS		9,006	87,149	19,989	13,380	37,915	44,451	306,907	106,427	625,224	554,508	60,569	10,147	380,734	142,535	963	393	-	24,431,710	1,302,388	2,584,645
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	*Reactor	-	2,547	-	-	-	-	-	382	2,929	-	-	2,929	-	-	-	-	-	-	28,779	-
3b.1.1.2	Administration Building	-	340	-	-	-	-	-	51	391	-	-	391	-	-	-	-	-	-	3,112	-
3b.1.1.3	Auxiliary Building	-	4,917	-	-	-	-	-	738	5,654	-	-	5,654	-	-	-	-	-	-	25,553	-
3b.1.1.4	Barge Unloading Facility	-	45	-	-	-	-	-	7	52	-	-	52	-	-	-	-	-	-	266	-
3b.1.1.5	Circulating Water Intake Canal	-	1,092	-	-	-	-	-	164	1,256	-	-	1,256	-	-	-	-	-	-	16,972	-
3b.1.1.6	Control Building	-	2,542	-	-	-	-	-	381	2,923	-	-	2,923	-	-	-	-	-	-	16,818	-
3b.1.1.7	Cooling Tower Foundation	-	2,761	-	-	-	-	-	414	3,176	-	-	3,176	-	-	-	-	-	-	40,191	-
3b.1.1.8	Diesel Generator Building	-	397	-	-	-	-	-	60	457	-	-	457	-	-	-	-	-	-	2,431	-
3b.1.1.9	FLEX Building	-	381	-	-	-	-	-	57	438	-	-	438	-	-	-	-	-	-	2,870	-
3b.1.1.10	Health Physics Building	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	72	-
3b.1.1.11	Heavy Haul Road (ISFSI)	-	227	-	-	-	-	-	34	261	-	-	261	-	-	-	-	-	-	1,310	-
3b.1.1.12	Miscellaneous Site Buildings	-	2,188	-	-	-	-	-	328	2,516	-	-	2,516	-	-	-	-	-	-	26,184	-
3b.1.1.13	Nuclear Service Cooling Water Facilities	-	755	-	-	-	-	-	113	868	-	-	868	-	-	-	-	-	-	4,620	-
3b.1.1.14	Radwaste Processing Facility	-	94	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	546	-
3b.1.1.15	Radwaste Solidification Building	-	2,055	-	-	-	-	-	308	2,363	-	-	2,363	-	-	-	-	-	-	14,471	-
3b.1.1.16	Radwaste Transfer & Alternate Buildings	-	338	-	-	-	-	-	51	389	-	-	389	-	-	-	-	-	-	2,253	-
3b.1.1.17	River Intake Structure	-	118	-	-	-	-	-	18	136	-	-	136	-	-	-	-	-	-	933	-
3b.1.1.18	Service Building	-	658	-	-	-	-	-	99	757	-	-	757	-	-	-	-	-	-	5,981	-
3b.1.1.19	Sewage Treatment Expansion	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	27	-
3b.1.1.20	Station Tunnels	-	436	-	-	-	-	-	65	502	-	-	502	-	-	-	-	-	-	5,350	-
3b.1.1.21	Storage Area & Tanks	-	638	-	-	-	-	-	96	734	-	-	734	-	-	-	-	-	-	5,134	-
3b.1.1.22	Turbine Building	-	1,492	-	-	-	-	-	224	1,716	-	-	1,716	-	-	-	-	-	-	22,887	-
3b.1.1.23	Turbine Pedestal	-	460	-	-	-	-	-	69	528	-	-	528	-	-	-	-	-	-	2,695	-
3b.1.1.24	Fuel Handling Building	-	1,054	-	-	-	-	-	158	1,213	-	-	1,213	-	-	-	-	-	-	5,242	-
3b.1.1	Totals	-	25,554	-	-	-	-	-	3,833	29,387	-	-	29,387	-	-	-	-	-	-	234,696	-
Site Closeout Activities																					
3b.1.2	BackFill Site	-	9,038	-	-	-	-	-	1,356	10,393	-	-	10,393	-	-	-	-	-	-	13,029	-
3b.1.3	Grade & landscape site	-	1,669	-	-	-	-	-	250	1,920	-	-	1,920	-	-	-	-	-	-	3,577	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	85	13	98	98	-	-	-	-	-	-	-	-	-	668
3b.1	Subtotal Period 3b Activity Costs	-	36,261	-	-	-	-	85	5,452	41,798	98	-	41,700	-	-	-	-	-	-	251,301	668
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	1,641	-	-	-	-	8	247	1,896	-	-	1,896	-	-	-	-	-	-	7,519	-
3b.2.2	Hyperbolic Cooling Tower Demolition	-	3,805	-	-	-	-	-	571	4,376	-	-	4,376	-	-	-	-	-	-	21,229	-
3b.2.3	Construction Debris	-	-	-	-	-	-	1,930	290	2,220	-	-	2,220	-	-	-	-	-	-	-	-
3b.2.4	Cofferdam - Service Water Intake	-	1,120	-	-	-	-	-	168	1,287	-	-	1,287	-	-	-	-	-	-	8,721	-
3b.2.5	Vehicle Barrier Disposition	-	257	-	-	-	-	-	39	296	-	-	296	-	-	-	-	-	-	2,520	-
3b.2	Subtotal Period 3b Additional Costs	-	6,822	-	-	-	-	1,938	1,314	10,074	-	-	10,074	-	-	-	-	-	-	39,989	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	237	-	-	-	-	-	36	273	-	-	273	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	632	95	726	-	726	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	237	-	-	-	-	632	130	999	-	726	273	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	754	75	830	830	-	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	9,119	-	-	-	-	-	1,368	10,487	-	-	10,487	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	190	29	219	-	219	-	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	511	51	562	-	562	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	359	36	395	-	395	-	-	-	-	-	-	-	-	-

