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CP-202100155  
TXX-21066  
March 31, 2021

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Ref 10 CFR 50.75(f)  
10 CFR 72.30(c)

Subject: Comanche Peak Nuclear Power Plant (CPNPP)  
Docket Nos. 50-445 and 50-446 and 72-74  
Decommissioning Report

Dear Sir or Madam:

Attached is the biennial decommissioning report for Comanche Peak Nuclear Power Plant (CPNPP) Units 1 and 2, prepared and submitted by Vistra Operations Company LLC (Vistra OpCo / operator) pursuant to 10CFR50.75(f) and 10CFR72.30(c). Comanche Peak Power Company LLC (CP PowerCo / owner) is an unregulated utility and therefore does not meet the definition of an electric utility as defined by 10CFR50.2. The recovery of decommissioning funds for the eventual decommissioning of CPNPP Units 1 and 2 is assured through the collection of a non-bypassable charge which is subsequently contributed to an external trust.

The applicable sections of the citation (e.g., an Order by the rate-regulatory authority) by the regulatory authority that allows for the collection of non-bypassable charges established for the collection of decommissioning funds estimated to be required under 10 CFR 50.75(b) and (c) is provided below.

The distribution utility will collect from customers and the generation company will contribute all funds collected to the decommissioning trust fund:

- Enclosure to TXX-21066, Public Utility Commission of Texas (PUCT) Docket No. 50945, Item No. 23, Order dated January 29, 2021, page 2 of 7, paragraph #11.

The annual collection rate for each unit:

- Enclosure to TXX-21066, PUCT Docket No. 50945, Item No. 1, 2020 Funding Analysis, Annual Projected Funding Requirement, Exhibit 4, Pages 20-24 of 24.
- Enclosure to TXX-21066, PUCT Docket No. 50945, Item No. 23, Order dated January 29, 2021, Page 7 of 7, paragraph #1 and 2 of Section III.

Also, pursuant to the requirements of 10 CFR 72.30(c), Vistra OpCo is submitting the 2021 Decommissioning Funding Status Report for Comanche Peak Nuclear Power Plant (CPNPP) Independent Spent Fuel Storage Installation, Docket No. 72-74 (CPNPP ISFSI). Attachment 2 to this letter contains the information required by 10 CFR 72.30(b).

The amounts to be collected for CPNPP decommissioning are based on a site specific decommissioning study that includes direct waste disposal. In addition, the radiological cost component breakdown of the 2019 Site Specific cost is included in the 2020 Financial Assurance filing (Enclosure to TXX-21066, PUCT Docket No. 50945, Item No. 1, Comanche Peak Power Company LLC Filing dated June 16, 2020, document L11-1774-001, Rev. 0, Page xx of xxi).



When projected to the license expiration date for each unit using the 2 percent annual real rate of return as allowed per 10CFR50.75(e)(ii), the projected Nuclear Decommissioning Trust balance is greater than the escalated NRC minimum cost of decommissioning for Units 1 and 2.

Should you have any questions, please contact Carl B. Corbin at (254) 897-0121 or [carl.corbin@luminant.com](mailto:carl.corbin@luminant.com).

Sincerely,

  
Steven K. Sewell

- Attachment 1 2021 Decommissioning Funding Status Report for Comanche Peak Nuclear Power Plant Units 1 and 2
- Attachment 2 2021 Decommissioning Funding Status Report for Comanche Peak Nuclear Power Plant Units 1 and 2 Independent Spent Fuel Storage Installation
- Enclosure Public Utility Commission of Texas (PUCT), Docket No. 50945 (Item Numbers 1 through 24), Application of Comanche Peak Power Company LLC for review of Nuclear Decommissioning Cost Study and Funding Analysis
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## NRC Decommissioning Funding Status Report for Financial Assurance at December 31, 2020

### Luminant Generation Company LLC Comanche Peak Nuclear Power Plant (CPNPP)

<u>Information is submitted to provide Financial Assurance</u>	<u>Unit # 1</u>	<u>Unit # 2</u>
1. The minimum amount of decommissioning funds estimated to be required pursuant to 10 CFR 50.75 (b) and (c).		
At December 31, 2020		
Using NRC 10 CFR 50.75(c) formulas (Note 1)	\$ 404.8 million	\$ 404.8 million
Site-specific study (Note 2) (Note 4)	\$ 873.2 million	\$ 902.0 million
2. The amount accumulated at the end of the calendar year preceding the date of the report for items included in 10 CFR 50.75 (b) and (c). Investment categories per Regulatory Guide 1.159 2.6.2. (Note 3)		
Cash	1%	1%
U.S. Equities	63%	63%
U.S. Fixed Income	36%	36%
	100%	100%
Market Value at December 31, 2020	\$ 797.8 million	\$ 875.9 million
3. A schedule of the annual amounts remaining to be collected for items in 10 CFR 50.75 (b) and (c).		
	<u>Unit # 1</u>	<u>Unit # 2</u>
Years 2021 through 2029 ( 9 years )	14.0 million	5.4 million
Year 2030	3.5 million	5.4 million
Year 2031		5.4 million
Year 2032		5.4 million
Year 2033		1.3 million
Totals	\$ 129.4 million	\$ 65.7 million
4. The assumptions used regarding escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections.		
	<u>Unit # 1</u>	<u>Unit # 2</u>
Estimated Escalation rate for decommissioning costs (Note 4)	2.6680%	2.6400%
Estimated Earnings rates on decommissioning funds (Note 5)		
2021 through 2029	3.73%	3.73%
2030 through 2091	3.04%	3.04%
2092 and thereafter	2.19%	2.19%
Rates of other factors used in funding projections	None	None
5. Any power sale contracts upon which licensee is relying to certifying financial assurance.	None	None
6. Modifications to licensee's method of providing financial assurance since previous report.	None	None
7. Material changes to trust agreement.	None	None

NOTE: All forecast data are based on the Decommissioning Cost Study and Funding Analysis filed with the Public Utility Commission of Texas on June 16, 2020 and is subject to approval by the Commission.



Note 1 Labor (South) and Energy are based on BLS (Lx=2.758, Ex=2.256) as of December 2020. Burial inflation factors are based on NUREG 1307, "Report on Waste Burial Charges," Revision 18 (Bx=8.040).

Note 2 The Site Specific Decommissioning Cost estimates for unit 1 and 2, with a 10% contingency adjustment, are provided in the Enclosure to TXX-21066 (Public Utility Commission of Texas (PUCT) Docket No. 50945, Item1, Financial Escalation Analysis Document L11-1774-002, Rev. 0, beginning Page 14 and 22 of 29).

Note 3 The after-tax amount of funds accumulated through December 31, 2020 is provided below.

	Tax Basis	Market Value	After Tax
Unit 1	\$399,909,707.36	\$797,770,529.35	\$718,198,364.95
Unit 2	\$442,985,649.11	\$875,902,564.95	\$789,319,181.78
Total	\$842,895,356.47	\$1,673,673,094.30	\$1,507,517,546.73

Note: Calculation of after tax balance assumes 20% tax rate.

Note 4 The rate of escalation in decommissioning costs for Unit 1 and 2 are provided in the Enclosure to TXX-21066 (PUCT Docket No. 50945, Item 1, Financial Escalation Analysis Document L11-1774-002, Rev. 0, Page 7 of 37).

Note 5 The rate of earnings on decommissioning funds is provided in the Enclosure to TXX-21066 (PUCT Docket No. 50945, Item 1, Exhibit 2 of Funding Analysis dated June 2020, pg 13-15 of 24). The Net Expected Investment Returns Allocation Factor in this schedule represents the weighted average allocations during the referenced Period as established in the June 16, 2020 filing.



## 2021 Decommissioning Funding Status Report for Comanche Peak Nuclear Power Plant Units 1 and 2 Independent Spent Fuel Storage Installation

Pursuant to 10 CFR 72.30(c), each licensee for an Independent Spent Fuel Storage Installation (ISFSI), including an ISFSI licensed under the General License provided for in 10 CFR Part 72, Subpart K, is required, at intervals not to exceed 3 years, to resubmit a decommissioning funding plan with adjustments as necessary to account for changes in costs and the extent of contamination, as well as information regarding the financial assurance provided for funding such costs. Vistra Operations Company LLC (Vistra OpCo) provides the following information regarding the Comanche Peak Nuclear Power Plant (CPNPP) Units 1 and 2 Independent Spent Fuel Storage Installation, Docket No. 72-74 (CPNPP ISFSI):

**1. Information on how reasonable assurance will be provided that funds will be available to decommission the ISFSI:**

See response to number 4 below, which discusses the appropriate method of financial assurance contemplated under 10 CFR 72.30(e).

**2. A detailed cost estimate (DCE) for decommissioning:**

In a report dated May 2020, TLG Services, Inc. (TLG) (Enclosure to TXX-21066) prepared a site specific Decommissioning Cost Study (with an adequate contingency factor) for the Comanche Peak Nuclear Power Plant (CPNPP) that included the costs of decommissioning the ISFSI. The TLG Report determined the total cost of decommissioning the CPNPP ISFSI to be:

	2019 Dollars (million) (Note 1)	Escalation Factor (%) (from TLG Report) (Note 2)	2020 Dollars (million)
Unit 1	5.2	2.668	5.35
Unit 2	5.2	2.640	5.34
			Total 10.69

This cost estimate includes the cost of an independent contractor to perform all decommissioning activities and the cost of meeting the 10 CFR 20.1402 criteria for unrestricted release.

Below is the effect of the following on the detailed cost estimate since the previous report.

Spills of radioactive material producing additional residual radioactivity in onsite subsurface material	None
Facility modifications	None (Note 3)
Changes in authorized possession limits	None



**2021 Decommissioning Funding Status Report for  
Comanche Peak Nuclear Power Plant Units 1 and 2  
Independent Spent Fuel Storage Installation**

Actual remediation costs that exceed the previous cost estimate	None
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**3. Identification of and justification for using the key assumptions contained in the decommissioning cost estimate:**

The assumptions used in the development of the decommissioning cost estimate and their justification can be found in the TLG Report.

**4. A description of the method of assuring funds for decommissioning from 10 CFR 72.30(e), including means of adjusting cost estimates and associated funding levels periodically over the life of the facility:**

Vistra OpCo is using the external sinking fund method as authorized in 10 CFR 72.30(e)(5) and 50.75(e)(1)(ii). Vistra OpCo recovers its costs for decommissioning through cost of service ratemaking, including the estimated costs to decommission the CPNPP ISFSI, which are included in the TLG Report. Pursuant to Substantive Rule 25.303(f)(2) of the Public Utility Commission of Texas (PUCT), the TLG Report is updated, and the required annual funding amount necessary to decommission CPNPP is adjusted under the jurisdiction of the PUCT.

In the event that funds remaining to be placed into the Vistra OpCo's external sinking funds are no longer approved for recovery in rates by competent rate making authorities, Vistra OpCo will make changes to provide financial assurance using one or more of the methods stated in 10 CFR 72.30(e)(1)-(4).

**5. The volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination:**

There has been no event at the ISFSI facility to lead us to believe there is subsurface contamination. Therefore, Vistra OpCo assumes that there is no volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination.

**6. A certification that financial assurance for decommission has been provided in the amount of the cost estimate for decommissioning:**

The submission of this report serves as certification that financial assurance has been provided in the amount of the cost estimate for decommissioning.



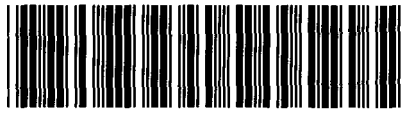
**2021 Decommissioning Funding Status Report for  
Comanche Peak Nuclear Power Plant Units 1 and 2  
Independent Spent Fuel Storage Installation**

- Note 1      The cost is without contingency is provided in Enclosure to letter TXX-21066 (Public Utility Commission of Texas (PUCT) Docket No. 50945, Item No. 1, document L11-1774-001, Rev. 0, Appendix E, page 2 of 2, Table E, "Comanche Peak Nuclear Power Plant ISFSI Decommissioning Cost Estimate").
- Note 2      The rate of escalation in decommissioning costs are provided in the Enclosure to TXX-21066 (PUCT Docket No. 50945, Item No. 1, document L11-1774-002, Rev. 0, Table 1, "Escalation Summary")
- Note 3      Enclosure to TXX-21066 (PUCT Docket No. 50945, Item 1, document L11-1703-002, Rev. 0, dated May 2020, page viii of xxi) states in part, "The only substantive changes made to the plant inventory from the 2014 analysis (that would impact decommissioning) is the addition of the Stator Rewind building." These changes (Stator Rewind building) are within the scope of the analysis under 10 CFR 50.75 which is included in Attachment 1 to TXX-21066.

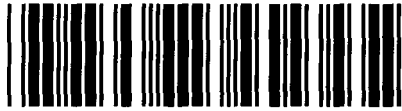


Enclosure to TXX-21066





Control Number: 50945



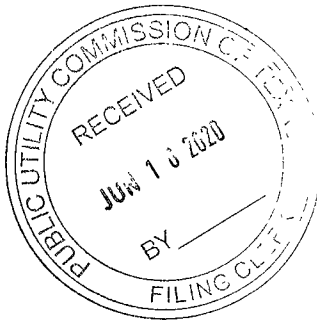
Item Number: 1

Addendum StartPage: 0





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June 16, 2020

Filing Clerk  
Public Utility Commission of Texas  
1701 Congress Avenue  
P.O. Box 13326  
Austin, TX 78711-3326

**RE: Nuclear Decommissioning Cost Study and Funding Analysis Pursuant to 16 TAC § 25.303(f)(2)**

In compliance with 16 Tex. Admin. Code (TAC) § 25.303(f)(2), Comanche Peak Power Company LLC (“Comanche Peak”), as Transferee Company, hereby files:

- (1) A study of the decommissioning costs of Comanche Peak Nuclear Power Plant (“CPNPP”), the *Decommissioning Cost Analysis for the Comanche Peak Nuclear Power Plant*, prepared by TLG Services, Inc. dated May 2020 (“Decommissioning Study”) (Attachment A);
- (2) A financial escalation analysis of the decommissioning costs of CPNPP, the *Financial Escalation Analysis for the Comanche Peak Nuclear Power Plant*, prepared by TLG Services, Inc. dated May 2020 (“Financial Escalation Analysis”) (Attachment B); and
- (3) An updated funding analysis, the *Funding Analysis for Comanche Peak Nuclear Power Plant*, prepared by Comanche Peak dated June 2020 (“Funding Analysis”) (Attachment C).

The Funding Analysis calculates the required annual funding amount necessary to ensure sufficient funds to decommission both units of CPNPP, which, according to the Financial Escalation Analysis, is \$1,729 million in 2019 dollars for the prompt decommissioning alternative (“DECON”) with a 10 percent contingency (*see* Tables 4 and 5). As shown on page 24 of Exhibit 4 of the Funding Analysis, an annual amount of \$19.4 million throughout the remaining operating life of CPNPP is necessary to fully fund the anticipated decommissioning costs for CPNPP Units 1 and 2.



The Funding Analysis additionally contains within the study a description of the assumptions used in the analysis. Although the Decommissioning Study recommended an appropriate contingency of approximately 17.29 percent for Unit 1 and 17.55 percent for Unit 2 for the DECON alternative (*see* Appendix C), in compliance with 16 TAC § 25.303(f)(2), an allowance for contingency of 10 percent was used in the Financial Escalation Analysis and Funding Analysis. In addition, because there is only a -2.7 percent difference between the required funding levels resulting from the Funding Analysis (\$19.4 million) and the five year average CPNPP decommissioning fund collections from 2015-2019 (\$19.9 million annually) and because of the assumptions in the Decommissioning Study, Financial Escalation Analysis, and Funding Analysis likely have inherent and considerable uncertainty based on the predictability of long-term costs and market conditions, Comanche Peak proposes no change in the current collection rate. Comanche Peak does propose an adjustment in the allocation between the Unit 1 and Unit 2 decommissioning funds from 57.1 percent for Unit 1 and 42.9 percent for Unit 2 to 72.3 percent for Unit 1 and 27.7 percent for Unit 2 (*see* page 24 of Exhibit 4 of the Funding Analysis).

If you have any questions or require additional information concerning this filing, please contact me at 214-875-8183.

**Respectfully Submitted,**

By: /s/ Stephanie Zapata Moore

Stephanie Zapata Moore  
Executive Vice President and General Counsel  
6555 Sierra Drive  
Irving, Texas 5039  
(214) 875-8183 (phone)  
(214) 875-9478 (fax)

**ON BEHALF OF COMANCHE PEAK POWER  
COMPANY LLC**



# Attachment A



**DECOMMISSIONING COST ANALYSIS**  
**for the**  
**COMANCHE PEAK NUCLEAR POWER PLANT**



*prepared for*

**Comanche Peak Power Company LLC**

*prepared by*

**TLG Services, Inc.**  
**Bridgewater, Connecticut**

**May 2020**



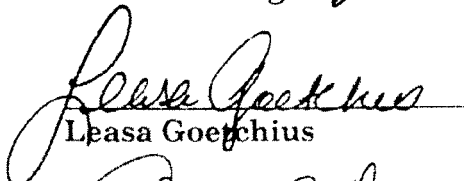
**APPROVALS**

**Project Manager**

  
Roderick Knight

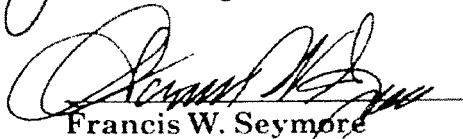
5/11/2020  
Date

**Project Engineer**

  
Leasa Goetchius

5/11/2020  
Date

**Technical Manager**

  
Francis W. Seymore

5/11/2020  
Date



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AIF/NESP-036	Atomic Industrial Forum document delineating a standardized cost estimating model for decommissioning
ALARA	As-Low-As-Reasonably-Achievable
Comanche Peak	Comanche Peak Nuclear Power Plant
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (also referred to as Superfund)
CFR	Code of Federal Regulations
CPPC	Comanche Peak Power Company, LLC
DECCER	TLG's Proprietary Decommissioning Cost Model
DECON	Prompt Decommissioning (NRC Acronym)
DOC	Decommissioning Operations Contractor
DOE	Department of Energy
ENTOMB	Entombment or Hardened Storage (NRC Acronym)
EPA	Environmental Protection Agency
FSAR	Final Safety Analysis Report
GTCC	Greater-than-Class C (as defined by 10 CFR §61)
IP	Industrial Package
ISFSI	Independent Spent Fuel Storage Installation
LSA	Low Specific Activity
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MOU	Memorandum of Understanding (between NRC and EPA)
MPC	Multi-Purpose Canister
MTU	Metric Tons of Uranium
NRC	Nuclear Regulatory Commission (or Commission)
NSSS	Nuclear Steam Supply System
NWPA	Nuclear Waste Policy Act
OFF	Oldest Fuel First
PERT	Program Evaluation and Review Technique
PSDAR	Post-Shutdown Decommissioning Activities Report
SAFSTOR	Passive Storage (NRC Acronym)
SCO	Surface Contaminated Object
TEDE	Total Effective Does Equivalent
WDF	Work Difficulty Adjustment Factors



**REVISION LOG**

<b>No.</b>	<b>Date</b>	<b>Item Revised</b>	<b>Reason for Revision</b>
0	05-11-2020		Original Issue



## **EXECUTIVE SUMMARY**

This report presents estimates of the cost to decommission the Comanche Peak Nuclear Power Plant (Comanche Peak) for the selected decommissioning alternatives following the scheduled and permanent cessation of plant operations. The estimates are designed to provide Comanche Peak Power Company LLC (CPPC) with sufficient information to assess its financial obligations, as they pertain to the decommissioning of Comanche Peak.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2014,<sup>[1]</sup> updated to reflect current plant inventory, current assumptions pertaining to the operating life of the reactor, disposition of the two nuclear units and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

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

The 2014 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. The only substantive changes made to the plant inventory from the 2014 analysis (that would impact decommissioning) is the addition of the Stator Rewind building.

The costs to decommission Comanche Peak for the alternatives evaluated are tabulated at the end of this section. Costs are reported in 2019 dollars and include monies anticipated to be spent for radiological remediation and operating license termination, spent fuel management, and site restoration activities.

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

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<sup>1</sup> "Decommissioning Cost Study for the Comanche Peak Nuclear Power Plant," Document L11-1703-001, Rev. 0, TLG Services, Inc., May 2015



Consistent with the 2014 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 estimates include the continued operation of the fuel building as an interim wet fuel storage facility for approximately five and one-half years after Unit 2 operations cease. During this time period, it is assumed that the spent fuel residing in the pools will be transferred to an independent spent fuel storage installation (ISFSI) located on the site. The ISFSI will remain operational until the Department of Energy (DOE) is able to complete the transfer of the fuel to a federal facility (e.g., a monitored retrievable storage facility).<sup>[2]</sup>

### Alternatives and Regulations

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

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

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."<sup>[5]</sup> Decommissioning is to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.

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<sup>2</sup> Projected expenditures for spent fuel management identified in the cost analyses do not consider any compensation from the DOE with regard to the delays incurred by CPPC in the timely removal of spent fuel from the site.

<sup>3</sup> 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

<sup>4</sup> Ibid. Page 24022, Column 3

<sup>5</sup> Ibid.



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."<sup>[6]</sup> As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety.

The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 2017, the NRC's staff issued the regulatory basis for proposed new regulations on the decommissioning of commercial nuclear power reactors. In the regulatory basis, the NRC staff proposed removing any discussion of the ENTOMB option from existing guidance documents "since the method is not deemed practically feasible for current U.S. power reactors, and the timeframe for decommissioning completion using the ENTOMB method is generally inconsistent with current regulations."<sup>[7]</sup>

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.<sup>[8]</sup> The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, (as revised in October 2013), further described the methods and procedures acceptable to the NRC staff for implementing the requirements of the 1996 revised rule relating to the initial activities and major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and processes described in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued in February 2005.<sup>[9]</sup>

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<sup>6</sup> Ibid. Page 24023, Column 2

<sup>7</sup> "Regulatory Improvement for Power Reactors Transitioning to Decommissioning," NRC Regulatory Basis Document, Docket ID NRC-2015-0070, RIN Number 3150-AJ59, November 20, 2017

<sup>8</sup> 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

<sup>9</sup> "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, U.S. Nuclear Regulatory Commission, February 2005



In 2011, the NRC issued regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.<sup>[10]</sup> The regulations require licensees to report additional details in their decommissioning cost estimate, including a decommissioning estimate for the ISFSI. This estimate is provided in Appendix E.

### Comanche Peak Decommissioning Scenarios

Two decommissioning scenarios were evaluated for Comanche Peak. The scenarios selected are representative of alternatives currently available to CPPC and are defined as follows:

1. The first scenario assumes that the units would be promptly decommissioned (DECON alternative) upon the expiration of the current operating licenses, i.e., 2030 and 2033 for Units 1 and 2, respectively. Spent fuel in the wet storage pools would be relocated to the ISFSI for interim storage until such time that the DOE can complete the transfer, presumed to be in the year 2095.
2. In the second scenario, the nuclear units are placed into safe-storage (SAFSTOR alternative) at the end of their current operating licenses. Spent fuel in wet storage pools at that time would be relocated to the ISFSI for interim storage so as to minimize caretaking costs. The fuel would be transferred to the DOE (consistent with the assumptions in the DECON scenario) until the process is presumed to be complete in the year 2095. Decommissioning is deferred to the maximum extent (approximately 50 years) such that the property is released for unrestricted use within the generally required 60-year period (i.e., 2090, based upon the current Unit 1 shutdown date).

### Methodology

The methodology used to develop the estimates described within this document follows the basic approach originally presented in the cost estimating guidelines<sup>[11]</sup> developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes 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.

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<sup>10</sup> 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

<sup>11</sup> T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986



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

The estimates also reflect lessons learned from 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 Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee, Fort Calhoun and Pilgrim 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."<sup>[12]</sup> The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the nuclear units.

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

### Low-Level Radioactive Waste Management

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,<sup>[13]</sup> and its

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<sup>12</sup> Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239

<sup>13</sup> "Low-Level Radioactive Waste Policy Act of 1980," Public Law 96-573, 1980



Amendments of 1985,<sup>[14]</sup> the States became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

The Texas Compact disposal facility is now operational and waste is being accepted from generators including CPPC by the operator, Waste Control Specialists (WCS).

For the purposes of this analysis, low-level radioactive waste generated in the decontamination and dismantling of the plant and remediation of the Comanche Peak site, and designated for direct disposal, is assumed to be shipped to the Texas Compact site. Waste disposal costs are based upon the Environmental Service Agreement for the disposal of low-level radioactive waste at the Texas Compact waste disposal facility between CPPC and WCS.

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 Greater than Class C or GTCC. The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigns the federal government the responsibility for the disposal of this material. The Act also states 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, if any, for GTCC disposal 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 manner similar to 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 stored on site (at the ISFSI). The GTCC is assumed to be transferred to a designated Federal disposal facility once the spent fuel has been removed from the site.

### High-Level Radioactive Waste Management

Congress passed the “Nuclear Waste Policy Act”<sup>[15]</sup> (NWP) in 1982, assigning the federal government’s long-standing responsibility for disposal of the spent nuclear fuel and high level radioactive waste created by the commercial nuclear generating plants to the DOE. The NWP provides that DOE will enter into contracts with utilities in which DOE promises to take the utilities’ spent fuel and high-level radioactive waste and utilities will pay the cost of the disposition services for that material. The NWP,

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<sup>14</sup> “Low-Level Radioactive Waste Policy Amendments Act of 1985,” Public Law 99-240, 1986

<sup>15</sup> “Nuclear Waste Policy Act of 1982 and Amendments,” DOE’s Office of Civilian Radioactive Management, 1982



along with the individual contracts with the utilities, specifies that the DOE was to begin accepting spent fuel by January 31, 1998.

Today, the country is at an impasse on high-level waste disposal, despite DOE's submittal of its License Application for a geologic repository to the NRC in 2008. The Obama administration eliminated the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle ... and make recommendations for a new plan."<sup>[16]</sup> Towards this goal, 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 included a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."<sup>[17]</sup>

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."<sup>[18]</sup>
- "[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."<sup>[19]</sup>

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..."<sup>[20]</sup>

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<sup>16</sup> "Advisory Committee Charter, Blue Ribbon Commission on America's Nuclear Future," Appendix A, January 2012

<sup>17</sup> Ibid.

<sup>18</sup> "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](http://www.brc.gov/sites/default/files/documents/brc_finalreport_jan2012.pdf), p. 32, January 2012

<sup>19</sup> Ibid., p.27

<sup>20</sup> "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013



“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.”<sup>[21]</sup>

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Obama 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)<sup>[22]</sup> 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. Although the DOE proposed it would start fuel acceptance in 2025, no progress has been made in the repository program since DOE’s 2013 strategy was issued except for the completion of the Yucca Mountain safety evaluation report.

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 certain exceptions defined in the DOE Contract, in the order (the “queue”) in which it was discharged from the reactor.<sup>[23]</sup> CPPC’s current spent fuel

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<sup>21</sup> *Ibid.*, p.2

<sup>22</sup> 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)

<sup>23</sup> 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



management plan for the Comanche Peak spent fuel is based in general upon: 1) a 2056 start date for DOE initiating transfer of Comanche Peak spent fuel to a federal facility (not necessarily a final repository), and 2) a spent fuel transfer 2095 completion date. Different DOE acceptance assumptions would result in different completion dates.

The 2056 start date for DOE acceptance of Comanche Peak spent fuel is based on assumed initial operation of the nation's first federal facility (not necessarily a final repository) in 25 years (2045) and Comanche Peak's place in the Oldest Fuel First (OFF) spent fuel queue per the schedule provided in DOE/RW-0567, Acceptance Priority Ranking & Annual Capacity Report.<sup>[24]</sup> DOE/RW-0567 also assumes an annual cap of 3000 metric tons of uranium (MTU) on its ability to accept spent nuclear fuel. Pursuant to that assumption, it is estimated that CPPC will be able to ship between 50 and 60 MTU per year from Comanche Peak to a federal interim storage facility or a geologic repository. This is an equivalent of 118 to 142 fuel assemblies per year, or approximately 4 dry cask containers (128 spent fuel assemblies) per year. At this rate, all spent fuel is estimated to be removed from the Comanche Peak site by 2095.

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.<sup>[25]</sup> Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel building's spent fuel storage pools, as well as at an on-site ISFSI.

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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 Comanche Peak, as a permanently shutdown station, 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 plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance.

<sup>24</sup> DOE/RW-0567 was published in July 2004 by the Department of Energy Office of Civilian Radioactive Waste Management. Although an alternate location may be sited in the future, the referenced study based on Yucca Mountain is the most recent report issued by DOE.

<sup>25</sup> U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses"



An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K<sup>[26]</sup>), has been constructed to support continued plant operations. The facility will be expanded at Comanche Peak to support future decommissioning operations. Once the spent fuel storage pools are emptied, the fuel building can be either decontaminated and dismantled or prepared for long term storage.

DOE has breached its obligations to remove fuel from reactor sites, and has also failed to provide CPPC with information about how it will ultimately perform. DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such amendment would involve. Consequently, CPPC has no information or expectations on how DOE will remove fuel from the site in the future. In the absence of information about how DOE will perform, and for purposes of this analysis only, it is assumed that DOE will accept already-canistered fuel. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers.

CPPC's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if, contrary to its contractual obligation, the DOE has not performed earlier.

### 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.

Consequently, this study assumes that non-essential site structures addressed by this analysis are removed, once remediation is complete, to a nominal depth of three feet below the local grade level wherever possible. The site is then graded and stabilized.

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<sup>26</sup> U.S. Code of Federal Regulations, Title 10, Part 72, Subpart K, "General License for Storage of Spent Fuel at Power Reactor Sites"



## Summary

The cost to decommission Comanche Peak assumes the removal of all contaminated and activated plant components and structural materials such that CPPC 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 controlled disposal facility.

Decommissioning and subsequent License Termination, exclusive of the ISFSI, is accomplished within the 60-year period required by current NRC regulations. Spent fuel remains in storage at the site until such time that the transfer to a DOE facility is complete (assumed to be 2095 for purposes of this analysis). Once the transfer is complete, the ISFSI is decommissioned and the site released for unrestricted use.

The decommissioning scenarios are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C and D for the DECON and SAFSTOR alternatives. 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, 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 Part 50.75). The cost reported for this subcategory is generally sufficient to terminate the operating licenses for the two reactors, recognizing that there may be some additional cost impact from spent fuel management. This subcategory also includes the costs of disposing of the retired steam generators and the reactor vessel closure head from Unit 1. The study assumes that the disposal of the components would occur after shutdown; however, the costs are identified separately because the disposal activities could be conducted at any time. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). Section 3.5.1 provides the basis for the ISFSI decommissioning cost.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the 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 expansion of the existing ISFSI to accommodate all of the spent fuel generated during plant operations, operation of the fuel building’s storage pools until the spent fuel is transferred to the ISFSI, and the management of the ISFSI until such time that the transfer to DOE is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any costs related to the final disposal of the spent fuel.



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

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

As noted within this document, the estimates were developed and costs are presented in 2019 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 station or during the decommissioning period.



**DECON COST SUMMARY**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2019 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,341	17,057	28,398
Removal	88,805	135,799	224,603
Packaging	30,685	31,258	61,943
Transportation	11,042	9,559	20,601
Waste Disposal	83,300	80,865	164,165
Off-site Waste Processing <sup>[1]</sup>	-	-	-
Program Management <sup>[2]</sup>	275,145	305,367	580,512
Security	132,081	111,849	243,931
Spent Fuel Pool(s) Isolation	14,174	9,449	23,624
Spent Fuel Management (Direct Costs) <sup>[3]</sup>	129,420	127,317	256,737
Insurance and Regulatory Fees	35,680	30,562	66,242
Energy	18,234	13,890	32,124
Characterization and Licensing Surveys	17,436	16,771	34,207
Property Taxes	38,100	28,200	66,300
Miscellaneous Equipment	9,609	9,269	18,878
Decommissioning Staff Severance	11,850	11,850	23,701
Total <sup>[4]</sup>	906,903	939,062	1,845,964

Cost Element	Unit 1	Unit 2	Total
License Termination	585,345	590,212	1,175,558
Spent Fuel Management	275,928	274,017	549,946
Site Restoration	45,629	74,832	120,461
Total <sup>[4]</sup>	906,903	939,062	1,845,964

<sup>[1]</sup> Not currently cost competitive with direct waste disposal

<sup>[2]</sup> Includes engineering costs

<sup>[3]</sup> Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pools O&M and EP fees

<sup>[4]</sup> Columns may not add due to rounding



**SAFSTOR COST SUMMARY  
DECOMMISSIONING COST ELEMENTS**  
(thousands of 2019 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	9,509	15,763	25,272
Removal	92,786	136,856	229,642
Packaging	25,809	26,266	52,075
Transportation	9,705	7,908	17,613
Waste Disposal	80,864	77,706	158,571
Off-site Waste Processing <sup>[1]</sup>	-	-	-
Program Management <sup>[2]</sup>	334,585	349,423	684,008
Security	164,042	144,238	308,280
Spent Fuel Pool(s) Isolation	14,174	9,449	23,624
Spent Fuel Management (Direct Costs) <sup>[3]</sup>	122,218	120,116	242,335
Insurance and Regulatory Fees	60,834	55,988	116,823
Energy	28,036	26,772	54,808
Characterization and Licensing Surveys	17,605	16,638	34,243
Property Taxes	38,100	28,200	66,300
Miscellaneous Equipment	20,049	40,354	60,404
Decommissioning Staff Severance	11,850	11,850	23,701
Total <sup>[4]</sup>	1,030,167	1,067,529	2,097,696

Cost Element	Unit 1	Unit 2	Total
License Termination	713,679	722,396	1,436,075
Spent Fuel Management	269,329	268,762	538,090
Site Restoration	47,160	76,371	123,531
Total <sup>[4]</sup>	1,030,167	1,067,529	2,097,696

<sup>[1]</sup> Not currently cost competitive with direct waste disposal

<sup>[2]</sup> Includes engineering costs

<sup>[3]</sup> Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pools O&M and EP fees

<sup>[4]</sup> Columns may not add due to rounding



## **1. INTRODUCTION**

This report presents estimates of the costs to decommission the Comanche Peak Nuclear Power Plant (Comanche Peak) for the selected decommissioning alternatives following the scheduled and permanent cessation of plant operations. The current estimates are designed to provide Comanche Peak Power Company LLC (CPPC) with sufficient information to assess their financial obligations, as they pertain to the decommissioning of Comanche Peak.

The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2014,<sup>[1]\*</sup> updated to reflect current plant inventory, current assumptions pertaining to the operating life of the reactor, disposition of the nuclear station and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

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

The 2014 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. The only substantive changes made to the plant inventory from the 2014 analysis (that would impact decommissioning) is the addition of the Stator Rewind building.

### **1.1 OBJECTIVES OF STUDY**

The objectives of this analysis are to present comprehensive estimates of the costs to decommission Comanche Peak, to provide a sequence or schedule for the associated activities, and to identify the waste streams expected from the decontamination and dismantling activities.

For the purposes of this study, the shutdown dates for the two units are assumed to be on February 8, 2030, for Unit 1 and on February 2, 2033, for Unit 2, based upon the expiration of the current operating licenses.

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\* References provided in Section 7 of the document



## **1.2 SITE DESCRIPTION**

Comanche Peak is located in Somervell County in North Central Texas, approximately 65 miles southwest of the Dallas-Fort Worth area. The nearest communities are Glen Rose and Granbury, about 4 and 10 miles, respectively, from the site. The station is comprised of two nuclear units that are essentially identical except for certain auxiliary systems.

The two nuclear steam supply systems (NSSS) each consist of a pressurized water reactor and a four-loop reactor coolant system. They are authorized to operate at 3,612 megawatts (thermal), following approval of a stretch power uprate application in 2008.

Each of the four loops of the reactor coolant system contains a vertical U-tube type steam generator and a single speed centrifugal reactor coolant pump. In addition, the system includes an electrically heated pressurizer, a pressurizer relief tank, and interconnected piping. The reactor coolant system is housed within a containment vessel, a free-standing cylindrical steel structure enclosed by a separate reinforced concrete reactor building. The Containment Building is designed to provide biological shielding as well as missile protection for the steel containment vessel. <sup>[LG1]</sup> The containment shell is anchored to the Containment Building foundation with a steel liner plate encased in concrete forming the base of the containment.

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 turbine generators consist of a tandem (single shaft) arrangement of a double-flow high-pressure turbine and two identical double-flow, low-pressure turbines driving a direct-coupled generator at 1800 rpm. The turbines are operated in a closed feedwater cycle, which condenses the steam. The heated feedwater is then returned to the steam generators. The condenser circulating water system removes heat rejected in the main condensers. The heat is dissipated to Squaw Creek Reservoir.



### **1.3 REGULATORY GUIDANCE**

The Nuclear Regulatory Commission (NRC) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.<sup>[2]</sup> 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,"<sup>[3]</sup> 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.

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 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 2017, the NRC's staff issued the regulatory basis for proposed new regulations on the decommissioning of commercial nuclear power reactors. In the regulatory basis, the NRC staff proposed removing any discussion of the ENTOMB option from existing guidance documents "since the method is not deemed practically feasible for current U.S. power reactors, and the timeframe for decommissioning completion using the ENTOMB method is generally inconsistent with current regulations."<sup>[4]</sup>

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants<sup>[5]</sup> 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. Before or within two years following cessation of operations, the licensee must submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit an application to the NRC to terminate the license, which includes a license termination plan (LTP).

In 2011, the NRC issued regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.<sup>[6]</sup> The regulations require licensees to report additional details in their decommissioning cost estimate including a decommissioning estimate for the ISFSI. This estimate is provided in Appendix E.

### 1.3.1 Low-Level Radioactive Waste Management

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,<sup>[7]</sup> and its Amendments of 1985,<sup>[8]</sup> the States became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.



The Texas Compact disposal facility is now operational and waste is being accepted from generators including CPPC by the operator, Waste Control Specialists (WCS).

For the purposes of this analysis, low-level radioactive waste generated in the decontamination and dismantling of the plant and remediation of the Comanche Peak site, and designated for direct disposal, is assumed to be shipped to the Texas Compact site. Waste disposal costs are based upon the Environmental Service Agreement for the disposal of low-level radioactive waste at the Texas compact waste disposal facility between CPPC and WCS.

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 Greater than Class C or GTCC). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigns the federal government the responsibility for the disposal of this material. The Act also states 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, if any, for GTCC disposal 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 manner similar to 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 stored on site (at the ISFSI). The GTCC is assumed to be transferred to a designated federal disposal facility once the spent fuel has been removed from the site.

### 1.3.2 High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act"<sup>[9]</sup> (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel and high level radioactive waste created by the commercial nuclear generating plants to the DOE. The NWPA provides that DOE will enter into contracts with utilities in which DOE promises to take the utilities' spent fuel and high-level radioactive waste and utilities will pay the cost of the disposition services for that material. The NWPA, along with the individual contracts with the utilities, specifies that the DOE was to begin accepting spent fuel by January 31, 1998.



Today, the country is at an impasse on high-level waste disposal, despite DOE's submittal of its License Application for a geologic repository to the NRC in 2008. The Obama administration eliminated the budget for the repository program and while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle ... and make recommendations for a new plan." Towards this goal, the 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."<sup>[10]</sup>

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."<sup>[11]</sup>

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..."<sup>[12]</sup>

"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 Obama 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) 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. Although the DOE proposed it would start fuel acceptance in 2025, no progress has been made in the repository program since DOE’s 2013 strategy was issued except for the completion of the Yucca Mountain safety evaluation report.

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 certain exceptions defined in the DOE Contract, in the order (the “queue”) in which it was discharged from the reactor. CPPC’s current spent fuel management plan for the Comanche Peak spent fuel is based in general upon: 1) a 2056 start date for DOE initiating transfer of Comanche Peak spent fuel to a federal facility (not necessarily a final repository), and 2) a spent fuel transfer 2095 completion date. Different DOE acceptance assumptions would result in different completion dates.

The 2056 start date for DOE acceptance of Comanche Peak spent fuel is based on assumed initial operation of the nation’s first federal facility (not necessarily a final repository) in 25 years (2045) and Comanche Peak’s place in the Oldest Fuel First (OFF) spent fuel queue per the schedule provided in DOE/RW-0567, Acceptance Priority Ranking & Annual Capacity Report.<sup>[13]</sup> DOE/RW-0567 also assumes an annual cap of 3000 metric tons of uranium (MTU) on its ability to accept spent nuclear fuel. Pursuant to that assumption, it is estimated that CPPC will be able to ship between 50



and 60 MTU per year from Comanche Peak to a federal interim storage facility or a geologic repository. This is an equivalent of 118 to 142 fuel assemblies per year, or approximately 4 dry cask containers (128 spent fuel assemblies) per year. At this rate, all spent fuel is estimated to be removed from the Comanche Peak site by 2095.

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.<sup>[14]</sup> Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel building's spent fuel storage pools, as well as at an on-site ISFSI.

An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K<sup>[15]</sup>), has been constructed at Comanche Peak to support continued plant operations. The facility is assumed to be expanded to support future decommissioning operations. Once the spent fuel storage pools are emptied the fuel building can be either decontaminated and dismantled or prepared for long term storage.

DOE has breached its obligations to remove fuel from reactor sites, and has also failed to provide CPPC with information about how it will ultimately perform. DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such amendment would involve. Consequently, CPPC has no information or expectations on how DOE will remove fuel from the site in the future. In the absence of information about how DOE will perform, and for purposes of this analysis only, it is assumed that DOE will accept already-canistered fuel. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers.

CPPC's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if, contrary to its contractual obligation, the DOE has not performed earlier.



### 1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"<sup>[16]</sup> 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 Comanche Peak 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).<sup>[17]</sup> An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.66, is applied to drinking water.<sup>[18]</sup>

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)<sup>[19]</sup> provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

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



## **2. DECOMMISSIONING ALTERNATIVES**

Detailed cost estimates were developed to decommission Comanche Peak based upon the approved decommissioning alternatives: DECON and SAFSTOR.

Two decommissioning scenarios were evaluated for Comanche Peak. The scenarios selected are representative of alternatives available to CPPC and are defined as follows:

1. The first scenario assumes that the units would be promptly decommissioned (DECON alternative) upon the expiration of the current operating licenses, i.e., 2030 and 2033 for Units 1 and 2, respectively. Spent fuel in the wet storage pools would be relocated to the ISFSI for interim storage until such time that the DOE can complete the transfer, presumed to be in the year 2095.
2. In the second scenario, the nuclear units are placed into safe-storage (SAFSTOR alternative) at the end of their current operating licenses. Spent fuel in wet storage pools at that time would be relocated to the ISFSI for interim storage so as to minimize caretaking costs. The fuel would be transferred to the DOE (consistent with the assumptions in the DECON scenario) until the process is presumed to be complete in the year 2095. Decommissioning is deferred to the maximum extent (approximately 50 years) such that the property is released for unrestricted use within the generally required 60-year period (i.e., 2090 based upon the current Unit 1 shutdown date).

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

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

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for Comanche Peak are also divided into phases or periods; however,



demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

## **2.1 DECON**

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

### **2.1.1 Period 1 - Preparations**

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

#### **Engineering and Planning**

The PSDAR provides a description of the licensee's planned decommissioning activities, a timetable, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local hearing to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, i.e., without specific NRC approval. Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, steam generators, and other large components that are radioactive. The NRC includes the following



additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

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

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

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

#### Site Preparations

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

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the reactor vessel and its internals), internal piping, and primary shield cores.
- Isolation of the spent fuel storage pools and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. The pools will remain operational for approximately five and one half years following the cessation of Unit 2 operations. During



this time period, it is assumed that the spent fuel residing in the pools that cannot be directly transferred to the DOE will be moved to an ISFSI for interim storage.

- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

#### 2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful termination of the 10 CFR §50 operating license. 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) as required to facilitate hauling and transport. Modifications may be required to the containment structure to facilitate access of large/heavy equipment. Modifications may also be required to the refueling area of the building 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 reactor vessel head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, i.e., by weight and activity. The operations are conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation of the remaining reactor internals, including the core baffle assembly, lower core barrel, and lower core plate. Some material is expected to exceed Class C disposal requirements. As such, the segments will be packaged in modified fuel storage canisters for geologic disposal.
- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in-air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the associated cubicles necessary for access and component extraction are removed.
- Removal of the steam generators and pressurizer for material recovery and controlled disposal. The generators will be moved to an on-site processing center and the steam domes removed for transportation. The steam domes, internal components, the lower shell and tube bundle will be packaged for direct disposal. These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized, e.g., with grout. Steel shielding will be added, as necessary, to those external areas of the package to meet transportation limits and regulations.



At least two years prior to the anticipated date of license termination, a LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the 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 and fuel building and any other contaminated facility. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity will facilitate surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and packaged for controlled disposal at the 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).”<sup>[20]</sup> This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on the requested change to the operating licenses (that would release the property, exclusive of the ISFSI, for unrestricted use).

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

#### 2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities will begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled, safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including the reactor, auxiliary, radwaste warehouse and fuel buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the station.

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



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, as well as topsoil, so that vegetation can be established for erosion control. Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding and inhibit the refloating of subsurface materials.

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

#### 2.1.4 ISFSI Operations and Decommissioning

For purposes only of this estimate, transfer of spent fuel to a DOE repository or interim facility is assumed to be exclusively from the ISFSI. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers and to dispose of existing containers. 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 fuel from Comanche Peak in 2056, transfer of spent fuel from the ISFSI is anticipated to continue through the year 2095. This assumption is made for purposes of this estimate, although it is acknowledged that CPPC will seek the most expeditious means of removing fuel from the site when DOE commences performance.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The NRC will terminate the Part 50 license when it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

Spent fuel is stored on the ISFSI in multi-purpose canisters, with concrete overpacks. For purposes of this cost analysis, it is assumed that once the inner canisters containing the spent fuel assemblies have been removed, any required decontamination performed on the storage



overpack (some minor activation is assumed), and the license for the facility terminated, the concrete overpacks can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pad is then removed and the area regraded to minimize ponding.

## **2.2 SAFSTOR**

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

The engineering and planning requirements are similar to those for the DECON alternative, although they are limited in scope with no large scale dismantling activities anticipated. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

### **2.2.1 Period 1 - Preparations**

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

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

- Isolating of the spent fuel storage services and fuel handling systems so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.



- Transferring of the spent fuel from the storage pools to the ISFSI for interim storage, following the minimum required cooling period in the spent fuel pools.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems with decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of the plant, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

#### 2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Site maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.



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

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

Consistent with the DECON alternative, the spent fuel storage pools are emptied within five and one half years of the cessation of operations. The transfer of the spent fuel to the DOE begins during the dormancy period in year 2056 and continues throughout (and beyond) the delayed decommissioning phase.

After a period of storage (such that license termination is accomplished within 60 years of the cessation of Unit 1 operations), it is required that the licensee submit an application to terminate the license, along with an LTP (described in Section 2.1.2), thereby initiating the third phase.

### 2.2.3 Periods 3 and 4 - Delayed Decommissioning

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

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



Variations in the length of the dormancy period are expected to have some effect upon the quantities of radioactive wastes generated from system and structure removal operations. Given the levels of radioactivity and spectrum of radionuclides expected from forty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone. The delay in decommissioning yields lower working area radiation levels. As such, the estimates for this delayed scenario incorporate reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

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

#### 2.2.4 Period 5 - Site Restoration

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

#### 2.2.5 ISFSI Operations and Decommissioning

Completion of the spent fuel transfer operations is currently assumed to be in year 2095. Once complete, the ISFSI will be decommissioned as described in Section 2.1.4.



### **3. COST ESTIMATE**

The cost estimates prepared for decommissioning Comanche Peak consider the unique features of the site, including the NSSS, power generation systems, support services, site buildings, and ancillary facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

#### **3.1 BASIS OF ESTIMATE**

The estimates were developed using the site-specific, technical information from the 2014 analysis. This information was reviewed for the current analysis and updated as deemed appropriate. The site-specific considerations and assumptions used in the previous evaluation were also revisited. Modifications were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

#### **3.2 METHODOLOGY**

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"<sup>[21]</sup> and the DOE "Decommissioning Handbook."<sup>[22]</sup> These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal (\$/cubic yard), steel removal (\$/ton), and cutting costs (\$/inch) are developed using local labor rates. The activity-dependent costs are estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. When specific CP information was not available, quantities were taken from information for a similar plant. 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 RSMeans.<sup>[23]</sup>

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



Regulatory Guide 1.184<sup>[24]</sup> Revision 1, issued in October 2013, 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,<sup>[25]</sup> issued February 2005.

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

#### Work Difficulty Factors

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

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

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

#### Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiological controlled areas. The resulting 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. In the DECON alternative, dismantling of the fuel building systems and decontamination of the spent fuel pools are also dependent upon the timetable for the transfer of the spent fuel assemblies from the pools to the 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 ensures a high degree of confidence in the reliability of the resulting costs.

### **3.3 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 estimates, 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 estimates are based on a



“lead” unit that includes these senior positions, and a “second” unit that excludes these positions. The designation as lead is based on the unit undertaking the most complex tasks (for instance vessel segmentation) or performing tasks for the first time.

- The final radiological survey schedule is also 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 transfer of the spent fuel from the storage pools and subsequent decontamination of the fuel building is coordinated so as to synchronize the final status survey for the station.
- The final demolition of buildings at Units 1 and 2 are considered to take place concurrently. This is considered a reasonable assumption since access to the buildings is considered good at the station.
- Unit 1, as the first unit to enter decommissioning, incurs the majority of site characterization costs.
- Shared systems and structures are generally assigned to Unit 2.
- Station costs such as emergency response fees, regulatory agency fees, corporate overhead, and insurance are generally allocated on an equal basis between the two units.