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 3b Period-Dependent Costs (continued)																						
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	153	23	176	-	176	-	-	-	-	-	-	-	-	-	
3b.4.8	Security Staff Cost	-	-	-	-	-	-	5,210	782	5,992	(0)	5,093	899	-	-	-	-	-	-	-	108,790	
3b.4.9	DOC Staff Cost	-	-	-	-	-	-	14,414	2,162	16,576	-	-	16,576	-	-	-	-	-	-	-	147,842	
3b.4.10	Utility Staff Cost	-	-	-	-	-	-	9,721	1,458	11,180	(0)	2,281	8,899	-	-	-	-	-	-	-	94,145	
3b.4	Subtotal Period 3b Period-Dependent Costs	-	9,119	-	-	-	-	31,312	5,983	46,415	830	8,724	36,860	-	-	-	-	-	-	-	350,777	
3b.0	TOTAL PERIOD 3b COST	-	52,439	-	-	-	-	33,967	12,880	99,286	928	9,451	88,907	-	-	-	-	-	-	291,290	351,445	
PERIOD 3c - Fuel Storage Operations/Shipping																						
Period 3c Direct Decommissioning Activities																						
Period 3c Collateral Costs																						
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,264	1,840	14,104	-	14,104	-	-	-	-	-	-	-	-	-	
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	12,264	1,840	14,104	-	14,104	-	-	-	-	-	-	-	-	-	
Period 3c Period-Dependent Costs																						
3c.4.1	Insurance	-	-	-	-	-	-	5,717	572	6,289	-	6,289	-	-	-	-	-	-	-	-	-	
3c.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,293	429	4,722	-	4,722	-	-	-	-	-	-	-	-	-	
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	2,720	272	2,992	-	2,992	-	-	-	-	-	-	-	-	-	
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,157	174	1,330	-	1,330	-	-	-	-	-	-	-	-	-	
3c.4.7	Security Staff Cost	-	-	-	-	-	-	33,549	5,032	38,581	-	38,581	-	-	-	-	-	-	-	-	612,950	
3c.4.8	Utility Staff Cost	-	-	-	-	-	-	15,040	2,256	17,296	-	17,296	-	-	-	-	-	-	-	-	142,670	
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	62,476	8,735	71,211	-	71,211	-	-	-	-	-	-	-	-	755,620	
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	74,740	10,575	85,315	-	85,315	-	-	-	-	-	-	-	-	755,620	
PERIOD 3d - GTCC shipping																						
Period 3d Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	776	-	-	11,950	-	1,987	14,713	14,713	-	-	-	-	-	-	2,061	410,142	-	-	
3d.1.1	Totals	-	-	776	-	-	11,950	-	1,987	14,713	14,713	-	-	-	-	-	-	2,061	410,142	-	-	
3d.1	Subtotal Period 3d Activity Costs	-	-	776	-	-	11,950	-	1,987	14,713	14,713	-	-	-	-	-	-	2,061	410,142	-	-	
Period 3d Collateral Costs																						
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Period 3d Period-Dependent Costs																						
3d.4.1	Insurance	-	-	-	-	-	-	11	1	12	12	-	-	-	-	-	-	-	-	-	-	
3d.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3d.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5	0	5	-	5	-	-	-	-	-	-	-	-	-	
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	5	1	6	-	6	-	-	-	-	-	-	-	-	-	
3d.4.6	ISFSI Operating Costs	-	-	-	-	-	-	2	0	3	-	3	-	-	-	-	-	-	-	-	-	
3d.4.7	Security Staff Cost	-	-	-	-	-	-	63	9	73	73	-	-	-	-	-	-	-	-	-	1,157	
3d.4.8	Utility Staff Cost	-	-	-	-	-	-	28	4	33	33	-	-	-	-	-	-	-	-	-	269	
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	115	16	131	117	14	-	-	-	-	-	-	-	-	1,426	
3d.0	TOTAL PERIOD 3d COST	-	-	776	-	-	11,950	115	2,003	14,843	14,830	14	-	-	-	-	-	2,061	410,142	-	1,426	
PERIOD 3e - ISFSI Decontamination																						
Period 3e Direct Decommissioning Activities																						
Period 3e Additional Costs																						
3e.2.1	License Termination ISFSI	-	250	194	1,538	-	2,356	1,841	1,545	7,725	7,725	-	-	-	45,635	-	-	-	2,431,346	11,914	1,233	
3e.2	Subtotal Period 3e Additional Costs	-	250	194	1,538	-	2,356	1,841	1,545	7,725	7,725	-	-	-	45,635	-	-	-	2,431,346	11,914	1,233	