### **3.4 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 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 the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.



### 3.4.1 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"<sup>[26]</sup> as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, contingency is included. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for percentage contingency in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

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

- |  |     |
|--|-----|
| • Decontamination                      | 50% |
| • Contaminated Component Removal       | 25% |
| • Contaminated Component Packaging     | 10% |
| • Contaminated Component Transport     | 15% |
| • Low-Level Radioactive Waste Disposal | 25% |
| • 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%
• Taxes and Fees	10%
• Insurance	10%
• Staffing	15%
• 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 and D). A contingency of 25% is applied to the subtotal of the ISFSI decommissioning costs in Appendix E.

### 3.4.2 Financial Risk

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

- Transition activities and costs: ancillary expenses associated with outplacement of 50% to 80% of the site labor force shortly after the cessation of plant operations, added cost for national or company-mandated retraining, and retention incentives for key personnel.



- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes, for example, affecting worker health and safety, site release criteria, waste transportation, and disposal.
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition), or in the timetable for such, for example, the start and rate of acceptance of spent fuel by the DOE.
- Pricing changes for basic inputs such as labor, energy, materials, and disposal. Items subject to widespread price competition (such as materials) may not show significant variation; however, others such as waste disposal could exhibit large pricing uncertainties, particularly in markets where limited access to services is available.

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 (e.g., in accordance with Regulatory Guide 1.159).

### **3.5 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.

#### **3.5.1 Spent Fuel Management**

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission Comanche Peak. 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, require licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy. This requirement is prepared for through inclusion of certain high-level waste cost elements within the estimates, as described below. Completion of the decommissioning process is 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. CPPC's current spent fuel management plan for the Comanche Peak spent fuel is based in general upon: 1) a 2056 start date for DOE initiating transfer of Comanche Peak spent fuel to a federal facility (not necessarily a final repository), and 2) a spent fuel transfer 2095 completion date. The management of the spent fuel inventory is delineated in Table 3.1. Different DOE acceptance assumptions would result in different completion dates.

### ISFSI

An ISFSI pad has been constructed at Comanche Peak to hold 84 storage casks (overpacks). The ISFSI was licensed by the NRC under the general license provisions of 10 CFR Part 72. The first cask was placed on the ISFSI pad on February 28, 2012.

Assuming that the DOE doesn't start accepting spent fuel until 2055; Comanche Peak will need to construct a second pad to accommodate the entire inventory of spent fuel discharged over the reactors' operating life.

Construction of a second pad is included within the estimates. Post-shutdown and maintenance costs for the ISFSI pads are also included and address the cost for staffing the facilities, as well as security, insurance, and licensing fees. Costs are provided for the final disposition of the pads once the transfer is complete.



### Canister Design

The design and capacity of the ISFSI is based upon the HOLTEC HI-STORM 100S Version B dry storage system. The system consists of a multi-purpose canister (MPC) with a nominal capacity of 32 fuel assemblies and a concrete storage overpack.

### Canister Loading and Transfer

The estimates include the cost for the labor and equipment to load and transfer each spent fuel canister to the ISFSI. For estimating purposes, an allowance is used for the cost to transfer the fuel from the ISFSI into the DOE transport cask.

Since the DOE has not published details about its cask system, this rough estimate is necessary. However, use of this estimate should not be used to infer that TLG 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 Unit 2 operations. ISFSI operating costs are based upon a 2095 end date for spent fuel transfer.

### 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.

The storage overpacks are assumed to have some level of neutron-induced activation, as a result of the long-term storage of the fuel, i.e., to levels exceeding free-release limits. As an allowance, 14 overpacks are assumed to require remediation, equivalent to the number of overpacks required to accommodate the final core off load from both units. The cost of the



disposition of this material, as well as the demolition of the ISFSI facility, is included in the estimates.

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 cost summary for decommissioning the ISFSI is presented in Appendix E.

### GTCC

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

It is assumed only for purposes of these estimates that the DOE would not accept this waste prior to completing the transfer of spent fuel. Therefore, until such time as the DOE is ready to accept GTCC waste, it is assumed that this material would remain in storage at the Comanche Peak site. It is acknowledged, however, that CPPC will seek the most expeditious means of removing the GTCC from the site when DOE commences performance.

#### 3.5.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed in the refueling canal, where a turntable and remote cutter are



installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

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

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

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

It is not known whether this option will be available when the Comanche Peak plant ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes that the reactor vessel will require segmentation, as a bounding condition.



### 3.5.3 Primary System Components

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

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

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

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

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



The generators are disassembled on-site for transport to the disposal site. The interior volume is filled with low-density cellular concrete for stabilization of the internal contamination.

Each component is then loaded onto a rail car for transport to the disposal facility.

#### 3.5.4 Main Turbine and Condenser

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

#### 3.5.5 Retired Components

The estimates include the disposition, from Unit 1, of four retired steam generators and a retired reactor vessel closure head. The components, currently in storage at the site, will be prepared for transport and disposal. Similar to the disposition of the operating units, the steam domes of the generators are assumed to be removed to meet transport clearances. The estimates for the retired components include the project management, contractor and supporting costs necessary to execute the tasks assuming that the disposition would be a coordinated effort (i.e., single mobilization effort).

The estimates also include the disposition of one high-pressure and two low-pressure turbine rotors as clean scrap.

#### 3.5.6 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.<sup>[27]</sup> The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 10 CFR 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are



expected to be transported in accordance with Part 71, as Type B containers. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

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

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

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

Transportation costs for material requiring controlled disposal are based upon the route and mileage to the Andrews County facility in western Texas. Truck transport costs are estimated using published tariffs from Tri-State Motor Transit.<sup>[28]</sup>

### 3.5.7 Low-Level Radioactive Waste Disposal

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



containerized material or a specific calculation for components serving as their own waste containers.

The more highly activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

The cost to dispose of the low-level radioactive material generated from the decontamination and dismantling activities is based upon CPPC's current cost for disposal at the Texas Compact facility operated by Waste Control Specialists in Andrews County.

#### 3.5.8 Site Conditions Following Decommissioning

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

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 four 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.

Only existing site structures are considered in the dismantling cost. The existing electrical switchyard and access roads will remain in support of the electrical transmission and distribution system. The site access road will be left intact.

Structures are removed to a nominal depth of three feet below grade. Concrete rubble generated from demolition activities is processed and made available as clean fill for the power block foundations. Additional fill is brought in to cap the power block excavations and to permit seeding for erosion control.



### **3.6 ASSUMPTIONS**

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

#### **3.6.1 Estimating Basis**

Decommissioning costs are reported in the year of projected expenditure; however, the values are provided in 2019 dollars. Costs are not inflated, escalated, or discounted over the periods of performance.

The estimates rely upon the physical plant inventory that was the basis for the 2014 analysis, with an adjustment to include the subsequent addition of the Stator Rewind Building.

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.

#### **3.6.2 Labor Costs**

CPPC will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. CPPC will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Costs for site administration, operations, construction, and maintenance personnel are based upon average salary information provided by CPPC.

Contract personnel will provide engineering services, e.g., for preparing the activity specifications, work procedures, activation, and structural analyses, under the direction of CPPC.

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



Reductions in the operating organization are handled through normal company practices. No costs have been included for this activity. Severance costs are included for the decommissioning staff as the organization is downsized.

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.

### **3.6.3 Design Conditions**

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

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.<sup>[29]</sup> Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Comanche Peak components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130<sup>[30]</sup> and NUREG/CR-0672,<sup>[31]</sup> 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 building structure is confined to the biological shield.

### **3.6.4 General**

#### **Transition Activities**

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

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.



- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.
- Process operating waste inventories, i.e., the estimates do not address the disposition of any legacy wastes; the disposal of operating wastes during this initial period is not considered a decommissioning expense.

#### Scrap and Salvage

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

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

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

#### Energy

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



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

#### **Emergency Planning**

FEMA and state 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. The timing is 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 pools water). State fees continue until all fuel has been moved from the pools into dry storage (approximately five and one-half years following the cessation of operations).

#### **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." [32] The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

#### **Taxes**

Property taxes are included within the estimates. However, the tax is based upon the land, without any consideration of any ongoing site operations and property assets.

#### **Site Modifications**

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

#### **Site Restoration**

All structures will be removed except for the switchyard. The switchyard is required for grid operations. Structures to be removed include but are not limited to the reactor, fuel, auxiliary, radwaste warehouse, safeguard, diesel generator, and turbine buildings.



### 3.7 COST ESTIMATE SUMMARY

Schedules of expenditures are provided in Tables 3.2 through 3.5. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

Additional tables in Appendices C and D provide detailed cost elements. The cost elements are also 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. This subcategory also includes the costs of disposing of the following Unit 1 components: the retired steam generators, the reactor vessel closure head, and spare high and low pressure turbine rotors. The study assumes that the disposal of the components would occur after shutdown, however, the costs are identified separately because the disposal activities could be conducted at any time.

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 both Appendices C and D is provided in Appendix E.

The "Spent Fuel Management" subcategory contains costs anticipated to be incurred once the nuclear units cease operation for the off-loading of the pools to the ISFSI for interim storage, and the eventual transfer of the fuel from the ISFSI to the DOE. Costs are also included for the operation of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., geologic repository) is complete.

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

As discussed in Section 3.5.1, it is not anticipated that the DOE will 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 geologic repository 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 2019 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant). The schedules are based upon the detailed activity costs reported in Appendices C and D, along with the timeline presented in Section 4.



**TABLE 3.1  
COMANCHE PEAK NUCLEAR POWER PLANT  
SPENT FUEL MANAGEMENT**

	Fuel Assembly Inventory (end of year)		DOE
Year	Pools	ISFSI	Acceptance
2009	2078		
2010	2171		
2011	2353		
2012	2154	288	
2013	1959	576	
2014	2143	576	
2015	2040	768	
2016	1937	960	
2017	2121	960	
2018	2014	1152	
2019	1911	1344	
2020	2093	1344	
2021	1990	1536	
2022	1891	1728	
2023	2073	1728	
2024	1970	1920	
2025	1871	2112	
2026	2053	2112	
2027	1950	2304	
2028	1851	2496	
2029	2033	2496	
2030	2123	2688	
2031	2123	2688	
2032	2212	2688	
2033	2405	2688	
2034	1893	3200	
2035	1413	3680	
2036	933	4160	
2037	453	4640	
2038	-	5093	



**TABLE 3.1 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT**  
**SPENT FUEL MANAGEMENT**

Year	Fuel Assembly Inventory (end of year)		DOE
	Pools	ISFSI	Acceptance
2039		5,093	
2040		5,093	
2041		5,093	
2042		5,093	
2043		5,093	
2044		5,093	
2045		5,093	
2046		5,093	
2047		5,093	
2048		5,093	
2049		5,093	
2050		5,093	
2051		5,093	
2052		5,093	
2053		5,093	
2054		5,093	
2055		5,093	
2056		4,965	128
2057		4,837	128
2058		4,709	128
2059		4,581	128
2060		4,453	128
2061		4,325	128
2062		4,197	128
2063		4,069	128
2064		3,941	128
2065		3,813	128
2066		3,685	128
2067		3,557	128
2068		3,429	128



**TABLE 3.1 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT**  
**SPENT FUEL MANAGEMENT**

Year	Fuel Assembly Inventory (end of year)		DOE
	Pools	ISFSI	Acceptance
2069		3,301	128
2070		3,173	128
2071		3,045	128
2072		2,917	128
2073		2,789	128
2074		2,661	128
2075		2,533	128
2076		2,405	128
2077		2,277	128
2078		2,149	128
2079		2,021	128
2080		1,893	128
2081		1,765	128
2082		1,637	128
2083		1,509	128
2084		1,381	128
2085		1,253	128
2086		1,125	128
2087		997	128
2088		869	128
2089		741	128
2090		613	128
2091		485	128
2092		357	128
2093		229	128
2094		101	128
2095			101
Total			5,093



**TABLE 3.2**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	55,641	12,806	2,065	23	8,408	78,943
2031	68,548	22,837	3,415	14,593	24,929	134,323
2032	62,171	27,663	2,196	34,336	13,184	139,549
2033	51,681	30,623	1,878	13,162	7,865	105,210
2034	46,751	32,074	1,729	3,091	5,342	88,987
2035	31,238	19,337	1,729	1,861	5,002	59,167
2036	7,991	233	1,734	16	4,505	14,478
2037	7,969	232	1,729	16	4,492	14,438
2038	8,896	1,246	940	1,525	4,303	16,910
2039	15,049	815	274	13	2,208	18,359
2040	13,709	5,985	268	3	1,057	21,022
2041	11,879	6,850	231	0	925	19,884
2042	3,423	1,070	36	0	966	5,494
2043	1,858	0	0	0	973	2,831
2044	1,863	0	0	0	976	2,839
2045	1,858	0	0	0	973	2,831
2046	1,858	0	0	0	973	2,831
2047	1,858	0	0	0	973	2,831
2048	1,863	0	0	0	976	2,839
2049	1,858	0	0	0	973	2,831
2050	1,858	0	0	0	973	2,831
2051	1,858	0	0	0	973	2,831
2052	1,863	0	0	0	976	2,839
2053	1,858	0	0	0	973	2,831
2054	1,858	0	0	0	973	2,831
2055	1,858	0	0	0	973	2,831
2056	1,963	300	0	0	976	3,239
2057	1,958	300	0	0	973	3,231
2058	1,958	300	0	0	973	3,231
2059	1,958	300	0	0	973	3,231



**TABLE 3.2 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	1,963	300	0	0	976	3,239
2061	1,958	300	0	0	973	3,231
2062	1,958	300	0	0	973	3,231
2063	1,958	300	0	0	973	3,231
2064	1,963	300	0	0	976	3,239
2065	1,958	300	0	0	973	3,231
2066	1,958	300	0	0	973	3,231
2067	1,958	300	0	0	973	3,231
2068	1,963	300	0	0	976	3,239
2069	1,958	300	0	0	973	3,231
2070	1,958	300	0	0	973	3,231
2071	1,958	300	0	0	973	3,231
2072	1,963	300	0	0	976	3,239
2073	1,958	300	0	0	973	3,231
2074	1,958	300	0	0	973	3,231
2075	1,958	300	0	0	973	3,231
2076	1,963	300	0	0	976	3,239
2077	1,958	300	0	0	973	3,231
2078	1,958	300	0	0	973	3,231
2079	1,958	300	0	0	973	3,231
2080	1,963	300	0	0	976	3,239
2081	1,958	300	0	0	973	3,231
2082	1,958	300	0	0	973	3,231
2083	1,958	300	0	0	973	3,231
2084	1,963	300	0	0	976	3,239
2085	1,958	300	0	0	973	3,231
2086	1,958	300	0	0	973	3,231
2087	1,958	300	0	0	973	3,231
2088	1,963	300	0	0	976	3,239
2089	1,958	300	0	0	973	3,231



**TABLE 3.2 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	1,958	300	0	0	973	3,231
2091	1,958	300	0	0	973	3,231
2092	1,963	300	0	0	976	3,239
2093	1,958	300	0	0	973	3,231
2094	1,958	300	0	0	973	3,231
2095	1,958	1,550	0	0	12,560	16,068
2096	3,466	1,344	12	3,073	3,260	11,156
Total	490,950	176,367	18,234	71,711	149,642	906,903



**TABLE 3.2a**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	51,330	1,746	2,065	23	7,511	62,674
2031	66,550	21,468	3,415	14,592	24,045	130,070
2032	60,817	27,450	2,196	34,333	12,476	137,273
2033	44,909	13,392	1,878	13,161	7,161	80,501
2034	37,388	6,712	1,729	3,091	4,638	53,558
2035	25,621	4,120	1,729	1,861	4,298	37,629
2036	7,991	233	1,734	16	3,799	13,772
2037	7,969	232	1,729	16	3,788	13,734
2038	7,988	1,246	940	1,525	3,448	15,147
2039	13,451	815	274	13	2,146	16,698
2040	3,499	205	73	3	544	4,324
2041	120	0	0	0	328	448
2042	19	0	0	0	51	70
2043-94	0	0	0	0	0	0
2095	71	1,250	0	0	11,618	12,940
2096	498	223	8	3,073	2,705	6,508
Total	328,221	79,094	17,769	71,706	88,555	585,345



**TABLE 3.2b**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	3,687	11,061	0	0	897	15,644
2031	428	1,285	0	0	884	2,598
2032	0	0	0	0	706	706
2033	5,708	17,125	0	0	704	23,537
2034	8,435	25,306	0	0	704	34,445
2035	5,061	15,184	0	0	704	20,949
2036	0	0	0	0	706	706
2037	0	0	0	0	704	704
2038	908	0	0	0	435	1,343
2039	1,599	0	0	0	63	1,661
2040	1,856	0	0	0	512	2,368
2041	1,858	0	0	0	595	2,453
2042	1,858	0	0	0	914	2,772
2043	1,858	0	0	0	973	2,831
2044	1,863	0	0	0	976	2,839
2045	1,858	0	0	0	973	2,831
2046	1,858	0	0	0	973	2,831
2047	1,858	0	0	0	973	2,831
2048	1,863	0	0	0	976	2,839
2049	1,858	0	0	0	973	2,831
2050	1,858	0	0	0	973	2,831
2051	1,858	0	0	0	973	2,831
2052	1,863	0	0	0	976	2,839
2053	1,858	0	0	0	973	2,831
2054	1,858	0	0	0	973	2,831
2055	1,858	0	0	0	973	2,831
2056	1,963	300	0	0	976	3,239
2057	1,958	300	0	0	973	3,231
2058	1,958	300	0	0	973	3,231
2059	1,958	300	0	0	973	3,231



**TABLE 3.2b** (continued)  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	1,963	300	0	0	976	3,239
2061	1,958	300	0	0	973	3,231
2062	1,958	300	0	0	973	3,231
2063	1,958	300	0	0	973	3,231
2064	1,963	300	0	0	976	3,239
2065	1,958	300	0	0	973	3,231
2066	1,958	300	0	0	973	3,231
2067	1,958	300	0	0	973	3,231
2068	1,963	300	0	0	976	3,239
2069	1,958	300	0	0	973	3,231
2070	1,958	300	0	0	973	3,231
2071	1,958	300	0	0	973	3,231
2072	1,963	300	0	0	976	3,239
2073	1,958	300	0	0	973	3,231
2074	1,958	300	0	0	973	3,231
2075	1,958	300	0	0	973	3,231
2076	1,963	300	0	0	976	3,239
2077	1,958	300	0	0	973	3,231
2078	1,958	300	0	0	973	3,231
2079	1,958	300	0	0	973	3,231
2080	1,963	300	0	0	976	3,239
2081	1,958	300	0	0	973	3,231
2082	1,958	300	0	0	973	3,231
2083	1,958	300	0	0	973	3,231
2084	1,963	300	0	0	976	3,239
2085	1,958	300	0	0	973	3,231
2086	1,958	300	0	0	973	3,231
2087	1,958	300	0	0	973	3,231
2088	1,963	300	0	0	976	3,239
2089	1,958	300	0	0	973	3,231



**TABLE 3.2b (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	1,958	300	0	0	973	3,231
2091	1,958	300	0	0	973	3,231
2092	1,963	300	0	0	976	3,239
2093	1,958	300	0	0	973	3,231
2094	1,958	300	0	0	973	3,231
2095	1,887	300	0	0	942	3,128
2096	0	0	0	0	0	0
Total	133,864	81,961	0	0	60,104	275,928



**TABLE 3.2c**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SITE RESTORATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	624	0	0	0	0	624
2031	1,569	84	0	0	1	1,654
2032	1,353	212	0	0	2	1,568
2033	1,064	106	0	0	1	1,171
2034	928	56	0	0	0	983
2035	557	33	0	0	0	590
2036	0	0	0	0	0	0
2037	0	0	0	0	0	0
2038	0	0	0	0	426	426
2039	0	0	0	0	0	0
2040	8,355	5,780	195	0	2	14,331
2041	9,901	6,850	231	0	2	16,983
2042	1,546	1,070	36	0	0	2,652
2043-95	0	0	0	0	0	0
2096	2,968	1,121	4	0	554	4,648
Total	28,865	15,312	465	0	987	45,629



**TABLE 3.3**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	50,370	13,041	2,103	23	5,329	70,867
2034	63,674	21,279	3,407	12,622	16,776	117,757
2035	63,826	27,907	2,190	27,892	9,173	130,988
2036	61,932	32,427	1,876	12,316	5,976	114,527
2037	60,841	34,318	1,729	5,311	4,525	106,723
2038	50,430	23,008	1,391	5,596	7,192	87,617
2039	31,093	3,960	648	2,440	7,139	45,279
2040	17,545	12,983	268	3	3,127	33,926
2041	15,568	15,074	231	0	2,843	33,716
2042	3,999	2,354	36	0	1,265	7,654
2043	1,858	0	0	0	973	2,831
2044	1,863	0	0	0	976	2,839
2045	1,858	0	0	0	973	2,831
2046	1,858	0	0	0	973	2,831
2047	1,858	0	0	0	973	2,831
2048	1,863	0	0	0	976	2,839
2049	1,858	0	0	0	973	2,831
2050	1,858	0	0	0	973	2,831
2051	1,858	0	0	0	973	2,831
2052	1,863	0	0	0	976	2,839
2053	1,858	0	0	0	973	2,831
2054	1,858	0	0	0	973	2,831
2055	1,858	0	0	0	973	2,831
2056	1,963	300	0	0	976	3,239
2057	1,958	300	0	0	973	3,231
2058	1,958	300	0	0	973	3,231
2059	1,958	300	0	0	973	3,231
2060	1,963	300	0	0	976	3,239
2061	1,958	300	0	0	973	3,231
2062	1,958	300	0	0	973	3,231



**TABLE 3.3 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,958	300	0	0	973	3,231
2064	1,963	300	0	0	976	3,239
2065	1,958	300	0	0	973	3,231
2066	1,958	300	0	0	973	3,231
2067	1,958	300	0	0	973	3,231
2068	1,963	300	0	0	976	3,239
2069	1,958	300	0	0	973	3,231
2070	1,958	300	0	0	973	3,231
2071	1,958	300	0	0	973	3,231
2072	1,963	300	0	0	976	3,239
2073	1,958	300	0	0	973	3,231
2074	1,958	300	0	0	973	3,231
2075	1,958	300	0	0	973	3,231
2076	1,963	300	0	0	976	3,239
2077	1,958	300	0	0	973	3,231
2078	1,958	300	0	0	973	3,231
2079	1,958	300	0	0	973	3,231
2080	1,963	300	0	0	976	3,239
2081	1,958	300	0	0	973	3,231
2082	1,958	300	0	0	973	3,231
2083	1,958	300	0	0	973	3,231
2084	1,963	300	0	0	976	3,239
2085	1,958	300	0	0	973	3,231
2086	1,958	300	0	0	973	3,231
2087	1,958	300	0	0	973	3,231
2088	1,963	300	0	0	976	3,239
2089	1,958	300	0	0	973	3,231
2090	1,958	300	0	0	973	3,231
2091	1,958	300	0	0	973	3,231
2092	1,963	300	0	0	976	3,239



**TABLE 3.3 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	1,958	300	0	0	973	3,231
2094	1,958	300	0	0	973	3,231
2095	1,958	1,550	0	0	12,560	16,068
2096	3,466	1,212	12	3,073	3,260	11,023
Total	525,281	200,813	13,890	69,276	129,802	939,062



**TABLE 3.3a**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	46,344	1,778	2,103	23	4,416	54,664
2034	62,206	20,098	3,407	12,621	15,897	114,228
2035	62,210	27,669	2,190	27,889	8,467	128,425
2036	54,395	14,697	1,876	12,315	5,270	88,553
2037	50,689	8,844	1,729	5,311	3,821	70,394
2038	43,697	8,212	1,391	5,596	6,544	65,440
2039	29,207	3,959	648	2,440	6,870	43,124
2040	4,164	263	73	3	995	5,498
2041	51	0	0	0	328	379
2042	8	0	0	0	51	59
2043-94	0	0	0	0	0	0
2095	71	1,250	0	0	11,618	12,940
2096	498	223	8	3,073	2,705	6,508
Total	353,541	86,994	13,425	69,271	66,982	590,212



**TABLE 3.3b**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	3,755	11,264	0	0	913	15,932
2034	361	1,082	0	0	878	2,321
2035	0	0	0	0	704	704
2036	5,854	17,562	0	0	706	24,122
2037	8,446	25,337	0	0	704	34,486
2038	5,729	14,716	0	0	435	20,881
2039	1,874	0	0	0	63	1,937
2040	1,856	0	0	0	512	2,368
2041	1,858	0	0	0	595	2,453
2042	1,858	0	0	0	914	2,772
2043	1,858	0	0	0	973	2,831
2044	1,863	0	0	0	976	2,839
2045	1,858	0	0	0	973	2,831
2046	1,858	0	0	0	973	2,831
2047	1,858	0	0	0	973	2,831
2048	1,863	0	0	0	976	2,839
2049	1,858	0	0	0	973	2,831
2050	1,858	0	0	0	973	2,831
2051	1,858	0	0	0	973	2,831
2052	1,863	0	0	0	976	2,839
2053	1,858	0	0	0	973	2,831
2054	1,858	0	0	0	973	2,831
2055	1,858	0	0	0	973	2,831
2056	1,963	300	0	0	976	3,239
2057	1,958	300	0	0	973	3,231
2058	1,958	300	0	0	973	3,231
2059	1,958	300	0	0	973	3,231
2060	1,963	300	0	0	976	3,239
2061	1,958	300	0	0	973	3,231
2062	1,958	300	0	0	973	3,231



**TABLE 3.3b** (continued)  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,958	300	0	0	973	3,231
2064	1,963	300	0	0	976	3,239
2065	1,958	300	0	0	973	3,231
2066	1,958	300	0	0	973	3,231
2067	1,958	300	0	0	973	3,231
2068	1,963	300	0	0	976	3,239
2069	1,958	300	0	0	973	3,231
2070	1,958	300	0	0	973	3,231
2071	1,958	300	0	0	973	3,231
2072	1,963	300	0	0	976	3,239
2073	1,958	300	0	0	973	3,231
2074	1,958	300	0	0	973	3,231
2075	1,958	300	0	0	973	3,231
2076	1,963	300	0	0	976	3,239
2077	1,958	300	0	0	973	3,231
2078	1,958	300	0	0	973	3,231
2079	1,958	300	0	0	973	3,231
2080	1,963	300	0	0	976	3,239
2081	1,958	300	0	0	973	3,231
2082	1,958	300	0	0	973	3,231
2083	1,958	300	0	0	973	3,231
2084	1,963	300	0	0	976	3,239
2085	1,958	300	0	0	973	3,231
2086	1,958	300	0	0	973	3,231
2087	1,958	300	0	0	973	3,231
2088	1,963	300	0	0	976	3,239
2089	1,958	300	0	0	973	3,231
2090	1,958	300	0	0	973	3,231
2091	1,958	300	0	0	973	3,231
2092	1,963	300	0	0	976	3,239



**TABLE 3.3b (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	1,958	300	0	0	973	3,231
2094	1,958	300	0	0	973	3,231
2095	1,887	300	0	0	942	3,128
2096	0	0	0	0	0	0
Total	134,056	81,961	0	0	58,001	274,017



**TABLE 3.3c**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF SITE RESTORATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	272	0	0	0	0	272
2034	1,107	98	0	0	1	1,207
2035	1,616	238	0	0	2	1,856
2036	1,683	169	0	0	1	1,852
2037	1,706	137	0	0	0	1,843
2038	1,004	80	0	0	216	1,299
2039	12	0	0	0	209	221
2040	11,525	12,720	195	0	1,621	26,061
2041	13,658	15,074	231	0	1,920	30,883
2042	2,133	2,354	36	0	300	4,823
2043-95	0	0	0	0	0	0
2096	2,968	989	4	0	554	4,515
Total	37,685	31,859	465	0	4,823	74,832



**TABLE 3.4**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	44,711	12,281	2,065	23	8,167	67,247
2031	32,645	9,623	1,572	365	21,421	65,626
2032	11,989	8,725	462	9	4,251	25,437
2033	11,957	8,702	461	9	4,239	25,368
2034	11,957	8,702	461	9	4,239	25,368
2035	11,957	8,702	461	9	4,239	25,368
2036	11,989	8,725	462	9	4,251	25,437
2037	11,957	8,702	461	9	4,239	25,368
2038	8,444	5,186	364	7	3,044	17,046
2039	3,577	314	231	4	1,388	5,515
2040	3,587	315	231	4	1,392	5,530
2041	3,577	314	231	4	1,388	5,515
2042	3,577	314	231	4	1,388	5,515
2043	3,577	314	231	4	1,388	5,515
2044	3,587	315	231	4	1,392	5,530
2045	3,577	314	231	4	1,388	5,515
2046	3,577	314	231	4	1,388	5,515
2047	3,577	314	231	4	1,388	5,515
2048	3,587	315	231	4	1,392	5,530
2049	3,577	314	231	4	1,388	5,515
2050	3,577	314	231	4	1,388	5,515
2051	3,577	314	231	4	1,388	5,515
2052	3,587	315	231	4	1,392	5,530
2053	3,577	314	231	4	1,388	5,515
2054	3,577	314	231	4	1,388	5,515
2055	3,577	314	231	4	1,388	5,515
2056	3,687	615	231	4	1,392	5,930
2057	3,677	614	231	4	1,388	5,915
2058	3,677	614	231	4	1,388	5,915
2059	3,677	614	231	4	1,388	5,915



**TABLE 3.4 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	3,687	615	231	4	1,392	5,930
2061	3,677	614	231	4	1,388	5,915
2062	3,677	614	231	4	1,388	5,915
2063	3,677	614	231	4	1,388	5,915
2064	3,687	615	231	4	1,392	5,930
2065	3,677	614	231	4	1,388	5,915
2066	3,677	614	231	4	1,388	5,915
2067	3,677	614	231	4	1,388	5,915
2068	3,687	615	231	4	1,392	5,930
2069	3,677	614	231	4	1,388	5,915
2070	3,677	614	231	4	1,388	5,915
2071	3,677	614	231	4	1,388	5,915
2072	3,687	615	231	4	1,392	5,930
2073	3,677	614	231	4	1,388	5,915
2074	3,677	614	231	4	1,388	5,915
2075	3,677	614	231	4	1,388	5,915
2076	3,687	615	231	4	1,392	5,930
2077	3,677	614	231	4	1,388	5,915
2078	3,677	614	231	4	1,388	5,915
2079	3,677	614	231	4	1,388	5,915
2080	3,687	615	231	4	1,392	5,930
2081	3,677	614	231	4	1,388	5,915
2082	3,699	679	231	4	1,388	6,001
2083	35,596	4,478	1,856	18	1,468	43,416
2084	48,521	12,944	2,279	11,369	3,511	78,624
2085	51,121	29,809	2,190	40,622	8,707	132,449
2086	32,707	10,488	1,792	8,805	4,517	58,308
2087	29,784	7,421	1,729	3,754	3,851	46,540
2088	10,098	2,241	450	980	2,001	15,770
2089	16,196	1,179	299	14	1,603	19,291



**TABLE 3.4 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	13,103	6,571	255	2	1,011	20,941
2091	11,925	7,150	231	0	925	20,231
2092	3,009	1,037	24	0	956	5,026
2093	1,955	292	0	0	957	3,204
2094	1,955	292	0	0	957	3,204
2095	1,955	1,542	0	0	12,544	16,042
2096	3,466	1,344	12	3,073	3,260	11,156
Total	579,224	188,142	28,036	69,275	165,490	1,030,167



**TABLE 3.4a**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	41,024	1,221	2,065	23	7,270	51,602
2031	28,804	5,051	1,572	365	20,514	56,306
2032	3,376	430	462	8	3,485	7,762
2033	3,367	429	461	8	3,475	7,741
2034	3,367	429	461	8	3,475	7,741
2035	3,367	429	461	8	3,475	7,741
2036	3,376	430	462	8	3,485	7,762
2037	3,367	429	461	8	3,475	7,741
2038	2,676	381	364	7	2,574	6,002
2039	1,719	314	231	4	1,326	3,594
2040	1,723	315	231	4	1,329	3,603
2041	1,719	314	231	4	1,326	3,594
2042	1,719	314	231	4	1,326	3,594
2043	1,719	314	231	4	1,326	3,594
2044	1,723	315	231	4	1,329	3,603
2045	1,719	314	231	4	1,326	3,594
2046	1,719	314	231	4	1,326	3,594
2047	1,719	314	231	4	1,326	3,594
2048	1,723	315	231	4	1,329	3,603
2049	1,719	314	231	4	1,326	3,594
2050	1,719	314	231	4	1,326	3,594
2051	1,719	314	231	4	1,326	3,594
2052	1,723	315	231	4	1,329	3,603
2053	1,719	314	231	4	1,326	3,594
2054	1,719	314	231	4	1,326	3,594
2055	1,719	314	231	4	1,326	3,594
2056	1,723	315	231	4	1,329	3,603
2057	1,719	314	231	4	1,326	3,594
2058	1,719	314	231	4	1,326	3,594
2059	1,719	314	231	4	1,326	3,594



**TABLE 3.4a (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	1,723	315	231	4	1,329	3,603
2061	1,719	314	231	4	1,326	3,594
2062	1,719	314	231	4	1,326	3,594
2063	1,719	314	231	4	1,326	3,594
2064	1,723	315	231	4	1,329	3,603
2065	1,719	314	231	4	1,326	3,594
2066	1,719	314	231	4	1,326	3,594
2067	1,719	314	231	4	1,326	3,594
2068	1,723	315	231	4	1,329	3,603
2069	1,719	314	231	4	1,326	3,594
2070	1,719	314	231	4	1,326	3,594
2071	1,719	314	231	4	1,326	3,594
2072	1,723	315	231	4	1,329	3,603
2073	1,719	314	231	4	1,326	3,594
2074	1,719	314	231	4	1,326	3,594
2075	1,719	314	231	4	1,326	3,594
2076	1,723	315	231	4	1,329	3,603
2077	1,719	314	231	4	1,326	3,594
2078	1,719	314	231	4	1,326	3,594
2079	1,719	314	231	4	1,326	3,594
2080	1,723	315	231	4	1,329	3,603
2081	1,719	314	231	4	1,326	3,594
2082	1,719	314	231	4	1,326	3,594
2083	33,032	4,243	1,856	18	1,406	40,554
2084	44,978	12,603	2,279	11,369	3,448	74,677
2085	47,702	29,365	2,190	40,622	8,644	128,523
2086	29,801	10,117	1,792	8,805	4,454	54,969
2087	26,960	7,062	1,729	3,754	3,789	43,293
2088	8,311	1,925	450	980	1,938	13,605
2089	14,439	879	299	14	1,540	17,171
2090	2,325	134	48	2	175	2,684



**TABLE 3.4a (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2091	120	0	0	0	0	120
2092	13	0	0	0	0	13
2093	0	0	0	0	0	0
2094	0	0	0	0	0	0
2095	71	1,250	0	0	11,618	12,940
2096	498	223	8	3,073	2,705	6,508
Total	376,645	90,873	27,571	69,270	149,320	713,679



**TABLE 3.4b**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	3,687	11,061	0	0	897	15,644
2031	3,830	4,563	0	0	883	9,276
2032	8,586	8,273	0	0	706	17,564
2033	8,562	8,250	0	0	704	17,516
2034	8,562	8,250	0	0	704	17,516
2035	8,562	8,250	0	0	704	17,516
2036	8,586	8,273	0	0	706	17,564
2037	8,562	8,250	0	0	704	17,516
2038	5,752	4,792	0	0	435	10,979
2039	1,859	0	0	0	63	1,921
2040	1,864	0	0	0	63	1,926
2041	1,859	0	0	0	63	1,921
2042	1,859	0	0	0	63	1,921
2043	1,859	0	0	0	63	1,921
2044	1,864	0	0	0	63	1,926
2045	1,859	0	0	0	63	1,921
2046	1,859	0	0	0	63	1,921
2047	1,859	0	0	0	63	1,921
2048	1,864	0	0	0	63	1,926
2049	1,859	0	0	0	63	1,921
2050	1,859	0	0	0	63	1,921
2051	1,859	0	0	0	63	1,921
2052	1,864	0	0	0	63	1,926
2053	1,859	0	0	0	63	1,921
2054	1,859	0	0	0	63	1,921
2055	1,859	0	0	0	63	1,921
2056	1,964	300	0	0	63	2,326
2057	1,959	300	0	0	63	2,321
2058	1,959	300	0	0	63	2,321
2059	1,959	300	0	0	63	2,321



**TABLE 3.4b** (continued)  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	1,964	300	0	0	63	2,326
2061	1,959	300	0	0	63	2,321
2062	1,959	300	0	0	63	2,321
2063	1,959	300	0	0	63	2,321
2064	1,964	300	0	0	63	2,326
2065	1,959	300	0	0	63	2,321
2066	1,959	300	0	0	63	2,321
2067	1,959	300	0	0	63	2,321
2068	1,964	300	0	0	63	2,326
2069	1,959	300	0	0	63	2,321
2070	1,959	300	0	0	63	2,321
2071	1,959	300	0	0	63	2,321
2072	1,964	300	0	0	63	2,326
2073	1,959	300	0	0	63	2,321
2074	1,959	300	0	0	63	2,321
2075	1,959	300	0	0	63	2,321
2076	1,964	300	0	0	63	2,326
2077	1,959	300	0	0	63	2,321
2078	1,959	300	0	0	63	2,321
2079	1,959	300	0	0	63	2,321
2080	1,964	300	0	0	63	2,326
2081	1,959	300	0	0	63	2,321
2082	1,980	365	0	0	63	2,408
2083	1,989	235	0	0	63	2,286
2084	2,000	300	0	0	63	2,363
2085	1,915	300	0	0	63	2,277
2086	1,842	300	0	0	63	2,204
2087	1,830	300	0	0	63	2,192
2088	1,528	300	0	0	63	1,891
2089	1,757	300	0	0	63	2,119



**TABLE 3.4b (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	1,925	300	0	0	146	2,371
2091	1,923	300	0	0	156	2,379
2092	1,967	324	0	0	876	3,167
2093	1,955	292	0	0	957	3,204
2094	1,955	292	0	0	957	3,204
2095	1,884	292	0	0	926	3,102
2096	0	0	0	0	0	0
Total	173,715	81,961	0	0	13,653	269,329



**TABLE 3.4c**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SITE RESTORATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	0	0	0	0	0	0
2031	11	9	0	0	24	44
2032	27	22	0	0	62	111
2033	27	22	0	0	61	111
2034	27	22	0	0	61	111
2035	27	22	0	0	61	111
2036	27	22	0	0	62	111
2037	27	22	0	0	61	111
2038	16	13	0	0	36	65
2039-82	0	0	0	0	0	0
2083	576	0	0	0	0	576
2084	1,544	40	0	0	0	1,584
2085	1,505	144	0	0	0	1,648
2086	1,064	71	0	0	0	1,136
2087	995	60	0	0	0	1,054
2088	259	16	0	0	0	274
2089	0	0	0	0	0	0
2090	8,853	6,137	207	0	690	15,886
2091	9,882	6,850	231	0	770	17,732
2092	1,029	713	24	0	80	1,846
2093	0	0	0	0	0	0
2094	0	0	0	0	0	0
2095	0	0	0	0	0	0
2096	2,968	1,121	4	0	554	4,648
Total	28,864	15,308	465	0	2,523	47,160



**TABLE 3.5**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	42,642	12,507	2,103	23	5,145	62,420
2034	35,716	13,638	1,542	396	14,913	66,205
2035	18,776	15,000	461	11	4,555	38,803
2036	18,828	15,041	462	11	4,568	38,910
2037	18,776	15,000	461	11	4,555	38,803
2038	12,520	8,882	364	8	3,256	25,032
2039	3,852	406	231	4	1,457	5,949
2040	3,862	407	231	4	1,461	5,965
2041	3,852	406	231	4	1,457	5,949
2042	3,852	406	231	4	1,457	5,949
2043	3,852	406	231	4	1,457	5,949
2044	3,862	407	231	4	1,461	5,965
2045	3,852	406	231	4	1,457	5,949
2046	3,852	406	231	4	1,457	5,949
2047	3,852	406	231	4	1,457	5,949
2048	3,862	407	231	4	1,461	5,965
2049	3,852	406	231	4	1,457	5,949
2050	3,852	406	231	4	1,457	5,949
2051	3,852	406	231	4	1,457	5,949
2052	3,862	407	231	4	1,461	5,965
2053	3,852	406	231	4	1,457	5,949
2054	3,852	406	231	4	1,457	5,949
2055	3,852	406	231	4	1,457	5,949
2056	3,962	707	231	4	1,461	6,365
2057	3,952	706	231	4	1,457	6,349
2058	3,952	706	231	4	1,457	6,349
2059	3,952	706	231	4	1,457	6,349
2060	3,962	707	231	4	1,461	6,365
2061	3,952	706	231	4	1,457	6,349



**TABLE 3.5 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2062	3,952	706	231	4	1,457	6,349
2063	3,952	706	231	4	1,457	6,349
2064	3,962	707	231	4	1,461	6,365
2065	3,952	706	231	4	1,457	6,349
2066	3,952	706	231	4	1,457	6,349
2067	3,952	706	231	4	1,457	6,349
2068	3,962	707	231	4	1,461	6,365
2069	3,952	706	231	4	1,457	6,349
2070	3,952	706	231	4	1,457	6,349
2071	3,952	706	231	4	1,457	6,349
2072	3,962	707	231	4	1,461	6,365
2073	3,952	706	231	4	1,457	6,349
2074	3,952	706	231	4	1,457	6,349
2075	3,952	706	231	4	1,457	6,349
2076	3,962	707	231	4	1,461	6,365
2077	3,952	706	231	4	1,457	6,349
2078	3,952	706	231	4	1,457	6,349
2079	3,952	706	231	4	1,457	6,349
2080	3,962	707	231	4	1,461	6,365
2081	3,952	706	231	4	1,457	6,349
2082	3,952	706	231	4	1,457	6,349
2083	3,962	736	231	4	1,457	6,390
2084	27,626	3,300	2,101	19	1,447	34,492
2085	42,072	16,011	2,258	13,468	3,606	77,415
2086	54,192	30,141	2,190	32,960	6,743	126,226
2087	46,028	11,229	1,731	7,901	4,129	71,018
2088	43,210	10,088	1,574	6,892	3,668	65,433
2089	26,095	3,275	623	1,149	4,573	35,715
2090	16,268	14,167	255	2	3,180	33,872



**TABLE 3.5 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2091	15,452	15,586	231	0	2,844	34,112
2092	3,376	1,915	24	0	1,156	6,471
2093	1,955	292	0	0	957	3,204
2094	1,955	292	0	0	957	3,204
2095	1,955	1,542	0	0	12,544	16,042
2096	3,466	1,212	12	3,073	3,260	11,023
Total	607,169	215,826	26,772	66,117	151,644	1,067,529



**TABLE 3.5a**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	38,888	1,243	2,103	23	4,232	46,489
2034	29,109	6,577	1,542	395	13,991	51,614
2035	3,679	547	461	10	3,745	8,442
2036	3,689	549	462	10	3,756	8,465
2037	3,679	547	461	10	3,745	8,442
2038	2,972	488	364	7	2,760	6,592
2039	1,993	406	231	4	1,394	4,028
2040	1,999	407	231	4	1,398	4,039
2041	1,993	406	231	4	1,394	4,028
2042	1,993	406	231	4	1,394	4,028
2043	1,993	406	231	4	1,394	4,028
2044	1,999	407	231	4	1,398	4,039
2045	1,993	406	231	4	1,394	4,028
2046	1,993	406	231	4	1,394	4,028
2047	1,993	406	231	4	1,394	4,028
2048	1,999	407	231	4	1,398	4,039
2049	1,993	406	231	4	1,394	4,028
2050	1,993	406	231	4	1,394	4,028
2051	1,993	406	231	4	1,394	4,028
2052	1,999	407	231	4	1,398	4,039
2053	1,993	406	231	4	1,394	4,028
2054	1,993	406	231	4	1,394	4,028
2055	1,993	406	231	4	1,394	4,028
2056	1,999	407	231	4	1,398	4,039
2057	1,993	406	231	4	1,394	4,028
2058	1,993	406	231	4	1,394	4,028
2059	1,993	406	231	4	1,394	4,028
2060	1,999	407	231	4	1,398	4,039
2061	1,993	406	231	4	1,394	4,028
2062	1,993	406	231	4	1,394	4,028



**TABLE 3.5a (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,993	406	231	4	1,394	4,028
2064	1,999	407	231	4	1,398	4,039
2065	1,993	406	231	4	1,394	4,028
2066	1,993	406	231	4	1,394	4,028
2067	1,993	406	231	4	1,394	4,028
2068	1,999	407	231	4	1,398	4,039
2069	1,993	406	231	4	1,394	4,028
2070	1,993	406	231	4	1,394	4,028
2071	1,993	406	231	4	1,394	4,028
2072	1,999	407	231	4	1,398	4,039
2073	1,993	406	231	4	1,394	4,028
2074	1,993	406	231	4	1,394	4,028
2075	1,993	406	231	4	1,394	4,028
2076	1,999	407	231	4	1,398	4,039
2077	1,993	406	231	4	1,394	4,028
2078	1,993	406	231	4	1,394	4,028
2079	1,993	406	231	4	1,394	4,028
2080	1,999	407	231	4	1,398	4,039
2081	1,993	406	231	4	1,394	4,028
2082	1,993	406	231	4	1,394	4,028
2083	1,993	406	231	4	1,394	4,028
2084	25,457	3,031	2,101	19	1,384	31,991
2085	38,955	15,640	2,258	13,468	3,544	73,864
2086	50,375	29,665	2,190	32,960	6,681	121,871
2087	41,771	10,756	1,731	7,901	4,067	66,225
2088	39,360	9,648	1,574	6,892	3,606	61,080
2089	24,066	2,975	623	1,149	4,511	33,324
2090	2,265	172	48	2	626	3,113
2091	52	0	0	0	0	52
2092	5	0	0	0	0	5



**TABLE 3.5a (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	0	0	0	0	0	0
2094	0	0	0	0	0	0
2095	71	1,250	0	0	11,618	12,940
2096	498	223	8	3,073	2,705	6,508
Total	394,649	101,589	26,307	66,112	133,739	722,396



**TABLE 3.5b**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	3,755	11,264	0	0	913	15,932
2034	6,587	7,045	0	0	878	14,510
2035	15,050	14,414	0	0	704	30,167
2036	15,091	14,453	0	0	706	30,250
2037	15,050	14,414	0	0	704	30,167
2038	9,520	8,372	0	0	435	18,327
2039	1,859	0	0	0	63	1,921
2040	1,864	0	0	0	63	1,926
2041	1,859	0	0	0	63	1,921
2042	1,859	0	0	0	63	1,921
2043	1,859	0	0	0	63	1,921
2044	1,864	0	0	0	63	1,926
2045	1,859	0	0	0	63	1,921
2046	1,859	0	0	0	63	1,921
2047	1,859	0	0	0	63	1,921
2048	1,864	0	0	0	63	1,926
2049	1,859	0	0	0	63	1,921
2050	1,859	0	0	0	63	1,921
2051	1,859	0	0	0	63	1,921
2052	1,864	0	0	0	63	1,926
2053	1,859	0	0	0	63	1,921
2054	1,859	0	0	0	63	1,921
2055	1,859	0	0	0	63	1,921
2056	1,964	300	0	0	63	2,326
2057	1,959	300	0	0	63	2,321
2058	1,959	300	0	0	63	2,321
2059	1,959	300	0	0	63	2,321
2060	1,964	300	0	0	63	2,326
2061	1,959	300	0	0	63	2,321
2062	1,959	300	0	0	63	2,321



**TABLE 3.5b** (continued)  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,959	300	0	0	63	2,321
2064	1,964	300	0	0	63	2,326
2065	1,959	300	0	0	63	2,321
2066	1,959	300	0	0	63	2,321
2067	1,959	300	0	0	63	2,321
2068	1,964	300	0	0	63	2,326
2069	1,959	300	0	0	63	2,321
2070	1,959	300	0	0	63	2,321
2071	1,959	300	0	0	63	2,321
2072	1,964	300	0	0	63	2,326
2073	1,959	300	0	0	63	2,321
2074	1,959	300	0	0	63	2,321
2075	1,959	300	0	0	63	2,321
2076	1,964	300	0	0	63	2,326
2077	1,959	300	0	0	63	2,321
2078	1,959	300	0	0	63	2,321
2079	1,959	300	0	0	63	2,321
2080	1,964	300	0	0	63	2,326
2081	1,959	300	0	0	63	2,321
2082	1,959	300	0	0	63	2,321
2083	1,969	330	0	0	63	2,362
2084	1,885	270	0	0	63	2,218
2085	1,923	300	0	0	63	2,286
2086	1,982	300	0	0	63	2,345
2087	2,090	300	0	0	63	2,452
2088	2,103	300	0	0	63	2,467
2089	2,029	300	0	0	63	2,391
2090	1,960	300	0	0	146	2,406
2091	1,958	300	0	0	156	2,413
2092	1,971	324	0	0	876	3,171



**TABLE 3.5b** (continued)  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	1,955	292	0	0	957	3,204
2094	1,955	292	0	0	957	3,204
2095	1,884	292	0	0	926	3,102
2096	0	0	0	0	0	0
Total	175,250	81,961	0	0	11,551	268,762



**TABLE 3.5c**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF SITE RESTORATION EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	0	0
2034	20	16	0	0	44	80
2035	48	39	0	0	107	194
2036	48	39	0	0	107	195
2037	48	39	0	0	107	194
2038	28	23	0	0	62	113
2039-2083	0	0	0	0	0	0
2084	283	0	0	0	0	283
2085	1,193	72	0	0	0	1,264
2086	1,835	175	0	0	0	2,010
2087	2,167	173	0	0	0	2,341
2088	1,747	140	0	0	0	1,887
2089	0	0	0	0	0	0
2090	12,044	13,694	207	0	2,408	28,353
2091	13,443	15,286	231	0	2,688	31,648
2092	1,400	1,591	24	0	280	3,295
2093	0	0	0	0	0	0
2094	0	0	0	0	0	0
2095	0	0	0	0	0	0
2096	2,968	989	4	0	554	4,515
Total	37,270	32,277	465	0	6,359	76,371



## **4. SCHEDULE ESTIMATE**

The schedules for the decommissioning scenarios considered in this study follow the sequences presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plan described in Section 3.5.1.

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

### **4.1 SCHEDULE ESTIMATE ASSUMPTIONS**

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

- The fuel building is isolated until such time that all spent fuel has been discharged from the spent fuel pools to the ISFSI for interim storage. Decontamination and dismantling of the storage pools is initiated once the transfer of spent fuel is complete (DECON alternative).
- All work (except vessel and internals removal) is 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 are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.



## **4.2 PROJECT SCHEDULE**

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

Project timelines are provided in Figures 4.2 and 4.3, with milestone dates based on the 2030 and 2033 shutdown dates for Units 1 and 2, respectively. The fuel pools are emptied approximately five and one half years after Unit 2 shutdown, while ISFSI operations continue until the DOE can complete the transfer of assemblies. Deferred decommissioning in the SAFSTOR alternative is assumed to commence so that the site can be released for alternative use, excluding the ISFSI, within a 60-year period from the cessation of plant operations.



FIGURE 4.1  
DECON ACTIVITY SCHEDULE

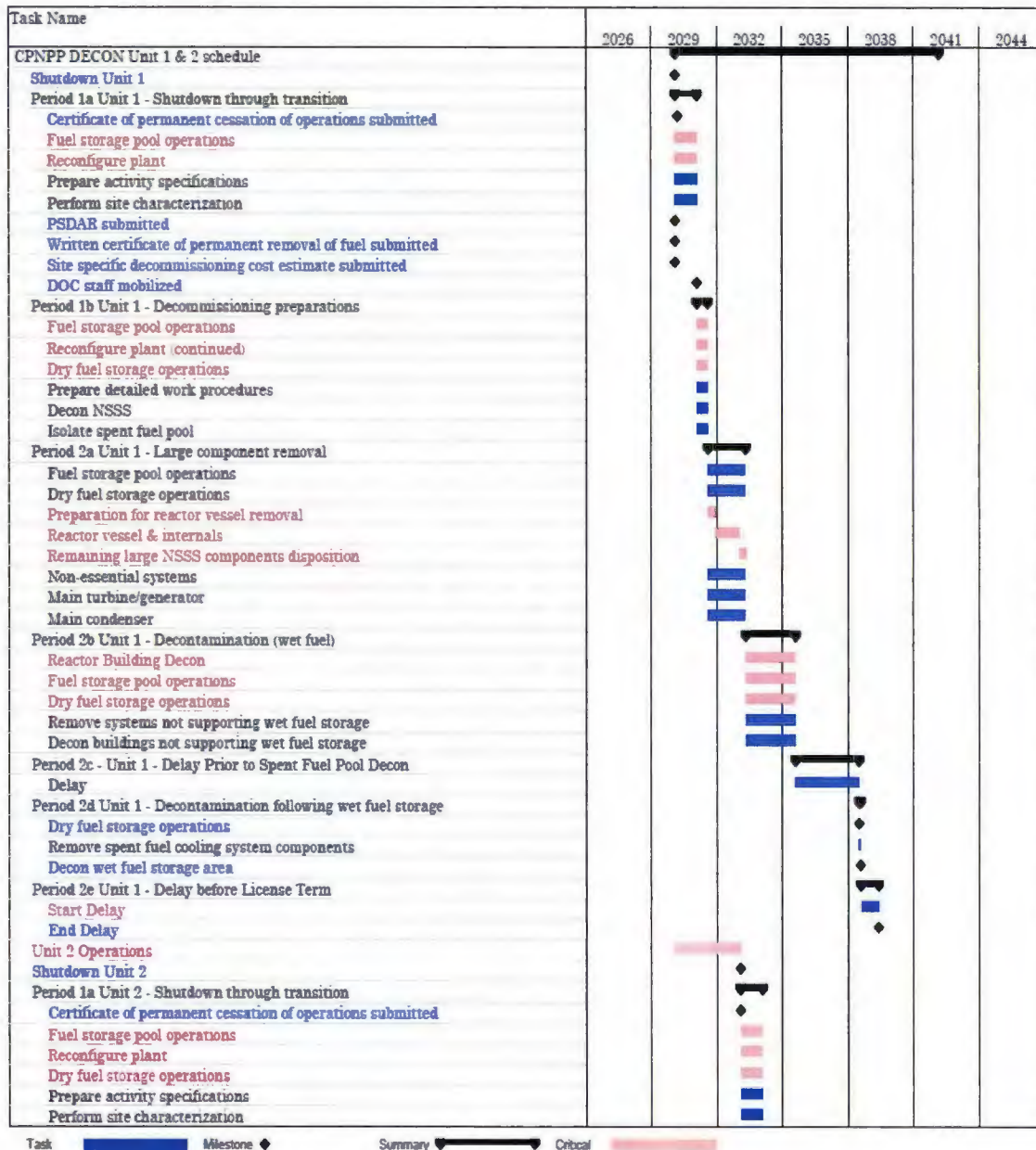


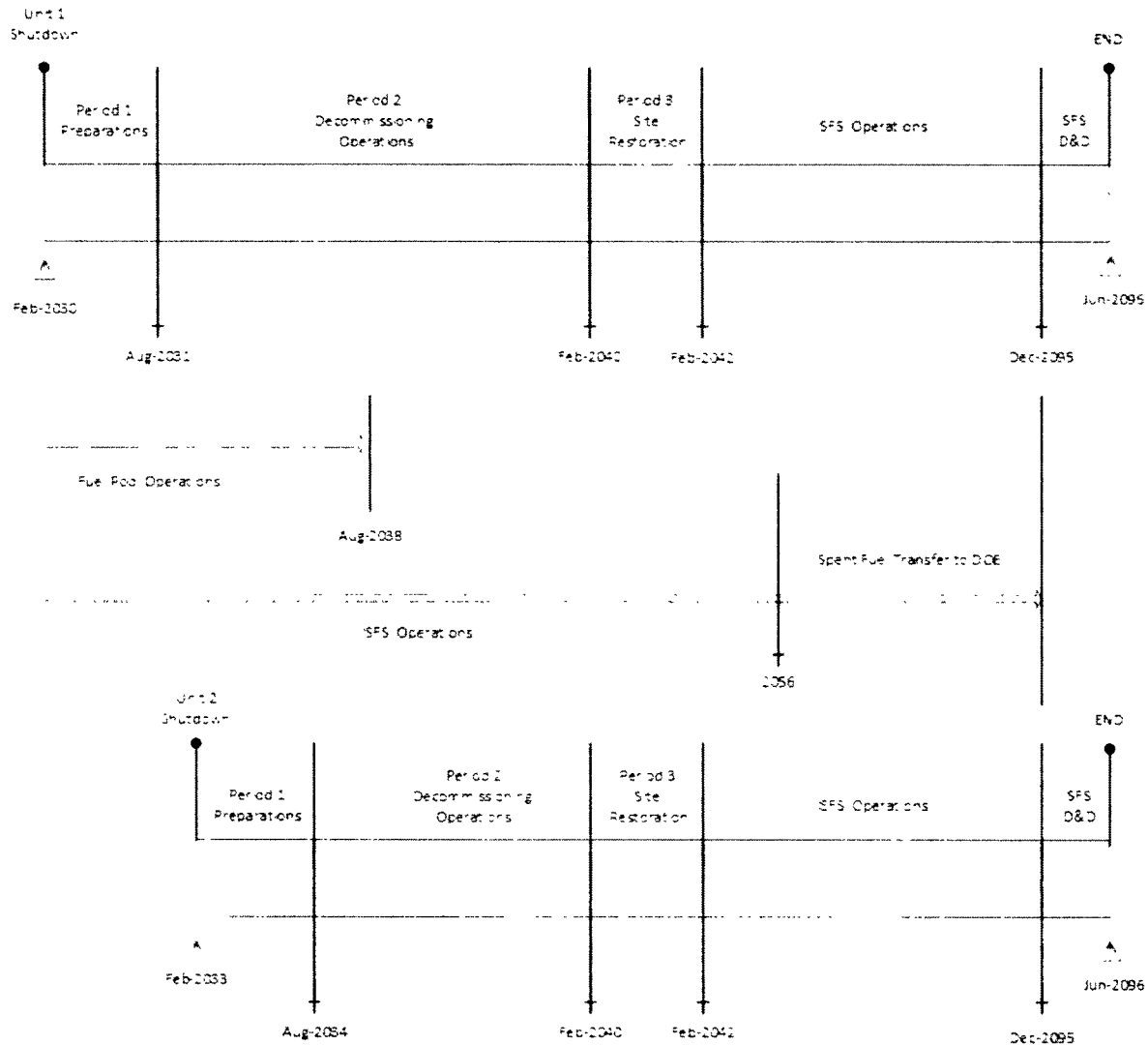


FIGURE 4.1 (continued)  
DECON ACTIVITY SCHEDULE



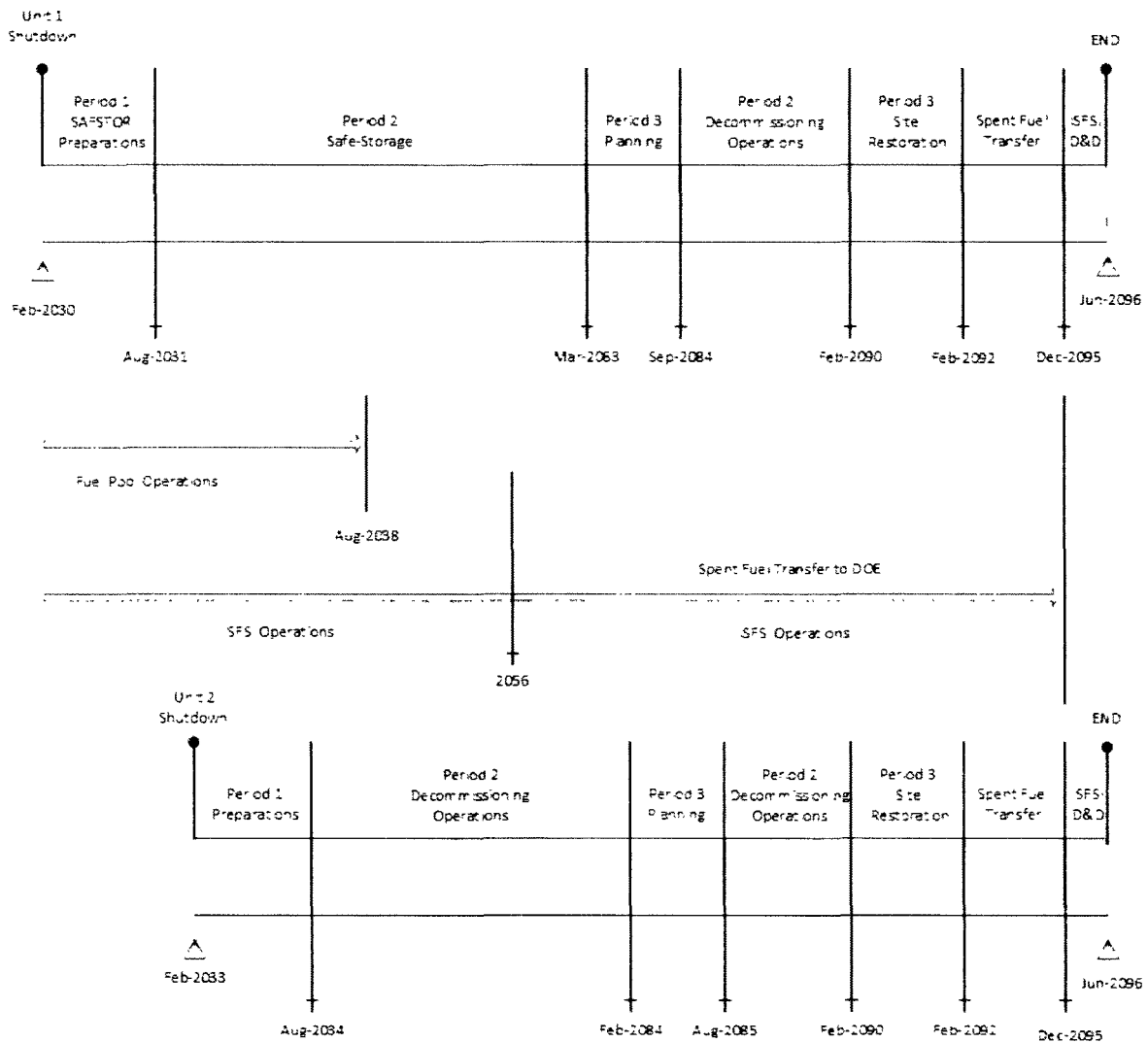


**FIGURE 4.2**  
**DECOMMISSIONING TIMELINE**  
**DECON**  
(not to scale)





**FIGURE 4.3**  
**DECOMMISSIONING TIMELINE**  
**SAFSTOR**  
(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. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,<sup>[34]</sup> the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

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

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

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping 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 <sup>137</sup>Cs will still control the disposition requirements.

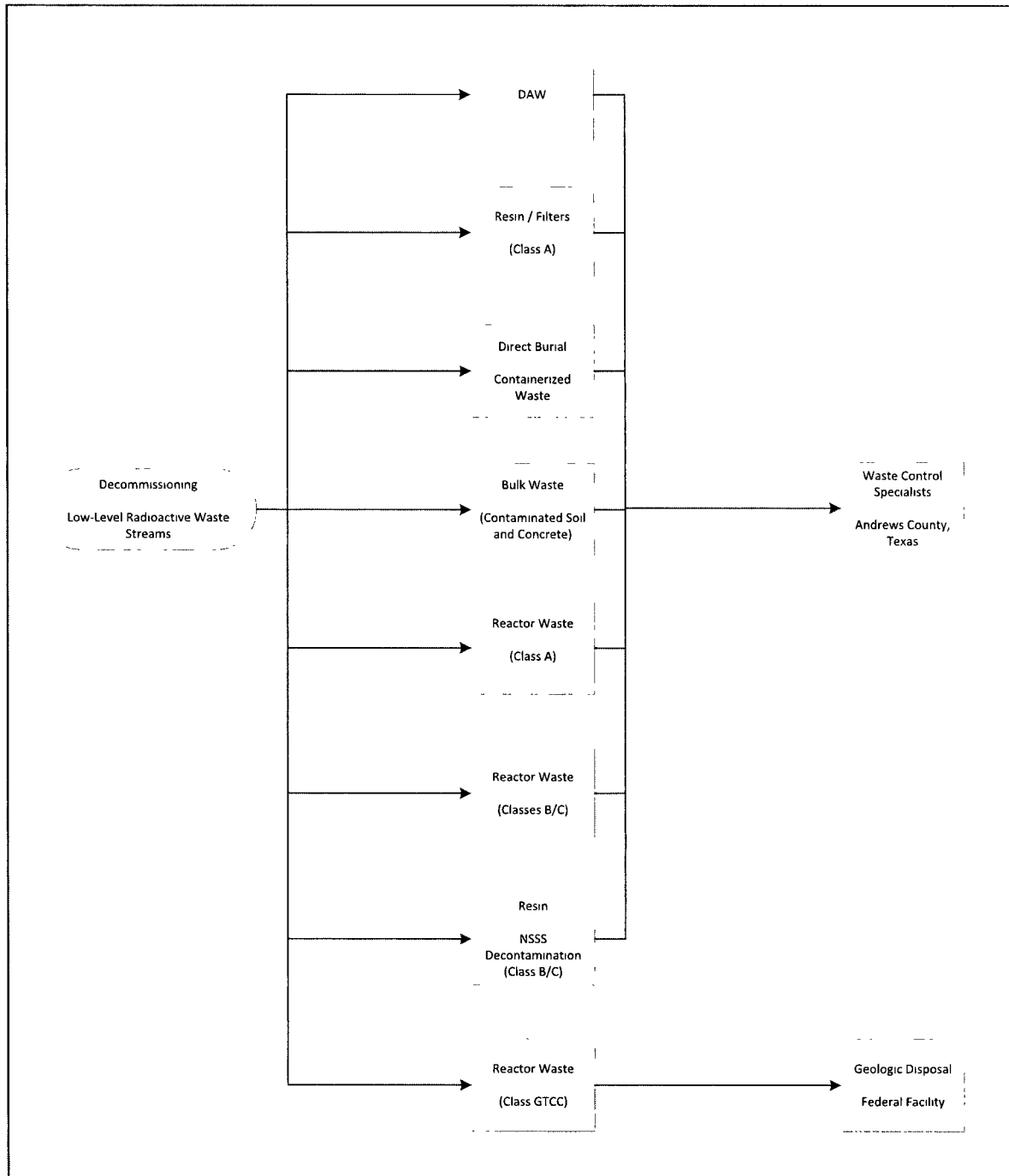


The waste material produced in the decontamination and dismantling of the nuclear plants is primarily generated during Period 2 of DECON and Period 4 of SAFSTOR. Contaminated components and activated materials are routed for controlled disposal.

For purposes of constructing the estimates, waste disposal costs are based upon CPPC's current rates for disposal at the Texas Compact facility, operated by Waste Control Specialists.



**FIGURE 5.1  
RADIOACTIVE WASTE DISPOSITION**





**FIGURE 5.2  
DECOMMISSIONING WASTE DESTINATIONS  
RADIOLOGICAL**





**TABLE 5.1**  
**DECON ALTERNATIVE**  
**DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	Waste Control Specialists (WCS)	A	777,961	55,072,098
		B	3,653	418,723
		C	673	90,169
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	4,123	803,947
Total <sup>[2]</sup>			786,410	56,384,937

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

<sup>[2]</sup> Columns may not add due to rounding



**TABLE 5.2**  
**SAFSTOR ALTERNATIVE**  
**DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	Waste Control Specialists (WCS)	A	774,980	54,114,229
		B	1,002	101,000
		C	811	90,705
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	4,123	803,947
Total <sup>[2]</sup>			780,916	55,109,881

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

<sup>[2]</sup> Columns may not add due to rounding.



## **6. RESULTS**

The analysis to estimate the costs to decommission Comanche Peak relied upon the site-specific, technical information developed for a previous analysis prepared in 2014, updated to reflect current assumptions pertaining to the disposition of the nuclear station and relevant industry experience in undertaking such projects. While not an engineering study, the estimates provide CPPC with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

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

The cost projected to promptly decommission the station (DECON), manage the spent fuel, and restore the site, is estimated to be \$1.846 billion. The majority of this cost (approximately 63.7%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 29.8% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 6.5% is for the demolition of the designated structures and limited restoration of the site.

The cost projected for deferred decommissioning (SAFSTOR) is estimated to be \$2.098 billion. The majority of this cost (approximately 68.5%) is associated with placing the plant in storage, ongoing caretaking of the plant during dormancy, and the eventual physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 25.7% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 5.9% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 and 6.2, are either labor-related or associated with the management and disposition of the radioactive waste. Program management is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that CPPC will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. CPPC 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 CPPC. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating licenses are terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative). Finally, both the estimates for DECON and SAFSTOR include the costs of disposing of the retired steam generators, the reactor vessel closure head, and spare high and low pressure turbine rotors from Unit 1. The study assumes that the disposal of the components would occur after shutdown, however, the costs are identified separately because the disposal activities could be conducted at any time.

As described in this report, the spent fuel pools will remain operational for a minimum of five and one half years following the cessation of operations. The pools will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool areas. Over the five and one half-year period, the spent fuel will be packaged into transportable canisters for relocation to the ISFSI.

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

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

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



general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure.

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

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



**TABLE 6.1**  
**DECON ALTERNATIVE**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2019 dollars)

Cost Element	Total	Percentage
Decontamination	28,398	1.5
Removal	224,603	12.2
Packaging	61,943	3.4
Transportation	20,601	1.1
Waste Disposal	164,165	8.9
Off-site Waste Processing <sup>[1]</sup>	0	0.0
Program Management <sup>[2]</sup>	580,512	31.4
Security	243,931	13.2
Spent Fuel Pool(s) Isolation	23,624	1.3
Spent Fuel Management (Direct Costs) <sup>[3]</sup>	256,737	13.9
Insurance and Regulatory Fees	66,242	3.6
Energy	32,124	1.7
Characterization and Licensing Surveys	34,207	1.9
Property Taxes	66,300	3.6
Miscellaneous Equipment	18,878	1.0
Decommissioning Staff Severance	23,701	1.3
Total <sup>[4]</sup>	1,845,964	100.0

Cost Element	Total	Percentage
License Termination	1,175,558	63.7
Spent Fuel Management	549,946	29.8
Site Restoration	120,461	6.5
Total <sup>[4]</sup>	1,845,964	100.0

<sup>[1]</sup> Not currently cost competitive with direct waste disposal

<sup>[2]</sup> Includes engineering costs

<sup>[3]</sup> Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pools O&M and EP fees

<sup>[4]</sup> Columns may not add due to rounding



**TABLE 6.2**  
**SAFSTOR ALTERNATIVE**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2019 dollars)

Cost Element	Total	Percentage
Decontamination	25,272	1.2
Removal	229,642	10.9
Packaging	52,075	2.5
Transportation	17,613	0.8
Waste Disposal	158,571	7.6
Off-site Waste Processing <sup>[1]</sup>	0	0.0
Program Management <sup>[2]</sup>	684,008	32.6
Security	308,280	14.7
Spent Fuel Pool(s) Isolation	23,624	1.1
Spent Fuel Management (Direct Costs) <sup>[3]</sup>	242,335	11.6
Insurance and Regulatory Fees	116,823	5.6
Energy	54,808	2.6
Characterization and Licensing Surveys	34,243	1.6
Property Taxes	66,300	3.2
Miscellaneous Equipment	60,404	2.9
Decommissioning Staff Severance	23,701	1.1
Total <sup>[4]</sup>	2,097,696	100.0

Cost Element	Total	Percentage
License Termination	1,436,075	68.5
Spent Fuel Management	538,090	25.7
Site Restoration	123,531	5.9
Total <sup>[4]</sup>	2,097,696	100.0

<sup>[1]</sup> Not currently cost competitive with direct waste disposal

<sup>[2]</sup> Includes engineering costs

<sup>[3]</sup> Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pools O&M and EP fees

<sup>[4]</sup> Columns may not add due to rounding



## **7. REFERENCES**

1. "Decommissioning Cost Study for the Comanche Peak Nuclear Power Plant," Document L11-1703-001, Rev. 0, TLG Services, Inc., May 2015
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, 53 Fed. Reg., 24018-, June 27, 1988 [\[Open\]](#)
3. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Rev. 2, October 2011 [\[Open\]](#)
4. "Regulatory Improvement for Power Reactors Transitioning to Decommissioning," NRC Regulatory Basis Document, Docket ID NRC-2015-0070, RIN Number 3150-AJ59, November 20, 2017 [\[Open\]](#)
5. U.S. Code of Federal Regulations, Title 10, Parts 2, 50 and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, 61 Fed. Reg. 39278, July 29, 1996 [\[Open\]](#)
6. 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 [\[Open\]](#)
7. "Low Level Radioactive Waste Policy Act," Public Law 96-573, 1980. [\[Open\]](#)
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9. "Nuclear Waste Policy Act of 1982," 42 U.S. Code 10101, et seq. [\[Open\]](#)
10. Charter of the Blue Ribbon Commission on America's Nuclear Future, "Objectives and Scope of Activities," Activities" [\[Open\]](#)
11. "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," p. 32, January 2012 [\[Open\]](#)
12. "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013 [\[Open\]](#)



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15. U.S. Code of Federal Regulations, Title 10, Part 72, Subpart K, "General License for Storage of Spent Fuel at Power Reactor Sites" [\[Open\]](#)
16. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, Final Rule, "Radiological Criteria for License Termination," 62 Fed. Reg. 39058, July 21, 1997 [\[Open\]](#)
17. "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," EPA Memorandum OSWER No. 9200.4-18, August 22, 1997 [\[Open\]](#)
18. U.S. Code of Federal Regulations, Title 40, Part 141.66, "Maximum contaminant levels for radionuclides" [\[Open\]](#)
19. "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites," OSWER 9295.8-06a, October 9, 2002 [\[Open\]](#)
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32. SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," June 2000 [\[Open\]](#)
33. "Microsoft Project Professional," Microsoft Corporation, Redmond, WA
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**APPENDIX A**  
**UNIT COST FACTOR DEVELOPMENT**



## APPENDIX A UNIT COST FACTOR DEVELOPMENT

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

### 1. SCOPE

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

### 2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	<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% of critical duration) 95

Adjusted work duration 478

+ Protective clothing adjustment (30% of adjusted duration) 143

Productive work duration 621

+ Work break adjustment (8.33 % of productive duration) 52

Total work duration (minutes) 673

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

\* alpha designators indicate activities that can be performed in parallel



**APPENDIX A  
(continued)**

**3. LABOR REQUIRED**

Crew	Number	Duration (hours)	Rate (\$/hr)	Cost
Laborers	3.00	11.217	\$23.37	\$786.42
Craftsmen	2.00	11.217	\$37.54	\$842.17
Foreman	1.00	11.217	\$42.51	\$476.83
General Foreman	0.25	11.217	\$45.31	\$127.06
Fire Watch	0.05	11.217	\$23.37	\$13.11
Health Physics Technician	1.00	11.217	\$38.74	<u>\$434.55</u>
Total Labor Cost				\$2,680.14

**4. EQUIPMENT & CONSUMABLES COSTS**

Equipment Costs	none
Consumables/Materials Costs	
-Universal Sorbent 50 @ \$0.70 sq ft <sup>(1)</sup>	\$35.00
-Tarpaulins (oil resistant/fire retardant) 50 @ \$0.54/sq ft <sup>(2)</sup>	\$27.00
-Gas torch consumables 1 @ \$22.43/hr x 1 hr <sup>(3)</sup>	<u>\$22.43</u>
Subtotal cost of equipment and materials	\$84.43
Overhead & profit on equipment and materials @ 16.25 %	<u>\$13.72</u>
Total costs, equipment & material	\$98.15

**TOTAL COST:**

<b>Removal of contaminated heat exchanger &lt;3000 pounds:</b>	<b>\$2,778.29</b>
Total labor cost:	\$2,680.14
Total equipment/material costs:	\$98.15
Total craft labor man-hours required per unit:	81.88



## **5. NOTES AND REFERENCES**

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.
- References for equipment & consumables costs:
  1. [www.mcmaster.com](http://www.mcmaster.com) online catalog, McMaster Carr Spill Control (7193T88)
  2. R.S. Means (2019) Division 01 56, Section 13.60-0600, page 23
  3. R.S. Means (2019) Division 01 54 33, Section 40-6360, page 736
- Material and consumable costs were adjusted using the regional indices for Dallas, Texas.



**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	0.28
Removal of clean pipe 0.25 to 2 inches diameter, \$/linear foot	2.95
Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	4.37
Removal of clean pipe >4 to 8 inches diameter, \$/linear foot	8.79
Removal of clean pipe >8 to 14 inches diameter, \$/linear foot	16.51
Removal of clean pipe >14 to 20 inches diameter, \$/linear foot	21.69
Removal of clean pipe >20 to 36 inches diameter, \$/linear foot	31.86
Removal of clean pipe >36 inches diameter, \$/linear foot	37.75
Removal of clean valve >2 to 4 inches	58.98
Removal of clean valve >4 to 8 inches	87.92
Removal of clean valve >8 to 14 inches	165.05
Removal of clean valve >14 to 20 inches	216.92
Removal of clean valve >20 to 36 inches	318.57
Removal of clean valve >36 inches	377.48
Removal of clean pipe hanger for small bore piping	22.98
Removal of clean pipe hanger for large bore piping	73.37
Removal of clean pump, <300 pound	153.24
Removal of clean pump, 300-1000 pound	424.68
Removal of clean pump, 1000-10,000 pound	1,640.49
Removal of clean pump, >10,000 pound	3,189.82
Removal of clean pump motor, 300-1000 pound	173.58
Removal of clean pump motor, 1000-10,000 pound	675.84
Removal of clean pump motor, >10,000 pound	1,520.64
Removal of clean heat exchanger <3000 pound	893.52
Removal of clean heat exchanger >3000 pound	2,273.02
Removal of clean feedwater heater/deaerator	6,318.47
Removal of clean moisture separator/reheater	12,871.52
Removal of clean tank, <300 gallons	196.54
Removal of clean tank, 300-3000 gallon	610.39
Removal of clean tank, >3000 gallons, \$/square foot surface area	5.28



## **APPENDIX B**

### **UNIT COST FACTOR LISTING (Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of clean electrical equipment, <300 pound	79.73
Removal of clean electrical equipment, 300-1000 pound	282.60
Removal of clean electrical equipment, 1000-10,000 pound	565.20
Removal of clean electrical equipment, >10,000 pound	1,370.12
Removal of clean electrical transformer < 30 tons	951.54
Removal of clean electrical transformer > 30 tons	2,740.26
Removal of clean standby diesel generator, <100 kW	971.92
Removal of clean standby diesel generator, 100 kW to 1 MW	2,169.37
Removal of clean standby diesel generator, >1 MW	4,491.03
Removal of clean electrical cable tray, \$/linear foot	7.74
Removal of clean electrical conduit, \$/linear foot	3.40
Removal of clean mechanical equipment, <300 pound	79.73
Removal of clean mechanical equipment, 300-1000 pound	282.60
Removal of clean mechanical equipment, 1000-10,000 pound	565.20
Removal of clean mechanical equipment, >10,000 pound	1,370.12
Removal of clean HVAC equipment, <300 pound	96.41
Removal of clean HVAC equipment, 300-1000 pound	339.58
Removal of clean HVAC equipment, 1000-10,000 pound	676.76
Removal of clean HVAC equipment, >10,000 pound	1,370.12
Removal of clean HVAC ductwork, \$/pound	0.30
Removal of contaminated instrument and sampling tubing, \$/linear foot	0.96
Removal of contaminated pipe 0.25 to 2 inches diameter, \$/linear foot	16.98
Removal of contaminated pipe >2 to 4 inches diameter, \$/linear foot	26.49
Removal of contaminated pipe >4 to 8 inches diameter, \$/linear foot	41.94
Removal of contaminated pipe >8 to 14 inches diameter, \$/linear foot	78.61
Removal of contaminated pipe >14 to 20 inches diameter, \$/linear foot	93.01
Removal of contaminated pipe >20 to 36 inches diameter, \$/linear foot	125.50
Removal of contaminated pipe >36 inches diameter, \$/linear foot	146.72
Removal of contaminated valve >2 to 4 inches	304.27
Removal of contaminated valve >4 to 8 inches	357.67



## **APPENDIX B**

### **UNIT COST FACTOR LISTING (Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of contaminated valve >8 to 14 inches	714.04
Removal of contaminated valve >14 to 20 inches	898.65
Removal of contaminated valve >20 to 36 inches	1,182.93
Removal of contaminated valve >36 inches	1,395.10
Removal of contaminated pipe hanger for small bore piping	100.72
Removal of contaminated pipe hanger for large bore piping	330.15
Removal of contaminated pump, <300 pound	647.02
Removal of contaminated pump, 300-1000 pound	1,485.28
Removal of contaminated pump, 1000-10,000 pound	4,538.08
Removal of contaminated pump, >10,000 pound	11,047.09
Removal of contaminated pump motor, 300-1000 pound	675.28
Removal of contaminated pump motor, 1000-10,000 pound	1,891.42
Removal of contaminated pump motor, >10,000 pound	4,246.86
Removal of contaminated heat exchanger <3000 pound	2,778.29
Removal of contaminated heat exchanger >3000 pound	8,198.72
Removal of contaminated tank, <300 gallons	1,086.50
Removal of contaminated tank, >300 gallons, \$/square foot	20.05
Removal of contaminated electrical equipment, <300 pound	475.56
Removal of contaminated electrical equipment, 300-1000 pound	1,175.08
Removal of contaminated electrical equipment, 1000-10,000 pound	2,265.99
Removal of contaminated electrical equipment, >10,000 pound	4,530.43
Removal of contaminated electrical cable tray, \$/linear foot	23.12
Removal of contaminated electrical conduit, \$/linear foot	12.92
Removal of contaminated mechanical equipment, <300 pound	528.02
Removal of contaminated mechanical equipment, 300-1000 pound	1,293.94
Removal of contaminated mechanical equipment, 1000-10,000 pound	2,490.96
Removal of contaminated mechanical equipment, >10,000 pound	4,530.43
Removal of contaminated HVAC equipment, <300 pound	528.02
Removal of contaminated HVAC equipment, 300-1000 pound	1,293.94
Removal of contaminated HVAC equipment, 1000-10,000 pound	2,490.96



## APPENDIX B

### UNIT COST FACTOR LISTING (Power Block Structures Only)

Unit Cost Factor	Cost/Unit(\$)
Removal of contaminated HVAC equipment, >10,000 pound	4,530.43
Removal of contaminated HVAC ductwork, \$/pound	1.60
Removal/plasma arc cut of contaminated thin metal components, \$/linear in.	2.53
Additional decontamination of surface by washing, \$/square foot	5.36
Additional decontamination of surfaces by hydrolasing, \$/square foot	23.65
Decontamination rig hook up and flush, \$/ 250 foot length	4,375.66
Chemical flush of components/systems, \$/gallon	23.27
Removal of clean standard reinforced concrete, \$/cubic yard	69.14
Removal of grade slab concrete, \$/cubic yard	78.57
Removal of clean concrete floors, \$/cubic yard	316.38
Removal of sections of clean concrete floors, \$/cubic yard	902.97
Removal of clean heavily rein concrete w/#9 rebar, \$/cubic yard	99.53
Removal of contaminated heavily rein concrete w/#9 rebar, \$/cubic yard	1,627.85
Removal of clean heavily rein concrete w/#18 rebar, \$/cubic yard	134.81
Removal of contaminated heavily rein concrete w/#18 rebar, \$/cubic yard	2,148.41
Removal heavily rein concrete w/#18 rebar & steel embedments, \$/cubic yard	363.98
Removal of below-grade suspended floors, \$/cubic yard	188.84
Removal of clean monolithic concrete structures, \$/cubic yard	695.81
Removal of contaminated monolithic concrete structures, \$/cubic yard	1,607.29
Removal of clean foundation concrete, \$/cubic yard	552.17
Removal of contaminated foundation concrete, \$/cubic yard	1,498.65
Explosive demolition of bulk concrete, \$/cubic yard	40.12
Removal of clean hollow masonry block wall, \$/cubic yard	23.51
Removal of contaminated hollow masonry block wall, \$/cubic yard	60.56
Removal of clean solid masonry block wall, \$/cubic yard	23.51
Removal of contaminated solid masonry block wall, \$/cubic yard	60.56
Backfill of below-grade voids, \$/cubic yard	32.27
Removal of subterranean tunnels/voids, \$/linear foot	84.40
Placement of concrete for below-grade voids, \$/cubic yard	150.69
Excavation of clean material, \$/cubic yard	2.73



## **APPENDIX B**

### **UNIT COST FACTOR LISTING (Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
-----	
Excavation of contaminated material, \$/cubic yard	34.30
Removal of clean concrete rubble (tipping fee included), \$/cubic yard	24.66
Removal of contaminated concrete rubble, \$/cubic yard	21.99
Removal of building by volume, \$/cubic foot	0.25
Removal of clean building metal siding, \$/square foot	1.01
Removal of contaminated building metal siding, \$/square foot	3.40
Removal of standard asphalt roofing, \$/square foot	1.32
Removal of transite panels, \$/square foot	1.54
Scarifying contaminated concrete surfaces (drill & spall), \$/square foot	10.25
Scabbling contaminated concrete floors, \$/square foot	5.75
Scabbling contaminated concrete walls, \$/square foot	14.56
Scabbling contaminated ceilings, \$/square foot	49.36
Scabbling structural steel, \$/square foot	4.69
Removal of clean overhead crane/monorail < 10 ton capacity	407.45
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,197.99
Removal of clean overhead crane/monorail >10-50 ton capacity	977.88
Removal of contaminated overhead crane/monorail >10-50 ton capacity	2,874.69
Removal of polar crane > 50 ton capacity	4,157.44
Removal of gantry crane > 50 ton capacity	15,299.77
Removal of structural steel, \$/pound	0.14
Removal of clean steel floor grating, \$/square foot	3.35
Removal of contaminated steel floor grating, \$/square foot	9.78
Removal of clean free standing steel liner, \$/square foot	7.92
Removal of contaminated free standing steel liner, \$/square foot	23.21
Removal of clean concrete-anchored steel liner, \$/square foot	3.96
Removal of contaminated concrete-anchored steel liner, \$/square foot	27.09
Placement of scaffolding in clean areas, \$/square foot	16.34
Placement of scaffolding in contaminated areas, \$/square foot	22.80
Landscaping with topsoil, \$/acre	24,918.61
Cost of CPC B-88 LSA box & preparation for use	2,254.33



**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
-----	-----
Cost of CPC B-25 LSA box & preparation for use	1,819.78
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,737.49
Cost of CPC B-144 LSA box & preparation for use	11,629.42
Cost of LSA drum & preparation for use	225.68
Cost of cask liner for CNSI 8 120A cask (resins)	13,434.75
Cost of cask liner for CNSI 8 120A cask (filters)	9,492.83
Decontamination of surfaces with vacuuming, \$/square foot	0.64



**APPENDIX C**  
**DETAILED COST ANALYSIS**  
**DECON**

**Tables**

C-1	Comanche Peak Nuclear Power Plant, Unit 1.....	2
C-2	Comanche Peak Nuclear Power Plant, Unit 2.....	10



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decom Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC 1u Term Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu Feet	Burial Volumes				Buried/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	-	-	-	-	-	-	174	26	201	201	-	-	-	-	-	-	-	-	-	1,900	
1a.1.2	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1a.1.3	Remove fuel & source material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1a.1.4	Notification of Permit to Defueling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1a.1.5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1a.1.6	Prepare and submit PSD-AR	-	-	-	-	-	-	268	10	309	309	-	-	-	-	-	-	-	-	-	2,000	
1a.1.7	Review plant design & specs	-	-	-	-	-	-	617	93	710	710	-	-	-	-	-	-	-	-	-	4,600	
1a.1.8	Perform detailed rad survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	114	20	151	151	-	-	-	-	-	-	-	-	-	1,000	
1a.1.10	End product description	-	-	-	-	-	-	114	20	151	151	-	-	-	-	-	-	-	-	-	1,000	
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	171	26	201	201	-	-	-	-	-	-	-	-	-	1,300	
1a.1.12	Define major work sequence	-	-	-	-	-	-	1,006	151	1,157	1,157	-	-	-	-	-	-	-	-	-	7,500	
1a.1.13	Perform SER and EA	-	-	-	-	-	-	416	62	478	478	-	-	-	-	-	-	-	-	-	1,100	
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	1,006	151	1,157	1,157	-	-	-	-	-	-	-	-	-	7,500	
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	671	103	774	774	-	-	-	-	-	-	-	-	-	5,000	
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	114	20	151	151	-	-	-	-	-	-	-	-	-	1,000	
Activity Specifications																						
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	660	99	759	681	-	76	-	-	-	-	-	-	-	4,920	
1a.1.17.2	Plant systems	-	-	-	-	-	-	559	81	640	578	-	61	-	-	-	-	-	-	-	1,167	
1a.1.17.3	NSSS decontamination flush	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	360	
1a.1.17.4	Reactor internals	-	-	-	-	-	-	952	114	1,066	1,095	-	-	-	-	-	-	-	-	-	7,100	
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	872	111	1,001	1,001	-	-	-	-	-	-	-	-	-	6,500	
1a.1.17.6	Biological shield	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	500	
1a.1.17.7	Site instrumentation	-	-	-	-	-	-	619	64	681	681	-	-	-	-	-	-	-	-	-	1,120	
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	217	32	247	124	-	123	-	-	-	-	-	-	-	1,600	
1a.1.17.9	Main Turbine	-	-	-	-	-	-	31	8	62	62	-	62	-	-	-	-	-	-	-	490	
1a.1.17.10	Main Condensers	-	-	-	-	-	-	31	8	62	62	-	62	-	-	-	-	-	-	-	490	
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	419	64	481	241	-	241	-	-	-	-	-	-	-	1,120	
1a.1.17.12	Waste management	-	-	-	-	-	-	617	93	710	710	-	-	-	-	-	-	-	-	-	4,600	
1a.1.17.13	Facility & site closure	-	-	-	-	-	-	121	18	139	69	-	69	-	-	-	-	-	-	-	800	
1a.1.17	Total	-	-	-	-	-	-	5,074	761	5,835	5,198	-	697	-	-	-	-	-	-	-	37,827	
Planning & Site Preparations																						
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	922	18	940	970	-	-	-	-	-	-	-	-	-	2,400	
1a.1.19	Plant prep & temp specs	-	-	-	-	-	-	1,000	510	1,510	1,510	-	-	-	-	-	-	-	-	-	-	
1a.1.20	Design water clean up system	-	-	-	-	-	-	108	28	136	216	-	-	-	-	-	-	-	-	-	1,400	
1a.1.21	Rigging/Cont. Entry Equipment/assembly	-	-	-	-	-	-	2,000	360	2,360	2,760	-	-	-	-	-	-	-	-	-	-	
1a.1.22	Procure casklines & containers	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	1,240	
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	10,284	2,113	12,397	18,029	-	697	-	-	-	-	-	-	-	78,157	
Period 1a Collateral Costs																						
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	11,311	2,147	13,458	-	16,161	-	-	-	-	-	-	-	-	-	
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,311	2,147	13,458	-	16,161	-	-	-	-	-	-	-	-	-	
Period 1a Period-Dependent Costs																						
1a.4.1	Insurance	-	-	-	-	-	-	1,207	921	2,128	1,527	-	-	-	-	-	-	-	-	-	-	
1a.4.2	Property taxes	-	-	-	-	-	-	1,132	131	1,263	1,544	-	-	-	-	-	-	-	-	-	-	
1a.4.3	Health physics supplies	-	-	-	-	-	-	-	128	641	641	-	-	-	-	-	-	-	-	-	-	
1a.4.4	Heavy equipment rental	-	-	-	-	-	-	82	628	710	628	-	-	-	-	-	-	-	-	-	-	
1a.4.5	Disposal of DAW generated	-	-	-	-	-	-	-	7	11	44	-	-	-	610	-	-	-	12,190	20	-	
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,004	601	2,605	2,605	-	-	-	-	-	-	-	-	-	-	
1a.4.7	NRC Fees	-	-	-	-	-	-	1,098	110	1,208	1,208	-	-	-	-	-	-	-	-	-	-	
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	421	42	463	-	463	-	-	-	-	-	-	-	-	-	
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	414	62	476	-	476	-	-	-	-	-	-	-	-	-	
1a.4.10	RPSU Operating Costs	-	-	-	-	-	-	54	8	62	-	-	64	-	-	-	-	-	-	-	-	
1a.4.11	Security Staff Cost	-	-	-	-	-	-	5,891	884	6,775	6,775	-	-	-	-	-	-	-	-	-	150,800	
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	28,842	1,125	29,967	31,157	-	-	-	-	-	-	-	-	-	422,230	
1a.4	Subtotal Period 1a Period-Dependent Costs	-	-	1,059	12	4	-	20	45,233	6,600	52,929	1,001	-	-	610	-	-	-	12,190	20	571,040	
1a.0	TOTAL PERIOD 1a COST	-	-	1,059	12	4	-	20	75,842	11,390	88,117	69,958	17,463	697	-	610	-	-	-	12,190	20	651,197
PERIOD 1b - Decommissioning Preparations																						
Period 1b Direct Decommissioning Activities																						
Detailed Work Procedures																						
1b.1.1.1	Plant systems	-	-	-	-	-	-	645	95	740	657	-	74	-	-	-	-	-	-	-	1,715	
1b.1.1.2	NSSS decontamination flush	-	-	-	-	-	-	114	20	134	134	-	-	-	-	-	-	-	-	-	1,000	
1b.1.1.3	Reactor internals	-	-	-	-	-	-	135	50	186	986	-	-	-	-	-	-	-	-	-	2,500	
1b.1.1.4	Reinforcing buildings	-	-	-	-	-	-	181	27	208	52	-	156	-	-	-	-	-	-	-	1,150	
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	114	20	151	151	-	-	-	-	-	-	-	-	-	1,000	
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	114	20	151	151	-	-	-	-	-	-	-	-	-	1,000	
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	114	20	151	151	-	-	-	-	-	-	-	-	-	1,000	



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTU/Cu Feet	Buried / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
<b>Detailed Work Procedures (continued)</b>																					
1b 1 18	Reactor vessel	-	-	-	-	-	-	187	73	560	560	-	-	-	-	-	-	-	-	-	0.60
1b 1 19	Facility closure	-	-	-	-	-	-	161	24	185	93	-	91	-	-	-	-	-	-	-	1,200
1b 1 10	Miscellaneous	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	170
1b 1 11	Biological shield	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	1,200
1b 1 12	Steam generators	-	-	-	-	-	-	617	93	710	710	-	-	-	-	-	-	-	-	-	1,600
1b 1 13	Reinforced concrete	-	-	-	-	-	-	131	20	151	77	-	77	-	-	-	-	-	-	-	1,000
1b 1 14	Main Turbine	-	-	-	-	-	-	209	31	241	241	-	241	-	-	-	-	-	-	-	1,560
1b 1 15	Main Condensers	-	-	-	-	-	-	209	31	241	241	-	241	-	-	-	-	-	-	-	1,560
1b 1 16	Auxiliary building	-	-	-	-	-	-	366	55	421	379	-	32	-	-	-	-	-	-	-	2,730
1b 1 17	Reactor building	-	-	-	-	-	-	366	55	421	379	-	32	-	-	-	-	-	-	-	2,730
1b 1 1	Total	-	-	-	-	-	-	4,459	669	5,128	4,161	-	964	-	-	-	-	-	-	-	33,211
1b 1 2	Decon primary loop	811	-	-	-	-	-	-	123	1,261	1,261	-	-	-	-	-	-	-	-	1,067	-
1b 1	Subtotal Period 1b Activity Costs	811	-	-	-	-	-	4,459	1,090	6,192	5,428	-	964	-	-	-	-	-	-	1,067	33,211
<b>Period 1b Additional Costs</b>																					
1b 2 1	Spent fuel pool isolation	-	-	-	-	-	-	12,325	1,819	14,174	14,174	-	-	-	-	-	-	-	-	-	-
1b 2 2	Site Characterization	-	-	-	-	-	-	5,301	1,651	7,155	7,155	-	-	-	-	-	-	-	-	90,500	10,852
1b 2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	17,626	3,470	21,129	21,129	-	-	-	-	-	-	-	-	90,500	10,852
<b>Period 1b Collateral Costs</b>																					
1b 3 1	Decon equipment	1,026	-	-	-	-	-	-	151	1,180	1,180	-	-	-	-	-	-	-	-	-	-
1b 3 2	DOE staff relocation expenses	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	-
1b 3 3	Process decommissioning water waste	51	-	16	44	-	16	-	16	215	215	-	-	-	326	-	-	-	19,719	64	-
1b 3 4	Process decommissioning chemical flush waste	3	-	91	241	-	817	-	251	1,401	1,401	-	-	-	-	861	-	-	92,070	162	-
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	2,091	-	-	-	-	-	-	111	2,106	2,106	-	-	-	-	-	-	-	-	-	-
1b 3	Subtotal Period 1b Collateral Costs	3,151	1,202	129	285	-	851	1,816	1,217	8,676	8,676	-	-	-	326	861	-	-	111,620	225	-
<b>Period 1b Period-Dependent Costs</b>																					
1b 4 1	Decon supplies	47	-	-	-	-	-	-	9	46	46	-	-	-	-	-	-	-	-	-	-
1b 4 2	Insurance	-	-	-	-	-	-	1,608	161	1,768	1,768	-	-	-	-	-	-	-	-	-	-
1b 4 3	Property taxes	-	-	-	-	-	-	1,501	150	1,655	1,655	-	-	-	-	-	-	-	-	-	-
1b 4 4	Health physics supplies	-	289	-	-	-	-	-	72	361	361	-	-	-	-	-	-	-	287,853	1,666	938
1b 4 5	Heavy equipment rental	-	271	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b 4 6	Disposal of DAW generated	-	-	7	3	-	12	-	4	26	26	-	-	-	358	-	-	-	7,159	12	-
1b 4 7	Plant energy budget	-	-	-	-	-	-	2,010	301	2,311	2,311	-	-	-	-	-	-	-	-	-	-
1b 4 8	NRC Fees	-	-	-	-	-	-	305	31	336	336	-	-	-	-	-	-	-	-	-	-
1b 4 9	Emergency Planning Fees	-	-	-	-	-	-	211	21	232	232	-	232	-	-	-	-	-	-	-	-
1b 4 10	Spent Fuel Pool O&M	-	-	-	-	-	-	207	31	239	239	-	239	-	-	-	-	-	-	-	-
1b 4 11	TS/RS Operating Costs	-	-	-	-	-	-	27	4	31	31	-	31	-	-	-	-	-	-	-	-
1b 4 12	Security Staff Cost	-	-	-	-	-	-	2,954	113	3,067	3,067	-	-	-	-	-	-	-	-	-	75,607
1b 4 13	DOE Staff Cost	-	-	-	-	-	-	5,580	817	6,398	6,398	-	-	-	-	-	-	-	287,853	1,666	938
1b 4 14	Utility Staff Cost	-	-	-	-	-	-	11,511	2,180	13,691	13,691	-	-	-	-	-	-	-	-	-	212,741
1b 4	Subtotal Period 1b Period-Dependent Costs	47	562	7	3	-	12	28,910	1,286	33,647	33,115	502	-	-	358	-	-	-	7,159	12	151,962
1b 0	TOTAL PERIOD 1b COST	4,054	1,764	137	287	-	865	53,015	10,091	70,244	68,778	502	964	-	681	861	-	-	138,779	31,804	396,057
<b>PERIOD 1 TOTALS</b>		4,054	2,823	139	291	-	885	128,876	21,281	158,961	138,735	17,961	1,661	-	1,243	861	-	-	140,969	31,823	1,017,254
<b>PERIOD 2a - Large Component Removal</b>																					
<b>Period 2a Direct Decommissioning Activities</b>																					
<b>Nuclear Steam Supply System Removal</b>																					
2a 1 1 1	Reactor Coolant Pump	81	92	21	25	-	172	-	108	483	483	-	-	-	1,275	-	-	-	88,981	1,117	-
2a 1 1 2	Pressurizer Relief Tank	21	18	11	11	-	69	-	35	166	166	-	-	-	581	-	-	-	10,513	1,082	-
2a 1 1 3	Reactor Coolant Pumps & Motors	79	66	297	261	-	1,207	-	427	2,138	2,138	-	-	-	7,241	-	-	-	792,800	1,595	300
2a 1 1 4	Pressurizer	-	18	719	141	-	575	-	226	1,509	1,509	-	-	-	1,115	-	-	-	287,853	1,666	938
2a 1 1 5	Steam Generators	-	1737	612	1,719	-	9,911	-	3,732	19,783	19,783	-	-	-	11,061	-	-	-	1,731,300	12,427	2,125
2a 1 1 6	Retired Steam Generator Units	-	-	518	1,695	-	9,911	-	2,789	11,936	11,936	-	-	-	11,061	-	-	-	3,527,500	-	730
2a 1 1 7	CRDM/Choke/Sieve Structure Removal	106	397	282	45	-	306	-	211	1,150	1,150	-	-	-	1,852	-	-	-	179,025	8,211	-
2a 1 1 8	Reactor Vessel Internals	69	5,421	12,995	681	-	1,988	402	9,574	11,113	13,151	-	-	-	2,115	363	-	-	336,907	92,723	1,459
2a 1 1 9	Reactor Vessel	79	6,915	2,832	668	-	1,832	402	7,041	19,811	19,811	-	-	-	1,594	-	-	-	971,221	92,723	1,459
2a 1 1	Totals	436	10,488	18,111	5,251	-	27,997	804	21,196	93,112	93,112	-	-	-	99,241	961	317	-	9,947,701	97,117	6,832
<b>Removal of Major Equipment</b>																					
2a 1 2	Main Turbine/Generator	-	277	978	360	-	1,969	-	1,478	8,161	8,161	-	-	-	45,741	-	-	-	2,905,961	7,988	-
2a 1 3	Main Condensers	-	111	1,127	621	-	6,712	-	2,922	11,157	11,157	-	-	-	62,059	-	-	-	3,942,111	12,760	-
<b>Cascading Costs from Clean Building Demolition</b>																					
2a 1 4 1	Reactor	-	695	-	-	-	-	-	91	695	695	-	-	-	-	-	-	-	-	5,539	-
2a 1 4 2	Safeguard	-	67	-	-	-	-	-	10	77	77	-	-	-	-	-	-	-	-	558	-
2a 1 4	Totals	-	672	-	-	-	-	-	101	773	773	-	-	-	-	-	-	-	-	6,117	-