Table C-2
Vogtle Electric Generating Plant Unit 2
DECON Decommissioning Cost Estimate
(Thousands of 2021 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					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 3e Collateral Costs																						
3e.3	Subtotal Period 3e Collateral Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Period 3e Period-Dependent Costs																						
3e.4.1	Insurance	-	-	-	-	-	-	43	11	54	54	-	-	-	-	-	-	-	-	-	-	
3e.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3e.4.3	Plant energy budget	-	-	-	-	-	-	2	1	3	3	-	-	-	-	-	-	-	-	-	-	
3e.4.4	Security Staff Cost	-	-	-	-	-	-	110	28	138	138	-	-	-	-	-	-	-	-	-	2,520	
3e.4.5	Utility Staff Cost	-	-	-	-	-	-	204	51	255	255	-	-	-	-	-	-	-	-	-	1,912	
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	360	90	451	451	-	-	-	-	-	-	-	-	-	4,432	
3e.0	TOTAL PERIOD 3e COST	-	250	194	1,538	-	2,356	2,202	1,635	8,175	8,175	-	-	-	45,635	-	-	-	2,431,346	11,914	5,665	
PERIOD 3f - ISFSI Site Restoration																						
Period 3f Direct Decommissioning Activities																						
Period 3f Additional Costs																						
3f.2.1	Site Restoration ISFSI	-	3,328	-	-	-	-	425	563	4,316	-	-	4,316	-	-	-	-	-	-	36,592	80	
3f.2	Subtotal Period 3f Additional Costs	-	3,328	-	-	-	-	425	563	4,316	-	-	4,316	-	-	-	-	-	-	36,592	80	
Period 3f Collateral Costs																						
3f.3.1	Small tool allowance	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	-	-	
3f.3	Subtotal Period 3f Collateral Costs	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	-	-	
Period 3f Period-Dependent Costs																						
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3f.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3f.4.3	Heavy equipment rental	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	-	-	
3f.4.4	Plant energy budget	-	-	-	-	-	-	1	0	1	-	-	1	-	-	-	-	-	-	-	-	
3f.4.5	Security Staff Cost	-	-	-	-	-	-	54	8	62	-	-	62	-	-	-	-	-	-	-	1,239	
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	90	13	103	-	-	103	-	-	-	-	-	-	-	769	
3f.4	Subtotal Period 3f Period-Dependent Costs	-	57	-	-	-	-	145	30	232	-	-	232	-	-	-	-	-	-	-	2,009	
3f.0	TOTAL PERIOD 3f COST	-	3,429	-	-	-	-	570	600	4,600	-	-	4,600	-	-	-	-	-	-	36,592	2,089	
PERIOD 3 TOTALS		-	56,119	970	1,538	-	14,306	111,594	27,692	212,219	23,933	94,779	93,507	-	45,635	-	-	2,061	2,841,488	339,795	1,116,244	
TOTAL COST TO DECOMMISSION		13,078	146,561	21,105	15,409	37,915	61,560	540,156	154,773	990,557	709,150	177,080	104,328	380,734	189,602	1,810	393	2,061	27,410,850	1,656,573	4,635,764	