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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				GTCC Cu Feet	Burial/Processed Wt. Lbs	Craft Manhours	Utility and Contractor Manhours																					
															Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	Class D Cu Feet																									
Disposal of Plant Systems																																											
2a151	Auxiliary Feedwater (insulated)	-	559	167	67	-	720	-	117	1860	1860	-	-	-	-	6,577	-	-	-	121,212	13,852	-	-																				
2a152	Auxiliary Steam	-	12	-	-	-	-	-	2	11	-	-	11	-	-	-	-	-	-	-	95	-	-																				
2a153	Boron Recycle (insulated)	1	5	1	0	-	2	-	2	13	13	-	-	-	-	21	-	-	-	1,570	131	-	-																				
2a154	Boron Recycle (uninsulated)	17	31	4	1	-	15	-	20	88	88	-	-	-	-	133	-	-	-	8,660	1,169	-	-																				
2a155	Boron Thermal Regeneration (insulated)	19	80	11	1	-	10	-	51	226	226	-	-	-	-	359	-	-	-	24,309	2,835	-	-																				
2a156	Boron Thermal Regeneration (uninsulated)	105	202	31	11	-	118	-	137	601	601	-	-	-	-	1,061	-	-	-	68,740	7,221	-	-																				
2a157	Chemical & Volume Control (insulated)	84	175	22	7	-	80	-	109	478	478	-	-	-	-	729	-	-	-	16,836	6,110	-	-																				
2a158	Chemical & Volume Control (uninsulated)	177	151	51	19	-	287	-	237	1,017	1,017	-	-	-	-	1,867	-	-	-	120,837	12,335	-	-																				
2a159	Chemical Feed	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	218	-	-																				
2a1510	Chemical Feed - RC's	-	8	1	0	-	2	-	2	13	13	-	-	-	-	15	-	-	-	971	251	-	-																				
2a1511	Chilled Water - Safety	-	1	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	-	139	-	-																				
2a1512	Chilled Water - Safety - RC's	-	87	11	4	-	17	-	36	188	188	-	-	-	-	427	-	-	-	27,756	2,902	-	-																				
2a1513	Circulating Water	-	177	-	-	-	-	-	26	293	-	-	293	-	-	-	-	-	-	-	5,720	-	-																				
2a1514	Component Cooling Water	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	-	709	-	-																				
2a1515	Component Cooling Water - RCA	-	920	171	171	-	1,812	-	753	1,057	1,057	-	-	-	-	16,878	-	-	-	1,077,151	21,199	-	-																				
2a1516	Condensate (insulated)	-	127	-	-	-	-	-	29	106	-	-	106	-	-	-	-	-	-	-	1,175	-	-																				
2a1517	Condensate (uninsulated)	-	102	-	-	-	-	-	15	117	-	-	117	-	-	-	-	-	-	-	1,200	-	-																				
2a1518	Condensate Polishing	-	97	-	-	-	-	-	14	111	-	-	111	-	-	-	-	-	-	-	1,095	-	-																				
2a1519	Condensate Vacuum & Water Box Priming	-	61	-	-	-	-	-	10	71	-	-	71	-	-	-	-	-	-	-	2,051	-	-																				
2a1520	Extraction Steam	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	-	2,435	-	-																				
2a1521	Feedwater	-	219	-	-	-	-	-	33	252	-	-	252	-	-	-	-	-	-	-	7,102	-	-																				
2a1522	Feedwater - RC's	-	56	26	12	-	113	-	52	278	278	-	-	-	-	1,217	-	-	-	77,593	1,149	-	-																				
2a1523	Generator & Exciter	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	49	-	-																				
2a1524	Generator Gas Cooling	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	-	247	-	-																				
2a1525	Generator Primary Water	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	-	2,003	-	-																				
2a1526	Generator Steam Oil Cool	-	8	-	-	-	-	-	3	9	-	-	9	-	-	-	-	-	-	-	232	-	-																				
2a1527	Hydrogen Gas	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	53	-	-																				
2a1528	Main Steam Reheat & Steam Dump	-	35	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	-	1,105	-	-																				
2a1529	Main Steam Reheat & Steam Dump - RC's	-	429	143	58	-	630	-	288	1,518	1,518	-	-	-	-	5,749	-	-	-	68,270	10,634	-	-																				
2a1530	Main Turbine Lub Oil	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	-	1,490	-	-																				
2a1531	Main Turbine Oil Purification	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	-	2,778	-	-																				
2a1532	Nitrogen Gas	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	50	-	-																				
2a1533	Post Accident Sampling	-	7	1	0	-	2	-	2	11	11	-	-	-	-	15	-	-	-	931	222	-	-																				
2a1534	Process Sampling (uninsulated)	-	9	3	2	-	19	-	8	41	41	-	-	-	-	177	-	-	-	11,246	209	-	-																				
2a1535	Reactor Coolant	53	111	15	3	-	79	-	71	435	435	-	-	-	-	5,935	-	-	-	416,437	8,808	-	-																				
2a1536	Residual Heat Removal	538	225	150	60	-	648	-	421	1,862	1,862	-	-	-	-	5,891	-	-	-	478,887	7,447	-	-																				
2a1537	Safety Injection (insulated)	-	110	35	15	-	158	-	80	329	329	-	-	-	-	1,111	-	-	-	92,591	1,714	-	-																				
2a1538	Safety Injection (uninsulated)	66	136	-	-	-	-	-	57	281	281	-	-	-	-	-	-	-	-	-	6,473	-	-																				
2a1539	Secondary Plant Sampling	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	-	1,040	-	-																				
2a1540	Steam Generator Blowdown & Cleanup	-	109	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	-	3,483	-	-																				
2a1541	Turbine Electrolubricant (insulated)	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	-	663	-	-																				
2a1542	Turbine Electrolubricant (uninsulated)	-	11	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	-	416	-	-																				
2a1543	Turbine Gland Steam & Drains	-	42	-	-	-	-	-	6	49	-	-	49	-	-	-	-	-	-	-	1,157	-	-																				
2a1544	Turbine Heater Drains	-	386	-	-	-	-	-	58	444	-	-	444	-	-	1,113	-	-	-	-	12,600	-	-																				
2a1545	Turbine Plant Cooling (insulated)	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	-	533	-	-																				
2a1546	Turbine Plant Cooling (uninsulated)	-	193	-	-	-	-	-	23	166	-	-	166	-	-	-	-	-	-	-	4,195	-	-																				
2a1547	Turbines (High - Low) (insulated)	-	31	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	-	1,105	-	-																				
2a1548	Turbines (High - Low) (uninsulated)	-	52	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	-	1,703	-	-																				
2a1549	Vent Chilled Water - Non Safety	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	-	500	-	-																				
2a1550	Vent Chilled Water - Non Safety - RC's	-	129	25	9	-	92	-	69	415	415	-	-	-	-	833	-	-	-	51,963	2,994	-	-																				
2a1551	Wastewater Process Instruments	-	4	0	0	-	1	-	1	6	6	-	-	-	-	33	-	-	-	853	95	-	-																				
2a15	Totals	899	5,699	1,073	446	-	4,815	-	1,046	15,968	13,856	-	2,312	-	-	13,921	-	-	-	2,815,905	171,847	-	-																				
2a16	% affording in support of decommissioning	-	882	7	3	-	13	-	130	655	655	-	-	-	-	907	-	-	-	19,534	17,252	-	-																				
2a1	Subtotal Period 2a Activities Costs	1,135	21,958	21,526	6,785	-	44,557	804	40,963	130,028	127,716	-	2,312	-	-	251,275	963	317	-	19,621,510	313,290	6,842	-																				
Period 2a Additional Costs																																											
2a21	Retired Reactor Closure Head	-	-	503	494	-	151	-	237	1,685	1,685	-	-	-	-	3,241	-	-	-	508,950	3,023	2,000	-																				
2a22	Retired HP and LP Turbine Rotors	-	117	152	220	-	194	-	238	1,750	1,750	-	-	-	-	3,501	-	-	-	1,921,100	3,814	1,000	-																				
2a23	Landfill	-	5	-	-	-	1	294	47	556	556	-	356	-	-	-	-	-	-	-	1,199	1,280	-																				
2a2	Subtotal Period 2a Additional Costs	-	151	958	717	-	949	294	522	1,991	3,243	-	356	-	-	6,742	-	-	-	1,510,050	7,005	4,280	-																				
Period 2a Collateral Costs																																											
2a31	Process decommissioning water waste	106	-	71	90	-	71	-	92	417	417	-	-	-	-	665	-	-	-	19,925	130	-	-																				
2a32	Process decommissioning chemical flush waste	5	-	123	314	-	222	-	117	778	778	-	-	-	-	1,128	-	-	-	129,223	211	-	-																				
2a33	Small tool allowance	-	235	-	-	-	-	-	35	271	271	-	-	-	-	27	-	-	-	-	-	-	-																				
2a34	Severance	-	-	-	-	-	-	-	1,157	173	1630	-	-	-	-	-	-	-	-	-	-	-	-																				
2a35	Subtotal Period 2a Collateral Costs	110	235	196	404	-	296	1,157	718	5,116	5,088	-	27	-	-	1,794	-	-	-	160,149	141	-	-																				
Period 2a Period-Dependent Costs																																											
2a41	Decon supplies	326	-	-	-	-	-	-	31	157	157	-	-	-	-	-	-	-	-	-	-	-	-																				
2a42	Insurance	-	-	-	-	-	-	10,26	-	1,129	1,129	-	-	-	-	-	-	-	-	-	-	-	-																				
2a43	Property taxes	-	-	-	-	-	-	4,333	-	431	4,711	-	-	-	-	-	-	-	-	-	-	-	-																				
2a44	Health physics supplies	-	2,423	-	-	-	-	-	606	9,029	9,029	-	-	-	-	-	-	-	-	-	-	-	-																				
2a45	Heavy equipment rental	-	3,671	-	-	-	-	-	551	4,222	4,222	-	-	-	-	-	-	-	-	-	-	-	-																				



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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	NR Lic. Team Costs	Spent Fuel Management Costs	Site Remediation Costs	Processed Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Buried / Processed Wt. Lbs.	Craft Manhours	Units and Contractor Manhours
Period 2a Period Dependent Costs (continued)																					
2a 1 6	Disposal of BAW generated	-	-	101	15	-	166	-	57	159	159	-	-	-	1,986	-	-	-	99,725	161	-
2a 4 7	Plant energy budget	-	-	-	-	-	-	3,270	491	3,768	3,768	-	-	-	-	-	-	-	-	-	-
2a 4 8	NRCC fees	-	-	-	-	-	-	952	95	1,047	1,047	-	-	-	-	-	-	-	-	-	-
2a 4 9	Emergency Planning Fees	-	-	-	-	-	-	250	26	285	-	-	-	-	-	-	-	-	-	-	-
2a 4 10	Spent Fuel Pool O&M	-	-	-	-	-	-	712	107	819	-	-	-	-	-	-	-	-	-	-	-
2a 4 11	ISFSI Operating Costs	-	-	-	-	-	-	94	14	108	-	-	-	-	-	-	-	-	-	-	-
2a 4 12	Remedial Actions Success	-	-	-	-	-	-	1,185	208	1,393	1,393	-	-	-	-	-	-	-	-	-	-
2a 4 14	Security Staff Cost	-	-	-	-	-	-	10,116	15,28	11,657	11,657	-	-	-	-	-	-	-	-	-	259,459
2a 4 14	DOC Staff Cost	-	-	-	-	-	-	23,178	15,22	26,999	26,999	-	-	-	-	-	-	-	-	-	271,981
2a 4 15	Utility Staff Cost	-	-	-	-	-	-	15,174	5,421	10,793	10,793	-	-	-	-	-	-	-	-	-	501,911
2a 4	Subtotal Period 2a Period Dependent Costs	126	6,094	101	15	-	166	81,105	11,083	100,710	99,499	1,211	-	-	1,986	-	-	-	99,725	161	1,015,184
2a 0	TOTAL PERIOD 2a COST	1,570	80,539	22,781	7,941	-	15,968	85,960	15,286	239,115	215,529	1,211	2,695	-	261,797	961	137	-	21,411,460	320,799	1,016,456
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b 1 1 2	Auxiliary Building HVAC (uninsulated)	-	8	1	1	-	7	-	1	20	20	-	-	-	61	-	-	-	4,014	218	-
2b 1 1 1	Batt Rm. & Misc Uncontrolled Acc. HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	51	-
2b 1 1 4	Compressed Air - Inst. Air (insulated)	-	2	-	-	-	-	-	0	2	-	-	-	-	-	-	-	-	-	58	-
2b 1 1 5	Compressed Air - Instrument Air - RCA (u)	-	-	2	1	-	6	-	22	1	22	-	-	-	-	-	-	-	1,448	243	-
2b 1 1 6	Compressed Air - Instrument Air - RCA (u)	-	115	17	5	-	57	-	16	240	240	-	-	-	513	-	-	-	35,085	2,823	-
2b 1 1 7	Compressed Air - Service Air	-	27	-	-	-	-	-	4	11	-	-	-	-	-	-	-	-	-	883	-
2b 1 1 8	Compressed Air - Service Air - RCU	-	133	21	7	-	73	-	57	289	289	-	-	-	-	-	-	-	12,761	3,229	-
2b 1 1 9	Compressed Air - Inst. Air (uninsulated)	-	27	-	-	-	-	-	4	31	-	-	11	-	-	-	-	-	-	883	-
2b 1 1 10	Containment Hatches	-	8	1	0	-	1	-	1	17	17	-	-	-	-	-	-	-	2,568	191	-
2b 1 1 11	Containment Hydrogen Purge HVAC	-	98	11	1	-	47	-	23	124	124	-	-	-	427	-	-	-	27,475	1,057	-
2b 1 1 12	Containment Spray	-	365	327	111	-	1,148	-	506	2,780	2,780	-	-	-	1,137	-	-	-	846,674	9,916	-
2b 1 1 13	Containment Ventilation HVAC (uninsulated)	-	206	121	36	-	601	-	222	1,206	1,206	-	-	-	5,764	-	-	-	151,564	5,523	-
2b 1 1 14	Containment Ventilation HVAC (uninsulated)	-	30	10	5	-	55	-	24	122	122	-	-	-	501	-	-	-	11,997	801	-
2b 1 1 15	Control Room HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	62	-
2b 1 1 16	Drum Storage & RCS Makeup Water	-	30	-	-	-	-	-	5	15	-	-	15	-	-	-	-	-	-	911	-
2b 1 1 17	Drum Storage & RCS Makeup Water - RCA	-	91	16	5	-	75	-	40	209	209	-	-	-	491	-	-	-	11,957	2,905	-
2b 1 1 18	Diesel Gen & Auxiliaries (uninsulated)	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	182	-
2b 1 1 19	Diesel Gen & Auxiliaries (uninsulated)	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	2,239	-
2b 1 1 20	Diesel Generator Fuel Oil	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	314	-
2b 1 1 21	Diesel Room HVAC	-	1	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	117	-
2b 1 1 22	Electrical - Clean	-	1,600	-	-	-	-	-	240	1,840	-	-	1,840	-	-	-	-	-	-	19,217	-
2b 1 1 23	Electrical - Contaminated	-	118	11	8	-	81	-	60	110	110	-	-	-	715	-	-	-	17,159	1,191	-
2b 1 1 24	Electrical - RCA	-	990	133	68	-	716	-	455	2,183	2,183	-	-	-	6,779	-	-	-	180,624	21,014	-
2b 1 1 25	Fire Protection	-	82	-	-	-	-	-	12	94	-	-	94	-	-	-	-	-	-	2,628	-
2b 1 1 26	Fire Protection - RCU	-	196	42	15	-	159	-	95	506	506	-	-	-	1,434	-	-	-	92,756	1,585	-
2b 1 1 27	Leak Rate Test	-	10	3	1	-	11	-	6	11	11	-	-	-	104	-	-	-	6,718	266	-
2b 1 1 28	Potable Water	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	49	-
2b 1 1 29	Radiation Monitoring	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	33	-
2b 1 1 30	Safeguards Building HVAC (insulated)	-	16	3	2	-	19	-	9	49	49	-	-	-	174	-	-	-	11,048	860	-
2b 1 1 31	Safeguards Building HVAC (uninsulated)	-	11	8	4	-	11	-	21	125	125	-	-	-	409	-	-	-	25,970	1,161	-
2b 1 1 32	Service Water	-	38	-	-	-	-	-	6	11	-	-	11	-	-	-	-	-	-	1,240	-
2b 1 1 33	Service Water - RCA	-	180	71	36	-	990	-	135	836	836	-	-	-	1,578	-	-	-	228,038	1,988	-
2b 1 1 34	Turbine Building HVAC (insulated)	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	92	-
2b 1 1 35	Turbine Building HVAC (uninsulated)	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	722	-
2b 1 1 36	Vents & Drums - RCA	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	495	-
2b 1 1 37	Vents & Drums - RCA	79	354	21	7	-	79	-	101	411	411	-	-	-	711	-	-	-	16,313	5,177	-
2b 1 1 38	Waste Management (uninsulated)	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	41	-
2b 1 1 39	Waste Processing Liquid (uninsulated)	-	62	165	5	-	96	-	89	152	152	-	-	-	568	-	-	-	13,022	1,811	-
2b 1 1 40	Waste Processing Liquid (uninsulated)	-	11	63	9	-	43	-	43	179	179	-	-	-	291	-	-	-	18,868	2,316	-
2b 1 1 41	Waste Processing Solid	-	2	0	0	-	1	-	1	5	5	-	-	-	11	-	-	-	860	51	-
2b 1 1	Totals	172	4,887	849	97	-	1,963	-	2,244	12,182	10,431	-	2,239	-	66,196	-	-	-	2,437,417	141,950	-
2b 1 2	Scaffolding in support of decommissioning	-	602	8	4	-	12	-	162	818	818	-	-	-	381	-	-	-	21,118	21,565	-
Decontamination of Site Buildings																					
2b 1 1 1	Reactor	1,135	715	119	151	-	1,296	-	1,110	4,315	4,315	-	-	-	18,945	-	-	-	862,151	49,418	-
2b 1 1 2	Safeguard	146	73	18	18	-	148	-	180	524	524	-	-	-	2,008	-	-	-	98,799	5,673	-
2b 1 1	Totals	1,282	807	136	169	-	1,444	-	1,240	5,069	5,069	-	-	-	20,953	-	-	-	961,250	55,091	-
2b 1 1	Prepare/Submit License Termination Plan	-	-	-	-	-	-	519	82	612	612	-	-	-	-	-	-	-	-	-	4,096
2b 1 5	Review NRCC approval of termination plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b 1	Subtotal Period 2b Activity Costs	1,453	6,297	994	510	-	5,109	519	1,729	19,001	16,762	-	2,239	-	57,541	-	-	-	1,802,985	211,606	4,096
Period 2b Additional Costs																					
2b 2 1	Underground Utilities Excavation	-	2,457	-	-	-	-	785	742	1,973	1,973	-	-	-	-	-	-	-	-	13,618	-
2b 2	Subtotal Period 2b Additional Costs	-	2,457	-	-	-	-	785	742	1,973	1,973	-	-	-	-	-	-	-	-	13,618	-



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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 Collateral Costs																						
2b 1.1	Process decommissioning water waste	-	85	-	61	71	-	61	-	75	556	556	-	-	-	-	-	-	517	107	-	
2b 1.2	Process decommissioning chemical flush waste	-	0	-	12	31	-	22	-	12	78	78	-	-	-	-	-	-	12 012	21	-	
2b 1.3	Small tool allowance	-	-	119	-	-	-	-	-	18	117	117	-	-	-	-	-	-	-	-	-	
2b 1.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	66 800	10 020	76 819	-	76 819	-	-	-	-	-	-	-	-	-	
2b 1.5	Severance	-	-	-	-	-	-	2 016	107	2 151	2 151	-	-	-	-	-	-	-	-	-	-	
2b 1	Subtotal Period 2b Collateral Costs	-	85	119	73	105	-	81	6 816	10 131	79 711	2 924	76 819	-	-	-	-	-	660	11 875	128	-
Period 2b Period-Dependent Costs																						
2b 1.1	Decon supplies	-	1 013	-	-	-	-	-	251	1 266	1 266	-	-	-	-	-	-	-	-	-	-	
2b 1.2	Insurance	-	-	-	-	-	-	1 558	136	1 694	1 694	-	-	-	-	-	-	-	-	-	-	
2b 1.4	Property taxes	-	-	-	-	-	-	911	91	1 002	1 002	-	-	-	-	-	-	-	-	-	-	
2b 1.1	Health physics supplies	-	-	2 127	-	-	-	-	532	2 659	2 659	-	-	-	-	-	-	-	-	-	-	
2b 1.5	Heavy equipment rental	-	-	5 010	-	-	-	-	752	5 762	-	-	-	-	-	-	-	-	-	-	-	
2b 1.6	Disposal of DAW generated	-	-	-	66	21	-	109	37	215	215	-	-	-	-	-	-	-	65 165	106	-	
2b 1.7	Plant energy budget	-	-	-	-	-	-	1 123	513	576	576	-	-	-	-	-	-	-	-	-	-	
2b 1.8	NRC Fees	-	-	-	-	-	-	1 260	126	1 386	-	-	-	-	-	-	-	-	-	-	-	
2b 1.9	Emergency Planning Fees	-	-	-	-	-	-	342	34	377	-	-	-	-	-	-	-	-	-	-	-	
2b 1.10	Spent Fuel Pool O&M	-	-	-	-	-	-	912	111	1 083	-	1 083	-	-	-	-	-	-	-	-	-	
2b 1.11	Liquid Effluent Processing Equipment/Services	-	-	-	-	-	-	474	71	515	515	-	-	-	-	-	-	-	-	-	-	
2b 1.12	ISFSI Operating Costs	-	-	-	-	-	-	121	19	112	-	112	-	-	-	-	-	-	-	-	-	
2b 1.13	Remedial Action Surveys	-	-	-	-	-	-	1 831	275	2 108	2 108	-	-	-	-	-	-	-	-	-	-	
2b 1.11	Security Staff Cost	-	-	-	-	-	-	11 131	2 012	15 125	15 125	-	-	-	-	-	-	-	-	-	513 928	
2b 1.15	DOC Staff Cost	-	-	-	-	-	-	21 254	3 188	24 112	24 112	-	-	-	-	-	-	-	-	-	255 720	
2b 1.16	Utility Staff Cost	-	-	-	-	-	-	33 060	1 959	38 018	38 018	-	-	-	-	-	-	-	-	-	170 921	
2b 1	Subtotal Period 2b Period-Dependent Costs	-	1 013	7 137	66	25	-	109	78 191	11 119	99 880	98 278	1 602	-	-	-	-	-	65 165	106	1 071 971	
2b 0	TOTAL PERIOD 2b COST	-	2 572	16 010	1 133	668	-	5 130	118 573	28 031	202 598	121 917	78 422	2 249	-	-	-	-	61 153	-	225 158	1 079 069
PERIOD 2c - Spent fuel delay prior to SFP decon																						
Period 2c Direct Decommissioning Activities																						
Period 2c Collateral Costs																						
2c 1	Severance	-	-	-	-	-	-	4 721	708	5 429	5 429	-	-	-	-	-	-	-	-	-	-	
2c 1	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	4 721	708	5 429	5 429	-	-	-	-	-	-	-	-	-	-	
Period 2c Period-Dependent Costs																						
2c 1.1	Insurance	-	-	-	-	-	-	1 732	173	1 905	1 905	-	-	-	-	-	-	-	-	-	-	
2c 1.2	Property taxes	-	-	-	-	-	-	1 161	116	1 277	1 277	-	-	-	-	-	-	-	-	-	-	
2c 1.3	Health physics supplies	-	-	521	-	-	-	-	130	652	652	-	-	-	-	-	-	-	-	-	-	
2c 1.4	Disposal of DAW generated	-	-	-	22	8	-	46	12	78	78	-	-	-	-	-	-	-	21 725	35	-	
2c 1.5	Plant energy budget	-	-	-	-	-	-	1 366	655	5 021	5 021	-	-	-	-	-	-	-	-	-	-	
2c 1.6	NRC Fees	-	-	-	-	-	-	1 531	151	1 687	1 687	-	-	-	-	-	-	-	-	-	-	
2c 1.7	Emergency Planning Fees	-	-	-	-	-	-	137	11	180	-	-	-	-	-	-	-	-	-	-	-	
2c 1.8	Spent Fuel Pool O&M	-	-	-	-	-	-	1 202	180	1 382	-	1 382	-	-	-	-	-	-	-	-	-	
2c 1.9	Liquid Effluent Processing Equipment/Services	-	-	-	-	-	-	605	91	696	696	-	-	-	-	-	-	-	-	-	-	
2c 1.10	ISFSI Operating Costs	-	-	-	-	-	-	558	21	182	-	182	-	-	-	-	-	-	-	-	-	
2c 1.11	Security Staff Cost	-	-	-	-	-	-	17 109	2 566	19 675	19 675	-	-	-	-	-	-	-	-	-	437 940	
2c 1.12	Utility Staff Cost	-	-	-	-	-	-	10 035	1 592	11 627	11 627	-	-	-	-	-	-	-	-	-	15 404	
2c 1	Subtotal Period 2c Period-Dependent Costs	-	-	521	22	8	-	36	11 117	4 597	36 501	31 157	2 044	-	-	-	-	-	1 086	-	35	181 244
2c 0	TOTAL PERIOD 2c COST	-	-	521	22	8	-	36	16 037	5 105	41 930	37 886	2 044	-	-	-	-	-	1 086	-	35	181 244
PERIOD 2d - Decontamination Following Wet Fuel Storage																						
Period 2d Direct Decommissioning Activities																						
2d 1.1	Remove spent fuel racks	-	259	21	127	11	-	110	-	235	1 007	1 007	-	-	-	-	-	-	19 216	838	-	
Disposal of Plant Systems																						
2d 1.2.1	Fuel Building HVAC (uninsulated)	-	-	6	1	0	-	5	-	3	11	11	-	-	-	-	-	-	-	2 679	170	-
2d 1.2.2	Fuel Handling	-	-	6	1	1	-	7	-	4	17	17	-	-	-	-	-	-	-	1 891	152	-
2d 1.2.3	Spent Fuel Pool Cooling & Cleanup	-	-	126	16	5	-	36	-	18	251	251	-	-	-	-	-	-	-	33 005	3 111	-
2d 1.2	Totals	-	-	137	18	6	-	68	-	51	281	281	-	-	-	-	-	-	-	39 575	3 165	-
2d 1.1	Scaffolding in support of decommissioning	-	-	130	2	1	-	8	-	32	161	161	-	-	-	-	-	-	-	1 881	1 111	-
2d 1	Subtotal Period 2d Activity Costs	-	259	282	146	18	-	106	-	122	1 151	1 151	-	-	-	-	-	-	17 130	-	8 616	-
Period 2d Additional Costs																						
2d 2.1	License Termination Survey Planning	-	-	-	-	-	-	1 019	806	1 325	1 325	-	-	-	-	-	-	-	-	-	6 210	-
2d 2.2	Operational Tools and Equipment	-	-	-	12	12	-	185	52	281	281	-	-	-	-	-	-	-	-	117 000	36	-
2d 2.3	Piling Range	-	-	-	-	-	-	365	55	120	-	-	-	-	-	-	-	-	-	-	-	-
2d 2	Subtotal Period 2d Additional Costs	-	-	-	12	12	-	195	1 381	413	2 026	1 606	-	-	-	-	-	-	-	117 000	36	6 210
Period 2d Collateral Costs																						
2d 1.1	Process decommissioning water waste	-	15	-	11	41	-	11	-	41	191	191	-	-	-	-	-	-	-	18 100	59	-



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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	NRI 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 (Collateral Costs (continued))																					
2d 1 1	Small tool allowance	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	-	-
2d 1 4	Decommissioning Equipment Disposition	-	-	111	51	-	55	-	163	301	301	-	-	-	5,290	-	-	-	18,079	147	-
2d 1	Subtotal Period 2d Collateral Costs	45	8	117	91	-	608	-	205	1,108	1,108	-	-	-	5,593	-	-	-	954,209	206	-
Period 2d Period-Dependent Costs																					
2d 4 1	Decon supplies	6	-	-	-	-	-	-	1	7	7	-	-	-	-	-	-	-	-	-	-
2d 4 2	Insurance	-	-	-	-	-	-	47	-	52	52	-	-	-	-	-	-	-	-	-	-
2d 4 3	Property taxes	-	-	-	-	-	-	12	-	15	15	-	-	-	-	-	-	-	-	-	-
2d 4 4	Health physics supplies	-	76	-	-	-	-	-	19	95	95	-	-	-	-	-	-	-	-	-	-
2d 4 5	Heavy equipment rental	-	175	-	-	-	-	-	26	201	201	-	-	-	-	-	-	-	-	-	-
2d 4 6	Disposal of DAW generated	-	-	7	1	-	12	-	1	26	26	-	-	-	86	-	-	-	7,111	12	-
2d 4 7	Plant energy budget	-	-	-	-	-	-	64	-	73	73	-	-	-	-	-	-	-	-	-	-
2d 4 8	NRC Fees	-	-	-	-	-	-	12	-	36	36	-	-	-	-	-	-	-	-	-	-
2d 4 9	Emergency Planning Fees	-	-	-	-	-	-	12	-	13	-	13	-	-	-	-	-	-	-	-	-
2d 4 10	Spent Fuel Pool O&M	-	-	-	-	-	-	31	-	98	-	98	-	-	-	-	-	-	-	-	-
2d 4 11	Liquid Effluents Processing Equipment/Services	-	-	-	-	-	-	51	-	98	-	98	-	-	-	-	-	-	-	-	-
2d 4 12	ISPSI Operating Costs	-	-	-	-	-	-	1	-	5	-	5	-	-	-	-	-	-	-	-	-
2d 4 13	Security Staff Cost	-	-	-	-	-	-	108	-	518	205	533	-	-	-	-	-	-	-	-	11,981
2d 4 14	DOC Staff Cost	-	-	-	-	-	-	199	-	775	574	574	-	-	-	-	-	-	-	-	6,032
2d 4 15	Utility Staff Cost	-	-	-	-	-	-	673	-	1011	774	799	86	-	-	-	-	-	-	-	29,938
2d 4	Subtotal Period 2d Period-Dependent Costs	6	251	7	1	-	12	1,907	430	2,716	2,093	425	-	-	86	-	-	-	7,111	12	28,012
2d 0	TOTAL PERIOD 2d COST	51	259	124	92	-	1,212	1,241	1,269	7,102	6,258	425	420	-	15,509	-	-	-	716,284	8,830	34,252
PERIOD 2e - Delay before License Termination																					
Period 2e Direct Decommissioning Activities																					
Period 2e Collateral Costs																					
2e 1 1	Severance	-	-	-	-	-	-	81	57	138	438	-	-	-	-	-	-	-	-	-	-
2e 1	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	81	57	138	438	-	-	-	-	-	-	-	-	-	-
Period 2e Period-Dependent Costs																					
2e 1 1	Insurance	-	-	-	-	-	-	492	49	541	541	-	-	-	-	-	-	-	-	-	-
2e 1 2	Property taxes	-	-	-	-	-	-	130	11	141	141	-	-	-	-	-	-	-	-	-	-
2e 1 3	Health physics supplies	-	76	-	-	-	-	-	19	95	95	-	-	-	-	-	-	-	-	-	-
2e 1 4	Disposal of DAW generated	-	-	2	1	-	1	-	1	6	6	-	-	-	82	-	-	-	1,641	1	-
2e 1 5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2e 1 6	NRC Fees	-	-	-	-	-	-	206	21	227	227	-	-	-	-	-	-	-	-	-	-
2e 1 7	ISPSI Operating Costs	-	-	-	-	-	-	45	7	52	-	52	-	-	-	-	-	-	-	-	-
2e 1 8	Remedial Action Surveys	-	-	-	-	-	-	664	100	764	764	-	-	-	-	-	-	-	-	-	-
2e 1 9	Security Staff Cost	-	-	-	-	-	-	1,399	210	1,608	613	996	-	-	-	-	-	-	-	-	9,021
2e 1 10	Utility Staff Cost	-	-	-	-	-	-	854	125	979	891	65	-	-	-	-	-	-	-	-	12,007
2e 1	Subtotal Period 2e Period-Dependent Costs	-	76	2	1	-	1	3,576	563	4,635	5,705	1,112	-	-	82	-	-	-	1,641	1	18,028
2e 0	TOTAL PERIOD 2e COST	-	76	2	1	-	1	4,550	621	5,055	5,940	1,112	-	-	82	-	-	-	1,641	1	18,028
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f 1 1	ORISE preliminary surveys	-	-	-	-	-	-	156	17	203	203	-	-	-	-	-	-	-	-	-	-
2f 1 2	Terminate license	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2f 1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	156	17	203	203	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f 2 1	License Termination Surveys	-	-	-	-	-	-	1,298	989	4,287	1,287	-	-	-	-	-	-	-	77,479	-	1,120
2f 2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	1,298	989	4,287	1,287	-	-	-	-	-	-	-	77,479	-	1,120
Period 2f Collateral Costs																					
2f 3 1	DOC staff relocation expenses	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	-
2f 3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f 4 1	Insurance	-	-	-	-	-	-	419	47	494	494	-	-	-	-	-	-	-	-	-	-
2f 4 2	Property taxes	-	-	-	-	-	-	301	40	341	341	-	-	-	-	-	-	-	-	-	-
2f 4 3	Health physics supplies	-	76	-	-	-	-	-	192	660	660	-	-	-	-	-	-	-	-	-	-
2f 4 4	Disposal of DAW generated	-	-	7	2	-	11	-	1	21	21	-	-	-	337	-	-	-	6,734	11	-
2f 4 5	Plant energy budget	-	-	-	-	-	-	102	45	447	447	-	-	-	-	-	-	-	-	-	-
2f 4 6	NRC Fees	-	-	-	-	-	-	197	40	437	437	-	-	-	-	-	-	-	-	-	-
2f 4 7	ISPSI Operating Costs	-	-	-	-	-	-	11	6	47	-	47	-	-	-	-	-	-	-	-	-
2f 4 8	Security Staff Cost	-	-	-	-	-	-	1,278	192	1,469	760	-	-	-	-	-	-	-	-	-	32,910
2f 4 9	DOC Staff Cost	-	-	-	-	-	-	1,062	409	4,571	4,571	-	-	-	-	-	-	-	-	-	46,622
2f 4 10	Utility Staff Cost	-	-	-	-	-	-	4,198	660	5,057	4,602	155	-	-	-	-	-	-	-	-	59,942
2f 4	Subtotal Period 2f Period-Dependent Costs	-	528	7	2	-	11	11,228	1,763	14,519	12,127	1,112	-	-	337	-	-	-	6,734	11	139,471
2f 0	TOTAL PERIOD 2f COST	-	528	7	2	-	11	16,499	4,071	20,118	18,706	1,112	-	-	337	-	-	-	6,734	77,490	142,991



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet	Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours	
PERIOD 2 TOTALS			1 132	18 211	21 257	8 786	-	52 861	294 111	81 581	516 216	426 266	81 626	5 351	-	413 323	963	637	-	25 600 870	6 126 34	2 833 682
PERIOD 3b - Site Restoration																						
Period 3b Direct Decommissioning Activities																						
Demolition of Remaining Site Buildings																						
3b 1.1.1	Reactor	-	1 431	-	-	-	-	-	515	1 946	-	-	1 936	-	-	-	-	-	-	91 617	-	
3b 1.1.2	Circ. Water Yard Piping	-	17	-	-	-	-	-	4	20	-	-	20	-	-	-	-	-	-	36	-	
3b 1.1.3	Diesel Generator	-	110	-	-	-	-	-	62	472	-	-	472	-	-	-	-	-	-	1 210	-	
3b 1.1.4	Old Steam Generator Storage Facility	-	511	-	-	-	-	-	81	622	-	-	622	-	-	-	-	-	-	16 622	-	
3b 1.1.5	Safeguard	-	1 279	-	-	-	-	-	192	1 471	-	-	1 471	-	-	-	-	-	-	10 725	-	
3b 1.1.6	Switchgear	-	84	-	-	-	-	-	13	96	-	-	96	-	-	-	-	-	-	795	-	
3b 1.1.7	Turbine	-	451	-	-	-	-	-	68	521	-	-	521	-	-	-	-	-	-	7 230	-	
3b 1.1.8	Turbine Pedestal	-	703	-	-	-	-	-	106	809	-	-	809	-	-	-	-	-	-	1 159	-	
3b 1.1	Totals	-	6 919	-	-	-	-	-	1 018	7 937	-	-	7 937	-	-	-	-	-	-	62 394	-	
Site Closure Activities																						
3b 1.2	Grade & Landscape site	-	546	-	-	-	-	-	82	628	-	-	628	-	-	-	-	-	-	1 252	-	
3b 1.3	Final report to NRC	-	-	-	-	-	-	209	31	241	211	-	-	-	-	-	-	-	-	-	1 560	
3b 1	Subtotal Period 3b Activity Costs	-	7 465	-	-	-	-	209	1 151	8 825	211	-	8 585	-	-	-	-	-	-	6 1686	1 560	
Period 3b Additional Costs																						
3b 2.1	Concrete Crushing	-	571	-	-	-	-	5	86	661	-	-	661	-	-	-	-	-	-	2 483	-	
3b 2	Subtotal Period 3b Additional Costs	-	571	-	-	-	-	5	86	661	-	-	661	-	-	-	-	-	-	2 483	-	
Period 3b Collateral Costs																						
3b 3.1	Small tool allowance	-	38	-	-	-	-	-	6	13	-	-	13	-	-	-	-	-	-	-	-	
3b 3	Subtotal Period 3b Collateral Costs	-	38	-	-	-	-	-	6	13	-	-	13	-	-	-	-	-	-	-	-	
Period 3b Period-Dependent Costs																						
3b 4.1	Insurance	-	-	-	-	-	-	796	60	656	656	-	-	-	-	-	-	-	-	-	-	
3b 4.2	Property taxes	-	-	-	-	-	-	799	80	879	-	879	-	-	-	-	-	-	-	-	-	
3b 4.3	Heavy equipment rental	-	5 998	-	-	-	-	-	960	6 858	-	-	6 858	-	-	-	-	-	-	-	-	
3b 4.4	Plant energy budget	-	-	-	-	-	-	401	60	161	-	-	161	-	-	-	-	-	-	-	-	
3b 4.5	NRC ISFSI Fees	-	-	-	-	-	-	169	17	186	-	186	-	-	-	-	-	-	-	-	-	
3b 4.6	ISFSI Operating Costs	-	-	-	-	-	-	109	16	125	-	-	125	-	-	-	-	-	-	-	-	
3b 4.7	Security Staff Cost	-	-	-	-	-	-	3 392	509	1 901	-	2 508	-	1 193	-	-	-	-	-	-	87 360	
3b 4.8	HOU Staff Cost	-	-	-	-	-	-	9 861	1 170	11 271	-	-	11 271	-	-	-	-	-	-	-	110 240	
3b 4.9	Utility Staff Cost	-	-	-	-	-	-	5 097	565	5 663	-	1 207	1 651	-	-	-	-	-	-	-	70 200	
3b 1	Subtotal Period 3b Period-Dependent Costs	-	5 998	-	-	-	-	20 464	1 876	10 249	656	4 906	21 677	-	-	-	-	-	-	-	267 800	
3b 0	TOTAL PERIOD 3b COST	-	11 072	-	-	-	-	20 577	5 119	19 708	897	4 906	11 966	-	-	-	-	-	-	66 169	269 360	
PERIOD 3c - Fuel Storage Operations/Shipping																						
Period 3c Direct Decommissioning Activities																						
Period 3c Collateral Costs																						
3c 1.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13 911	2 087	16 000	-	16 000	-	-	-	-	-	-	-	-	-	
3c 1	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	13 911	2 087	16 000	-	16 000	-	-	-	-	-	-	-	-	-	
Period 3c Period-Dependent Costs																						
3c 4.1	Insurance	-	-	-	-	-	-	16 051	1 603	17 660	-	17 660	-	-	-	-	-	-	-	-	-	
3c 4.2	Property taxes	-	-	-	-	-	-	21 522	2 152	23 674	-	-	23 674	-	-	-	-	-	-	-	-	
3c 4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3c 4.4	NRC ISFSI Fees	-	-	-	-	-	-	6 990	699	7 689	-	7 689	-	-	-	-	-	-	-	-	-	
3c 4.5	ISFSI Operating Costs	-	-	-	-	-	-	2 930	440	1 170	-	1 170	-	-	-	-	-	-	-	-	-	
3c 4.6	Security Staff Cost	-	-	-	-	-	-	58 011	8 804	67 294	-	67 194	-	-	-	-	-	-	-	-	1 155 861	
3c 4.7	Utility Staff Cost	-	-	-	-	-	-	28 295	1 211	12 510	-	12 510	-	-	-	-	-	-	-	-	177 965	
3c 1	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	111 182	17 941	152 126	-	152 126	-	-	-	-	-	-	-	-	1 833 828	
3c 0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	118 395	20 411	168 126	-	168 126	-	-	-	-	-	-	-	-	1 835 828	
PERIOD 3d - GTCC shipping																						
Period 3d Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
3d 1.1.1	Vessel & Internals GTCC Disposal	-	-	1 000	-	-	-	10 077	1 762	12 839	12 839	-	-	-	-	-	-	2 061	101 974	-	-	
3d 1.1	Totals	-	-	1 000	-	-	-	10 077	1 762	12 839	12 839	-	-	-	-	-	-	2 061	101 974	-	-	
3d 1	Subtotal Period 3d Activity Costs	-	-	1 000	-	-	-	10 077	1 762	12 839	12 839	-	-	-	-	-	-	2 061	101 974	-	-	
Period 3d Period-Dependent Costs																						
3d 4.1	Insurance	-	-	-	-	-	-	11	1	13	13	-	-	-	-	-	-	-	-	-	-	
3d 4.2	Property taxes	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-	
3d 4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



Table C-1  
Comanche Peak Nuclear Power Plant Unit 1  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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	GTCU Cu Feet			
Period 1d Period-Dependent Costs (continued)																					
1d 4.4	NRC ISFSI Fees	-	-	-	-	-	-	1	0	1	-	1	-	-	-	-	-	-	-	-	-
1d 4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
1d 4.6	Security Staff Cost	-	-	-	-	-	-	42	6	48	-	18	-	-	-	-	-	-	-	-	1,017
1d 4.7	Utility Staff Cost	-	-	-	-	-	-	20	3	23	-	23	-	-	-	-	-	-	-	-	269
1d 4	Subtotal Period 1d Period-Dependent Costs	-	-	-	-	-	-	91	13	107	-	101	-	-	-	-	-	-	-	-	1,306
1d 0	TOTAL PERIOD 1d COST	-	-	1,000	-	-	10,077	91	1,771	12,946	12,940	0	-	-	-	-	-	2,061	101,971	-	1,906
PERIOD 1e - ISFSI Decontamination																					
Period 1e Direct Decommissioning Activities																					
Period 1e Additional Costs																					
1e 2.1	License Termination (ISFSI)	-	200	172	171	-	2,158	1,472	1,168	5,812	5,812	-	-	-	18,111	-	-	-	1,891,180	9,429	1,221
1e 2	Subtotal Period 1e Additional Costs	-	200	172	171	-	2,158	1,472	1,168	5,812	5,812	-	-	-	18,111	-	-	-	1,891,180	9,429	1,221
Period 1e Period-Dependent Costs																					
1e 1.1	Insurance	-	-	-	-	-	-	54	11	67	-	67	-	-	-	-	-	-	-	-	-
1e 1.2	Property taxes	-	-	-	-	-	-	207	67	114	-	114	-	-	-	-	-	-	-	-	-
1e 1.3	Plant energy budget	-	-	-	-	-	-	7	2	8	-	8	-	-	-	-	-	-	-	-	-
1e 1.4	Security Staff Cost	-	-	-	-	-	-	63	16	79	-	79	-	-	-	-	-	-	-	-	1,710
1e 1.5	Utility Staff Cost	-	-	-	-	-	-	141	36	179	-	179	-	-	-	-	-	-	-	-	1,881
1e 1	Subtotal Period 1e Period-Dependent Costs	-	-	-	-	-	-	515	113	666	-	666	-	-	-	-	-	-	-	-	1,590
1e 0	TOTAL PERIOD 1e COST	-	200	172	171	-	2,158	2,005	1,302	6,508	6,508	-	-	-	18,111	-	-	-	1,891,180	9,429	1,811
PERIOD 1f - ISFSI Site Restoration																					
Period 1f Direct Decommissioning Activities																					
Period 1f Additional Costs																					
1f 2.1	Demolition and Site Restoration (ISFSI)	-	1,126	-	-	-	-	355	552	1,233	-	-	1,233	-	-	-	-	-	-	15,216	80
1f 2	Subtotal Period 1f Additional Costs	-	1,126	-	-	-	-	355	552	1,233	-	-	1,233	-	-	-	-	-	-	15,216	80
Period 1f Collateral Costs																					
1f 1.1	Small tool allowance	-	11	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-
1f 1	Subtotal Period 1f Collateral Costs	-	11	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-
Period 1f Period-Dependent Costs																					
1f 1.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1f 1.2	Property taxes	-	-	-	-	-	-	114	11	117	-	-	117	-	-	-	-	-	-	-	-
1f 1.3	Heavy equipment rental	-	115	-	-	-	-	-	17	132	-	-	132	-	-	-	-	-	-	-	-
1f 1.4	Plant energy budget	-	-	-	-	-	-	1	1	1	-	1	-	-	-	-	-	-	-	-	-
1f 1.5	Security Staff Cost	-	-	-	-	-	-	13	2	11	-	11	-	-	-	-	-	-	-	-	342
1f 1.6	Utility Staff Cost	-	-	-	-	-	-	58	9	67	-	67	-	-	-	-	-	-	-	-	769
1f 1	Subtotal Period 1f Period-Dependent Costs	-	115	-	-	-	-	207	32	361	-	361	-	-	-	-	-	-	-	-	1,111
1f 0	TOTAL PERIOD 1f COST	-	1,485	-	-	-	-	362	600	1,618	-	-	1,618	-	-	-	-	-	-	15,216	1,191
PERIOD 1 TOTALS																					
TOTAL COST TO DECOMMISSION																					
1		8,185	68,791	25,578	9,119	-	66,282	591,621	133,624	906,901	585,545	275,929	45,629	-	36,503	1,827	157	2,061	28,021,990	775,272	5,991,432
TOTAL COST TO DECOMMISSION WITH 17.29% CONTINGENCY																					
TOTAL NRC LICENSE TERMINATION COST IS 64.54%, OR																					
SPENT FUEL MANAGEMENT COST IS 30.44%, OR																					
NON-NUCLEAR DEMOLITION COST IS 5.04%, OR																					
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCU)																					
TOTAL GREATER THAN CLASS C RADIOACTIVE WASTE VOLUME GENERATED																					
TOTAL SCRAP METAL REMOVED																					
TOTAL CRAFT LABOR REQUIREMENTS																					

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  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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 Volume				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	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	556
1a 1.2	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-
1a 1.3	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-
1a 1.4	Notification of Permanent Disfueling	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
1a 1.5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
1a 1.6	Prepare and submit PSD/R	-	-	-	-	-	-	113	17	132	132	-	-	-	-	-	-	-	-	-	856
1a 1.7	Review plant docs & specs	-	-	-	-	-	-	261	40	301	301	-	-	-	-	-	-	-	-	-	1,969
1a 1.8	Perform detailed rad survey	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
1a 1.9	Estimate by-product inventory	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	428
1a 1.10	End product description	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	428
1a 1.11	Detailed by-product inventory	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	556
1a 1.12	Define major work sequence	-	-	-	-	-	-	131	65	195	195	-	-	-	-	-	-	-	-	-	1,210
1a 1.13	Perform SER and EA	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,127
1a 1.14	Prepare/submit Disfueled Technical Specifications	-	-	-	-	-	-	131	65	195	195	-	-	-	-	-	-	-	-	-	1,210
1a 1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	287	11	300	300	-	-	-	-	-	-	-	-	-	2,140
1a 1.16	Prepare/submit Disfueled Fuel Management Plan	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a 1.17.1	Plant & temporary facilities	-	-	-	-	-	-	282	12	325	292	-	92	-	-	-	-	-	-	-	2,106
1a 1.17.2	Plant systems	-	-	-	-	-	-	239	36	275	248	-	28	-	-	-	-	-	-	-	1,781
1a 1.17.3	NSRS Decontamination Flush	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	411
1a 1.17.4	Reactor internals	-	-	-	-	-	-	108	61	169	169	-	-	-	-	-	-	-	-	-	1,039
1a 1.17.5	Reactor vessel	-	-	-	-	-	-	173	56	329	329	-	-	-	-	-	-	-	-	-	2,782
1a 1.17.6	Biological shield	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	211
1a 1.17.7	Steam generators	-	-	-	-	-	-	179	27	206	206	-	-	-	-	-	-	-	-	-	1,335
1a 1.17.8	Reinforced concrete	-	-	-	-	-	-	92	11	106	53	-	53	-	-	-	-	-	-	-	685
1a 1.17.9	Main Turbine	-	-	-	-	-	-	23	3	26	-	-	26	-	-	-	-	-	-	-	171
1a 1.17.10	Main Condensers	-	-	-	-	-	-	23	3	26	-	-	26	-	-	-	-	-	-	-	171
1a 1.17.11	Plant structures & buildings	-	-	-	-	-	-	179	27	206	103	-	103	-	-	-	-	-	-	-	1,115
1a 1.17.12	Waste management	-	-	-	-	-	-	261	40	301	301	-	-	-	-	-	-	-	-	-	1,969
1a 1.17.13	Facility & site closure	-	-	-	-	-	-	52	8	59	30	-	30	-	-	-	-	-	-	-	383
1a 1.17	Total	-	-	-	-	-	-	2,172	126	2,497	2,199	-	298	-	-	-	-	-	-	-	16,190
Planning & Site Preparations																					
1a 1.18	Prepare dismantling sequence	-	-	-	-	-	-	138	21	158	158	-	-	-	-	-	-	-	-	-	1,027
1a 1.19	Plant prep. & temp. access	-	-	-	-	-	-	3,100	530	3,930	1,910	-	-	-	-	-	-	-	-	-	-
1a 1.20	Design water cleanup system	-	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-	-	-	-	599
1a 1.21	Rigging/ent. Cont. Envelopes/shielding	-	-	-	-	-	-	2,100	960	2,760	2,760	-	-	-	-	-	-	-	-	-	-
1a 1.22	Procure tasks/lines & containers	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	526
1a 1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	10,287	1,543	11,830	11,532	-	298	-	-	-	-	-	-	-	13,151
Period 1a Collateral Costs																					
1a 3.1	Spent Fuel Capital and Transfers	-	-	-	-	-	-	13,414	2,147	16,461	-	16,161	-	-	-	-	-	-	-	-	-
1a 3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,414	2,147	16,161	-	16,161	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a 4.1	Insurance	-	-	-	-	-	-	3,497	921	3,727	1,527	-	-	-	-	-	-	-	-	-	-
1a 4.2	Property taxes	-	-	-	-	-	-	115	13	179	179	-	-	-	-	-	-	-	-	-	-
1a 4.3	Health physics supplies	-	511	-	-	-	-	-	128	641	641	-	-	-	-	-	-	-	-	-	-
1a 4.4	Heavy equipment rental	-	516	-	-	-	-	-	82	628	628	-	-	-	-	-	-	-	-	-	-
1a 4.5	Disposal of BAW generated	-	-	12	-	4	-	20	7	11	11	-	-	-	610	-	-	-	12,190	20	-
1a 4.6	Plant energy budget	-	-	-	-	-	-	2,004	601	2,405	2,405	-	-	-	-	-	-	-	-	-	-
1a 4.7	NRC Fees	-	-	-	-	-	-	751	75	829	829	-	-	-	-	-	-	-	-	-	-
1a 4.8	Emergency Planning Fees	-	-	-	-	-	-	121	12	163	-	-	163	-	-	-	-	-	-	-	-
1a 4.9	Spent Fuel Fuel O&M	-	-	-	-	-	-	111	62	176	-	-	176	-	-	-	-	-	-	-	-
1a 4.10	NSFM Operating Costs	-	-	-	-	-	-	51	8	63	-	-	63	-	-	-	-	-	-	-	-
1a 4.11	Security Staff Cost	-	-	-	-	-	-	5,891	881	6,775	6,775	-	-	-	-	-	-	-	-	-	170,800
1a 4.12	Utility Staff Cost	-	-	-	-	-	-	28,812	4,125	33,157	33,157	-	-	-	-	-	-	-	-	-	422,240
1a 4	Subtotal Period 1a Period-Dependent Costs	-	1,059	12	4	-	20	12,912	6,258	19,486	18,185	1,001	-	-	610	-	-	-	12,190	20	573,040
1a 0	TOTAL PERIOD 1a COST	-	1,059	12	4	-	20	66,613	9,968	77,677	59,916	17,163	298	-	610	-	-	-	12,190	20	606,491
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b 1.1	Plant systems	-	-	-	-	-	-	272	11	312	281	-	31	-	-	-	-	-	-	-	2,026
1b 1.1.2	NSRS Decontamination Flush	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	428
1b 1.1.3	Reactor internals	-	-	-	-	-	-	144	22	165	165	-	-	-	-	-	-	-	-	-	1,070
1b 1.1.4	Remaining buildings	-	-	-	-	-	-	78	12	89	22	-	67	-	-	-	-	-	-	-	558
1b 1.1.5	CRD cooling assembly	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	428
1b 1.1.6	CRD housings & IC tubes	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	428
1b 1.1.7	Incore instrumentation	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	428



Table C-2  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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 Volume				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			
Detailed Work Procedures (continued)																					
Ib 11.8	Reactor vessel	-	-	-	-	-	-	208	31	240	240	-	-	-	-	-	-	-	-	1,554	
Ib 11.9	Facility layout	-	-	-	-	-	-	69	10	79	10	-	10	-	-	-	-	-	-	511	
Ib 11.10	Missile shields	-	-	-	-	-	-	26	1	30	40	-	-	-	-	-	-	-	-	193	
Ib 11.11	Biological shield	-	-	-	-	-	-	69	10	79	79	-	-	-	-	-	-	-	-	511	
Ib 11.12	Steam generators	-	-	-	-	-	-	264	40	304	304	-	-	-	-	-	-	-	-	1,968	
Ib 11.13	Reinforced concrete	-	-	-	-	-	-	57	9	66	33	-	33	-	-	-	-	-	-	428	
Ib 11.14	Main Turbine	-	-	-	-	-	-	90	13	104	-	-	104	-	-	-	-	-	-	668	
Ib 11.15	Main Condensers	-	-	-	-	-	-	90	13	104	-	-	104	-	-	-	-	-	-	668	
Ib 11.16	Auxiliary building	-	-	-	-	-	-	157	24	180	162	-	18	-	-	-	-	-	-	1,168	
Ib 11.17	Reactor building	-	-	-	-	-	-	157	24	180	162	-	18	-	-	-	-	-	-	1,168	
Ib 11	Total	-	-	-	-	-	-	1,909	286	2,195	1,782	-	111	-	-	-	-	-	-	14,228	
Ib 12	Decon primary loop	844	-	-	-	-	-	-	423	1,264	1,264	-	-	-	-	-	-	-	-	1,067	
Ib 1	Subtotal Period Ib Activity Costs	844	-	-	-	-	-	1,909	708	3,459	3,046	-	111	-	-	-	-	-	-	1,067	11,228
Period Ib Additional Costs																					
Ib 2.1	Spent fuel pool isolation	-	-	-	-	-	-	8,217	1,211	9,449	9,449	-	-	-	-	-	-	-	-	-	
Ib 2.2	Site Characterization	-	-	-	-	-	-	2,351	706	3,059	3,059	-	-	-	-	-	-	-	-	13,042	
Ib 2	Subtotal Period Ib Additional Costs	-	-	-	-	-	-	10,570	1,919	12,509	12,509	-	-	-	-	-	-	-	-	13,042	13,410
Period Ib Collateral Costs																					
Ib 3.1	Decon equipment	1,026	-	-	-	-	-	-	154	1,180	1,180	-	-	-	-	-	-	-	-	-	
Ib 3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	
Ib 3.3	Process decommissioning water waste	51	-	46	11	-	36	-	16	215	215	-	-	-	126	-	-	-	19,555	61	
Ib 3.4	Process decommissioning chemical flush waste	3	-	93	211	-	815	-	251	1,401	1,401	-	-	-	-	-	-	-	92,070	162	
Ib 3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	
Ib 3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	
Ib 3.7	Decon rig	2,093	-	-	-	-	-	-	314	2,406	2,406	-	-	-	-	-	-	-	-	-	
Ib 3	Subtotal Period Ib Collateral Costs	3,174	1,202	129	285	-	853	1,816	1,217	8,676	8,676	-	-	-	126	864	-	-	111,626	225	
Period Ib Period-Dependent Costs																					
Ib 4.1	Decon supplies	36	-	-	-	-	-	-	9	45	45	-	-	-	-	-	-	-	-	-	
Ib 4.2	Insurance	-	-	-	-	-	-	1,599	160	1,759	1,759	-	-	-	-	-	-	-	-	-	
Ib 4.3	Property taxes	-	-	-	-	-	-	199	20	219	219	-	-	-	-	-	-	-	-	-	
Ib 4.4	Health physics supplies	-	287	-	-	-	-	-	52	339	339	-	-	-	-	-	-	-	-	-	
Ib 4.5	Heavy equipment rental	-	272	-	-	-	-	-	11	313	313	-	-	-	-	-	-	-	-	-	
Ib 4.6	Disposal of DAW generated	-	-	7	3	-	12	-	1	26	26	-	-	-	356	-	-	-	7,122	12	
Ib 4.7	Plant energy budget	-	-	-	-	-	-	1,999	300	2,299	2,299	-	-	-	-	-	-	-	-	-	
Ib 4.8	NRC Fees	-	-	-	-	-	-	193	19	212	212	-	-	-	-	-	-	-	-	-	
Ib 4.9	Emergency Planning Fees	-	-	-	-	-	-	210	21	231	-	243	-	-	-	-	-	-	-	-	
Ib 4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	206	31	237	-	247	-	-	-	-	-	-	-	-	
Ib 4.11	ISFSI Operating Costs	-	-	-	-	-	-	27	1	31	-	31	-	-	-	-	-	-	-	-	
Ib 4.12	Security Staff Cost	-	-	-	-	-	-	2,938	441	3,378	3,378	-	-	-	-	-	-	-	-	73,193	
Ib 4.13	DOC Staff Cost	-	-	-	-	-	-	5,550	832	6,382	6,382	-	-	-	-	-	-	-	-	63,266	
Ib 4.14	Utility Staff Cost	-	-	-	-	-	-	14,434	2,168	16,622	16,622	-	-	-	-	-	-	-	-	211,379	
Ib 4	Subtotal Period Ib Period-Dependent Costs	36	559	7	3	-	12	27,375	1,122	32,111	31,615	199	-	-	356	-	-	-	7,122	12	950,618
Ib 0	TOTAL PERIOD Ib COST	1,053	1,761	137	287	-	865	41,670	7,985	56,758	55,816	199	113	-	682	864	-	-	118,717	11,146	968,906
PERIOD I TOTALS																					
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a 11.1	Reactor Coolant Piping	81	92	24	25	-	152	-	108	483	483	-	-	-	1,275	-	-	-	88,981	1,137	-
2a 11.2	Pressurizer Relief Tank	21	18	11	11	-	69	-	35	366	366	-	-	-	53	-	-	-	40,513	1,082	-
2a 11.3	Reactor Coolant Pumps & Motors	79	66	297	261	-	1,207	-	427	2,438	2,438	-	-	-	7,231	-	-	-	792,800	1,795	100
2a 11.4	Pressurizer	-	98	519	121	-	575	-	226	1,509	1,509	-	-	-	4,145	-	-	-	287,853	1,666	938
2a 11.5	Steam Generators	-	17,157	632	17,199	-	9,931	-	1,712	19,783	19,783	-	-	-	51,061	-	-	-	1,711,200	12,127	2,125
2a 11.6	CRDMS/Relic/Structure Removal	106	197	282	15	-	306	-	214	1,150	1,150	-	-	-	4,852	-	-	-	179,025	8,214	1,459
2a 11.7	Reactor Vessel Internals	69	5,421	12,955	681	-	3,988	102	9,573	33,131	33,131	-	-	-	2,145	963	137	-	336,605	32,523	1,459
2a 11.8	Reactor Vessel	79	6,919	2,832	668	-	1,832	102	7,081	19,814	19,814	-	-	-	15,581	-	-	-	973,221	32,523	1,459
2a 11	Totals	436	16,588	17,623	1,556	-	18,063	801	21,496	78,376	78,376	-	-	-	66,178	963	137	-	6,410,201	97,117	6,082
Removal of Major Equipment																					
2a 1.2	Main Turbine/Generator	-	275	978	160	-	4,969	-	1,178	8,161	8,161	-	-	-	45,714	-	-	-	2,905,961	7,936	-
2a 1.3	Main Condensers	-	441	1,127	621	-	6,712	-	2,022	11,157	11,157	-	-	-	62,059	-	-	-	1,942,111	12,750	-
Casing Costs from Clean Building Demolition																					
2a 1.1.1	Reactor	-	605	-	-	-	-	-	91	695	695	-	-	-	-	-	-	-	-	5,539	-
2a 1.1.2	Auxiliary	-	281	-	-	-	-	-	12	325	325	-	-	-	-	-	-	-	-	2,011	-
2a 1.4.1	Safeguard	-	17	-	-	-	-	-	10	27	27	-	-	-	-	-	-	-	-	938	-
2a 1.4.4	Fuel	-	807	-	-	-	-	-	16	823	823	-	-	-	-	-	-	-	-	3,097	-
2a 1.4	Totals	-	1,262	-	-	-	-	-	189	1,451	1,451	-	-	-	-	-	-	-	-	11,248	-



Table C-2  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	ILRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu Feet	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GT/C Cu Feet	Burial / Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours
Deposited of Plant Systems																					
24.1.1.1	Auxiliary Feedwater (insulated)	-	576	171	69	-	740	-	536	1,912	1,912	-	-	-	6,755	-	-	-	432,570	14,312	-
24.1.1.2	Auxiliary Steam	-	116	-	-	-	-	-	17	131	-	-	134	-	-	-	-	-	-	3,676	-
24.1.1.3	Boron Recycle (insulated)	17	95	1	1	-	15	-	23	91	91	-	-	-	143	-	-	-	8,751	1,295	-
24.1.1.4	Boron Recycle (uninsulated)	258	142	82	15	-	674	-	921	1,412	1,412	-	-	-	3,420	-	-	-	218,161	15,708	-
24.1.1.5	Boron Thermal Regeneration (insulated)	99	81	11	1	-	10	-	52	226	226	-	-	-	159	-	-	-	51,281	2,877	-
24.1.1.6	Boron Thermal Regeneration (uninsulated)	111	217	54	12	-	134	-	148	657	657	-	-	-	1,215	-	-	-	78,156	7,885	-
24.1.1.7	Carbon Dioxide Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	20	-	-
24.1.1.8	Chemical & Volume Control (insulated)	90	191	24	8	-	87	-	108	517	517	-	-	-	779	-	-	-	59,589	6,876	-
24.1.1.9	Chemical & Volume Control (uninsulated)	800	504	97	88	-	414	-	995	1,718	1,718	-	-	-	4,771	-	-	-	242,220	29,040	-
24.1.1.10	Chemical Feed	-	15	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	121	-
24.1.1.11	Chemical Feed - RCA	-	8	1	0	-	2	-	2	13	13	-	-	-	15	-	-	-	971	253	-
24.1.1.12	Chilled Water - Safety	-	5	-	-	-	-	-	1	5	-	-	6	-	-	-	-	-	-	179	-
24.1.1.13	Chilled Water - Safety - RCA	-	97	15	5	-	52	-	40	209	209	-	-	-	471	-	-	-	30,651	2,232	-
24.1.1.14	Chlorine	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	69	-
24.1.1.15	Circulating Water	-	121	-	-	-	-	-	18	969	-	-	969	-	-	-	-	-	-	10,429	-
24.1.1.16	Component Cooling Water	-	25	-	-	-	-	-	1	28	-	-	28	-	-	-	-	-	-	763	-
24.1.1.17	Component Cooling Water - RCA	-	1,045	402	180	-	1,943	-	814	1,981	4,381	-	-	-	17,786	-	-	-	1,136,465	26,119	-
24.1.1.18	Condensate (insulated)	-	134	-	-	-	-	-	20	154	-	-	154	-	-	-	-	-	-	1,571	-
24.1.1.19	Condensate (uninsulated)	-	113	-	-	-	-	-	17	129	-	-	129	-	-	-	-	-	-	1,511	-
24.1.1.20	Condensate Polishing	-	104	-	-	-	-	-	16	119	-	-	119	-	-	-	-	-	-	3,427	-
24.1.1.21	Condenser Vacuum & Water Box Priming	-	64	-	-	-	-	-	9	72	-	-	-	-	-	-	-	-	-	2,017	-
24.1.1.22	Extraction Steam	-	55	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	1,806	-
24.1.1.23	Feedwater	-	219	-	-	-	-	-	15	278	-	-	278	-	-	-	-	-	-	7,081	-
24.1.1.24	Feedwater - RCA	-	38	27	15	-	19	-	53	286	286	-	-	-	1,250	-	-	-	79,675	1,502	-
24.1.1.25	Generator & Exciter	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	69	-
24.1.1.26	Generator Gas Cooling	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	217	-
24.1.1.27	Generator Primary Water	-	5	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	1,745	-
24.1.1.28	Generator Seal Oil	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	218	-
24.1.1.29	Hydrogen Gas	-	2	-	-	-	-	-	0	2	-	-	-	-	-	-	-	-	-	54	-
24.1.1.30	Main Steam Reheat & Steam Dump	-	36	-	-	-	-	-	5	42	-	-	42	-	-	-	-	-	-	1,136	-
24.1.1.31	Main Steam Reheat & Steam Dump - RCA	-	123	140	77	-	619	-	284	1,245	1,525	-	-	-	5,611	-	-	-	861,941	10,542	-
24.1.1.32	Main Turbine Lub Oil	-	11	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	1,083	-
24.1.1.33	Main Turbine Oil Purification	-	83	-	-	-	-	-	13	97	-	-	97	-	-	-	-	-	-	2,663	-
24.1.1.34	Nitrogen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	19	-
24.1.1.35	Oxygen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	12	-
24.1.1.36	Post Accident Sampling	-	7	1	0	-	2	-	2	11	11	-	-	-	15	-	-	-	951	222	-
24.1.1.37	Process Sampling (uninsulated)	-	9	1	2	-	19	-	8	41	41	-	-	-	177	-	-	-	112,46	269	-
24.1.1.38	Reactor Coolant	54	111	15	5	-	59	-	71	315	315	-	-	-	531	-	-	-	31,556	3,821	-
24.1.1.39	Reservoir Makeup Water	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	2,790	-
24.1.1.40	Reservoir Return Water	-	64	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	2,095	-
24.1.1.41	Reservoir Service Tanks	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	908	-
24.1.1.42	Residual Heat Removal	950	224	159	59	-	642	-	115	1,840	1,840	-	-	-	5,835	-	-	-	375,247	7,176	-
24.1.1.43	Safety Injection (insulated)	-	112	36	15	-	161	-	73	398	398	-	-	-	1,465	-	-	-	93,997	2,765	-
24.1.1.44	Safety Injection (uninsulated)	-	339	170	75	-	806	-	315	1,704	1,704	-	-	-	7,106	-	-	-	471,538	9,419	-
24.1.1.45	Secondary Plant Sampling	-	29	-	-	-	-	-	1	34	-	-	34	-	-	-	-	-	-	1,030	-
24.1.1.46	Steam Generator Blowdown & Cleanup	-	144	-	-	-	-	-	20	174	-	-	174	-	-	-	-	-	-	4,655	-
24.1.1.47	Turbine Electrohydraulic Control (insulated)	-	26	-	-	-	-	-	1	30	-	-	30	-	-	-	-	-	-	838	-
24.1.1.48	Turbine Electrohydraulic Control (uninsulated)	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	552	-
24.1.1.49	Turbine Gland Steam & Drains	-	15	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	1,133	-
24.1.1.50	Turbine Heat Exchangers	-	157	-	-	-	-	-	56	433	-	-	433	-	-	-	-	-	-	12,290	-
24.1.1.51	Turbine Plant Cooling (insulated)	-	37	-	-	-	-	-	4	19	-	-	19	-	-	-	-	-	-	549	-
24.1.1.52	Turbine Plant Cooling (uninsulated)	-	137	-	-	-	-	-	21	157	-	-	157	-	-	-	-	-	-	4,420	-
24.1.1.53	Turbines (HIGH / LOW) (insulated)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	136	-
24.1.1.54	Turbines (HIGH / LOW) (uninsulated)	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	471	-
24.1.1.55	Vent Chilled Water - Non Safety	-	75	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	2,423	-
24.1.1.56	Vent Chilled Water - Non Safety - RCA	-	581	113	52	-	562	-	908	1,619	1,619	-	-	-	5,008	-	-	-	328,470	13,960	-
24.1.1.57	Westinghouse Process Instruments	-	4	0	0	-	2	-	1	7	-	-	-	-	16	-	-	-	993	111	-
24.1.1	Totals	1,217	7,115	1,525	631	-	6,807	-	4,167	21,562	18,947	-	2,813	-	62,132	-	-	-	4,880,992	226,622	-
24.1.6	Scaffolding in support of decommissioning	-	1,152	25	12	-	126	-	121	1,638	1,638	-	-	-	1,157	-	-	-	71,520	40,258	-
24.1	Subtotal Period 2a Activity Costs	1,653	27,035	21,178	5,283	-	96,707	801	29,586	122,545	119,740	-	2,813	-	237,270	963	137	-	17,313,110	596,162	6,082
Period 2a Additional Costs																					
24.2.1	Landfill	-	5	2	1	-	4	294	17	356	-	-	356	-	-	-	-	-	-	139	1,280
24.2	Subtotal Period 2a Additional Costs	-	5	2	1	-	4	294	17	356	-	-	356	-	-	-	-	-	-	139	1,280
Period 2a Collateral Costs																					
24.3.1	Process decommissioning, water waste	188	-	132	160	-	131	-	164	775	775	-	-	-	1,181	-	-	-	70,819	2,40	-
24.3.2	Process decommissioning chemical flush waste	1	-	128	132	-	235	-	123	823	823	-	-	-	1,191	-	-	-	327,197	223	-
24.3.3	Small tool allowance	-	277	-	-	-	-	-	42	319	287	-	32	-	-	-	-	-	-	-	-
24.3.4	Sky crane	-	-	-	-	-	-	1,122	468	4,590	4,590	-	-	-	-	-	-	-	-	-	-
24.3	Subtotal Period 2a Collateral Costs	192	277	260	492	-	966	1,122	797	5,507	5,176	-	32	-	2,174	-	-	-	198,016	154	-
Period 2a Period-Independent Costs																					
24.4.1	Decon supplies	126	-	-	-	-	-	-	31	137	137	-	-	-	-	-	-	-	-	-	-



Table C-2  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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	1st 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	GTFU Cu Feet				
Period 21 Period-Dependent Costs (continued)																						
2a 4.2	Insurance	-	-	-	-	-	-	1,028	103	1,130	1,130	-	-	-	-	-	-	-	-	-	-	
2a 4.1	Property Taxes	-	-	-	-	-	-	689	69	758	758	-	-	-	-	-	-	-	-	-	-	
2a 4.4	Health physics supplies	-	2,768	-	-	-	-	-	697	3,465	3,465	-	-	-	-	-	-	-	-	-	-	
2a 4.5	Heavy equipment rental	-	1,677	-	-	-	-	-	532	1,229	1,229	-	-	-	-	-	-	-	-	-	-	
2a 4.6	Disposal of DAW generated	-	-	128	44	-	211	-	72	435	435	-	-	-	-	6,321	-	-	126,426	206	-	
2a 4.7	Plant energy budget	-	-	-	-	-	-	3,281	192	3,774	1,774	-	-	-	-	-	-	-	-	-	-	
2a 4.8	NRC Fees	-	-	-	-	-	-	626	63	689	689	-	-	-	-	-	-	-	-	-	-	
2a 4.9	Emergency Planning Fees	-	-	-	-	-	-	259	26	285	-	285	-	-	-	-	-	-	-	-	-	
2a 4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	711	107	820	-	820	-	-	-	-	-	-	-	-	-	
2a 4.11	198M Operating Costs	-	-	-	-	-	-	94	11	108	-	108	-	-	-	-	-	-	-	-	-	
2a 4.12	Remedial Actions Surveys	-	-	-	-	-	-	1,388	208	1,596	1,596	-	-	-	-	-	-	-	-	-	-	
2a 4.13	Security Staff Cost	-	-	-	-	-	-	10,152	1,523	11,675	11,675	-	-	-	-	-	-	-	-	-	239,872	
2a 4.14	DOC Staff Cost	-	-	-	-	-	-	23,515	3,327	27,042	27,042	-	-	-	-	-	-	-	-	-	272,117	
2a 4.15	Utility Staff Cost	-	-	-	-	-	-	35,734	5,363	41,117	41,117	-	-	-	-	-	-	-	-	-	507,198	
2a 4	Subtotal Period 2a Period-Dependent Costs	126	6,465	128	44	-	211	77,300	12,817	97,121	96,108	1,213	-	-	-	6,321	-	-	126,426	206	1,019,487	
2a 0	TOTAL PERIOD 2a (COST)	1,971	11,782	21,868	5,823	-	17,249	81,720	11,278	225,740	221,114	1,213	1,201	-	215,965	961	117	-	17,617,580	396,960	1,016,819	
PERIOD 2b - Site Decontamination																						
Period 2b Unit 2 Decommissioning Activities																						
Disposal of Plant Systems																						
2b 1.1.1	Auxiliary Building HVAC (uninsulated)	-	50	10	6	-	60	-	29	155	155	-	-	-	-	-	-	-	11,870	1,137	-	
2b 1.1.2	Auxiliary Building HVAC (uninsulated)	-	62	12	6	-	69	-	35	184	184	-	-	-	-	-	-	-	10,541	1,483	-	
2b 1.1.3	Batt Rm & Misc Uncontrolled Air HVAC	-	3	-	-	-	-	-	0	3	-	-	-	-	-	-	-	-	-	91	-	
2b 1.1.4	Compressed Air - Instr Air (uninsulated)	-	3	-	-	-	-	-	0	3	-	-	-	-	-	-	-	-	-	83	-	
2b 1.1.5	Compressed Air - Instrument Air - R/C/A/B	-	41	4	1	-	46	-	14	74	74	-	-	-	-	-	-	-	7,912	1,178	-	
2b 1.1.6	Compressed Air - Instrument Air - R/C/A/B	-	141	21	7	-	169	-	54	284	284	-	-	-	-	-	-	-	42,246	2,977	-	
2b 1.1.7	Compressed Air - Service Air	-	27	-	-	-	-	-	1	31	-	-	31	-	-	-	-	-	-	886	-	
2b 1.1.8	Compressed Air - Service Air - R/C/A	-	144	19	6	-	169	-	52	276	276	-	-	-	-	-	-	-	37,981	3,284	-	
2b 1.1.9	Compressed Air - Instr Air (uninsulated)	-	19	-	-	-	-	-	6	45	-	-	45	-	-	-	-	-	-	1,267	-	
2b 1.1.10	Containment Hatches	-	46	2	1	-	49	-	10	7	37	-	-	-	-	-	-	-	6,019	114	-	
2b 1.1.11	Containment Hydrogen Purge HVAC	-	55	15	6	-	76	-	61	171	171	-	-	-	-	-	-	-	37,163	1,364	-	
2b 1.1.12	Containment Spray	-	174	130	115	-	419	-	512	2,812	2,812	-	-	-	-	15,138	-	-	851,411	10,156	-	
2b 1.1.13	Containment Ventilation HVAC (annual)	-	30	10	5	-	45	-	23	122	122	-	-	-	-	504	-	-	31,997	804	-	
2b 1.1.14	Containment Ventilation HVAC (uninsulated)	-	201	123	57	-	381	-	225	1,223	1,223	-	-	-	-	5,623	-	-	159,197	5,365	-	
2b 1.1.15	Control Room HVAC	-	46	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	1,114	-	
2b 1.1.16	Demanded & RCS Makeup Water	-	129	-	-	-	-	-	18	149	-	-	149	-	-	-	-	-	-	1,662	-	
2b 1.1.17	Demanded & RCS Makeup Water - R/C/A	-	416	71	21	-	508	-	177	938	938	-	-	-	-	2,253	-	-	146,336	9,741	-	
2b 1.1.18	Diesel Gen & Auxiliaries (uninsulated)	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	185	-	
2b 1.1.19	Diesel Gen & Auxiliaries (uninsulated)	-	71	-	-	-	-	-	11	85	-	-	85	-	-	-	-	-	-	2,311	-	
2b 1.1.20	Diesel Generator Fuel Oil	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	863	-	
2b 1.1.21	Diesel Room HVAC	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	117	-	
2b 1.1.22	Electrical - Clean	-	1,846	-	-	-	-	-	277	2,123	-	-	2,123	-	-	-	-	-	-	56,765	-	
2b 1.1.23	Electrical - Contaminated	-	297	19	21	-	337	-	148	720	720	-	-	-	-	-	-	-	133,669	7,000	-	
2b 1.1.24	Electrical - R/C/A	-	2,665	151	186	-	3,002	-	1,232	6,448	6,448	-	-	-	-	-	-	-	1,175,973	66,381	-	
2b 1.1.25	Fire Protection	-	474	-	-	-	-	-	71	545	-	-	545	-	-	-	-	-	-	11,858	-	
2b 1.1.26	Leak Rate Test	-	5	1	0	-	6	-	2	12	12	-	-	-	-	34	-	-	2,202	123	-	
2b 1.1.27	Misc. Plant HVAC (uninsulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	72	-	
2b 1.1.28	Misc. Plant HVAC (uninsulated)	-	27	-	-	-	-	-	1	31	-	-	31	-	-	-	-	-	-	955	-	
2b 1.1.29	Miscellaneous Equipment	-	6	1	1	-	8	-	4	21	21	-	-	-	-	-	-	-	4,779	178	-	
2b 1.1.30	Office & Service HVAC	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	81	-	
2b 1.1.31	Potable Water	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,892	-	
2b 1.1.32	Primary Plant HVAC (uninsulated)	-	52	11	6	-	69	-	30	161	161	-	-	-	-	-	-	-	6,188	1,180	-	
2b 1.1.33	Primary Plant HVAC (uninsulated)	-	95	25	13	-	133	-	64	199	199	-	-	-	-	-	-	-	83,821	2,436	-	
2b 1.1.34	Radiation Monitoring	-	3	-	-	-	-	-	1	3	-	-	3	-	-	-	-	-	-	102	-	
2b 1.1.35	Safeguards Building HVAC (uninsulated)	-	16	1	2	-	19	-	9	49	49	-	-	-	-	4	-	-	11,018	569	-	
2b 1.1.36	Safeguards Building HVAC (uninsulated)	-	11	8	4	-	23	-	23	123	123	-	-	-	-	-	-	-	25,970	1,364	-	
2b 1.1.37	Service Water	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,882	-	
2b 1.1.38	Service Water - R/C/A	-	206	109	52	-	367	-	211	1,113	1,113	-	-	-	-	-	-	-	329,913	5,180	-	
2b 1.1.39	Turbine Building HVAC (uninsulated)	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	92	-	
2b 1.1.40	Turbine Building HVAC (uninsulated)	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	840	-	
2b 1.1.41	UPS HVAC	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-	
2b 1.1.42	Vents & Drains	-	15	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	1,092	-	
2b 1.1.43	Vents & Drains - R/C/A	226	117	63	22	-	215	-	293	1,284	1,284	-	-	-	-	-	-	-	117,366	15,760	-	
2b 1.1.44	Waste Management (uninsulated)	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	329	-	
2b 1.1.45	Waste Management (uninsulated)	-	127	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	4,044	-	
2b 1.1.46	Waste Processing Gas (uninsulated)	-	90	36	17	-	143	-	74	197	197	-	-	-	-	-	-	-	105,149	2,637	-	
2b 1.1.47	Waste Processing Liquid (uninsulated)	129	242	14	11	-	396	-	170	716	716	-	-	-	-	-	-	-	69,969	10,444	-	
2b 1.1.48	Waste Processing Liquid (uninsulated)	291	364	101	45	-	491	-	678	1,677	1,677	-	-	-	-	-	-	-	287,192	17,449	-	
2b 1.1.49	Waste Processing Solid	6	21	9	4	-	40	-	22	110	110	-	-	-	-	-	-	-	-	27,878	673	-
2b 1.1.50	Water Treatment (uninsulated)	-	36	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	1,780	-	
2b 1.1.51	Water Treatment (uninsulated)	-	587	-	-	-	-	-	88	675	-	-	675	-	-	-	-	-	-	18,716	-	
2b 1.1	Totals	655	9,711	1,411	638	-	6,887	-	4,158	23,695	19,501	-	4,191	-	6,109	-	-	-	1,027,362	282,996	-	



Table C-2  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Costs	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	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet	Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours	
2b 1.2	Scaffolding in support of decommissioning	-	1,440	0	15	-	157	-	105	2,017	2,017	-	-	-	1,447	-	-	-	91,900	50,323	-	
Decontamination of Site Buildings																						
2b 1.1.1	Reactor	1,115	735	119	151	-	1,296	-	1,110	1,515	4,545	-	-	-	18,945	-	-	-	862,451	49,418	-	
2b 1.1.2	Auxiliary	757	393	67	112	-	778	-	695	2,805	2,805	-	-	-	12,156	-	-	-	589,032	29,108	-	
2b 1.1.3	Radioactive Warehouse	217	26	2	5	-	31	-	139	151	151	-	-	-	371	-	-	-	26,961	7,498	-	
2b 1.1.4	Safeguard	116	71	18	18	-	118	-	130	321	521	-	-	-	2,008	-	-	-	98,799	5,673	-	
2b 1.1	Totals	2,285	1,228	206	286	-	2,217	-	2,075	8,327	8,327	-	-	-	15,680	-	-	-	1,577,217	91,777	-	
2b 1.1	Prepare/submit License Termination Plan	-	-	-	-	-	-	215	35	270	270	-	-	-	-	-	-	-	-	-	1,753	
2b 1.3	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2b 1	Subtotal Period 2b Activity Costs	2,281	1,232	1,651	908	-	9,290	215	6,873	11,110	10,119	-	4,191	-	98,166	-	-	-	5,696,249	425,996	1,753	
Period 2b Additional Costs																						
2b 2.1	Underground Utilities Excavation	-	2,157	-	-	-	-	785	732	1,971	1,971	-	-	-	-	-	-	-	-	13,618	-	
2b 2	Subtotal Period 2b Additional Costs	-	2,157	-	-	-	-	785	732	1,971	1,971	-	-	-	-	-	-	-	-	13,618	-	
Period 2b Collateral Costs																						
2b 3.1	Process decommissioning water waste	151	-	111	131	-	110	-	136	641	641	-	-	-	990	-	-	-	59,427	191	-	
2b 3.2	Process decommissioning chemical flush waste	1	-	45	91	-	61	-	31	221	221	-	-	-	325	-	-	-	34,656	61	-	
2b 3.3	Small tool allowance	-	212	-	-	-	-	-	15	267	267	-	-	-	-	-	-	-	-	-	-	
2b 3.4	Spent Fuel Capital and Transfers	-	-	-	-	-	-	16,800	10,020	76,819	-	76,819	-	-	-	-	-	-	-	-	-	
2b 3.5	Severance	-	-	-	-	-	-	905	16	120	150	-	-	-	-	-	-	-	-	-	-	
2b 3	Subtotal Period 2b Collateral Costs	155	212	146	225	-	171	67,101	10,279	78,495	1,086	76,819	-	-	1,316	-	-	-	94,081	254	-	
Period 2b Period-Dependent Costs																						
2b 4.1	License supplies	1,916	-	-	-	-	-	-	186	2,432	2,432	-	-	-	-	-	-	-	-	-	-	
2b 4.2	Inventory	-	-	-	-	-	-	-	1,356	1,492	1,492	-	-	-	-	-	-	-	-	-	-	
2b 4.3	Property taxes	-	-	-	-	-	-	-	909	91	1,000	1,000	-	-	-	-	-	-	-	-	-	
2b 4.4	Health physics supplies	-	1,243	-	-	-	-	-	830	4,051	1,051	-	-	-	-	-	-	-	-	-	-	
2b 4.5	Heavy equipment rental	-	5,004	-	-	-	-	-	751	5,755	5,755	-	-	-	-	-	-	-	-	-	-	
2b 4.6	Disposal of DAW generated	-	-	119	11	-	197	-	67	425	125	-	-	-	5,899	-	-	-	117,982	192	-	
2b 4.7	Plant energy budget	-	-	-	-	-	1,418	-	511	3,911	1,911	-	-	-	-	-	-	-	-	-	-	
2b 4.8	NRC Fees	-	-	-	-	-	826	-	84	305	309	-	-	-	-	-	-	-	-	-	-	
2b 4.9	Emergency Planning Fees	-	-	-	-	-	142	-	31	376	-	176	-	-	-	-	-	-	-	-	-	
2b 4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	-	941	111	1,082	-	1,082	-	-	-	-	-	-	-	-	
2b 4.11	Liquid Radioactive Processing Equipment/Services	-	-	-	-	-	-	-	171	71	545	545	-	-	-	-	-	-	-	-	-	
2b 4.12	INPP Operating Costs	-	-	-	-	-	-	-	124	19	142	-	142	-	-	-	-	-	-	-	-	
2b 4.13	Remedial Action Surveys	-	-	-	-	-	-	-	1,831	275	2,106	2,106	-	-	-	-	-	-	-	-	-	
2b 4.14	Security Staff Cost	-	-	-	-	-	-	-	13,997	2,010	15,406	15,406	-	-	-	-	-	-	-	112,915	-	
2b 4.15	DOE Staff Cost	-	-	-	-	-	-	-	29,830	1,458	31,428	31,428	-	-	-	-	-	-	-	115,280	-	
2b 4.16	Utility Staff Cost	-	-	-	-	-	-	-	45,292	9,734	52,086	52,086	-	-	-	-	-	-	-	640,896	-	
2b 4	Subtotal Period 2b Period-Dependent Costs	1,916	8,215	119	11	-	197	98,761	16,757	126,066	124,166	1,601	-	-	5,899	-	-	-	117,982	192	1,329,092	
2b 0	TOTAL PERIOD 2b COST	5,011	21,146	1,916	1,204	-	9,661	166,844	11,611	242,645	160,074	78,420	4,191	-	105,181	-	-	-	5,908,513	439,161	1,330,815	
PERIOD 2d - Decontamination Following Wet Fuel Storage																						
Period 2d Direct Decommissioning Activities																						
2d 1.1	Remove spent fuel racks	259	24	127	31	-	130	-	235	1,007	1,007	-	-	-	1,042	-	-	-	191,246	838	-	
Disposal of Plant Systems																						
2d 1.2.1	Electrical - Contaminated FHB	-	68	8	4	-	45	-	39	175	175	-	-	-	112	-	-	-	26,148	1,082	-	
2d 1.2.2	Electrical - RCA FHB	-	158	76	19	-	421	-	233	1,227	1,227	-	-	-	1,879	-	-	-	246,432	10,271	-	
2d 1.2.3	Fire Protection - RCA	-	777	191	70	-	740	-	414	2,212	2,212	-	-	-	6,891	-	-	-	111,645	18,575	-	
2d 1.2.4	Fuel Building HVAC (insulated)	-	235	5	2	-	27	-	11	70	70	-	-	-	248	-	-	-	15,765	511	-	
2d 1.2.5	Fuel Building HVAC (uninsulated)	-	28	6	1	-	12	-	16	81	81	-	-	-	290	-	-	-	18,444	681	-	
2d 1.2.6	Fuel Handling	-	6	1	1	-	7	-	3	17	17	-	-	-	61	-	-	-	1,891	132	-	
2d 1.2.7	Sewage Treatment	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	678	-	
2d 1.2.8	Spent Fuel Pool Cooling & Cleanup	-	851	221	81	-	803	-	470	2,517	2,517	-	-	-	8,990	-	-	-	522,128	22,215	-	
2d 1.2	Totals	-	2,212	507	202	-	2,184	-	1,183	6,309	6,281	-	25	-	19,871	-	-	-	1,277,151	51,773	-	
Decontamination of Site Buildings																						
2d 1.1.1	Fuel	772	811	112	76	-	300	-	739	3,011	3,011	-	-	-	5,881	-	-	-	326,536	417,108	-	
2d 1.1	Totals	772	811	112	76	-	300	-	739	3,011	3,011	-	-	-	5,881	-	-	-	326,536	417,108	-	
2d 1.1	Scaffolding in support of decommissioning	-	288	6	1	-	11	-	81	109	109	-	-	-	289	-	-	-	18,380	10,061	-	
2d 1	Subtotal Period 2d Activity Costs	1,011	1,179	732	292	-	1,016	-	3,239	10,719	10,711	-	25	-	29,088	-	-	-	1,815,615	109,111	-	
Period 2d Additional Costs																						
2d 2.1	License Termination Surveys Planning	-	-	-	-	-	-	1,019	66	1,125	1,125	-	-	-	-	-	-	-	-	-	6,210	
2d 2.2	Operational Tools and Equipment	-	-	12	12	-	-	185	-	52	281	-	-	-	5,880	-	-	-	147,000	16	6,210	
2d 2.3	Filing Fees	-	-	-	-	-	-	965	55	120	-	-	120	-	-	-	-	-	-	-	-	
2d 2	Subtotal Period 2d Additional Costs	-	-	12	12	-	-	1,85	1,384	113	2,026	1,606	-	120	-	5,880	-	-	-	147,000	16	6,210



Table C-2  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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. Fee Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu Feet	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet	Burial / Processed Wt. Lbs	Craft Manhours	Utility and Contractor Manhours
<b>Period 2d Collateral Costs</b>																					
2d 1.1	Process decommissioning water waste	-	72	-	52	-	52	-	61	302	302	-	-	-	167	-	-	-	27,996	91	-
2d 1.3	Small tool allowance	-	61	-	-	-	-	-	10	74	74	-	-	-	-	-	-	-	-	-	-
2d 1.4	Decommissioning Equipment Disposition	-	-	111	51	-	575	-	163	901	901	-	-	-	5,290	-	-	-	516,079	147	-
2d 1.5	Services	-	-	-	-	-	-	1,873	731	5,601	5,601	-	-	-	-	-	-	-	-	-	-
2d 1	Subtotal Period 2d Collateral Costs	-	72	61	103	-	626	1,873	967	6,881	6,881	-	-	-	5,757	-	-	-	961,075	238	-
<b>Period 2d Period-Dependent Costs</b>																					
2d 1.1	Decon supplies	-	139	-	-	-	-	-	85	423	423	-	-	-	-	-	-	-	-	-	-
2d 1.2	Insurance	-	-	-	-	-	-	192	19	511	511	-	-	-	-	-	-	-	-	-	-
2d 1.3	Property taxes	-	-	-	-	-	-	130	13	363	363	-	-	-	-	-	-	-	-	-	-
2d 1.4	Health physics supplies	-	-	907	-	-	-	-	226	1,131	1,131	-	-	-	-	-	-	-	-	-	-
2d 1.5	Heavy equipment rental	-	1,817	-	-	-	-	-	272	2,087	2,087	-	-	-	-	-	-	-	-	-	-
2d 1.6	Disposal of DAW generated	-	-	57	20	-	91	-	12	201	201	-	-	-	2,817	-	-	-	76,311	92	-
2d 1.7	Plant energy budget	-	-	-	-	-	-	661	99	760	760	-	-	-	-	-	-	-	-	-	-
2d 1.8	NRC Fees	-	-	-	-	-	-	284	28	312	312	-	-	-	-	-	-	-	-	-	-
2d 1.9	Liquid Radiaste Processing Equipment/Services	-	-	-	-	-	-	114	52	166	166	-	-	-	-	-	-	-	-	-	-
2d 1.10	ISFSI Operating Costs	-	-	-	-	-	-	45	7	52	52	-	52	-	-	-	-	-	-	-	-
2d 1.11	Remedial Action Surveys	-	-	-	-	-	-	664	100	764	764	-	-	-	-	-	-	-	-	-	-
2d 1.12	Security Staff Cost	-	-	-	-	-	-	1,199	210	1,409	1,409	-	996	-	-	-	-	-	-	-	36,021
2d 1.13	DOC Staff Cost	-	-	-	-	-	-	7,118	1,113	8,531	8,531	-	-	-	-	-	-	-	-	-	83,764
2d 1.14	Utility Staff Cost	-	-	-	-	-	-	11,828	1,774	13,602	13,602	-	626	-	-	-	-	-	-	-	161,810
2d 1	Subtotal Period 2d Period-Dependent Costs	-	139	2,720	57	20	91	23,364	1,080	30,773	29,100	1,673	-	-	2,817	-	-	-	76,311	92	285,795
2d 0	TOTAL PERIOD 2d COST	-	1,112	6,363	986	160	-	1,952	22,721	7,198	50,122	48,801	1,673	-	43,532	-	-	-	2,181,011	109,760	291,815
<b>PERIOD 2f - License Termination</b>																					
<b>Period 2f Direct Decommissioning Activities</b>																					
2f 1.1	GRISE confirmation survey	-	-	-	-	-	-	156	17	201	201	-	-	-	-	-	-	-	-	-	-
2f 1.2	Terminate license	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
2f 1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	156	17	201	201	-	-	-	-	-	-	-	-	-	-
<b>Period 2f Additional Costs</b>																					
2f 2.1	License Termination Survey	-	-	-	-	-	-	5,937	1,781	7,718	7,718	-	-	-	-	-	-	-	-	151,521	3,120
2f 2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	5,937	1,781	7,718	7,718	-	-	-	-	-	-	-	-	151,521	3,120
<b>Period 2f Collateral Costs</b>																					
2f 1.1	DOC staff relocation expenses	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	-
2f 1.2	Services	-	-	-	-	-	-	2,005	301	2,306	2,306	-	-	-	-	-	-	-	-	-	-
2f 3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	3,821	573	4,395	4,395	-	-	-	-	-	-	-	-	-	-
<b>Period 2f Period-Dependent Costs</b>																					
2f 4.1	Insurance	-	-	-	-	-	-	119	15	134	134	-	-	-	-	-	-	-	-	-	-
2f 4.2	Property taxes	-	-	-	-	-	-	301	30	331	331	-	-	-	-	-	-	-	-	-	-
2f 4.3	Health physics supplies	-	-	718	-	-	-	-	187	915	915	-	-	-	-	-	-	-	-	-	-
2f 4.4	Disposal of DAW generated	-	-	7	2	-	11	-	1	21	24	-	-	-	117	-	-	-	6,734	11	-
2f 4.5	Plant energy budget	-	-	-	-	-	-	802	45	847	847	-	-	-	-	-	-	-	-	-	-
2f 4.6	NRC Fees	-	-	-	-	-	-	216	25	240	240	-	-	-	-	-	-	-	-	-	-
2f 4.7	ISFSI Operating Costs	-	-	-	-	-	-	41	6	47	47	-	47	-	-	-	-	-	-	-	-
2f 4.8	Security Staff Cost	-	-	-	-	-	-	1,278	192	1,469	1,469	-	930	-	-	-	-	-	-	-	32,910
2f 4.9	DOC Staff Cost	-	-	-	-	-	-	1,082	169	1,251	1,251	-	-	-	-	-	-	-	-	-	16,422
2f 4.10	Utility Staff Cost	-	-	-	-	-	-	4,908	660	5,957	5,957	-	455	-	-	-	-	-	-	-	59,942
2f 4	Subtotal Period 2f Period-Dependent Costs	-	-	718	7	2	11	11,077	1,803	13,618	12,236	1,412	-	-	137	-	-	-	6,734	11	119,474
2f 0	TOTAL PERIOD 2f COST	-	-	718	7	2	11	20,991	1,204	25,963	21,553	1,412	-	-	137	-	-	-	6,734	151,515	112,394
<b>PERIOD 2 TOTALS</b>																					
<b>PERIOD 2b - Site Restoration</b>																					
<b>Period 2b Direct Decommissioning Activities</b>																					
<b>Demolition of Remaining Site Buildings</b>																					
2b 1.1	Reactor	-	3,431	-	-	-	-	-	535	3,966	-	-	3,966	-	-	-	-	-	-	33,617	-
2b 1.1.2	Administration	-	77	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,232	-
2b 1.1.3	Auxiliary	-	2,549	-	-	-	-	-	982	2,931	-	-	2,931	-	-	-	-	-	-	18,402	-
2b 1.1.4	Chlorination (RW Intake)	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	87	-
2b 1.1.5	Chlorination (SW Intake)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	95	-
2b 1.1.6	Civ. Water Intake	-	779	-	-	-	-	-	117	896	-	-	896	-	-	-	-	-	-	5,446	-
2b 1.1.7	Civ. Water Yard Piping	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	36	-
2b 1.1.8	Diesel Generator	-	310	-	-	-	-	-	62	472	-	-	472	-	-	-	-	-	-	4,210	-
2b 1.1.9	Flex Storage Building	-	636	-	-	-	-	-	92	708	-	-	708	-	-	-	-	-	-	1,621	-
2b 1.1.10	Maintenance	-	130	-	-	-	-	-	21	171	-	-	171	-	-	-	-	-	-	2,104	-
2b 1.1.11	Megawatt Support Cr. & Material Staging	-	270	-	-	-	-	-	10	270	-	-	270	-	-	-	-	-	-	1,909	-
2b 1.1.12	Miscellaneous Site Structures	-	6,465	-	-	-	-	-	970	7,435	-	-	7,435	-	-	-	-	-	-	98,785	-
2b 1.1.13	PA Fencing Vehicle Barriers/BERS	-	885	-	-	-	-	-	133	1,018	-	-	1,018	-	-	-	-	-	-	1,812	-