TOTAL COST TO DECOMMISSION WITH 18.52% CONTINGENCY:	\$990,557	thousands of 2021 dollars
TOTAL NRC LICENSE TERMINATION COST IS 71.59% OR:	\$709,150	thousands of 2021 dollars
SPENT FUEL MANAGEMENT COST IS 17.88% OR:	\$177,079	thousands of 2021 dollars
NON-NUCLEAR DEMOLITION COST IS 10.53% OR:	\$104,328	thousands of 2021 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	191,806	Cubic Feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	2,061	Cubic Feet
TOTAL SCRAP METAL REMOVED:	79,415	Tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,656,573	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

REQUIRED INFORMATION

APPENDIX D REQUIRED INFORMATION

In accordance with Title 10 of the Code of Federal Regulations (10 CFR), Part 50.75(g), "Reporting and Recordkeeping for Decommissioning Planning," each licensee will maintain records of information "...important to the safe and effective decommissioning of the facility." Information considered important includes "...records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when significant contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete." SNC maintains drawings of structures that may be affected by these occurrences. A list of structures that are considered contaminated and may require decontamination is provided in Tables C-1 and C-2, Periods 2b and 2c ("Decontamination of Site Buildings"). In accordance with this requirement SNC has identified the following information^[39]:

1. Trace contamination of the sludge in the waste water retention basins has been detected. Also the potential exists for trace contamination of the concrete walls. In addition, the soil around the basins may be contaminated due to past spills in this area.
2. The soil around the refueling water storage tank missile shield may be contaminated due to past leaks in the area.
3. Soil around the storm drain and roadway at the intersection of the Unit 1 NSCW tower going up to the Missile Shield doors. The approximate quantity of affected slightly contaminated dirt was four to six B-25 box loads (approx. 100 ft³ per box).

APPENDIX E
ISFSI DECOMMISSIONING

<u>Tables</u>	<u>Page</u>
ISFSI Decommissioning Cost Estimate	E-2

Table E
Vogtle Electric Generating Plant
ISFSI Decommissioning Cost Estimate
DECON Decommissioning Alternative
(thousands of 2021 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
Decommissioning Contractor									
Planning (characterization, specs and procedures)	-	-	-	-	513	513	-	-	1,312
Decontamination (activated disposition)	501	388	3,077	4,712	-	8,677	91,270	5,359	-
License Termination (radiological surveys)	-	-	-	-	2,616	2,616	-	18,468	-
Subtotal	501	388	3,077	4,712	3,129	11,806	91,270	23,827	1,312
Supporting Costs									
NRC and NRC Contractor Fees and Costs	-	-	-	-	553	553	-	-	1,153
Insurance	-	-	-	-	87	87	-	-	-
Property taxes	-	-	-	-	-	-	-	-	-
Plant energy budget	-	-	-	-	5	5	-	-	-
Security Staff Cost	-	-	-	-	221	221	-	-	5,040
Utility Staff Cost	-	-	-	-	409	409	-	-	3,824
Subtotal	-	-	-	-	1,274	1,274	-	-	10,017
Total (w/o contingency)	501	388	3,077	4,712	4,403	13,080	91,270	23,827	11,329
Total (w/25% contingency)	626	485	3,846	5,890	5,504	16,351	-	-	-

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)