Table C-2  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	On-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC In-Term Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu Feet	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet	Residual / Processed Wt. Lbs.	Craft Manhours	Utility and Contract Manhours
Demolition of Remaining Site Buildings (continued)																					
db 1 114	RP Building	-	48	-	-	-	-	-	7	55	-	-	55	-	-	-	-	-	-	742	
db 1 115	Radwaste Warehouse	-	175	-	-	-	-	-	26	201	-	-	201	-	-	-	-	-	-	1571	
db 1 116	Safeguard	-	1,479	-	-	-	-	-	192	1,471	-	-	1,471	-	-	-	-	-	-	10,723	
db 1 117	Service Water Intake Structure	-	116	-	-	-	-	-	17	91	-	-	91	-	-	-	-	-	-	2,450	
db 1 118	Stator Removal	-	108	-	-	-	-	-	16	125	-	-	125	-	-	-	-	-	-	2,030	
db 1 119	Switchgear	-	84	-	-	-	-	-	11	96	-	-	96	-	-	-	-	-	-	795	
db 1 120	Switchyard Relay House	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	290	
db 1 121	Tanks & Tunnels	-	592	-	-	-	-	-	89	681	-	-	681	-	-	-	-	-	-	7,676	
db 1 122	Turbine	-	452	-	-	-	-	-	68	521	-	-	521	-	-	-	-	-	-	7,230	
db 1 123	Turbine Pedestal	-	703	-	-	-	-	-	106	809	-	-	809	-	-	-	-	-	-	4,159	
db 1 124	Fuel	-	2,703	-	-	-	-	-	115	3,180	-	-	3,180	-	-	-	-	-	-	27,877	
db 1 1	Totals	-	22,210	-	-	-	-	-	3,411	25,541	-	-	25,541	-	-	-	-	-	-	212,951	
Site Closeout Activities																					
db 1 2	Backfill Site	-	3,415	-	-	-	-	-	512	3,928	-	-	3,928	-	-	-	-	-	-	6,150	
db 1 3	Grade & landscape site	-	616	-	-	-	-	-	82	698	-	-	698	-	-	-	-	-	-	1,292	
db 1 4	Final report to NRC	-	-	-	-	-	-	-	90	11	103	-	-	-	-	-	-	-	-	668	
db 1	Subtotal Period db Activity Costs	-	26,172	-	-	-	-	-	90	3,939	103	-	3,909	-	-	-	-	-	-	250,594	
Period db Additional Costs																					
db 2 1	Concrete crushing	-	1,673	-	-	-	-	-	10	252	1,936	-	1,936	-	-	-	-	-	-	7,271	
db 2 2	Circulating Water Cofferdam	-	463	-	-	-	-	-	70	535	-	-	535	-	-	-	-	-	-	3,941	
db 2 3	Service Water Cofferdam	-	450	-	-	-	-	-	68	518	-	-	518	-	-	-	-	-	-	3,811	
db 2 4	Construction Debris Disposal	-	-	-	-	-	-	-	1,110	500	1,610	-	1,610	-	-	-	-	-	-	-	
db 2	Subtotal Period db Additional Costs	-	2,586	-	-	-	-	-	1,110	889	6,816	-	6,816	-	-	-	-	-	-	15,021	
Period db Collateral Costs																					
db 3 1	Small tool allowance	-	152	-	-	-	-	-	23	174	-	-	174	-	-	-	-	-	-	-	
db 3	Subtotal Period db Collateral Costs	-	152	-	-	-	-	-	23	174	-	-	174	-	-	-	-	-	-	-	
Period db Period-Dependent Costs																					
db 4 1	Insurance	-	-	-	-	-	-	-	596	60	656	656	-	-	-	-	-	-	-	-	
db 4 2	Property taxes	-	-	-	-	-	-	-	799	80	879	-	879	-	-	-	-	-	-	-	
db 4 3	Heavy equipment rental	-	5,998	-	-	-	-	-	-	900	6,898	-	6,898	-	-	-	-	-	-	-	
db 4 4	Plant energy budget	-	-	-	-	-	-	-	401	60	161	-	161	-	-	-	-	-	-	-	
db 4 5	NRC ISPSI Fees	-	-	-	-	-	-	-	169	17	186	-	186	-	-	-	-	-	-	-	
db 4 6	ISPSI Operating Costs	-	-	-	-	-	-	-	109	16	125	-	125	-	-	-	-	-	-	-	
db 4 7	Security Staff Cost	-	-	-	-	-	-	-	3,352	508	3,860	-	2,508	-	-	-	-	-	-	87,361	
db 4 8	ISPSI Staff Cost	-	-	-	-	-	-	-	9,801	1,170	11,271	-	11,271	-	-	-	-	-	-	110,240	
db 4 9	Utility Staff Cost	-	-	-	-	-	-	-	5,097	765	5,861	-	1,207	-	-	-	-	-	-	70,280	
db 4	Subtotal Period db Period-Dependent Costs	-	5,998	-	-	-	-	-	20,364	1,876	30,219	656	4,906	21,677	-	-	-	-	-	267,800	
db 0	TOTAL PERIOD db COST	-	34,910	-	-	-	-	-	21,791	8,727	67,132	750	1,906	61,767	-	-	-	-	-	265,617	
PERIOD 1c - Fuel Storage Operations/Shipping																					
Period 1c Direct Decommissioning Activities																					
Period 1c Collateral Costs																					
1c 1 1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	-	13,913	2,087	16,000	-	16,000	-	-	-	-	-	-	-	
1c 1	Subtotal Period 1c Collateral Costs	-	-	-	-	-	-	-	13,913	2,087	16,000	-	16,000	-	-	-	-	-	-	-	
Period 1c Period-Dependent Costs																					
1c 4 1	Insurance	-	-	-	-	-	-	-	16,051	1,605	17,656	-	17,656	-	-	-	-	-	-	-	
1c 4 2	Property taxes	-	-	-	-	-	-	-	21,322	2,132	23,671	-	23,671	-	-	-	-	-	-	-	
1c 4 4	NRC ISPSI Fees	-	-	-	-	-	-	-	6,990	699	7,689	-	7,689	-	-	-	-	-	-	-	
1c 4 5	ISPSI Operating Costs	-	-	-	-	-	-	-	2,939	180	3,119	-	3,119	-	-	-	-	-	-	-	
1c 4 6	Security Staff Cost	-	-	-	-	-	-	-	56,001	8,801	67,191	-	67,191	-	-	-	-	-	-	1,155,861	
1c 4 7	Utility Staff Cost	-	-	-	-	-	-	-	28,295	4,214	32,510	-	32,510	-	-	-	-	-	-	177,965	
1c 4	Subtotal Period 1c Period-Dependent Costs	-	-	-	-	-	-	-	114,482	17,911	152,126	-	152,126	-	-	-	-	-	-	1,831,828	
1c 0	TOTAL PERIOD 1c COST	-	-	-	-	-	-	-	118,395	20,011	168,126	-	168,126	-	-	-	-	-	-	1,831,828	
PERIOD 1d - GTCC shipping																					
Period 1d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
1d 1 1	Access & Internals GTCC Disposal	-	1,000	-	-	-	-	-	10,077	1,762	12,839	12,839	-	-	-	-	-	-	2,061	101,971	
1d 1	Totals	-	1,000	-	-	-	-	-	10,077	1,762	12,839	12,839	-	-	-	-	-	-	2,061	101,971	
1d 1	Subtotal Period 1d Activity Costs	-	1,000	-	-	-	-	-	10,077	1,762	12,839	12,839	-	-	-	-	-	-	2,061	101,971	
Period 1d Period-Dependent Costs																					
1d 4 1	Insurance	-	-	-	-	-	-	-	11	1	13	13	-	-	-	-	-	-	-	-	
1d 4 2	Property taxes	-	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	
1d 4 3	NRC ISPSI Fees	-	-	-	-	-	-	-	3	0	4	4	-	-	-	-	-	-	-	-	



Table C-2  
Comanche Peak Nuclear Power Plant Unit 2  
DECON Decommissioning Cost Estimate  
(Thousands of 2019 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 3d Period-Dependent Costs (continued)																					
3d 1.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d 1.6	Security Staff Cost	-	-	-	-	-	-	42	6	48	18	-	-	-	-	-	-	-	-	-	1,017
3d 4.7	Utility Staff Cost	-	-	-	-	-	-	20	3	23	23	-	-	-	-	-	-	-	-	-	269
3d 1	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	94	13	107	101	6	-	-	-	-	-	-	-	-	1,506
3d 0	TOTAL PERIOD 3d COST	-	-	1,090	-	-	10,077	94	1,771	12,946	12,910	6	-	-	-	-	-	2,061	101,971	-	1,506
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e 2.1	License Termination ISFSI	-	200	172	371	-	2,458	1,172	1,168	5,842	5,842	-	-	-	18,111	-	-	-	1,891,180	9,429	1,221
3e 2	Subtotal Period 3e Additional Costs	-	200	172	371	-	2,458	1,172	1,168	5,842	5,842	-	-	-	18,111	-	-	-	1,891,180	9,429	1,221
Period 3e Period-Dependent Costs																					
3e 4.1	Insurance	-	-	-	-	-	-	54	13	67	67	-	-	-	-	-	-	-	-	-	-
3e 4.2	Property taxes	-	-	-	-	-	-	267	67	333	333	-	-	-	-	-	-	-	-	-	-
3e 4.3	Plant energy budget	-	-	-	-	-	-	7	2	8	8	-	-	-	-	-	-	-	-	-	-
3e 4.4	Security Staff Cost	-	-	-	-	-	-	63	16	79	79	-	-	-	-	-	-	-	-	-	1,719
3e 4.5	Utility Staff Cost	-	-	-	-	-	-	113	36	179	179	-	-	-	-	-	-	-	-	-	1,881
3e 4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	533	133	666	666	-	-	-	-	-	-	-	-	-	5,900
3e 0	TOTAL PERIOD 3e COST	-	200	172	371	-	2,458	2,005	1,802	6,508	6,508	-	-	-	18,111	-	-	-	1,891,180	9,429	4,811
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f 2.1	Demolition and Site Restoration ISFSI	-	3,326	-	-	-	-	355	532	1,233	-	-	4,233	-	-	-	-	-	-	35,216	80
3f 2	Subtotal Period 3f Additional Costs	-	3,326	-	-	-	-	355	532	1,233	-	-	4,233	-	-	-	-	-	-	35,216	80
Period 3f Collateral Costs																					
3f 3.1	Small tool allowance	-	11	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-
3f 3	Subtotal Period 3f Collateral Costs	-	11	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f 4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f 4.2	Property taxes	-	-	-	-	-	-	133	13	147	-	-	147	-	-	-	-	-	-	-	-
3f 4.3	Plant energy budget	-	-	-	-	-	-	3	1	4	-	-	4	-	-	-	-	-	-	-	-
3f 4.4	Security Staff Cost	-	-	-	-	-	-	13	2	14	-	-	14	-	-	-	-	-	-	-	342
3f 4.5	Utility Staff Cost	-	-	-	-	-	-	58	9	67	-	-	67	-	-	-	-	-	-	-	769
3f 4	Subtotal Period 3f Period-Dependent Costs	-	-	-	-	-	-	207	21	232	-	-	232	-	-	-	-	-	-	-	1,111
3f 0	TOTAL PERIOD 3f COST	-	3,370	-	-	-	-	562	583	1,515	-	-	1,515	-	-	-	-	-	-	35,216	1,191
PERIOD 3 TOTALS																					
		-	38,180	1,172	371	-	12,537	171,850	32,417	259,827	20,206	173,538	66,282		18,111	-	2,061	2,293,154	310,262	2,109,601	
TOTAL COST TO DECOMMISSION		12,507	105,339	26,098	8,152	-	61,331	582,450	110,182	939,062	590,212	271,017	71,832		111,940	1,827	337	2,061	28,359,950	1,121,044	5,897,124
TOTAL COST TO DECOMMISSION WITH 17.5% CONTINGENCY		\$919,062 thousands of 2019 dollars																			
TOTAL NRC LICENSE TERMINATION COST IS 42.85%, OR		\$590,212 thousands of 2019 dollars																			
SPENT FUEL MANAGEMENT COST IS 29.18%, OR		\$274,017 thousands of 2019 dollars																			
NON-NUCLEAR DEMOLITION COST IS 7.97%, OR		\$74,832 thousands of 2019 dollars																			
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC)		417,094 Cubic Feet																			
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED		2,061 Cubic Feet																			
TOTAL SCRAP METAL REMOVED		94,586 Tons																			
TOTAL CRAFT LABOR REQUIREMENTS		1,421,044 Man-hours																			

End Notes

n/a indicates that this activity not charged as decommissioning expense

a+ indicates that this activity performed by decommissioning staff

0- indicates that this value is less than 0.5 but is non zero

A cell containing "-" indicates a zero value



**APPENDIX D**  
**DETAILED COST ANALYSIS**  
**SAFSTOR**

**Tables**

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D-2	Comanche Peak Nuclear Power Plant, Unit 2.....	12



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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.	Civil Manhours	Utility and Contractor Manhours
															Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GFC Cu Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	110	94	104	104	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	174	26	201	201	-	-	-	-	-	-	-	-	-	1,900
1a.1.3	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.4	Remove fuel & source material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.5	Notification of Permanent Dedicating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	268	40	309	309	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant docs & specs	-	-	-	-	-	-	174	26	201	201	-	-	-	-	-	-	-	-	-	1,900
1a.1.9	Perform detailed rad. survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	144	20	164	164	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	144	20	164	164	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	401	40	441	441	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define minor work sequence	-	-	-	-	-	-	144	20	164	164	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SRK and RA	-	-	-	-	-	-	416	62	478	478	-	-	-	-	-	-	-	-	-	1,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	674	101	775	775	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	660	99	759	759	-	-	-	-	-	-	-	-	-	4,520
1a.1.16.2	Plant systems	-	-	-	-	-	-	559	84	643	643	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	129	64	193	193	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	268	10	278	278	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site domain	-	-	-	-	-	-	268	10	278	278	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	2,174	326	2,500	2,500	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	359	24	383	383	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closure & dormancy	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	520	48	568	568	-	-	-	-	-	-	-	-	-	2,383
1a.1.18	Pressure vacuum drying system	-	-	-	-	-	-	14	2	16	16	-	-	-	-	-	-	-	-	-	100
1a.1.19	Dismantle-energy non-cont. systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.20	Dismantle-dry NSSS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.21	Dismantle-energy contaminated systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.22	Decontaminate contaminated systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	5,125	815	5,940	5,940	-	-	-	-	-	-	-	-	-	15,890
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	14,114	2,147	16,261	-	16,261	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	14,114	2,147	16,261	-	16,261	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,207	221	1,428	1,428	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	1,432	143	1,575	1,575	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	-	-	-	-	-	-	128	643	643	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	-	-	-	-	-	546	-	628	628	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	12	4	16	16	-	-	610	-	-	-	-	12,190	20	-
1a.4.7	NRG Fees	-	-	-	-	-	-	2,901	101	3,002	3,002	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	154	35	189	189	-	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	121	42	163	-	163	-	-	-	-	-	-	-	-	-
1a.4.10	ISPSI Operating Costs	-	-	-	-	-	-	111	62	173	-	173	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	71	8	79	-	79	-	-	-	-	-	-	-	-	-
1a.4.12	Utilities Staff Cost	-	-	-	-	-	-	5,891	884	6,775	6,775	-	-	-	-	-	-	-	-	-	150,800
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,059	12	4	-	-	20	44,989	6,576	52,660	51,679	1,603	-	610	-	-	-	12,190	20	57,690
1a.0	TOTAL PERIOD 1a COST	-	1,059	12	4	-	-	20	64,428	9,538	75,061	57,599	17,464	-	610	-	-	-	12,190	20	608,930
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,124	-	-	-	-	-	-	561	1,684	1,684	-	-	-	-	-	-	-	-	10,861	-
1b.1.1.2	Safequard	141	-	-	-	-	-	-	70	211	211	-	-	-	-	-	-	-	-	1,960	-
1b.1.1	Total	1,264	-	-	-	-	-	-	632	1,895	1,895	-	-	-	-	-	-	-	-	12,821	-
1b.1	Subtotal Period 1b Activity Costs	1,264	-	-	-	-	-	-	632	1,895	1,895	-	-	-	-	-	-	-	-	12,821	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	12,325	1,819	14,144	14,144	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	12,325	1,819	14,144	14,144	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	1,026	-	-	-	-	-	-	174	1,180	1,180	-	-	-	-	-	-	-	-	-	-



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	On-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Fees Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu Feet	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	HYCC Cu Feet	Burial / Processed Wt. Lbs.	Crane Manhours	Utility and Contractor Manhours
Period 1b Collateral Costs (continued)																					
1b 1.2	Process decommissioning water waste	-	175	-	121	-	119	-	151	712	712	-	-	-	1,077	-	-	-	61,591	210	-
1b 1.3	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1b 1.4	Small tool allowance	-	-	19	-	-	-	-	1	22	22	-	-	-	-	-	-	-	-	-	
1b 1	Subtotal Period 1b Collateral Costs	-	1,201	19	121	146	-	119	-	1,911	1,911	-	-	-	1,077	-	-	-	61,591	210	-
Period 1b Period-Dependent Costs																					
1b 4.1	Insurance	-	827	-	-	-	-	-	297	1,014	1,014	-	-	-	-	-	-	-	-	-	
1b 4.2	Property taxes	-	-	-	-	-	-	799	80	879	879	-	-	-	-	-	-	-	-	-	
1b 4.3	Health physics supplies	-	-	294	-	-	-	748	75	823	823	-	-	-	-	-	-	-	-	-	
1b 4.4	Heavy equipment rental	-	-	116	-	-	-	-	50	137	137	-	-	-	-	-	-	-	-	-	
1b 4.5	Disposal of DAW generated	-	-	-	11	4	18	-	6	38	38	-	-	-	525	-	-	-	10,506	17	-
1b 4.6	Plant energy budget	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	
1b 4.7	NRC Fees	-	-	-	-	-	-	172	15	187	187	-	-	-	-	-	-	-	-	-	
1b 4.8	Emergency Planning Fees	-	-	-	-	-	-	105	10	115	-	115	-	-	-	-	-	-	-	-	
1b 4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	119	-	119	-	-	-	-	-	-	-	-	
1b 4.10	ISFSI Operating Costs	-	-	-	-	-	-	14	2	16	-	16	-	-	-	-	-	-	-	-	
1b 4.11	Security Staff Cost	-	-	-	-	-	-	1,469	220	1,689	1,689	-	-	-	-	-	-	-	-	17,707	
1b 4.12	Utility Staff Cost	-	-	-	-	-	-	7,188	1,078	8,266	8,266	-	-	-	-	-	-	-	105,271	-	-
1b 4	Subtotal Period 1b Period-Dependent Costs	-	827	410	11	4	-	11,078	1,878	14,244	14,244	250	-	-	525	-	-	-	10,506	17	142,868
1b 0	TOTAL PERIOD 1b COST	-	3,290	450	131	149	-	117	21,493	4,666	92,227	14,978	250	-	1,602	-	-	-	75,101	35,018	142,868
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c 1.1	Prepare support equipment for storage	-	-	103	-	-	-	-	60	163	163	-	-	-	-	-	-	-	-	1,000	-
1c 1.2	Install containment pressure equalizers	-	-	26	-	-	-	-	4	30	30	-	-	-	-	-	-	-	790	-	-
1c 1.3	Interim survey prior to dormancy	-	-	-	-	-	-	714	220	933	933	-	-	-	-	-	-	-	-	17,807	-
1c 1.4	Secure building accesses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1c 1.5	Prepare & submit interim report	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	583
1c 1	Subtotal Period 1c Activity Costs	-	-	429	-	-	-	811	296	1,536	1,536	-	-	-	-	-	-	-	-	21,507	583
Period 1c Collateral Costs																					
1c 1.1	Process decommissioning water waste	-	212	-	146	177	-	145	-	181	862	862	-	-	1,405	-	-	-	78,318	254	-
1c 1.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1c 1.3	Small tool allowance	-	-	2	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	-	-
1c 1	Subtotal Period 1c Collateral Costs	-	212	2	146	177	-	145	-	181	865	865	-	-	1,405	-	-	-	78,318	254	-
Period 1c Period-Dependent Costs																					
1c 4.1	Insurance	-	-	-	-	-	-	799	80	879	879	-	-	-	-	-	-	-	-	-	-
1c 4.2	Property taxes	-	-	-	-	-	-	718	75	793	793	-	-	-	-	-	-	-	-	-	-
1c 4.3	Health physics supplies	-	-	231	-	-	-	-	58	289	289	-	-	-	-	-	-	-	-	-	-
1c 4.4	Heavy equipment rental	-	-	196	-	-	-	-	20	157	157	-	-	-	-	-	-	-	-	-	-
1c 4.5	Disposal of DAW generated	-	-	-	3	1	-	-	2	11	11	-	-	-	152	-	-	-	1,019	5	-
1c 4.6	Plant energy budget	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	-
1c 4.7	NRC Fees	-	-	-	-	-	-	152	15	167	167	-	-	-	-	-	-	-	-	-	-
1c 4.8	Emergency Planning Fees	-	-	-	-	-	-	105	10	115	-	115	-	-	-	-	-	-	-	-	-
1c 4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	119	-	119	-	-	-	-	-	-	-	-	-
1c 4.10	ISFSI Operating Costs	-	-	-	-	-	-	14	2	16	-	16	-	-	-	-	-	-	-	-	-
1c 4.11	Security Staff Cost	-	-	-	-	-	-	1,469	220	1,689	1,689	-	-	-	-	-	-	-	-	17,707	-
1c 4.12	Utility Staff Cost	-	-	-	-	-	-	7,188	1,078	8,266	8,266	-	-	-	-	-	-	-	105,271	-	-
1c 4	Subtotal Period 1c Period-Dependent Costs	-	-	367	5	1	-	11,078	1,631	13,106	12,856	250	-	-	152	-	-	-	1,019	5	142,868
1c 0	TOTAL PERIOD 1c COST	-	212	799	149	178	-	150	11,889	2,141	15,507	15,257	250	-	1,457	-	-	-	81,358	21,766	143,151
PERIOD 1 TOTALS																					
			3,502	2,307	293	351	-	807	99,719	16,135	122,795	104,834	17,962	-	3,669	-	-	-	168,618	56,811	895,248
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a 1.1	Quarterly inspection	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-
2a 1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-
2a 1.3	Prepare reports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2a 1.4	Bituminous roof replacement	-	-	-	-	-	-	4	1	1	1	-	-	-	-	-	-	-	-	-	-
2a 1.5	Maintenance supplies	-	-	-	-	-	-	1,081	270	1,351	1,351	-	-	-	-	-	-	-	-	-	-
2a 1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	1,085	271	1,355	1,355	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a 2.1	Landfill	-	-	5	-	5	-	1	294	47	156	-	-	756	-	-	-	-	-	119	1,280
2a 2.2	Filling Range	-	-	-	2	-	-	-	61	55	120	-	-	420	-	-	-	-	-	-	-
2a 2	Subtotal Period 2a Additional Costs	-	-	5	2	5	-	4	659	102	776	-	-	776	-	-	-	-	-	119	1,280
Period 2a Collateral Costs																					
2a 1.2	Spent Fuel Capital and Triangles	-	-	-	-	-	-	66,800	10,020	76,819	-	76,819	-	-	-	-	-	-	-	-	-



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	GRS/SLC 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.	C/cft Manhours	Utility and Contractor Manhours
															Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet			
Period 2a Collateral Costs (continued)																					
2a.1.5	Severance	-	-	-	-	-	-	9,578	1,147	11,015	11,015	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	76,477	11,157	87,834	11,015	76,819	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	4,365	136	4,581	4,581	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	6,121	612	7,067	7,067	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	-	-	-	-	-	-	523	1,616	1,616	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	1,293	-	-	-	-	-	36	100	100	-	-	-	-	-	-	-	-	-	-
2a.4.5	Plant energy budget	-	-	28	10	-	47	2,800	120	3,219	3,219	-	-	-	-	1,495	-	-	27,890	45	-
2a.4.6	NRC Fees	-	-	-	-	-	-	1,419	115	1,594	1,594	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,010	105	1,155	-	1,155	-	-	-	-	-	-	-	-	-
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	2,890	433	3,323	-	3,323	-	-	-	-	-	-	-	-	-
2a.4.9	USFS Operating Costs	-	-	-	-	-	-	980	57	1,137	-	-	-	-	-	-	-	-	-	-	-
2a.4.10	Security Staff Cost	-	-	-	-	-	-	41,143	6,171	47,314	10,019	11,275	-	-	-	-	-	-	-	-	1,071,121
2a.4.11	Utility Staff Cost	-	-	-	-	-	-	14,597	2,180	16,787	7,470	9,147	-	-	-	-	-	-	-	-	207,363
2a.4	Subtotal Period 2a Period-Dependent Costs	-	1,293	28	10	-	47	71,897	10,919	87,293	41,687	15,506	-	-	-	1,495	-	-	27,890	15	1,261,084
2a.0	TOTAL PERIOD 2a COST	-	1,298	33	13	-	51	155,017	22,749	177,158	51,057	122,426	776	-	1,495	-	-	-	27,899	181	1,262,364
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly inspection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.1.4	Recommence roof replacement	-	-	-	-	-	-	25	4	28	28	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	6,912	1,728	8,640	8,640	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	6,937	1,732	8,669	8,669	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,467	1,420	10,887	-	10,887	-	-	-	-	-	-	-	-	-
2b.3.2	Severance	-	-	-	-	-	-	747	309	836	836	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	10,193	1,529	11,722	836	10,887	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	26,637	2,661	29,088	29,088	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	17,851	1,785	19,636	19,636	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	-	-	-	-	-	-	1,070	5,296	5,296	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	93	12	-	151	-	51	132	332	-	-	-	-	4,611	-	-	92,275	150	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	8,953	1,311	10,296	10,296	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	8,547	855	9,401	9,401	-	-	-	-	-	-	-	-	-	-
2b.4.7	USFS Operating Costs	-	-	-	-	-	-	4,131	605	4,793	-	2,795	-	-	-	-	-	-	-	-	-
2b.4.8	Security Staff Cost	-	-	-	-	-	-	7,167	11,031	84,723	28,722	96,083	-	-	-	-	-	-	-	-	1,951,000
2b.4.9	Utility Staff Cost	-	-	-	-	-	-	65,243	9,786	75,029	48,019	27,010	-	-	-	-	-	-	-	-	925,048
2b.4	Subtotal Period 2b Period-Dependent Costs	-	4,257	93	12	-	151	285,508	28,963	236,813	131,086	85,803	-	-	-	4,611	-	-	92,275	150	2,880,038
2b.0	TOTAL PERIOD 2b COST	-	4,257	93	12	-	151	220,168	32,223	257,206	160,511	96,696	936	-	-	4,611	-	-	92,275	150	2,880,038
PERIOD 2 TOTALS																					
		-	5,555	124	15	-	205	175,185	54,970	131,364	211,567	219,022	776	-	6,609	-	-	-	120,171	195	1,112,112
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	171	26	201	201	-	-	-	-	-	-	-	-	-	1,800
3a.1.2	Review plant drawings & specs	-	-	-	-	-	-	617	93	710	710	-	-	-	-	-	-	-	-	-	1,600
3a.1.3	Perform detailed survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	134	20	154	154	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventories	-	-	-	-	-	-	171	26	201	201	-	-	-	-	-	-	-	-	-	1,800
3a.1.6	Define major work sequence	-	-	-	-	-	-	1,006	151	1,157	1,157	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Prepare/submit Detailed Technical Specifications	-	-	-	-	-	-	1,006	151	1,157	1,157	-	-	-	-	-	-	-	-	-	7,500
3a.1.9	Perform Site-Specific Cost Study	-	-	-	-	-	-	671	101	771	771	-	-	-	-	-	-	-	-	-	5,000
3a.1.10	Prepare/submit Initial and Fuel Management Plan	-	-	-	-	-	-	111	20	131	131	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	989	118	1,137	1,023	-	131	-	-	-	-	-	-	-	7,470
3a.1.11.2	Plant systems	-	-	-	-	-	-	539	81	643	578	-	61	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	932	114	1,095	1,095	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	872	111	1,003	1,003	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	119	65	181	181	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	215	12	217	121	-	-	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	51	8	62	-	-	121	-	-	-	-	-	-	-	100
3a.1.11.9	Main Condensers	-	-	-	-	-	-	51	8	62	-	-	62	-	-	-	-	-	-	-	100
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	419	63	481	211	-	211	-	-	-	-	-	-	-	1,120
3a.1.11.11	Waste management	-	-	-	-	-	-	617	91	710	710	-	-	-	-	-	-	-	-	-	1,600
3a.1.11.12	Facility & site cleanout	-	-	-	-	-	-	123	18	139	69	-	69	-	-	-	-	-	-	-	960



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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	NRG Loc. Term Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu Feet	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	UPC Cu Feet	Burial/Processed Wt. Lbs.	Crane Manhours	Utility and Contractor Manhours	
1a.1.11	Total	-	-	-	-	-	-	5,116	880	6,116	5,101	-	715	-	-	-	-	-	-	-	19,777	
Planning & Site Preparations																						
1a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	422	18	470	379	-	-	-	-	-	-	-	-	-	2,100	
1a.1.13	Plant prep. & temp. sys.	-	-	-	-	-	-	1,100	510	1,910	1,910	-	-	-	-	-	-	-	-	-	-	
1a.1.14	Design water clean up system	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,100	
1a.1.15	Building Front Cont. Encl. (sheddling)	-	-	-	-	-	-	2,100	960	2,760	2,760	-	-	-	-	-	-	-	-	-	-	
1a.1.16	Process tank drums & containers	-	-	-	-	-	-	163	25	190	190	-	-	-	-	-	-	-	-	-	1,280	
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	16,141	2,421	18,565	17,800	-	715	-	-	-	-	-	-	-	77,107	
Period 1a Additional Costs																						
1a.2.1	Site Characterization	-	-	-	-	-	-	5,501	1,651	7,155	7,155	-	-	-	-	-	-	-	-	40,500	10,852	
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	5,501	1,651	7,155	7,155	-	-	-	-	-	-	-	-	-	40,500	10,852
Period 1a Collateral Costs																						
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	318	52	400	-	100	-	-	-	-	-	-	-	-	-	
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	318	52	400	-	100	-	-	-	-	-	-	-	-	-	
Period 1a Period-Dependent Costs																						
1a.4.1	Insurance	-	-	-	-	-	-	596	60	656	656	-	-	-	-	-	-	-	-	-	-	
1a.4.2	Property taxes	-	-	-	-	-	-	100	10	440	440	-	-	-	-	-	-	-	-	-	-	
1a.4.3	Health physics supplies	-	-	-	-	-	-	119	112	361	361	-	-	-	-	-	-	-	-	-	-	
1a.4.4	Heavy equipment rental	-	-	-	-	-	-	516	82	628	628	-	-	-	-	-	-	-	-	-	-	
1a.4.5	Disposal of DAW generated	-	-	-	10	4	17	-	6	37	37	-	-	-	-	-	-	-	10,311	17	-	
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,101	101	2,405	2,405	-	-	-	-	-	-	-	-	-	-	
1a.4.7	NRG Fees	-	-	-	-	-	-	298	40	328	328	-	-	-	-	-	-	-	-	-	-	
1a.4.8	ISFSI Operating Costs	-	-	-	-	-	-	51	8	63	63	-	-	-	-	-	-	-	-	-	-	
1a.4.9	Security Staff Cost	-	-	-	-	-	-	1,619	217	1,897	660	1,247	-	-	-	-	-	-	-	-	11,680	
1a.4.10	Utility Staff Cost	-	-	-	-	-	-	18,132	2,520	20,852	20,164	688	-	-	-	-	-	-	-	-	260,000	
1a.4	Subtotal Period 1a Period-Dependent Costs	-	995	10	4	-	17	21,134	1,605	27,766	25,779	1,987	-	-	-	-	-	-	10,311	17	801,680	
1a.0	TOTAL PERIOD 1a COST	-	995	10	4	-	17	15,129	7,730	5,886	50,764	2,387	715	-	-	-	-	-	10,311	40,517	916,399	
PERIOD 1b - Decommissioning Preparations																						
Period 1b Direct Decommissioning Activities																						
Detailed Work Procedures																						
1b.1.1.1	Plant systems	-	-	-	-	-	-	635	95	730	657	-	71	-	-	-	-	-	-	-	1,711	
1b.1.1.2	Reactor internals	-	-	-	-	-	-	135	50	386	386	-	-	-	-	-	-	-	-	-	2,500	
1b.1.1.3	Remaining buildings	-	-	-	-	-	-	101	27	208	52	-	156	-	-	-	-	-	-	-	1,150	
1b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	134	20	154	154	-	-	-	-	-	-	-	-	-	1,000	
1b.1.1.5	CRD housings & IOT tubes	-	-	-	-	-	-	131	20	151	151	-	-	-	-	-	-	-	-	-	1,000	
1b.1.1.6	Reactor instrumentation	-	-	-	-	-	-	134	20	154	154	-	-	-	-	-	-	-	-	-	1,000	
1b.1.1.7	Reactor vessel	-	-	-	-	-	-	487	73	560	560	-	-	-	-	-	-	-	-	-	4,839	
1b.1.1.8	Facility closure	-	-	-	-	-	-	161	24	185	91	-	91	-	-	-	-	-	-	-	1,200	
1b.1.1.9	Myself shields	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	450	
1b.1.1.10	Biological shield	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	1,200	
1b.1.1.11	Steam generators	-	-	-	-	-	-	617	91	710	710	-	-	-	-	-	-	-	-	-	4,600	
1b.1.1.12	Reinforced concrete	-	-	-	-	-	-	134	20	154	77	-	77	-	-	-	-	-	-	-	1,000	
1b.1.1.13	Main turbine	-	-	-	-	-	-	209	31	241	-	241	-	-	-	-	-	-	-	-	1,560	
1b.1.1.14	Main condensers	-	-	-	-	-	-	209	31	241	-	241	-	-	-	-	-	-	-	-	1,560	
1b.1.1.15	Auxiliary building	-	-	-	-	-	-	366	55	421	379	-	42	-	-	-	-	-	-	-	2,730	
1b.1.1.16	Reactor building	-	-	-	-	-	-	366	55	421	379	-	42	-	-	-	-	-	-	-	2,730	
1b.1.1	Total	-	-	-	-	-	-	1,425	619	1,974	4,009	961	-	-	-	-	-	-	-	-	32,211	
1b.1	Subtotal Period 1b Activity Costs	-	-	-	-	-	-	1,425	619	1,974	4,009	961	-	-	-	-	-	-	-	-	32,211	
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	1,026	-	-	-	-	-	-	171	1,180	1,180	-	-	-	-	-	-	-	-	-	-	
1b.3.2	DOE staff relocation expenses	-	-	-	-	-	-	1,816	272	2,088	2,088	-	-	-	-	-	-	-	-	-	-	
1b.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,980	1,980	-	-	-	-	-	-	-	-	-	-	
1b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	176	28	202	-	492	-	-	-	-	-	-	-	-	-	
1b.3	Subtotal Period 1b Collateral Costs	1,026	1,200	-	-	-	-	1,992	611	1,850	4,648	202	-	-	-	-	-	-	-	-	-	
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	17	-	-	-	-	-	-	9	46	46	-	-	-	-	-	-	-	-	-	-	
1b.4.2	Insurance	-	-	-	-	-	-	892	40	1,52	1,52	-	-	-	-	-	-	-	-	-	-	
1b.4.3	Property taxes	-	-	-	-	-	-	202	20	222	222	-	-	-	-	-	-	-	-	-	-	
1b.4.4	Health physics supplies	-	251	-	-	-	-	202	63	314	314	-	-	-	-	-	-	-	-	-	-	
1b.4.5	Heavy equipment rental	-	277	-	-	-	-	-	12	18	318	-	-	-	-	-	-	-	-	-	-	
1b.4.6	Disposal of DAW generated	-	-	-	6	2	10	-	3	21	21	-	-	-	-	-	-	-	5,910	10	-	
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,016	152	1,168	1,168	-	-	-	-	-	-	-	-	-	-	
1b.4.8	NRG Fees	-	-	-	-	-	-	151	15	166	166	-	-	-	-	-	-	-	-	-	-	
1b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	28	4	32	32	-	12	-	-	-	-	-	-	-	-	
1b.4.10	Security Staff Cost	-	-	-	-	-	-	836	125	961	335	627	-	-	-	-	-	-	-	-	22,119	
1b.4.11	DOE Staff Cost	-	-	-	-	-	-	3,191	779	5,974	5,974	-	-	-	-	-	-	-	-	-	79,038	
1b.4.12	Utility Staff Cost	-	-	-	-	-	-	9,190	1,179	10,569	10,220	449	-	-	-	-	-	-	-	-	331,781	
1b.4	Subtotal Period 1b Period-Dependent Costs	17	527	6	2	-	10	16,919	2,622	20,121	19,116	1,067	-	-	-	-	-	-	5,910	10	412,958	



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decom 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 Volume				Buried / Processed Wt. Lbs.	Crane Manhours	Utility and Contractor Manhours
															Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTFC Cu Feet			
96.0	TOTAL PERIOD 96 COST		1,063	1,727	6	2	-	10	23,236	1,903	29,918	27,771	1,210	964	-	296	-	-	5,910	10	245,201
PERIOD 1 TOTALS			1,063	2,724	16	6	-	27	68,965	11,634	83,833	78,537	1,997	1,699	-	811	-	-	16,441	30,526	636,840
Period 1a - Large Component Removal																					
Period 1a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
1a.1.1.1	Reactor Coolant Piping		17	86	24	17	-	152	-	73	369	369	-	-	1,275	-	-	-	88,981	2,465	-
1a.1.1.2	Pressurizer Relief Tank		4	16	11	8	-	69	-	26	135	135	-	-	581	-	-	-	40,513	605	-
1a.1.1.3	Reactor Coolant Pumps & Motors		18	59	73	298	-	1,207	-	64	1,929	1,929	-	-	7,411	-	-	-	792,880	2,575	80
1a.1.1.4	Pressurizer		-	18	173	111	-	575	-	207	1,301	1,301	-	-	3,415	-	-	-	285,853	1,446	750
1a.1.1.5	Steam Generators		-	1,737	519	1,645	-	9,934	-	1,723	19,608	19,608	-	-	33,064	-	-	-	1,527,500	11,067	1,500
1a.1.1.6	Reactor Steam Generator Units		-	-	162	1,645	-	9,934	-	2,784	14,874	14,874	-	-	33,064	-	-	-	1,527,500	-	750
1a.1.1.7	CRDMs/CLP Service Structure Removal		22	171	282	32	-	306	-	164	979	979	-	-	4,852	-	-	-	379,925	5,142	-
1a.1.1.8	Reactor Vessel Internals		69	4,822	10,511	423	-	3,064	117	7,949	27,126	27,126	-	-	3,581	501	106	-	318,811	21,790	1,150
1a.1.1.9	Reactor Vessel		-	6,320	1,964	412	-	2,108	117	6,146	17,557	17,557	-	-	17,631	-	-	-	978,871	23,790	1,150
1a.1.1	Totals		160	15,250	14,219	1,601	-	27,349	611	21,726	83,879	83,879	-	-	162,721	501	406	-	9,719,877	73,080	5,380
Removal of Major Equipment																					
1a.1.2	Main Turbine/Generator		-	245	978	460	-	4,969	-	1,170	8,124	8,123	-	-	13,743	-	-	-	2,905,964	7,045	-
1a.1.3	Main Condensers		-	397	1,527	624	-	6,742	-	2,011	11,102	11,102	-	-	62,059	-	-	-	1,912,411	11,911	-
Calculating Costs from Civil Building Demolition																					
1a.1.2.1	Reactor		-	605	-	-	-	-	-	91	695	695	-	-	-	-	-	-	-	5,559	-
1a.1.2.2	Safeguard		-	67	-	-	-	-	-	10	77	77	-	-	-	-	-	-	-	538	-
1a.1.1	Totals		-	672	-	-	-	-	-	101	773	773	-	-	-	-	-	-	-	6,117	-
Disposal of Plant Systems																					
1a.1.5.1	Auxiliary Feedwater (insulated)		-	559	167	67	-	720	-	317	1,860	1,860	-	-	6,577	-	-	-	421,212	13,852	-
1a.1.5.2	Auxiliary Steam		-	12	-	-	-	-	-	2	14	-	-	11	-	-	-	-	-	995	-
1a.1.5.3	Boron Recycle (insulated)		-	5	1	0	-	2	-	2	10	10	-	-	-	21	-	-	1,570	118	-
1a.1.5.4	Boron Recycle (uninsulated)		-	28	4	1	-	15	-	13	60	60	-	-	-	153	-	-	8,660	685	-
1a.1.5.5	Boron Thermal Regeneration (insulated)		-	73	11	4	-	10	-	10	159	159	-	-	-	159	-	-	21,309	1,842	-
1a.1.5.6	Boron Thermal Regeneration (uninsulated)		-	186	31	11	-	118	-	81	126	126	-	-	-	1,061	-	-	68,710	1,602	-
1a.1.5.7	Chemical & Volume Control (insulated)		-	161	22	7	-	80	-	61	115	115	-	-	-	722	-	-	16,896	3,960	-
1a.1.5.8	Chemical & Volume Control (uninsulated)		-	126	51	19	-	207	-	111	747	747	-	-	-	1,867	-	-	120,817	8,087	-
1a.1.5.9	Chemical Feed		-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	218	-
1a.1.5.10	Chemical Feed - RCA		-	8	1	0	-	2	-	2	14	11	-	-	-	15	-	-	971	251	-
1a.1.5.11	Chilled Water - Safety		-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	149	-
1a.1.5.12	Chilled Water - Safety - RCA		-	87	14	4	-	17	-	6	188	188	-	-	-	427	-	-	27,756	2,002	-
1a.1.5.13	Circulating Water		-	177	-	-	-	-	-	26	203	-	-	203	-	-	-	-	-	5,720	-
1a.1.5.14	Component Cooling Water		-	24	-	-	-	-	-	1	26	-	-	26	-	-	-	-	-	709	-
1a.1.5.15	Component Cooling Water - RCA		-	920	171	171	-	1,842	-	754	1,077	1,077	-	-	-	16,878	-	-	1,077,151	23,198	-
1a.1.5.16	Condensate (insulated)		-	127	-	-	-	-	-	19	116	-	-	116	-	-	-	-	-	1,155	-
1a.1.5.17	Condensate (uninsulated)		-	102	-	-	-	-	-	15	117	-	-	117	-	-	-	-	-	820	-
1a.1.5.18	Condensate Polishing		-	97	-	-	-	-	-	14	111	-	-	111	-	-	-	-	-	3,095	-
1a.1.5.19	Condensate Vacuum & Water Box Priming		-	64	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	2,054	-
1a.1.5.20	Extraction Steam		-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	2,135	-
1a.1.5.21	Feedwater		-	219	-	-	-	-	-	33	252	-	-	252	-	-	-	-	-	7,102	-
1a.1.5.22	Feedwater - RCA		-	56	26	12	-	133	-	52	278	278	-	-	-	1,217	-	-	77,791	1,149	-
1a.1.5.23	Generator & Exciter		-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	89	-
1a.1.5.24	Generator Gas Cooling		-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	247	-
1a.1.5.25	Generator Primary Water		-	64	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	2,001	-
1a.1.5.26	Generator Seal Oil		-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	242	-
1a.1.5.27	Hydrogen Gas		-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	51	-
1a.1.5.28	Main Steam Reheat & Steam Dump		-	95	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	1,105	-
1a.1.5.29	Main Steam Reheat & Steam Dump - RCA		-	129	115	58	-	610	-	288	1,518	1,518	-	-	-	5,719	-	-	98,270	10,611	-
1a.1.5.30	Main Turbine Inlet Oil		-	13	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	1,900	-
1a.1.5.31	Main Turbine Oil Purification		-	88	-	-	-	-	-	14	101	-	-	101	-	-	-	-	-	2,778	-
1a.1.5.32	Nitrogen Gas		-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	50	-
1a.1.5.33	Post Accident Sampling		-	7	1	0	-	2	-	7	11	11	-	-	-	15	-	-	951	242	-
1a.1.5.34	Process Sampling (uninsulated)		-	8	1	2	-	19	-	7	30	10	-	-	-	172	-	-	11,236	241	-
1a.1.5.35	Reactor Coolant		-	102	15	5	-	59	-	43	225	225	-	-	-	735	-	-	31,637	2,522	-
1a.1.5.36	Residual Heat Removal		-	205	130	60	-	618	-	217	1,300	1,300	-	-	-	5,891	-	-	178,887	5,722	-
1a.1.5.37	Safety Injection (insulated)		-	138	35	15	-	158	-	128	414	414	-	-	-	1,415	-	-	92,591	1,809	-
1a.1.5.38	Safety Injection (uninsulated)		-	158	-	-	-	-	-	21	182	182	-	-	-	-	-	-	-	1,753	-
1a.1.5.39	Secondary Plant Sampling		-	29	-	-	-	-	-	1	31	-	-	31	-	-	-	-	-	1,040	-
1a.1.5.40	Steam Generator Blowdown & Cleanup		-	109	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	3,481	-
1a.1.5.41	Turbine Electrohydraulic Control (insulated)		-	21	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	663	-
1a.1.5.42	Turbine Electrohydraulic Control (uninsulated)		-	11	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	416	-
1a.1.5.43	Turbine Inlet Steam & Drains		-	12	-	-	-	-	-	6	49	-	-	49	-	-	-	-	-	1,357	-
1a.1.5.44	Turbine Inlet Drains		-	386	-	-	-	-	-	58	113	-	-	113	-	-	-	-	-	12,600	-
1a.1.5.45	Turbine Plant Cooling (uninsulated)		-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	513	-
1a.1.5.46	Turbine Plant Cooling (uninsulated)		-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	1,195	-
1a.1.5.47	Turbines (High - Low) (insulated)		-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	1,105	-
1a.1.5.48	Turbines (High - Low) (uninsulated)		-	52	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	1,701	-



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	On-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	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet	Burial / Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
1a15.19	Vent Chilled Water - Non Safety	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	500	-
1a15.50	Vent Chilled Water - Non Safety - RCA	-	129	25	9	-	92	-	59	115	415	-	-	-	844	-	-	-	5196.5	2,994	-
4a15.51	Wet storage Process Instruments	-	5	0	0	-	1	-	1	6	6	-	-	-	11	-	-	-	851	85	-
4a15	Totals	-	3,790	1,073	146	-	4,815	-	2,559	11,183	12,171	-	2,312	-	43,924	-	-	-	2,815,905	155,132	-
4a16	Scaffolding in support of decommissioning	-	456	7	3	-	33	-	121	623	623	-	-	-	307	-	-	-	19,514	16,173	-
4a1	Subtotal Period 1a Activity Costs	100	22,610	17,605	6,145	-	15,308	6,14	27,990	118,982	116,670	-	2,312	-	251,757	501	406	-	19,443,710	269,437	5,980
Period 1a Additional Costs																					
4a2.1	Retired Reactor Closure Head	-	-	504	194	-	151	-	237	1,685	1,685	-	-	-	3,241	-	-	-	508,950	3,023	2,000
4a2.2	Retired HP and LP Turbine Rotors	-	115	472	220	-	191	-	238	1,530	1,530	-	-	-	3,501	-	-	-	1,023,100	3,813	1,000
4a2	Subtotal Period 1a Additional Costs	-	115	976	714	-	342	-	475	3,215	3,215	-	-	-	6,742	-	-	-	1,532,050	6,836	3,000
Period 1a Collateral Costs																					
1a1.1	Process decommissioning water waste	5	-	9	11	-	9	-	8	41	43	-	-	-	83	-	-	-	5,000	16	-
1a1.3	Small tool allowance	-	197	-	-	-	-	-	40	227	204	-	23	-	-	-	-	-	-	-	-
1a1.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	492	71	566	-	566	-	-	-	-	-	-	-	-	-
1a1	Subtotal Period 1a Collateral Costs	5	197	9	11	-	9	492	111	835	447	566	23	-	83	-	-	-	5,000	16	-
Period 1a Period-Dependent Costs																					
4a1.1	Decon supplies	103	-	-	-	-	-	-	26	129	129	-	-	-	-	-	-	-	-	-	-
4a1.2	Inventory	-	-	-	-	-	-	815	84	929	929	-	-	-	-	-	-	-	-	-	-
4a1.3	Property taxes	-	-	-	-	-	-	566	623	623	623	-	-	-	-	-	-	-	-	-	-
4a1.4	Health physics supplies	-	2,021	-	-	-	-	565	2,586	2,586	2,586	-	-	-	-	-	-	-	-	-	-
4a1.5	Heavy equipment rental	-	1,023	-	-	-	-	-	453	1,476	1,476	-	-	-	-	-	-	-	-	-	-
4a1.6	Disposal of DAW generated	-	-	81	28	-	131	-	16	290	290	-	-	-	4,022	-	-	-	80,431	131	-
4a1.7	Plant emergency budget	-	-	-	-	-	2,697	-	105	1,102	1,102	-	-	-	-	-	-	-	-	-	-
4a1.8	NRC Fees	-	-	-	-	-	633	-	63	696	696	-	-	-	-	-	-	-	-	-	-
4a1.9	Liquid Radioactive Processing Equipment/Services	-	-	-	-	-	590	-	89	679	679	-	-	-	-	-	-	-	-	-	-
4a1.10	ISHSI Operating Costs	-	-	-	-	-	57	-	12	69	69	-	89	-	-	-	-	-	-	-	-
1a4.11	Remedial Action Surveys	-	-	-	-	-	-	1,141	171	1,312	1,312	-	-	-	-	-	-	-	-	-	-
1a1.12	Security Staff Cost	-	-	-	-	-	-	2,336	950	2,687	945	1,752	-	-	-	-	-	-	-	61,870	-
1a1.13	DOC Staff Cost	-	-	-	-	-	-	17,190	2,738	19,708	19,708	-	-	-	-	-	-	-	-	201,019	-
1a4.14	Utility Staff Cost	-	-	-	-	-	-	23,363	3,084	28,217	27,428	-	-	-	-	-	-	-	-	175,144	-
4a4	Subtotal Period 1a Period-Dependent Costs	103	5,011	81	28	-	154	50,638	8,524	64,532	61,893	2,660	-	-	1,022	-	-	-	80,431	131	618,233
1a0	TOTAL PERIOD 1a COST	209	27,996	18,661	6,888	-	11,997	51,761	37,100	187,605	182,015	1,226	2,335	-	267,601	501	406	-	21,071,190	276,450	626,613
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b1.1	Remove spent fuel racks	236	24	127	11	-	180	-	224	973	973	-	-	-	3,012	-	-	-	193,236	838	-
Disposal of Plant Systems																					
4b1.2.2	Auxiliary Building HVAC (uninsulated)	-	7	1	1	-	7	-	4	19	19	-	-	-	64	-	-	-	4,014	195	-
4b1.2.3	Batt Room & Misc Uninsulated Air - HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	73	-
4b1.2.4	Compressed Air - Instr Air (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	78	-
4b1.2.5	Compressed Air - Instrument Air - RCA b	-	10	2	1	-	6	-	4	22	22	-	-	-	51	-	-	-	3,338	233	-
4b1.2.6	Compressed Air - Instrument Air - RCA b	-	115	17	5	-	57	-	46	230	230	-	-	-	314	-	-	-	13,985	2,825	-
4b1.2.7	Compressed Air - Service Air	-	27	-	-	-	-	-	4	11	-	-	31	-	-	-	-	-	-	883	-
4b1.2.8	Compressed Air - Service Air - RCA	-	133	21	7	-	73	-	55	289	289	-	-	-	658	-	-	-	42,761	3,229	-
4b1.2.9	Compressed Air - Instr Air (uninsulated)	-	27	-	-	-	-	-	3	11	-	-	31	-	-	-	-	-	-	883	-
4b1.2.10	Contaminant Hatches	-	-	1	0	-	-	-	5	16	16	-	-	-	10	-	-	-	2,568	170	-
4b1.2.11	Contaminant Hydrogen Purge HVAC	-	35	11	4	-	17	-	22	119	119	-	-	-	127	-	-	-	27,475	943	-
4b1.2.12	Contaminant Spray	-	95	327	154	-	1,118	-	536	2,780	2,780	-	-	-	11,197	-	-	-	846,674	9,936	-
4b1.2.13	Contaminant Ventilation HVAC (insulated)	-	188	322	36	-	601	-	218	1,183	1,183	-	-	-	3,304	-	-	-	151,564	4,809	-
4b1.2.14	Contaminant Ventilation HVAC (uninsulated)	-	27	10	5	-	53	-	22	118	118	-	-	-	304	-	-	-	11,997	713	-
4b1.2.15	Control Room HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	62	-
4b1.2.16	Demonsalred & RCN Makeup Water	-	30	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	511	-
4b1.2.17	Demonsalred & RCN Makeup Water - RCA	-	91	16	5	-	55	-	40	209	209	-	-	-	193	-	-	-	11,957	2,095	-
4b1.2.18	Diesel (Gen & Auxiliaries) (insulated)	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	182	-
4b1.2.19	Diesel (Gen & Auxiliaries) (uninsulated)	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	2,239	-
4b1.2.20	Diesel Generator Fuel Oil	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	64	-
4b1.2.21	Diesel Room HVAC	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	117	-
4b1.2.22	Electrical - Clean	-	1,600	-	-	-	-	-	240	1,840	-	-	1,840	-	-	-	-	-	-	49,217	-
4b1.2.23	Electrical - Contaminated	-	136	34	8	-	81	-	57	295	295	-	-	-	715	-	-	-	47,159	3,326	-
4b1.2.24	Electrical - RCA	-	990	145	68	-	796	-	175	2,081	2,081	-	-	-	6,779	-	-	-	430,344	21,014	-
4b1.2.25	Fire Protection	-	82	-	-	-	-	-	12	91	-	-	91	-	-	-	-	-	-	2,628	-
4b1.2.26	Fire Protection - RCA	-	196	42	15	-	159	-	95	506	506	-	-	-	1,134	-	-	-	92,796	4,985	-
4b1.2.27	Fuel Handling HVAC (insulated)	-	5	1	0	-	5	-	3	14	14	-	-	-	32	-	-	-	2,679	132	-
4b1.2.28	Fuel Handling	-	5	1	1	-	7	-	4	17	17	-	-	-	64	-	-	-	1,893	114	-
4b1.2.29	Leak Rate Test	-	9	5	1	-	11	-	6	40	40	-	-	-	104	-	-	-	6,738	238	-
4b1.2.30	Potable Water	-	-	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	39	-
4b1.2.31	Radiation Monitoring	-	-	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	13	-
4b1.2.32	Safeguards Building HVAC (insulated)	-	14	3	2	-	19	-	9	47	47	-	-	-	171	-	-	-	11,048	511	-
4b1.2.33	Safeguards Building HVAC (uninsulated)	-	49	8	4	-	11	-	22	118	118	-	-	-	409	-	-	-	25,970	1,040	-



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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				GTCC Cu Feet	Burial/Processed Wt. Lbs.	C/ft Manhours	Utility and Contractor Manhours
															Class A Cu Feet	Class B Cu Feet	Class C Cu Feet					
Disposal of Plant Systems (continued)																						
db 1.2.34	Service Water	-	98	-	-	-	-	-	6	11	-	-	11	-	-	-	-	-	-	-	1,240	-
db 1.2.35	Service Water - RCA	-	164	74	96	-	390	-	151	816	816	-	-	-	1,578	-	-	-	-	228,038	1,467	-
db 1.2.36	Spent Fuel Pool Cooling & Cleanup	-	116	16	5	-	56	-	16	239	239	-	-	-	708	-	-	-	-	11,005	2,817	-
db 1.2.37	Turbine Building HVAC (uninsulated)	-	-	1	-	-	-	-	0	3	-	-	-	-	5	-	-	-	-	-	92	-
db 1.2.38	Turbine Building HVAC (uninsulated)	-	-	22	-	-	-	-	3	25	-	-	-	-	25	-	-	-	-	-	722	-
db 1.2.39	Vents & Drains	-	16	-	-	-	-	-	2	18	-	-	-	-	-	-	-	-	-	-	193	-
db 1.2.40	Vents & Drains - RCA	-	112	21	7	-	79	-	59	308	308	-	-	-	18	-	-	-	-	46,113	1,137	-
db 1.2.41	Waste Management (uninsulated)	-	-	3	-	-	-	-	0	3	-	-	-	-	-	-	-	-	-	-	91	-
db 1.2.42	Waste Processing Liquid (insulated)	-	122	16	5	-	56	-	17	246	246	-	-	-	308	-	-	-	-	13,022	2,980	-
db 1.2.43	Waste Processing Liquid (uninsulated)	-	58	9	1	-	12	-	21	126	126	-	-	-	291	-	-	-	-	18,868	1,128	-
db 1.2.44	Waste Processing Solid	-	2	0	0	-	1	-	1	4	-	-	-	-	-	-	-	-	-	860	18	-
db 1.2	Totals	-	1,928	867	173	-	1,040	-	2,188	12,386	10,147	-	2,239	-	96,407	-	-	-	-	2,356,892	131,333	-
db 1.3	Scaffolding in support of decommissioning	-	684	10	5	-	50	-	185	931	934	-	-	-	161	-	-	-	-	29,301	21,579	-
Decommissionation of Site Buildings																						
db 1.4.1	Reactor	1,025	609	114	147	-	992	-	945	3,821	3,821	-	-	-	11,719	-	-	-	-	734,248	13,036	-
db 1.4.2	Safeguard	131	46	15	12	-	96	-	104	401	401	-	-	-	1,292	-	-	-	-	61,941	1,627	-
db 1.4	Totals	1,156	655	129	149	-	1,088	-	1,049	4,222	4,222	-	-	-	13,011	-	-	-	-	796,189	14,663	-
db 1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	549	82	632	632	-	-	-	-	-	-	-	-	-	-	4,096
db 1.6	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
db 1	Subtotal Period 1b Activity Costs	1,192	6,291	1,133	557	-	5,199	549	1,728	19,149	16,910	-	2,239	-	96,451	-	-	-	-	1,577,627	201,933	1,096
Period 1b Additional Costs																						
db 2.1	License Termination Survey/Planning	-	-	-	-	-	-	1,019	306	1,325	1,325	-	-	-	-	-	-	-	-	-	-	6,240
db 2.2	Underground Utilities Excavation	-	2,157	-	-	-	-	783	512	5,973	5,973	-	-	-	-	-	-	-	-	-	13,618	-
db 2.3	Operational Tools and Equipment	-	-	12	32	-	185	-	32	281	281	-	-	-	5,880	-	-	-	-	147,000	36	-
db 2.4	Not Used	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
db 2	Subtotal Period 1b Additional Costs	-	2,157	12	32	-	185	1,801	1,040	5,579	5,579	-	-	-	5,880	-	-	-	-	117,000	136,11	6,240
Period 1b Collateral Costs																						
db 3.1	Process decommissioning water waste	10	-	19	22	-	18	-	15	84	84	-	-	-	366	-	-	-	-	9,944	32	-
db 3.2	Process decommissioning chemical waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
db 3.3	Small tool allowance	-	118	-	-	-	-	-	18	136	136	-	-	-	-	-	-	-	-	-	-	-
db 3.4	Decommissioning Equipment Disposition	-	-	113	53	-	575	-	163	901	901	-	-	-	5,290	-	-	-	-	166,079	147	-
db 3.5	Spent Fuel Capital and Franchise	-	-	-	-	-	-	718	111	819	-	819	-	-	-	-	-	-	-	-	-	-
db 3	Subtotal Period 1b Collateral Costs	10	118	132	76	-	593	718	306	1,974	1,124	849	-	-	5,156	-	-	-	-	146,021	179	-
Period 1b Period-Dependent Costs																						
db 4.1	Decon supplies	963	-	-	-	-	-	-	211	1,204	1,204	-	-	-	-	-	-	-	-	-	-	-
db 4.2	Insurance	-	-	-	-	-	-	1,266	127	1,393	1,393	-	-	-	-	-	-	-	-	-	-	-
db 4.3	Property taxes	-	-	-	-	-	-	849	85	934	934	-	-	-	-	-	-	-	-	-	-	-
db 4.4	Health physics supplies	-	1,980	-	-	-	-	-	495	2,475	2,475	-	-	-	-	-	-	-	-	-	-	-
db 4.5	Heavy equipment rental	-	4,673	-	-	-	-	-	701	5,374	5,374	-	-	-	-	-	-	-	-	-	-	-
db 4.6	Disposal of DAW generated	-	-	60	21	-	100	-	34	216	216	-	-	-	2,993	-	-	-	-	79,851	98	-
db 4.7	Plant energy budget	-	-	-	-	-	-	1,192	479	1,671	1,671	-	-	-	-	-	-	-	-	-	-	-
db 4.8	NRC Fees	-	-	-	-	-	-	949	95	1,044	1,044	-	-	-	-	-	-	-	-	-	-	-
db 4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	881	111	1,017	1,017	-	-	-	-	-	-	-	-	-	-	-
db 4.10	ISPSH Operating Costs	-	-	-	-	-	-	116	17	133	-	131	-	-	-	-	-	-	-	-	-	-
db 4.11	Remedial Action Surveys	-	-	-	-	-	-	1,710	236	1,946	1,946	-	-	-	-	-	-	-	-	-	-	-
db 4.12	Security Staff Cost	-	-	-	-	-	-	1,502	325	1,827	1,827	2,626	-	-	-	-	-	-	-	-	-	92,713
db 4.13	Utility Staff Cost	-	-	-	-	-	-	17,021	2,053	19,074	19,074	-	-	-	-	-	-	-	-	-	-	207,571
db 4.14	Utility Staff Cost	-	-	-	-	-	-	25,295	1,794	29,089	29,089	1,047	-	-	-	-	-	-	-	-	-	170,981
db 4	Subtotal Period 1b Period-Dependent Costs	963	6,652	60	21	-	100	51,781	9,335	72,116	68,330	1,806	-	-	2,993	-	-	-	-	59,851	98	671,299
db 0	TOTAL PERIOD 1b COST	2,166	15,518	1,317	686	-	6,377	57,876	11,660	98,818	91,924	1,655	2,239	-	70,679	-	-	-	-	1,940,501	218,903	681,635
PERIOD 1c - Delay before License Termination																						
Period 1c Direct Decommissioning Activities																						
Period 1c Collateral Costs																						
db 3.1	Spent Fuel Capital and Franchise	-	-	-	-	-	-	980	57	136	-	136	-	-	-	-	-	-	-	-	-	-
db 3	Subtotal Period 1c Collateral Costs	-	-	-	-	-	-	980	57	136	-	136	-	-	-	-	-	-	-	-	-	-
Period 1c Period-Dependent Costs																						
db 4.1	Insurance	-	-	-	-	-	-	652	65	717	717	-	-	-	-	-	-	-	-	-	-	-
db 4.2	Property taxes	-	-	-	-	-	-	136	11	146	146	-	-	-	-	-	-	-	-	-	-	-
db 4.3	Health physics supplies	-	101	-	-	-	-	-	25	126	126	-	-	-	-	-	-	-	-	-	-	-
db 4.4	Disposal of DAW generated	-	-	2	1	-	1	-	1	8	8	-	-	-	109	-	-	-	-	2,179	1	-
db 4.5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
db 4.6	NRC Fees	-	-	-	-	-	-	185	18	203	203	-	-	-	-	-	-	-	-	-	-	-
db 4.7	ISPSH Operating Costs	-	-	-	-	-	-	79	9	88	-	68	-	-	-	-	-	-	-	-	-	-
db 4.8	Security Staff Cost	-	-	-	-	-	-	1,813	270	2,074	2,074	1,952	-	-	-	-	-	-	-	-	-	17,749
db 4.9	Utility Staff Cost	-	-	-	-	-	-	1,106	166	1,272	1,272	1,184	-	-	-	-	-	-	-	-	-	15,936



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LWR 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			
4e 4	Subtotal Period 4e Period-Dependent Costs	-	301	2	1	-	4	1,242	599	1,948	3,410	1,508	-	-	109	-	-	-	2,179	1	616.65
4e 0	TOTAL PERIOD 4e COST	-	301	2	1	-	4	1,621	636	5,985	3,410	1,945	-	-	109	-	-	-	2,179	1	616.65
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f 1.1	ORISE confirmation survey	-	-	-	-	-	-	136	47	203	203	-	-	-	-	-	-	-	-	-	-
4f 1.2	Terminate license	-	-	-	-	-	-	136	17	203	203	-	-	-	-	-	-	-	-	-	-
4f 1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	136	17	203	203	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f 2.1	License Termination Survey	-	-	-	-	-	-	1,298	989	1,287	1,287	-	-	-	-	-	-	-	77,179	3,120	1,120
4f 2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	1,298	989	1,287	1,287	-	-	-	-	-	-	-	77,179	3,120	1,120
Period 4f Collateral Costs																					
4f 3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	-
4f 3.2	Spent Fuel Capital and Transport	-	-	-	-	-	-	26.2	39	301	-	301	-	-	-	-	-	-	-	-	-
4f 3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	2,058	312	2,390	2,089	301	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f 4.1	Insurance	-	-	-	-	-	-	149	45	494	494	-	-	-	-	-	-	-	-	-	-
4f 4.2	Property Taxes	-	-	-	-	-	-	301	30	332	332	-	-	-	-	-	-	-	-	-	-
4f 4.3	Health physics supplies	-	528	-	-	-	-	-	132	660	660	-	-	-	-	-	-	-	-	-	-
4f 4.4	Disposal of DAW generated	-	-	-	-	-	-	11	1	24	24	-	-	-	137	-	-	-	6,734	11	-
4f 4.5	Plant energy budget	-	-	7	2	-	-	602	45	137	137	-	-	-	-	-	-	-	-	-	-
4f 4.6	NRC Fees	-	-	-	-	-	-	97	10	137	137	-	-	-	-	-	-	-	-	-	-
4f 4.7	ISFSI Operating Costs	-	-	-	-	-	-	11	6	17	17	17	-	-	-	-	-	-	-	-	-
4f 4.8	Security Staff Cost	-	-	-	-	-	-	1,213	186	1,433	1,433	912	-	-	-	-	-	-	-	-	12,940
4f 4.9	DOC Staff Cost	-	-	-	-	-	-	1,062	699	1,671	1,671	-	-	-	-	-	-	-	-	-	16,622
4f 4.10	Utility Staff Cost	-	-	-	-	-	-	1,198	660	5,057	1,662	175	-	-	-	-	-	-	-	-	59,942
4f 4	Subtotal Period 4f Period-Dependent Costs	-	528	7	2	-	-	11,119.3	1,757	13,499	12,085	1,144	-	-	137	-	-	-	6,734	11	139,174
4f 0	TOTAL PERIOD 4f COST	-	528	7	2	-	-	11,167.26	3,105	20,479	18,614	1,715	-	-	137	-	-	-	6,734	77,190	142,594
PERIOD 4 TOTALS		2,373	11,142	19,997	7,577	-	31,989	130,987	55,321	332,387	296,053	11,561	1,573	-	136,729	501	106	-	21,998,610	572,217	1,511,307
PERIOD 5a - Site Restoration																					
Period 5a Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5a 1.1.1	Reactor	-	3,431	-	-	-	-	-	315	5,916	-	-	3,916	-	-	-	-	-	-	31,617	-
5a 1.1.2	Cool Water Yard Piping	-	17	-	-	-	-	-	1	29	-	-	29	-	-	-	-	-	-	36	-
5a 1.1.3	Diesel Generator	-	410	-	-	-	-	-	62	172	-	-	172	-	-	-	-	-	-	1,210	-
5a 1.1.4	Old Steam Generator Storage Facility	-	541	-	-	-	-	-	81	622	-	-	622	-	-	-	-	-	-	3,622	-
5a 1.1.5	Safeguards	-	1,279	-	-	-	-	-	192	1,171	-	-	1,171	-	-	-	-	-	-	10,725	-
5a 1.1.6	Switchgear	-	81	-	-	-	-	-	13	96	-	-	96	-	-	-	-	-	-	705	-
5a 1.1.7	Turbine	-	153	-	-	-	-	-	18	521	-	-	521	-	-	-	-	-	-	7,230	-
5a 1.1.8	Turbine Pedestal	-	703	-	-	-	-	-	106	809	-	-	809	-	-	-	-	-	-	4,179	-
5a 1.1	Totals	-	6,919	-	-	-	-	-	1,018	7,937	-	-	7,937	-	-	-	-	-	-	62,191	-
Site Closeout Activities																					
5a 1.2	Grass & Landscaping	-	516	-	-	-	-	-	82	628	-	-	628	-	-	-	-	-	-	1,492	-
5a 1.3	Final report to NRC	-	-	-	-	-	-	209	31	241	241	-	-	-	-	-	-	-	-	-	1,760
5a 1	Subtotal Period 5a Activity Costs	-	7,463	-	-	-	-	209	1,151	8,825	241	-	8,585	-	-	-	-	-	-	63,686	1,760
Period 5a Additional Costs																					
5a 2.1	Concrete Crushing	-	571	-	-	-	-	5	86	661	-	-	661	-	-	-	-	-	-	2,183	-
5a 2	Subtotal Period 5a Additional Costs	-	571	-	-	-	-	5	86	661	-	-	661	-	-	-	-	-	-	2,183	-
Period 5a Collateral Costs																					
5a 3.1	Small tool allowance	-	38	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	-	-
5a 3.2	Spent Fuel Capital and Transport	-	-	-	-	-	-	686	101	800	-	800	-	-	-	-	-	-	-	-	-
5a 3	Subtotal Period 5a Collateral Costs	-	38	-	-	-	-	686	110	843	-	800	13	-	-	-	-	-	-	-	-
Period 5a Period-Dependent Costs																					
5a 4.1	Insurance	-	-	-	-	-	-	556	60	656	-	-	656	-	-	-	-	-	-	-	-
5a 4.2	Property Taxes	-	-	-	-	-	-	800	80	880	-	-	880	-	-	-	-	-	-	-	-
5a 4.3	Heavy equipment rental	-	5,998	-	-	-	-	-	900	6,898	-	-	6,898	-	-	-	-	-	-	-	-
5a 4.4	Plant energy budget	-	-	-	-	-	-	401	60	461	-	-	461	-	-	-	-	-	-	-	-
5a 4.5	NRC ISFSI Fees	-	-	-	-	-	-	169	17	186	-	-	186	-	-	-	-	-	-	-	-
5a 4.6	ISFSI Operating Costs	-	-	-	-	-	-	109	16	125	-	-	125	-	-	-	-	-	-	-	-
5a 4.7	Security Staff Cost	-	-	-	-	-	-	1,239	195	1,434	-	2,419	1,451	-	-	-	-	-	-	-	87,660
5a 4.8	DOC Staff Cost	-	-	-	-	-	-	9,801	1,470	11,271	-	-	11,271	-	-	-	-	-	-	-	110,240
5a 4.9	Utility Staff Cost	-	-	-	-	-	-	3,077	763	5,861	-	1,297	4,634	-	-	-	-	-	-	-	70,280
5a 4	Subtotal Period 5a Period-Dependent Costs	-	5,998	-	-	-	-	20,272	3,862	30,112	-	3,958	26,174	-	-	-	-	-	-	-	267,880



Table D-1  
Comanche Peak Nuclear Power Plant Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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. Firm Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume, Cu Feet	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet	Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
5b 0	TOTAL PERIOD 5b COST	-	14 072	-	-	-	-	21 180	5 210	10 462	241	1 758	15 163	-	-	-	-	-	-	66 160	260 360
PERIOD 5c - Fuel Storage Operations/Shipping																					
Period 5c Direct Decommissioning Activities																					
Period 5c Collateral Costs																					
5c 1.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1 155	203	1 558	-	1 558	-	-	-	-	-	-	-	-	-
5c 1	Subtotal Period 5c Collateral Costs	-	-	-	-	-	-	1 155	203	1 558	-	1 558	-	-	-	-	-	-	-	-	-
Period 5c Period-Dependent Costs																					
5c 4.1	Insurance	-	-	-	-	-	-	1 151	115	1 266	-	1 266	-	-	-	-	-	-	-	-	-
5c 4.2	Property taxes	-	-	-	-	-	-	1 543	151	1 697	-	1 697	-	-	-	-	-	-	-	-	-
5c 4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5c 4.4	NRC ISFSI Fees	-	-	-	-	-	-	111	44	155	-	155	-	-	-	-	-	-	-	-	-
5c 4.5	ISFSI Operating Costs	-	-	-	-	-	-	210	12	222	-	222	-	-	-	-	-	-	-	-	-
5c 4.6	Security Staff Cost	-	-	-	-	-	-	1 208	611	4 839	-	4 839	-	-	-	-	-	-	-	-	101 982
5c 4.7	Utility Staff Cost	-	-	-	-	-	-	2 029	304	2 333	-	2 333	-	-	-	-	-	-	-	-	27 099
5c 1	Subtotal Period 5c Period-Dependent Costs	-	-	-	-	-	-	9 585	1 281	10 866	-	10 866	-	-	-	-	-	-	-	-	131 181
5c 0	TOTAL PERIOD 5c COST	-	-	-	-	-	-	10 940	1 484	12 424	-	12 424	-	-	-	-	-	-	-	-	131 181
PERIOD 5d - GTCC shipping																					
Period 5d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
5d 1.1.1	Steel & Internals GTCC Disposal	-	-	1 000	-	-	-	10 077	-	1 762	12 839	12 839	-	-	-	-	-	2 061	401 974	-	-
5d 1.1	Totals	-	-	1 000	-	-	-	10 077	-	1 762	12 839	12 839	-	-	-	-	-	2 061	401 974	-	-
5d 1	Subtotal Period 5d Activity Costs	-	-	1 000	-	-	-	10 077	-	1 762	12 839	12 839	-	-	-	-	-	2 061	401 974	-	-
Period 5d Period-Dependent Costs																					
5d 4.1	Insurance	-	-	-	-	-	-	11	1	12	13	-	-	-	-	-	-	-	-	-	-
5d 4.2	Property taxes	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
5d 4.4	NRC ISFSI Fees	-	-	-	-	-	-	3	0	3	-	1	-	-	-	-	-	-	-	-	-
5d 4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
5d 4.6	Security Staff Cost	-	-	-	-	-	-	12	6	18	18	-	-	-	-	-	-	-	-	-	1 037
5d 4.7	Utility Staff Cost	-	-	-	-	-	-	20	3	23	23	-	-	-	-	-	-	-	-	-	269
5d 1	Subtotal Period 5d Period-Dependent Costs	-	-	-	-	-	-	91	13	107	101	6	-	-	-	-	-	-	-	-	1 406
5d 0	TOTAL PERIOD 5d COST	-	-	1 000	-	-	-	10 077	91	1 771	12 946	12 940	6	-	-	-	-	2 061	401 974	-	1 406
PERIOD 5e - ISFSI Decontamination																					
Period 5e Direct Decommissioning Activities																					
Period 5e Additional Costs																					
5e 2.1	License Termination ISFSI	-	280	172	471	-	-	2 458	1 472	1 168	5 842	5 842	-	-	-	-	-	-	1 891 180	9 429	1 421
5e 2	Subtotal Period 5e Additional Costs	-	280	172	471	-	-	2 458	1 472	1 168	5 842	5 842	-	-	-	-	-	-	1 891 180	9 429	1 421
Period 5e Period-Dependent Costs																					
5e 4.1	Insurance	-	-	-	-	-	-	31	13	67	67	-	-	-	-	-	-	-	-	-	-
5e 4.2	Property taxes	-	-	-	-	-	-	267	67	334	333	-	-	-	-	-	-	-	-	-	-
5e 4.3	Plant energy budget	-	-	-	-	-	-	7	2	9	9	-	-	-	-	-	-	-	-	-	-
5e 4.4	Security Staff Cost	-	-	-	-	-	-	64	36	79	79	-	-	-	-	-	-	-	-	-	1 730
5e 4.5	Utility Staff Cost	-	-	-	-	-	-	144	16	179	179	-	-	-	-	-	-	-	-	-	1 881
5e 1	Subtotal Period 5e Period-Dependent Costs	-	-	-	-	-	-	515	133	646	646	-	-	-	-	-	-	-	-	-	5 560
5e 0	TOTAL PERIOD 5e COST	-	280	172	471	-	-	2 458	2 005	1 302	6 508	6 508	-	-	-	-	-	-	1 891 180	9 429	1 811
PERIOD 5f - ISFSI Site Restoration																					
Period 5f Direct Decommissioning Activities																					
Period 5f Additional Costs																					
5f 2.1	Demolition and Site Restoration ISFSI	-	3 426	-	-	-	-	655	552	4 233	-	-	1 213	-	-	-	-	-	-	15 216	80
5f 2	Subtotal Period 5f Additional Costs	-	3 426	-	-	-	-	655	552	4 233	-	-	1 213	-	-	-	-	-	-	15 216	80
Period 5f Collateral Costs																					
5f 1.1	Smith tool allowances	-	11	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-
5f 1	Subtotal Period 5f Collateral Costs	-	11	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-
Period 5f Period-Dependent Costs																					
5f 4.2	Property taxes	-	-	-	-	-	-	123	13	147	-	-	117	-	-	-	-	-	-	-	-
5f 4.3	Heavy equipment rental	-	315	-	-	-	-	-	17	132	-	-	132	-	-	-	-	-	-	-	-
5f 4.4	Plant energy budget	-	-	-	-	-	-	3	1	4	-	-	4	-	-	-	-	-	-	-	-
5f 4.5	Security Staff Cost	-	-	-	-	-	-	13	2	14	-	-	13	-	-	-	-	-	-	-	312
5f 4.6	Utility Staff Cost	-	-	-	-	-	-	58	9	67	-	-	67	-	-	-	-	-	-	-	769



**Table D-1**  
**Comanche Peak Nuclear Power Plant Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(Thousands of 2019 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			
5/4	Subtotal Period 3/ Period-Dependent Costs	-	115	-	-	-	-	207	12	94	-	-	364	-	-	-	-	-	-	-	1,111
9/0	TOTAL PERIOD 5/ COST	-	1,485	-	-	-	-	562	600	11,148	-	-	4,618	-	-	-	-	-	15,416	1,191	-
PERIOD 5 TOTALS			17,757	1,172	571	-	12,515	14,782	10,470	76,987	19,688	17,188	40,111		18,411	-	-	2,061	2,291,154	110,811	408,149
TOTAL COST TO DECOMMISSION		7,110	72,461	21,602	8,141	-	61,063	707,118	148,840	1,010,167	711,679	269,329	47,160		165,611	501	106	2,061	27,596,800	770,756	7,592,156
TOTAL COST TO DECOMMISSION WITH 16.8% CONTINGENCY								\$1,040,167 thousands of 2019 dollars													
TOTAL NRC LICENSE TERMINATION COST IS 69.28% OR								\$711,679 thousands of 2019 dollars													
SPENT FUEL MANAGEMENT COST IS 26.14% OR								\$269,329 thousands of 2019 dollars													
NON-NUCLEAR DEMOLITION COST IS 4.58% OR								\$47,160 thousands of 2019 dollars													
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC)								166,718 Cubic Feet													
TOTAL SCRAP METAL REMOVED								59,380 Tons													
TOTAL CRAFT LABOR REQUIREMENTS								770,756 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 is due to less than 0.5 but is non-zero  
A cell containing "-" indicates a zero value



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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	NRG Lac. 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	GFCU Cu Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	110	93	103	103	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	556
1a.1.3	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
1a.1.4	Remove fuel & source material	-	-	-	-	-	-	-	-	64	-	-	-	-	-	-	-	-	-	-	-
1a.1.5	Notification of Permanent De-fueling	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
1a.1.6	Deactivate plant systems & process waste	-	-	-	-	-	-	115	17	132	132	-	-	-	-	-	-	-	-	-	856
1a.1.7	Prepare and submit PSD-AR	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	556
1a.1.8	Remove plant dikes & pipes	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
1a.1.9	Perform detailed rad survey	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	128
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	128
1a.1.11	End product description	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	128
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	86	13	99	99	-	-	-	-	-	-	-	-	-	612
1a.1.13	Define major work sequence	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	128
1a.1.14	Perform NER and EA	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,327
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	287	45	332	332	-	-	-	-	-	-	-	-	-	2,110
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	282	42	325	325	-	-	-	-	-	-	-	-	-	2,106
1a.1.16.2	Plant systems	-	-	-	-	-	-	244	36	279	279	-	-	-	-	-	-	-	-	-	1,781
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	179	27	206	206	-	-	-	-	-	-	-	-	-	1,115
1a.1.16.4	Waste management	-	-	-	-	-	-	111	17	128	128	-	-	-	-	-	-	-	-	-	856
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	115	17	132	132	-	-	-	-	-	-	-	-	-	856
1a.1.16	Total	-	-	-	-	-	-	930	140	1,070	1,070	-	-	-	-	-	-	-	-	-	6,936
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	68	10	78	78	-	-	-	-	-	-	-	-	-	506
1a.1.17.2	Facility closure & dormancy	-	-	-	-	-	-	69	10	79	79	-	-	-	-	-	-	-	-	-	514
1a.1.17	Total	-	-	-	-	-	-	137	21	157	157	-	-	-	-	-	-	-	-	-	1,020
1a.1.18	Pressure vacuum drying system	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	45
1a.1.19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
1a.1.20	Drain & dry NSSS	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
1a.1.21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
1a.1.22	Decontaminate contaminated systems	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	2,371	402	2,773	2,773	-	-	-	-	-	-	-	-	-	15,361
Period 1a Collateral Costs																					
1a.1.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	14,314	2,117	16,431	-	16,431	-	-	-	-	-	-	-	-	-
1a.1	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	14,314	2,117	16,431	-	16,431	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.1.1	Insurance	-	-	-	-	-	-	3,207	321	3,527	3,527	-	-	-	-	-	-	-	-	-	-
1a.1.2	Property taxes	-	-	-	-	-	-	435	44	479	479	-	-	-	-	-	-	-	-	-	-
1a.1.3	Health physics supplies	-	514	-	-	-	-	-	128	641	641	-	-	-	-	-	-	-	-	-	-
1a.1.4	Heavy equipment rental	-	516	-	-	-	-	-	82	628	628	-	-	-	-	-	-	-	-	-	-
1a.1.5	Disposal of DAW generated	-	-	12	4	-	20	-	7	41	41	-	-	-	610	-	-	-	12,190	20	-
1a.1.6	Plant energy budget	-	-	-	-	-	-	2,091	301	2,392	2,392	-	-	-	-	-	-	-	-	-	-
1a.1.7	NRG Fees	-	-	-	-	-	-	573	57	628	628	-	-	-	-	-	-	-	-	-	-
1a.1.8	Emergency Planning Fees	-	-	-	-	-	-	421	42	463	-	463	-	-	-	-	-	-	-	-	-
1a.1.9	Spent Fuel Pool O&M	-	-	-	-	-	-	414	62	476	-	476	-	-	-	-	-	-	-	-	-
1a.1.10	ISFSI Operating Costs	-	-	-	-	-	-	51	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.1.11	Security Staff Cost	-	-	-	-	-	-	5,801	864	6,665	6,775	-	-	-	-	-	-	-	-	-	150,800
1a.1.12	Utility Staff Cost	-	-	-	-	-	-	28,832	4,125	32,957	33,157	-	-	-	-	-	-	-	-	-	422,240
1a.1	Subtotal Period 1a Period-Dependent Costs	-	1,059	12	4	-	20	11,829	6,260	49,184	48,183	1,091	-	-	610	-	-	-	12,190	20	57,104
1a.0	TOTAL PERIOD 1a COST	-	1,059	12	4	-	20	58,514	8,809	68,418	50,956	17,363	-	-	610	-	-	-	12,190	20	588,401
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,123	-	-	-	-	-	-	561	1,684	1,684	-	-	-	-	-	-	-	-	30,861	-
1b.1.1.2	Auxiliary	513	-	-	-	-	-	-	357	1,070	1,070	-	-	-	-	-	-	-	-	20,089	-
1b.1.1.3	Radwaste Warehouse	241	-	-	-	-	-	-	120	361	361	-	-	-	-	-	-	-	-	6,787	-
1b.1.1.4	Storage	141	-	-	-	-	-	-	70	211	211	-	-	-	-	-	-	-	-	1,960	-
1b.1.1	Totals	2,217	-	-	-	-	-	-	1,109	3,226	3,226	-	-	-	-	-	-	-	-	61,697	-
1b.1	Subtotal Period 1b Activity Costs	2,217	-	-	-	-	-	-	1,109	3,226	3,226	-	-	-	-	-	-	-	-	61,697	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	8,217	1,233	9,449	9,449	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	8,217	1,233	9,449	9,449	-	-	-	-	-	-	-	-	-	-



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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	OTCC Cu Feet			
Period 1b Collateral Costs																					
1b 1.1	Decon equipment		1,026	-	-	-	-	-	151	1,180	1,180	-	-	-	-	-	-	-	70,800	230	-
1b 1.2	Process decommissioning water waste		192	-	132	160	-	111	-	780	780	-	-	-	1,180	-	-	-	-	-	-
1b 1.3	Process decommissioning chemical flush waste		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b 1.4	Small tool allowance		-	33	-	-	-	-	5	38	38	-	-	-	-	-	-	-	-	-	-
1b 1	Subtotal Period 1b Collateral Costs		1,217	33	132	160	-	111	325	1,998	1,998	-	-	-	1,180	-	-	-	70,800	230	-
Period 1b Period-Dependent Costs																					
1b 1.1	Decon supplies	1,660	-	-	-	-	-	-	415	2,075	2,075	-	-	-	-	-	-	-	-	-	-
1b 1.2	Insurance	-	-	-	-	-	-	799	80	879	879	-	-	-	-	-	-	-	-	-	-
1b 1.3	Property taxes	-	-	-	-	-	-	100	10	110	110	-	-	-	-	-	-	-	-	-	-
1b 1.4	Health physics supplies	-	-	122	-	-	-	-	105	527	527	-	-	-	-	-	-	-	-	-	-
1b 1.5	Heavy equipment rental	-	-	136	-	-	-	-	20	137	137	-	-	-	-	-	-	-	-	-	-
1b 1.6	Disposal of DAW generated	-	-	-	18	6	-	30	10	65	65	-	-	902	-	-	-	-	18,031	29	-
1b 1.7	Plant energy budget	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	-
1b 1.8	NRC Fees	-	-	-	-	-	-	97	10	106	106	-	-	-	-	-	-	-	-	-	-
1b 1.9	Emergency Planning Fees	-	-	-	-	-	-	105	10	115	115	115	-	-	-	-	-	-	-	-	-
1b 1.10	Spent Fuel Pool O&M	-	-	-	-	-	-	103	15	119	119	119	-	-	-	-	-	-	-	-	-
1b 1.11	PSFSI Operating Costs	-	-	-	-	-	-	34	2	36	36	36	-	-	-	-	-	-	-	-	17,797
1b 1.12	Security Staff Cost	-	-	-	-	-	-	1,169	220	1,389	1,389	-	-	-	-	-	-	-	-	-	103,271
1b 1.11	Utility Staff Cost	-	-	-	-	-	-	7,188	1,078	8,266	8,266	-	-	-	-	-	-	-	-	-	112,868
1b 1	Subtotal Period 1b Period-Dependent Costs	1,660	558	18	6	-	30	10,574	2,052	14,699	14,699	250	-	-	902	-	-	-	18,031	29	112,868
1b 0	TOTAL PERIOD 1b COST	5,091	591	150	166	-	161	18,591	1,718	29,472	29,221	250	-	-	2,082	-	-	-	88,832	61,936	112,868
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c 1.1	Prepare support equipment for storage	-	103	-	-	-	-	-	60	163	163	-	-	-	-	-	-	-	-	3,000	-
1c 1.2	Install containment pressure eqpt. lines	-	26	-	-	-	-	-	1	30	30	-	-	-	-	-	-	-	-	700	-
1c 1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	17,807	-
1c 1.4	Secure building access ways	-	-	-	-	-	-	-	4	4	4	-	-	-	-	-	-	-	-	-	-
1c 1.5	Prepare & submit interim report	-	-	-	-	-	-	33	5	39	39	-	-	-	-	-	-	-	-	-	250
1c 1	Subtotal Period 1c Activity Costs	-	429	-	-	-	-	766	289	1,185	1,185	-	-	-	-	-	-	-	-	21,507	250
Period 1c Collateral Costs																					
1c 1.1	Process decommissioning water waste		212	-	146	177	-	115	-	183	862	862	-	-	1,405	-	-	-	78,338	251	-
1c 1.3	Small tool allowance		-	2	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	-	-
1c 1	Subtotal Period 1c Collateral Costs		212	2	146	177	-	115	-	184	865	865	-	-	1,405	-	-	-	78,338	251	-
Period 1c Period-Dependent Costs																					
1c 1.1	Insurance	-	-	-	-	-	-	799	80	879	879	-	-	-	-	-	-	-	-	-	-
1c 1.2	Property taxes	-	-	-	-	-	-	100	10	110	110	-	-	-	-	-	-	-	-	-	-
1c 1.3	Health physics supplies	-	-	231	-	-	-	-	58	289	289	-	-	-	-	-	-	-	-	-	-
1c 1.4	Heavy equipment rental	-	-	146	-	-	-	-	20	137	137	-	-	-	-	-	-	-	-	-	-
1c 1.5	Disposal of DAW generated	-	-	-	3	1	-	5	2	11	11	-	-	152	-	-	-	-	3,039	5	-
1c 1.6	Plant energy budget	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	-
1c 1.7	NRC Fees	-	-	-	-	-	-	97	10	106	106	-	-	-	-	-	-	-	-	-	-
1c 1.8	Emergency Planning Fees	-	-	-	-	-	-	105	10	115	115	115	-	-	-	-	-	-	-	-	-
1c 1.9	Spent Fuel Pool O&M	-	-	-	-	-	-	103	15	119	119	119	-	-	-	-	-	-	-	-	-
1c 1.10	PSFSI Operating Costs	-	-	-	-	-	-	34	2	36	36	36	-	-	-	-	-	-	-	-	-
1c 1.11	Security Staff Cost	-	-	-	-	-	-	1,169	220	1,389	1,389	-	-	-	-	-	-	-	-	-	17,797
1c 1.12	Utility Staff Cost	-	-	-	-	-	-	7,188	1,078	8,266	8,266	-	-	-	-	-	-	-	-	-	103,271
1c 1	Subtotal Period 1c Period-Dependent Costs	-	367	3	1	-	5	10,574	1,581	12,332	12,082	250	-	-	152	-	-	-	3,039	5	142,808
1c 0	TOTAL PERIOD 1c COST	212	799	149	178	-	150	11,110	2,054	11,681	11,432	250	-	-	1,457	-	-	-	81,358	21,766	143,117
PERIOD 1 TOTALS																					
		5,306	2,149	312	348	-	311	88,215	15,581	112,572	91,630	17,962	-	-	4,118	-	-	-	182,180	83,712	871,986
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a 1.1	Quarterly inspection	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-
2a 1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-
2a 1.3	Prepare reports	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-
2a 1.4	Bituminous roof replacement	-	-	-	-	-	-	1,466	220	1,686	1,686	-	-	-	-	-	-	-	-	-	-
2a 1.5	Maintenance supplies	-	-	-	-	-	-	619	155	774	774	-	-	-	-	-	-	-	-	-	-
2a 1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	2,085	375	2,459	2,459	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a 2.1	Landfill	-	5	2	3	-	4	294	17	356	-	-	356	-	-	-	-	-	-	139	1,280
2a 2.2	Prong Range	-	-	-	-	-	-	65	55	120	-	-	120	-	-	-	-	-	-	-	-
2a 2	Subtotal Period 2a Additional Costs	-	5	2	3	-	4	659	102	776	-	-	776	-	-	-	-	-	-	139	1,280
Period 2a Collateral Costs																					
2a 1.2	Spent Fuel Capital and T1 under	-	-	-	-	-	-	66,800	10,020	76,819	-	76,819	-	-	-	-	-	-	-	-	-



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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	Lic. Term Costs	Spent Fuel Management Costs	Site Restoration Costs	Procured 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	TPC C Cu Feet			
Period 2a - Collateral Costs (continued)																					
2a.1.3	Severance	-	-	-	-	-	-	8,900	1,215	9,515	9,515	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	75,099	11,265	86,364	9,515	76,849	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.1.1	Insurance	-	-	-	-	-	-	2,381	218	2,622	2,622	-	-	-	-	-	-	-	-	-	-
2a.1.2	Property taxes	-	-	-	-	-	-	1,798	160	1,758	1,758	-	-	-	-	-	-	-	-	-	-
2a.1.3	Health physics supplies	-	822	-	-	-	-	-	208	1,028	1,028	-	-	-	-	-	-	-	-	-	-
2a.1.4	Disposal of DAW generated	-	-	19	6	-	11	-	13	86	66	-	-	-	920	-	-	-	18,994	30	-
2a.1.5	Plant energy budget	-	-	-	-	-	-	1,602	210	1,811	1,811	-	-	-	-	-	-	-	-	-	-
2a.1.6	NRC Fees	-	-	-	-	-	-	715	75	820	820	-	-	-	-	-	-	-	-	-	-
2a.1.7	Emergency Planning Fees	-	-	-	-	-	-	601	60	661	-	661	-	-	-	-	-	-	-	-	-
2a.1.8	Spent Fuel Pool O&M	-	-	-	-	-	-	1,654	218	1,902	-	1,902	-	-	-	-	-	-	-	-	-
2a.1.9	ISFSI Operating Costs	-	-	-	-	-	-	218	33	250	-	250	-	-	-	-	-	-	-	-	-
2a.1.10	Security Staff Cost	-	-	-	-	-	-	23,549	3,332	27,082	9,181	17,901	-	-	-	-	-	-	-	-	602,787
2a.1.11	Utility Staff Cost	-	-	-	-	-	-	21,802	3,381	27,476	1,121	21,054	-	-	-	-	-	-	-	-	328,415
2a.1	Subtotal Period 2a Period-Dependent Costs	-	822	19	6	-	11	56,243	8,186	65,507	21,711	43,767	-	-	920	-	-	-	18,994	30	911,202
2a.0	TOTAL PERIOD 2a COST	-	828	21	10	-	15	134,085	20,428	155,107	31,714	120,586	776	-	920	-	-	-	18,994	169	912,182
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly inspection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.1.3	Prepar. reports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	16,708	2,706	19,211	19,211	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	7,049	1,762	8,811	8,811	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	21,737	4,268	28,026	28,026	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.1.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,771	1,466	11,240	-	11,240	-	-	-	-	-	-	-	-	-
2b.1.2	Severance	-	-	-	-	-	-	2,005	301	2,306	2,306	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	11,775	1,767	13,546	2,306	11,240	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.1.1	Insurance	-	-	-	-	-	-	27,165	2,716	29,881	29,881	-	-	-	-	-	-	-	-	-	-
2b.1.2	Property taxes	-	-	-	-	-	-	18,208	1,821	20,029	20,029	-	-	-	-	-	-	-	-	-	-
2b.1.3	Health physics supplies	-	4,321	-	-	-	-	-	1,080	5,401	5,401	-	-	-	-	-	-	-	-	-	-
2b.1.4	Disposal of DAW generated	-	-	95	11	-	157	-	54	159	159	-	-	-	4,705	-	-	-	91,103	151	-
2b.1.5	Plant energy budget	-	-	-	-	-	-	9,130	1,170	10,500	10,500	-	-	-	-	-	-	-	-	-	-
2b.1.6	NRC Fees	-	-	-	-	-	-	7,940	794	8,734	8,734	-	-	-	-	-	-	-	-	-	-
2b.1.7	ISFSI Operating Costs	-	-	-	-	-	-	2,479	372	2,851	-	2,851	-	-	-	-	-	-	-	-	-
2b.1.8	Security Staff Cost	-	-	-	-	-	-	75,114	11,270	86,384	29,291	57,113	-	-	-	-	-	-	-	-	1,989,634
2b.1.9	Utility Staff Cost	-	-	-	-	-	-	68,515	9,980	76,516	48,970	27,546	-	-	-	-	-	-	-	-	947,454
2b.1	Subtotal Period 2b Period-Dependent Costs	-	4,321	95	11	-	157	206,591	29,457	210,634	151,115	87,909	-	-	4,705	-	-	-	91,103	151	2,937,108
2b.0	TOTAL PERIOD 2b COST	-	4,321	95	11	-	157	212,127	35,492	282,226	181,176	98,750	-	-	4,705	-	-	-	91,103	151	2,937,108
PERIOD 2 TOTALS																					
		-	5,149	116	11	-	192	376,213	55,620	431,933	217,221	219,136	776	-	5,625	-	-	-	112,497	322	3,869,590
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant design & specs	-	-	-	-	-	-	264	40	304	304	-	-	-	-	-	-	-	-	-	1,969
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	37	9	66	66	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventories	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	111	65	195	195	-	-	-	-	-	-	-	-	-	3,210
3a.1.7	Perform SER and EA	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,427
3a.1.8	Prep submittal Detailed Technical Specifications	-	-	-	-	-	-	411	65	495	495	-	-	-	-	-	-	-	-	-	1,210
3a.1.9	Perform Site-Specific Cost Study	-	-	-	-	-	-	287	43	330	330	-	-	-	-	-	-	-	-	-	2,110
3a.1.10	Prepare submittal Detailed Fuel Management Plan	-	-	-	-	-	-	37	9	66	66	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
3a.1.11.1	Reactivate plant & temporary facilities	-	-	-	-	-	-	421	63	487	198	-	49	-	-	-	-	-	-	-	1,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	219	36	275	218	-	28	-	-	-	-	-	-	-	1,783
3a.1.11.3	Radioactive materials	-	-	-	-	-	-	108	16	129	129	-	-	-	-	-	-	-	-	-	1,099
3a.1.11.4	Radioactive vessel	-	-	-	-	-	-	65	9	72	72	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	179	27	206	206	-	-	-	-	-	-	-	-	-	1,415
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	92	14	106	54	-	53	-	-	-	-	-	-	-	685
3a.1.11.8	Main Turbine	-	-	-	-	-	-	21	3	26	-	-	26	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	23	3	26	-	-	26	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	179	27	206	101	-	10	-	-	-	-	-	-	-	1,115
3a.1.11.11	Waste management	-	-	-	-	-	-	264	40	304	304	-	-	-	-	-	-	-	-	-	1,969
3a.1.11.12	Facility & site closure	-	-	-	-	-	-	32	5	39	30	-	30	-	-	-	-	-	-	-	985



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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	Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet	Burned/Processed Wt. Lbs	Craft Manhours	Utility and Contractor Manhours
1a.1.11	Total	-	-	-	-	-	-	2,281	341	2,626	2,312	-	315	-	-	-	-	-	-	-	17,024
1a.1.12	Planning & Site Preparations	-	-	-	-	-	-	198	21	198	158	-	-	-	-	-	-	-	-	-	1,027
1a.1.13	Plant prep. & temp. sites	-	-	-	-	-	-	1,800	310	1,910	1,910	-	-	-	-	-	-	-	-	-	599
1a.1.14	Design water clean up system	-	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-	-	-	-	-
1a.1.15	Rigging/Cont. Entry/Envelope/cooling/leak	-	-	-	-	-	-	2,800	360	2,760	2,760	-	-	-	-	-	-	-	-	-	526
1a.1.16	Pressure calculations & containers	-	-	-	-	-	-	51	11	81	81	-	-	-	-	-	-	-	-	-	33,002
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	10,227	1,511	11,761	11,116	-	315	-	-	-	-	-	-	-	-
1a.2.1	Period 1a Additional Costs	-	-	-	-	-	-	2,351	706	1,059	1,059	-	-	-	-	-	-	-	-	13,012	4,640
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	2,351	706	1,059	1,059	-	-	-	-	-	-	-	-	13,012	4,640
1a.3	Period 1a Collateral Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	317	52	399	-	399	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	317	52	399	-	399	-	-	-	-	-	-	-	-	-
1a.4	Period 1a Period-Dependent Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.1	Insurance	-	-	-	-	-	-	596	60	656	656	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	399	10	409	409	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	-	-	-	-	-	106	512	512	512	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	-	-	-	-	-	82	628	628	628	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	-	-	-	-	5	35	40	40	-	-	-	-	-	-	-	-	-	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,001	301	2,305	2,305	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	254	25	280	280	-	-	-	-	-	-	-	-	-	-
1a.4.8	ISFSI Operating Costs	-	-	-	-	-	-	54	8	63	-	63	-	-	-	-	-	-	-	-	-
1a.4.9	Security Staff Cost	-	-	-	-	-	-	1,096	234	1,330	679	1,272	-	-	-	-	-	-	-	-	-
1a.4.10	Utility Staff Cost	-	-	-	-	-	-	13,471	2,421	15,491	11,980	511	-	-	-	-	-	-	-	-	-
1a.4	Subtotal Period 1a Period-Dependent Costs	-	971	10	1	-	16	18,475	2,902	22,378	20,511	1,845	-	-	481	-	-	-	9,611	16	213,860
1a.0	TOTAL PERIOD 1a COST	-	971	10	1	-	16	31,021	5,195	37,797	35,038	2,244	315	-	481	-	-	-	9,611	13,058	281,002
1b.0	PERIOD 1b - Decommissioning Preparations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.1	Period 1b Direct Decommissioning Activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.1.1	Detailed Work Procedures	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.1.1.1	Plant systems	-	-	-	-	-	-	272	11	312	281	-	11	-	-	-	-	-	-	-	2,926
1b.1.1.2	Reactor internals	-	-	-	-	-	-	144	32	165	165	-	-	-	-	-	-	-	-	-	1,970
1b.1.1.3	Reactor building	-	-	-	-	-	-	58	14	89	82	-	67	-	-	-	-	-	-	-	578
1b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	128
1b.1.1.5	CRD housings & HCI tanks	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	128
1b.1.1.6	Reactor instrumentation	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	128
1b.1.1.7	Reactor vessel	-	-	-	-	-	-	208	31	240	240	-	-	-	-	-	-	-	-	-	1,554
1b.1.1.8	Facility closeout	-	-	-	-	-	-	69	10	79	80	-	10	-	-	-	-	-	-	-	511
1b.1.1.9	Missile shields	-	-	-	-	-	-	26	1	30	30	-	-	-	-	-	-	-	-	-	191
1b.1.1.10	Radiological shield	-	-	-	-	-	-	69	10	79	79	-	-	-	-	-	-	-	-	-	511
1b.1.1.11	Steam generators	-	-	-	-	-	-	261	40	301	301	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.12	Reinforced concrete	-	-	-	-	-	-	57	9	66	66	-	31	-	-	-	-	-	-	-	128
1b.1.1.13	Main Turbine	-	-	-	-	-	-	90	11	101	-	-	101	-	-	-	-	-	-	-	668
1b.1.1.14	Main Condensers	-	-	-	-	-	-	90	11	101	-	-	101	-	-	-	-	-	-	-	668
1b.1.1.15	Auxiliary building	-	-	-	-	-	-	157	24	180	162	-	18	-	-	-	-	-	-	-	1,168
1b.1.1.16	Reactor building	-	-	-	-	-	-	157	24	180	162	-	18	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,851	278	2,129	1,716	-	413	-	-	-	-	-	-	-	11,800
1b.1	Subtotal Period 1b Activity Costs	-	-	-	-	-	-	1,851	278	2,129	1,716	-	413	-	-	-	-	-	-	-	11,800
1b.2	Period 1b Collateral Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.2.1	Decon equipment	1,026	-	-	-	-	-	-	151	1,180	1,180	-	-	-	-	-	-	-	-	-	-
1b.2.2	DOC staff relocation expenses	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	-
1b.2.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.2.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	172	26	197	-	197	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Collateral Costs	1,026	1,200	-	-	-	-	1,988	632	1,816	1,648	197	-	-	-	-	-	-	-	-	-
1b.3	Period 1b Period-Dependent Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.3.1	Decon supplies	16	-	-	-	-	-	-	9	45	45	-	-	-	-	-	-	-	-	-	-
1b.3.2	Insurance	-	-	-	-	-	-	291	29	321	321	-	-	-	-	-	-	-	-	-	-
1b.3.3	Property taxes	-	-	-	-	-	-	197	20	217	217	-	-	-	-	-	-	-	-	-	-
1b.3.4	Health physics supplies	-	-	-	-	-	-	226	57	283	283	-	-	-	-	-	-	-	-	-	-
1b.3.5	Heavy equipment rental	-	-	-	-	-	-	269	10	310	310	-	-	-	-	-	-	-	-	-	-
1b.3.6	Disposal of DAW generated	-	-	-	-	-	-	5	3	19	19	-	-	-	-	-	-	-	-	-	-
1b.3.7	Plant energy budget	-	-	-	-	-	-	988	148	1,137	1,137	-	-	-	-	-	-	-	-	-	-
1b.3.8	NRC Fees	-	-	-	-	-	-	125	14	148	148	-	-	-	-	-	-	-	-	-	-
1b.3.9	ISFSI Operating Costs	-	-	-	-	-	-	27	1	31	-	31	-	-	-	-	-	-	-	-	-
1b.3.10	Security Staff Cost	-	-	-	-	-	-	836	125	962	355	627	-	-	-	-	-	-	-	-	-
1b.3.11	Utility Staff Cost	-	-	-	-	-	-	5,566	535	1,101	4,101	-	-	-	-	-	-	-	-	-	-
1b.3.12	Utility Staff Cost	-	-	-	-	-	-	6,615	906	7,540	7,987	232	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Period-Dependent Costs	-	36	495	5	2	-	9	12,677	1,980	15,201	14,294	910	-	-	-	-	-	5,228	9	162,069



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decom 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 Volume				Burial Volume Processed Wt. Lbs.	Contractor Manhours	Utility and Contractor Manhours
															Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	CFR/C Cu Feet			
36.0	TOTAL PERIOD 36 COST		1,062	1,695	5	2	-	9	16,516	2,889	22,179	20,559	1,107	413	-	261	-	-	5,228	9	175,869
PERIOD 4 TOTALS			1,062	2,662	15	5	-	25	17,919	8,081	59,776	55,697	1,952	727	-	512	-	-	11,840	11,066	456,871
Period 4a - Large Component Removal																					
Period 1a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping		17	86	24	17	-	152	-	71	869	869	-	-	-	1,275	-	-	88,984	2,865	-
4a.1.1.2	Pressurizer Relief Tank		4	16	11	8	-	69	-	26	135	135	-	-	-	581	-	-	10,513	605	-
4a.1.1.3	Reactor Coolant Pumps & Motors		18	59	73	208	-	1,207	-	864	1,929	1,929	-	-	-	7,233	-	-	792,800	2,573	80
4a.1.1.4	Pressurizer		-	38	173	111	-	573	-	207	1,303	1,303	-	-	-	1,435	-	-	285,853	1,136	750
4a.1.1.5	Steam Generator		-	1,537	519	1,695	-	9,911	-	3,723	19,608	19,608	-	-	-	11,064	-	-	1,527,500	11,067	1,500
4a.1.1.6	CRDMs (Nuclear Structure Removal)		22	174	282	32	-	806	-	164	979	979	-	-	-	4,852	-	-	179,025	5,142	-
4a.1.1.7	Reactor Vessel Internals		39	1,822	10,311	423	-	4,964	317	7,949	27,126	27,126	-	-	-	3,581	501	106	1,088,811	21,790	1,150
4a.1.1.8	Reactor Vessel		-	6,320	1,963	412	-	2,108	117	6,436	17,557	17,557	-	-	-	15,631	-	-	958,871	21,790	1,150
4a.1.1	Totals		100	15,250	11,757	2,906	-	17,117	611	18,942	69,001	69,001	-	-	-	6,232	501	106	6,232,178	73,080	14,930
Removal of Major Equipment																					
4a.1.2	Main Turbine Generator		-	213	978	160	-	1,969	-	1,470	8,121	8,121	-	-	-	15,711	-	-	2,905,964	6,999	-
4a.1.3	Main Condensers		-	397	1,127	624	-	6,742	-	2,011	11,102	11,102	-	-	-	62,059	-	-	1,942,131	11,191	-
Cascading Costs from Cleared Building Demolition																					
4a.1.4.1	Reactor		-	605	-	-	-	-	-	91	605	605	-	-	-	-	-	-	-	5,559	-
4a.1.4.2	Auxiliaries		-	283	-	-	-	-	-	42	425	425	-	-	-	-	-	-	-	2,013	-
4a.1.4.3	Subgrinding		-	67	-	-	-	-	-	10	77	77	-	-	-	-	-	-	-	558	-
4a.1.4.4	Fuel		-	307	-	-	-	-	-	46	353	353	-	-	-	-	-	-	-	3,097	-
4a.1.4	Totals		-	1,262	-	-	-	-	-	189	1,451	1,451	-	-	-	-	-	-	-	11,248	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Feedwaters (insulated)		-	576	173	69	-	740	-	356	1,912	1,912	-	-	-	6,755	-	-	192,570	14,332	-
4a.1.5.2	Auxiliary Steam		-	116	-	-	-	-	-	17	134	-	-	-	-	-	-	-	-	1,676	-
4a.1.5.3	Boiler Reactor (insulated)		-	32	1	-	-	15	-	12	65	65	-	134	-	-	-	-	8,754	797	-
4a.1.5.4	Boiler Reactor (uninsulated)		-	513	82	55	-	573	-	185	988	988	-	-	-	3,420	-	-	238,169	8,407	-
4a.1.5.5	Boiler Thermal Regeneration (insulated)		-	75	11	4	-	10	-	10	139	139	-	-	-	359	-	-	21,281	1,851	-
4a.1.5.6	Boiler Thermal Regeneration (uninsulated)		-	199	34	12	-	134	-	89	469	469	-	-	-	1,215	-	-	78,156	5,014	-
4a.1.5.7	Carbon Dioxide Gas		-	1	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-	20	-
4a.1.5.8	Chemical & Volume Control (insulated)		-	176	21	8	-	87	-	69	664	664	-	-	-	779	-	-	50,589	1,346	-
4a.1.5.9	Chemical & Volume Control (uninsulated)		-	461	97	98	-	111	-	233	1,245	1,245	-	-	-	3,771	-	-	242,220	11,961	-
4a.1.5.10	Chemical Feed		-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	121	-
4a.1.5.11	Chemical Feed - RCA		-	8	1	0	-	2	-	2	14	13	-	-	-	15	-	-	971	253	-
4a.1.5.12	Chilled Water - Safety		-	5	-	-	-	-	-	1	6	-	-	-	-	-	-	-	-	159	-
4a.1.5.13	Chilled Water - Safety - RCA		-	97	15	5	-	52	-	10	209	209	-	-	-	171	-	-	10,651	2,232	-
4a.1.5.14	Chlorine		-	12	-	-	-	-	-	2	11	-	-	-	-	11	-	-	-	368	-
4a.1.5.15	Circulating Water		-	323	-	-	-	-	-	18	369	-	-	-	-	-	-	-	-	10,429	-
4a.1.5.16	Component Cooling Water		-	25	-	-	-	-	-	1	28	-	-	-	-	28	-	-	-	763	-
4a.1.5.17	Component Cooling Water - RCA		-	1,015	102	180	-	1,413	-	811	1,984	1,984	-	-	-	17,586	-	-	1,136,965	26,119	-
4a.1.5.18	Condensate (insulated)		-	134	-	-	-	-	-	20	154	-	-	-	-	151	-	-	-	4,573	-
4a.1.5.19	Condensate (uninsulated)		-	113	-	-	-	-	-	17	129	-	-	-	-	129	-	-	-	1,511	-
4a.1.5.20	Condensate Polishing		-	104	-	-	-	-	-	16	119	-	-	-	-	119	-	-	-	1,327	-
4a.1.5.21	Condensate Vacuum & Water Box Pumping		-	63	-	-	-	-	-	9	72	-	-	-	-	72	-	-	-	2,017	-
4a.1.5.22	Extraction Steam		-	55	-	-	-	-	-	8	63	-	-	-	-	63	-	-	-	1,806	-
4a.1.5.23	Feedwater		-	219	-	-	-	-	-	41	252	-	-	-	-	252	-	-	-	7,084	-
4a.1.5.24	Feedwater - RCA		-	58	27	11	-	136	-	53	286	286	-	-	-	1,250	-	-	79,675	1,502	-
4a.1.5.25	Generator & Exciter		-	12	-	-	-	-	-	2	11	-	-	-	-	-	-	-	-	39	-
4a.1.5.26	Generator Gas Cooling		-	8	-	-	-	-	-	1	9	-	-	-	-	-	-	-	-	247	-
4a.1.5.27	Generator Primary Water		-	55	-	-	-	-	-	8	63	-	-	-	-	63	-	-	-	1,745	-
4a.1.5.28	Generator Seal Oil		-	7	-	-	-	-	-	1	8	-	-	-	-	-	-	-	-	218	-
4a.1.5.29	Hydrogen Gas		-	2	-	-	-	-	-	0	2	-	-	-	-	2	-	-	-	54	-
4a.1.5.30	Main Steam Reheat & Steam Dump		-	36	-	-	-	-	-	5	42	-	-	-	-	42	-	-	-	1,136	-
4a.1.5.31	Main Steam Reheat & Steam Dump - RCA		-	125	110	57	-	619	-	281	1,525	1,525	-	-	-	5,611	-	-	861,941	10,542	-
4a.1.5.32	Main Turbine Inlet Oil		-	13	-	-	-	-	-	7	50	-	-	-	-	-	-	-	-	1,981	-
4a.1.5.33	Main Turbine Oil Purification		-	85	-	-	-	-	-	11	97	-	-	-	-	97	-	-	-	2,663	-
4a.1.5.34	Nitrogen Gas		-	1	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-	99	-
4a.1.5.35	Oxygen Gas		-	7	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-	12	-
4a.1.5.36	Post-Accident Sampling		-	1	1	0	-	2	-	2	11	11	-	-	-	15	-	-	911	2,232	-
4a.1.5.37	Process Sampling (uninsulated)		-	8	1	2	-	19	-	7	10	10	-	-	-	177	-	-	11,236	213	-
4a.1.5.38	Reactor Coolant		-	102	15	5	-	59	-	43	225	225	-	-	-	331	-	-	14,556	2,512	-
4a.1.5.39	Reservoir Makeup Water		-	87	-	-	-	-	-	13	100	-	-	-	-	100	-	-	-	2,790	-
4a.1.5.40	Reservoir Return Water		-	64	-	-	-	-	-	10	74	-	-	-	-	74	-	-	-	2,095	-
4a.1.5.41	Reservoir Service Tower		-	9	-	-	-	-	-	1	11	-	-	-	-	11	-	-	-	308	-
4a.1.5.42	Residual Heat Removal		-	204	149	59	-	612	-	235	1,290	1,290	-	-	-	5,833	-	-	575,217	5,701	-
4a.1.5.43	Safety Injection (insulated)		-	132	86	13	-	161	-	71	398	398	-	-	-	1,465	-	-	91,997	2,763	-
4a.1.5.44	Safety Injection (uninsulated)		-	129	170	75	-	806	-	315	1,591	1,591	-	-	-	5,106	-	-	171,598	9,119	-
4a.1.5.45	Secondary Plant Sampling		-	29	-	-	-	-	-	4	34	-	-	-	-	-	-	-	-	1,040	-
4a.1.5.46	Steam Generator Blowdown & Cleanup		-	144	-	-	-	-	-	20	154	-	-	-	-	154	-	-	-	1,265	-
4a.1.5.47	Turbine Electrical Control (insulated)		-	26	-	-	-	-	-	4	30	-	-	-	-	30	-	-	-	838	-



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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	GFC Cu Feet			
Disposal of Plant Systems (continued)																					
4x1548	Turbine Electricals & Cols (uninsul'd)	-	18	-	-	-	-	-	5	21	-	-	21	-	-	-	-	-	-	552	-
4x1549	Turbine Gland Steam & Drains	-	35	-	-	-	-	-	5	30	-	-	30	-	-	-	-	-	-	1,133	-
4x1550	Turbine Heater Drains	-	377	-	-	-	-	-	36	413	-	-	413	-	-	-	-	-	-	12,296	-
4x1551	Turbine Plant Cooling (insulated)	-	17	-	-	-	-	-	4	19	-	-	19	-	-	-	-	-	-	549	-
4x1552	Turbine Plant Cooling (uninsulated)	-	137	-	-	-	-	-	21	157	-	-	157	-	-	-	-	-	-	4,420	-
4x1553	Turbines (HIOH - LOW) (insulated)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	136	-
4x1554	Turbines (HIOH - LOW) (uninsulated)	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	474	-
4x1555	Vent Chilled Water - Non Safety	-	75	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	2,424	-
4x1556	Vent Chilled Water - Non Safety - RCA	-	584	113	52	-	762	-	308	1,649	1,649	-	-	-	7,088	-	-	-	628,470	15,960	-
4x1557	Wastehouse Process Instruments	-	4	0	0	-	2	-	3	7	-	-	-	-	16	-	-	-	993	99	-
4x15	Totals	-	7,272	1,325	631	-	6,807	-	5,722	19,737	16,942	-	2,835	-	62,132	-	-	-	3,981,992	201,298	-
4x16	Scaffolding in support of decommissioning	-	1,057	25	12	-	126	-	300	1,519	1,519	-	-	-	1,157	-	-	-	73,520	36,951	-
4x1	Subtotal Period 4a Activity Costs	100	27,181	17,613	4,633	-	9,059	611	26,431	110,951	108,139	-	2,835	-	210,752	501	406	-	17,115,280	519,966	16,900
Period 4a Collateral Costs																					
4x11	Process decommissioning water waste	6	-	10	12	-	10	-	8	45	45	-	-	-	88	-	-	-	5,266	17	-
4x13	Small tool allowance	-	232	-	-	-	-	-	15	267	240	-	27	-	-	-	-	-	-	-	-
4x11	Spent Fuel Capital and Transfer	-	-	-	-	-	-	82	74	565	-	565	-	-	-	-	-	-	-	-	-
4x1	Subtotal Period 4a Collateral Costs	6	232	10	12	-	10	-	117	877	285	-	565	-	88	-	-	-	5,266	17	-
Period 4a Period-Dependent Costs																					
4x11	Decon supplies	103	-	-	-	-	-	-	26	129	129	-	-	-	-	-	-	-	-	-	-
4x12	Insurance	-	-	-	-	-	-	84	84	327	327	-	-	-	-	-	-	-	-	-	-
4x13	Property taxes	-	-	-	-	-	-	565	57	622	622	-	-	-	-	-	-	-	-	-	-
4x11	Health physics supplies	-	2,335	-	-	-	-	-	784	2,919	2,919	-	-	-	-	-	-	-	-	-	-
4x15	Heavy equipment rental	-	3,017	-	-	-	-	-	152	3,469	3,469	-	-	-	-	-	-	-	-	-	-
4x16	Disposal of DAW generated	-	-	105	36	-	173	-	50	373	373	-	-	-	5,185	-	-	-	103,691	169	-
4x17	Plant energy budget	-	-	-	-	-	-	2,692	401	6,996	6,996	-	-	-	-	-	-	-	-	-	-
4x18	NRC Fees	-	-	-	-	-	-	80	40	141	141	-	-	-	-	-	-	-	-	-	-
4x19	Liquid Radioactive Processing Equipment/Services	-	-	-	-	-	-	589	88	677	677	-	-	-	-	-	-	-	-	-	-
4x10	ISFSI Operating Costs	-	-	-	-	-	-	77	12	88	-	88	-	-	-	-	-	-	-	-	-
4x111	Remedial Actions Survey	-	-	-	-	-	-	1,138	173	1,309	1,309	-	-	-	-	-	-	-	-	-	-
4x112	Security Staff Cost	-	-	-	-	-	-	2,198	360	4,757	960	1,798	-	-	-	-	-	-	-	-	61,750
4x113	RUC Staff Cost	-	-	-	-	-	-	17,126	2,414	20,499	20,499	-	-	-	-	-	-	-	-	-	282,894
4x14	Utility Staff Cost	-	-	-	-	-	-	25,883	1,882	29,766	28,902	863	-	-	-	-	-	-	-	-	170,502
4x1	Subtotal Period 4a Period-Dependent Costs	103	5,352	105	36	-	173	32,012	8,833	66,611	61,865	2,719	-	-	5,185	-	-	-	103,694	169	615,117
4x0	TOTAL PERIOD 4a COST	209	31,061	17,727	1,682	-	9,212	54,117	35,483	178,445	172,288	3,115	2,832	-	216,021	501	406	-	17,211,230	521,152	6,917,777
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
4b111	Auxiliary Building HVAC (insulated)	-	46	10	6	-	60	-	28	150	150	-	-	-	549	-	-	-	34,870	982	-
4b112	Auxiliary Building HVAC (uninsulated)	-	56	12	6	-	69	-	31	178	178	-	-	-	618	-	-	-	40,531	1,291	-
4b113	Batt Rm & Misc Uncontrolled Air HVAC	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	91	-
4b114	Compressed Air - Instr Air (insulated)	-	3	-	-	-	-	-	0	3	-	-	-	3	-	-	-	-	-	83	-
4b115	Compressed Air - Instrument Air - RCA In	-	11	4	1	-	16	-	14	74	74	-	-	-	121	-	-	-	7,932	1,178	-
4b116	Compressed Air - Instrument Air - RCA In	-	411	21	7	-	72	-	54	284	284	-	-	-	649	-	-	-	12,216	2,977	-
4b117	Compressed Air - Service Air	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	886	-
4b118	Compressed Air - Service Air - RCA	-	114	19	6	-	65	-	52	276	276	-	-	-	583	-	-	-	37,981	3,284	-
4b119	Compressed Air - Inst Air (uninsulated)	-	19	-	-	-	-	-	6	15	-	-	15	-	-	-	-	-	-	1,267	-
4b110	Contaminant Hatches	-	15	2	1	-	18	-	7	35	35	-	-	-	33	-	-	-	6,019	369	-
4b111	Contaminant Hydrogen Purge HVAC	-	50	15	6	-	71	-	11	163	163	-	-	-	578	-	-	-	37,161	1,112	-
4b112	Contaminant Storage	-	71	330	145	-	146	-	512	2,812	2,812	-	-	-	11,336	-	-	-	831,411	10,136	-
4b113	Contaminant Ventilation HVAC (uninsul)	-	27	10	3	-	55	-	22	118	118	-	-	-	501	-	-	-	11,997	713	-
4b114	Contaminant Ventilation HVAC (uninsulated)	-	181	124	57	-	611	-	220	1,199	1,199	-	-	-	5,623	-	-	-	379,197	4,753	-
4b115	Control Room HVAC	-	36	-	-	-	5	-	31	11	-	-	11	-	-	-	-	-	-	1,114	-
4b116	Demineralized & RUCS Makeup Water	-	120	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	3,662	-
4b117	Demineralized & RUCS Makeup Water - RCA	-	116	71	23	-	210	-	177	938	938	-	-	-	2,253	-	-	-	116,136	9,744	-
4b118	Diesel Gen & Auxiliaries (insulated)	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	185	-
4b119	Diesel Gen & Auxiliaries (uninsulated)	-	74	-	-	-	-	-	11	85	-	-	85	-	-	-	-	-	-	2,114	-
4b1120	Diesel Generator Fuel Oil	-	12	-	-	-	-	-	2	14	-	-	13	-	-	-	-	-	-	86	-
4b1121	Diesel Room HVAC	-	1	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	117	-
4b1122	Electricity - Clean	-	1,816	-	-	-	-	-	277	2,123	-	-	2,123	-	-	-	-	-	-	56,765	-
4b1123	Electricity - Contaminated FHB	-	271	10	21	-	225	-	13	688	688	-	-	-	2,071	-	-	-	119,669	8,932	-
4b1124	Electrical - Contaminated FHB	-	63	8	4	-	15	-	28	148	148	-	-	-	412	-	-	-	26,118	1,504	-
4b1125	Electrical - RCA FHB	-	2,436	353	186	-	2,011	-	1,175	6,162	6,162	-	-	-	18,111	-	-	-	1,175,973	59,411	-
4b1126	Electrical - RCA FHB	-	598	76	39	-	121	-	23	1,227	1,227	-	-	-	1,879	-	-	-	216,132	10,273	-
4b1127	Fire Protection	-	173	-	-	-	-	-	73	515	-	-	515	-	-	-	-	-	-	11,808	-
4b1128	Fire Protection - RCA	-	777	191	70	-	760	-	414	2,212	2,212	-	-	-	6,893	-	-	-	114,645	18,575	-
4b1129	Fuel Building HVAC (insulated)	-	21	5	2	-	27	-	13	68	68	-	-	-	208	-	-	-	15,765	444	-
4b1130	Fuel Building HVAC (uninsul'd)	-	20	4	1	-	42	-	15	81	81	-	-	-	291	-	-	-	18,444	796	-
4b1131	Fuel Handling	-	5	1	1	-	7	-	3	17	17	-	-	-	61	-	-	-	1,891	144	-



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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 Volume				Burial/Processed Wt. Lbs.	Chest 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)																						
4b 1 1 32	Leak Rate Test	-	4	1	0	-	1	-	2	11	11	-	-	-	34	-	-	-	-	2,202	110	-
4b 1 1 33	Misc. Plant HVAC (insulated)	-	2	-	-	-	-	-	0	2	-	-	-	-	-	-	-	-	-	-	72	-
4b 1 1 34	Misc. Plant HVAC (uninsulated)	-	27	-	-	-	-	-	1	31	-	-	-	-	-	-	-	-	-	-	955	-
4b 1 1 35	Miscellaneous Equipment	-	6	1	1	-	8	-	4	20	20	-	-	-	-	75	-	-	-	4,779	177	-
4b 1 1 36	Office & Service HVAC	-	3	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-	-	-	84	-
4b 1 1 37	Potable Water	-	62	-	-	-	-	-	9	71	-	-	-	-	-	-	-	-	-	-	1,802	-
4b 1 1 38	Primary Plant HVAC (insulated)	-	17	11	6	-	62	29	175	175	-	-	-	-	-	-	-	-	-	16,188	1,039	-
4b 1 1 39	Primary Plant HVAC (uninsulated)	-	86	25	13	-	142	-	62	329	429	-	-	-	-	1,312	-	-	-	83,521	2,141	-
4b 1 1 40	Radiation Monitoring	-	3	-	-	-	-	-	1	4	-	-	-	-	-	-	-	-	-	-	302	-
4b 1 1 41	Safeguards Building HVAC (insulated)	-	11	3	2	-	19	9	47	47	-	-	-	-	-	-	-	-	-	11,048	611	-
4b 1 1 42	Safeguards Building HVAC (uninsulated)	-	39	8	1	-	44	-	22	118	118	-	-	-	-	-	-	-	-	25,970	1,040	-
4b 1 1 43	Service Water	-	58	-	-	-	-	-	9	67	-	-	-	-	-	-	-	-	-	-	1,882	-
4b 1 1 44	Service Water - R/A	-	206	109	32	-	564	-	211	1,113	1,113	-	-	-	-	-	-	-	-	129,913	5,180	-
4b 1 1 45	Sewage Treatment	-	22	-	-	-	-	-	3	25	-	-	-	-	-	-	-	-	-	-	678	-
4b 1 1 46	Spent Fuel Pool Cooling & Cleanup	-	782	221	83	-	893	-	153	2,132	2,132	-	-	-	-	-	-	-	-	522,128	19,899	-
4b 1 1 47	Turbine Building HVAC (insulated)	-	4	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-	-	-	92	-
4b 1 1 48	Turbine Building HVAC (uninsulated)	-	26	-	-	-	-	-	1	30	-	-	-	-	-	-	-	-	-	-	810	-
4b 1 1 49	UPS HVAC	-	1	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-	-	-	49	-
4b 1 1 50	Vents & Drains	-	35	-	-	-	-	-	5	40	-	-	-	-	-	-	-	-	-	-	1,092	-
4b 1 1 51	Vents & Drains - R/A	-	112	63	22	-	215	-	173	902	902	-	-	-	-	2,118	-	-	-	117,326	10,245	-
4b 1 1 52	Waste Management (insulated)	-	12	-	-	-	-	-	2	11	-	-	-	-	-	-	-	-	-	-	690	-
4b 1 1 53	Waste Management (uninsulated)	-	127	-	-	-	-	-	19	147	-	-	-	-	-	-	-	-	-	-	4,014	-
4b 1 1 54	Waste Processing Gas (uninsulated)	-	81	6	17	-	180	-	72	386	386	-	-	-	-	1,658	-	-	-	105,449	2,475	-
4b 1 1 55	Waste Processing Liquid (insulated)	-	260	11	11	-	140	-	100	521	521	-	-	-	-	1,075	-	-	-	64,909	6,495	-
4b 1 1 56	Waste Processing Liquid (uninsulated)	-	111	101	45	-	491	-	223	1,195	1,195	-	-	-	-	4,305	-	-	-	287,192	9,997	-
4b 1 1 57	Waste Processing Solid	-	19	9	1	-	18	-	18	98	98	-	-	-	-	138	-	-	-	27,878	544	-
4b 1 1 58	Water Treatment (insulated)	-	56	-	-	-	-	-	8	64	-	-	-	-	-	-	-	-	-	-	1,780	-
4b 1 1 59	Water Treatment (uninsulated)	-	587	-	-	-	-	-	88	676	-	-	-	-	-	-	-	-	-	-	18,716	-
4b 1 1	Totals	-	11,487	1,921	810	-	9,071	-	5,093	28,411	21,191	-	-	-	-	82,912	-	-	-	5,301,755	307,216	-
4b 1 2	St. affording in support of decommissioning	-	1,321	91	15	-	157	-	375	1,898	1,898	-	-	-	-	1,147	-	-	-	91,900	46,189	-
Decontamination of Site Buildings																						
4b 1 3 1	Reactor	1,025	609	111	137	-	992	-	915	3,821	1,821	-	-	-	-	115,490	-	-	-	733,248	110,96	-
4b 1 3 2	Auxiliary	670	210	49	62	-	458	-	316	1,963	1,963	-	-	-	-	111,608	-	-	-	22,770	-	-
4b 1 3 3	Radiation Warehouse	-	223	12	1	-	17	-	119	371	371	-	-	-	-	285	-	-	-	11,182	6,381	-
4b 1 3 4	Safeguard	-	111	16	15	12	96	-	101	401	401	-	-	-	-	1,292	-	-	-	61,911	4,827	-
4b 1 3	Totals	2,019	875	179	233	-	1,563	-	1,681	6,563	6,563	-	-	-	-	210,96	-	-	-	1,146,909	76,814	-
4b 1 4	Prepare/Submit License Termination Plan	-	-	-	-	-	-	215	45	270	270	-	-	-	-	-	-	-	-	-	-	1,751
4b 1 5	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4b 1	Subtotal Period 4b Activity Costs	2,019	11,681	2,111	1,068	-	10,791	215	7,185	37,142	12,926	-	-	-	-	107,155	-	-	-	6,542,961	440,218	1,751
Period 4b Additional Costs																						
4b 2 1	License Termination Survey Planning	-	-	-	-	-	-	1,019	306	1,325	1,325	-	-	-	-	-	-	-	-	-	-	6,240
4b 2 2	Underground Utilities Preservation	-	2,157	-	-	-	-	785	52	1,971	1,971	-	-	-	-	-	-	-	-	-	116,648	0
4b 2 3	Operational Tools and Equipment	-	-	12	42	-	185	-	52	281	281	-	-	-	-	5,880	-	-	-	117,000	0	-
4b 2 4	Not Used	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4b 2 5	Not Used	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4b 2	Subtotal Period 4b Additional Costs	-	2,157	12	42	-	185	1,801	1,090	5,579	5,579	-	-	-	-	5,880	-	-	-	117,000	116,648	6,240
Period 4b Collateral Costs																						
4b 3 1	Process decommissioning water waste	-	7	13	16	-	13	-	11	60	60	-	-	-	-	118	-	-	-	7,078	23	-
4b 3 2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4b 3 3	Small tool allowance	-	213	-	-	-	-	-	35	268	268	-	-	-	-	-	-	-	-	-	-	-
4b 3 4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	625	94	719	-	-	-	-	-	-	-	-	-	-	-	-
4b 3	Subtotal Period 4b Collateral Costs	-	7	213	16	-	13	625	139	1,048	929	-	-	-	-	118	-	-	-	7,078	23	-
Period 4b Period-Dependent Costs																						
4b 4 1	Decon supplies	1,773	-	-	-	-	-	-	113	2,216	2,216	-	-	-	-	-	-	-	-	-	-	-
4b 4 2	Insurance	-	-	-	-	-	-	-	1,073	1,081	1,081	-	-	-	-	-	-	-	-	-	-	-
4b 4 3	Property taxes	-	-	-	-	-	-	719	72	791	791	-	-	-	-	-	-	-	-	-	-	-
4b 4 4	Health physics supplies	-	2,986	-	-	-	-	-	746	3,732	3,732	-	-	-	-	-	-	-	-	-	-	-
4b 4 5	Heavy equipment rental	-	3,961	-	-	-	-	-	591	4,555	4,555	-	-	-	-	-	-	-	-	-	-	-
4b 4 6	Disposal of DAW generated	-	-	115	10	-	189	-	45	409	409	-	-	-	-	5,672	-	-	-	113,419	185	-
4b 4 7	Plant energy budget	-	-	-	-	-	-	2,706	406	3,112	3,112	-	-	-	-	-	-	-	-	-	-	-
4b 4 8	NRC Fees	-	-	-	-	-	-	510	51	562	562	-	-	-	-	-	-	-	-	-	-	-
4b 4 9	Liquid Radioactive Processing Equipment/Services	-	-	-	-	-	-	730	112	862	862	-	-	-	-	-	-	-	-	-	-	-
4b 4 10	RFEM Operating Costs	-	-	-	-	-	-	98	15	113	113	-	-	-	-	-	-	-	-	-	-	-
4b 4 11	Remedial Actions Services	-	-	-	-	-	-	1,119	217	1,667	1,667	-	-	-	-	-	-	-	-	-	-	-
4b 4 12	Security Staff Cost	-	-	-	-	-	-	1,053	138	1,531	1,222	-	-	-	-	-	-	-	-	-	-	78,624
4b 4 13	DOE Staff Cost	-	-	-	-	-	-	27,611	12,212	21,876	21,876	-	-	-	-	-	-	-	-	-	-	270,848
4b 4 14	Utility Staff Cost	-	-	-	-	-	-	31,260	4,680	15,950	11,655	-	-	-	-	-	-	-	-	-	-	115,536
4b 4	Subtotal Period 4b Period-Dependent Costs	1,773	6,947	115	10	-	189	6,123	11,218	81,515	79,839	-	-	-	-	5,672	-	-	-	113,139	185	775,008
4b 0	TOTAL PERIOD 4b COST	1,829	21,120	2,270	1,156	-	11,179	65,808	19,631	127,285	118,651	1,115	4,216	-	-	119,125	-	-	-	6,810,481	441,015	781,001



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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.	Cost Manhours	Utility and Contractor Manhours
															Class A Cu Feet	Class B Cu Feet	Class C Cu Feet	GTCC Cu Feet			
PERIOD 4d - Continuing Site Decontamination																					
Period 4d Direct Decommissioning Activities																					
4d 1.1	Remove spent fuel racks	236	21	127	31	-	190	-	224	973	973	-	-	-	3,042	-	-	-	193,216	838	-
Disposal of Plant Systems																					
4d 1.2	Totals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Decommissioning of Site Buildings																					
4d 1.3.1	Fuel	690	699	107	11	-	418	-	641	2,599	2,599	-	-	-	4,501	-	-	-	261,176	37,978	-
4d 1.3	Totals	690	699	107	11	-	418	-	641	2,599	2,599	-	-	-	4,501	-	-	-	261,176	37,978	-
4d 1.4	Scaffolding in support of decommissioning	-	264	6	3	-	51	-	75	380	380	-	-	-	289	-	-	-	18,580	9,238	-
4d 1	Subtotal Period 4d Activity Costs	926	987	241	77	-	779	-	940	3,951	3,951	-	-	-	7,835	-	-	-	471,001	18,054	-
Period 4d Collateral Costs																					
4d 4.1	Process decommissioning water/waste	5	-	10	32	-	10	-	8	15	15	-	-	-	87	-	-	-	5,414	17	-
4d 4.3	Small tool allowance	-	11	-	-	-	-	-	5	66	66	-	-	-	-	-	-	-	-	-	-
4d 4.4	Decommissioning Equipment Disposition	-	-	114	31	-	575	-	164	901	904	-	-	-	5,290	-	-	-	196,079	117	-
4d 4.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	190	29	219	-	-	-	-	-	-	-	-	-	-	-
4d 4	Subtotal Period 4d Collateral Costs	5	31	124	63	-	581	190	204	1,201	985	219	-	-	5,378	-	-	-	141,121	164	-
Period 4d Period-Dependent Costs																					
4d 4.1	Decon supplies	294	-	-	-	-	-	-	74	968	968	-	-	-	-	-	-	-	-	-	-
4d 4.2	Insurance	-	-	-	-	-	-	427	44	479	479	-	-	-	-	-	-	-	-	-	-
4d 4.3	Property taxes	-	-	-	-	-	-	219	22	241	243	-	-	-	-	-	-	-	-	-	-
4d 4.4	Health physics supplies	-	180	-	-	-	-	-	120	600	600	-	-	-	-	-	-	-	-	-	-
4d 4.5	Heavy equipment rental	-	1,206	-	-	-	-	-	181	1,387	1,387	-	-	-	-	-	-	-	-	-	-
4d 4.6	Disposal of DAW generated	-	-	35	12	-	57	-	20	124	124	-	-	-	1,721	-	-	-	11,125	56	-
4d 4.7	Plant energy budget	-	-	-	-	-	-	139	66	505	505	-	-	-	-	-	-	-	-	-	-
4d 4.8	NRC Fees	-	-	-	-	-	-	155	16	171	171	-	-	-	-	-	-	-	-	-	-
4d 4.9	ISPSI Operating Costs	-	-	-	-	-	-	30	1	31	31	-	-	-	-	-	-	-	-	-	-
4d 4.10	Security Staff Cost	-	-	-	-	-	-	929	139	1,069	1,072	697	-	-	-	-	-	-	-	23,934	-
4d 4.11	DOC Staff Cost	-	-	-	-	-	-	1,125	664	5,089	5,089	-	-	-	-	-	-	-	-	31,288	-
4d 4.12	Utility Staff Cost	-	-	-	-	-	-	7,139	1,103	8,110	8,025	111	-	-	-	-	-	-	-	101,145	-
4d 4	Subtotal Period 4d Period-Dependent Costs	294	1,686	15	12	-	57	1,664	2,499	18,887	17,542	1,115	-	-	1,721	-	-	-	11,425	56	178,167
4d 0	TOTAL PERIOD 4d COST	1,226	2,704	398	154	-	1,121	11,055	3,583	21,512	22,178	1,664	-	-	11,914	-	-	-	818,749	48,271	178,167
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f 1.1	ORISE confirmation survey	-	-	-	-	-	-	156	17	203	203	-	-	-	-	-	-	-	-	-	-
4f 1.2	Terminate license	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4f 1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	156	17	203	203	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f 2.1	License Termination Survey	-	-	-	-	-	-	5,937	1,781	7,718	7,718	-	-	-	-	-	-	-	153,521	5,120	-
4f 2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	5,937	1,781	7,718	7,718	-	-	-	-	-	-	-	153,521	5,120	-
Period 4f Collateral Costs																					
4f 1.1	DOC staff relocation expenses	-	-	-	-	-	-	1,816	272	2,089	2,089	-	-	-	-	-	-	-	-	-	-
4f 1.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	262	39	301	-	-	-	-	-	-	-	-	-	-	-
4f 4	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	2,078	312	2,390	2,089	901	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f 1.1	Insurance	-	-	-	-	-	-	149	15	194	191	-	-	-	-	-	-	-	-	-	-
4f 1.2	Property taxes	-	-	-	-	-	-	301	30	332	332	-	-	-	-	-	-	-	-	-	-
4f 1.3	Health physics supplies	-	718	-	-	-	-	-	187	935	935	-	-	-	-	-	-	-	-	-	-
4f 1.4	Disposal of DAW generated	-	-	7	2	-	11	-	4	24	21	-	-	-	117	-	-	-	6,734	11	-
4f 1.5	Plant energy budget	-	-	-	-	-	-	402	45	447	447	-	-	-	-	-	-	-	-	-	-
4f 1.6	NRC Fees	-	-	-	-	-	-	246	25	270	270	-	-	-	-	-	-	-	-	-	-
4f 1.7	ISPSI Operating Costs	-	-	-	-	-	-	41	6	47	47	-	-	-	-	-	-	-	-	-	-
4f 1.8	Security Staff Cost	-	-	-	-	-	-	1,278	392	3,169	511	958	-	-	-	-	-	-	-	32,930	-
4f 1.9	DOC Staff Cost	-	-	-	-	-	-	4,662	699	1,671	1,671	-	-	-	-	-	-	-	-	46,622	-
4f 1.10	Utility Staff Cost	-	-	-	-	-	-	1,898	666	5,057	1,602	155	-	-	-	-	-	-	-	59,942	-
4f 1	Subtotal Period 4f Period-Dependent Costs	-	718	7	2	-	11	11,077	1,803	11,648	12,187	1,460	-	-	137	-	-	-	6,734	11	139,174
4f 0	TOTAL PERIOD 4f COST	-	718	7	2	-	11	19,448	3,942	21,959	22,197	1,762	-	-	137	-	-	-	6,734	153,535	142,591
PERIOD 4 TOTALS																					
		5,264	57,817	20,103	3,991	-	48,853	152,118	62,511	351,230	355,137	10,855	7,056	-	380,420	501	106	-	24,910,210	987,006	1,743,749



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decom Cost	Removal Cost	Packaging Costs	Transport Costs	GH-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu Feet	Burial Volumes Class A Cu Feet	Burial Volumes Class B Cu Feet	Burial Volumes Class C Cu Feet	Burial Volumes GTRC Cu Feet	Burial/Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours
<b>PERIOD 3b - Site Restoration</b>																					
<b>Period 3b Direct Decommissioning Activities</b>																					
<b>Dismantling of Remaining Site Buildings</b>																					
3b 1.1	Reactor	-	1,111	-	-	-	-	-	515	1,916	-	-	1,916	-	-	-	-	-	-	11,617	-
3b 1.1.2	Administration	-	77	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,242	-
3b 1.1.3	Auxiliary	-	2,519	-	-	-	-	-	182	2,911	-	-	2,911	-	-	-	-	-	-	18,402	-
3b 1.1.4	Chlorination (CW Intake)	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	807	-
3b 1.1.5	Chlorination (SW Intake)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	95	-
3b 1.1.6	CW Water Intake	-	279	-	-	-	-	-	117	896	-	-	896	-	-	-	-	-	-	5,146	-
3b 1.1.7	CW Water Yard Piping	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	86	-
3b 1.1.8	Diesel Generator	-	110	-	-	-	-	-	62	172	-	-	172	-	-	-	-	-	-	1,410	-
3b 1.1.9	Flex Storage Building	-	616	-	-	-	-	-	92	708	-	-	708	-	-	-	-	-	-	16,211	-
3b 1.1.10	Maintenance	-	150	-	-	-	-	-	21	171	-	-	171	-	-	-	-	-	-	2,403	-
3b 1.1.11	Megawatt Support Ctr & Material Staging	-	270	-	-	-	-	-	40	310	-	-	310	-	-	-	-	-	-	3,909	-
3b 1.1.12	Miscellaneous Site Structures	-	6,165	-	-	-	-	-	970	7,135	-	-	7,135	-	-	-	-	-	-	98,285	-
3b 1.1.13	PA Feeding Vehicle Barricade BRKs	-	885	-	-	-	-	-	113	1,018	-	-	1,018	-	-	-	-	-	-	5,832	-
3b 1.1.14	RF Building	-	18	-	-	-	-	-	7	35	-	-	35	-	-	-	-	-	-	742	-
3b 1.1.15	Radioactive Warehouse	-	175	-	-	-	-	-	26	201	-	-	201	-	-	-	-	-	-	3,171	-
3b 1.1.16	Safeguard	-	1,279	-	-	-	-	-	192	1,171	-	-	1,171	-	-	-	-	-	-	10,725	-
3b 1.1.17	Service Water Intake Structure	-	116	-	-	-	-	-	17	86.1	-	-	86.1	-	-	-	-	-	-	2,570	-
3b 1.1.18	Steam Island	-	309	-	-	-	-	-	16	125	-	-	125	-	-	-	-	-	-	2,040	-
3b 1.1.19	Switchgear	-	84	-	-	-	-	-	13	96	-	-	96	-	-	-	-	-	-	795	-
3b 1.1.20	Switchgear and Relay House	-	16	-	-	-	-	-	2	38	-	-	38	-	-	-	-	-	-	290	-
3b 1.1.21	Tanks & Tunnels	-	792	-	-	-	-	-	89	681	-	-	681	-	-	-	-	-	-	7,676	-
3b 1.1.22	Turbine	-	454	-	-	-	-	-	68	521	-	-	521	-	-	-	-	-	-	7,240	-
3b 1.1.23	Turbine Pedestal	-	704	-	-	-	-	-	106	809	-	-	809	-	-	-	-	-	-	4,139	-
3b 1.1.24	Fuel	-	2,765	-	-	-	-	-	115	1,140	-	-	1,140	-	-	-	-	-	-	27,877	-
3b 1.1	<b>Totals</b>	-	<b>22,210</b>	-	-	-	-	-	<b>1,131</b>	<b>25,541</b>	-	-	<b>25,541</b>	-	-	-	-	-	-	<b>242,953</b>	-
<b>Site Closeout Activities</b>																					
3b 1.2	Backfill Site	-	1,415	-	-	-	-	-	112	1,928	-	-	1,928	-	-	-	-	-	-	6,150	-
3b 1.3	Grub & Landscaping	-	346	-	-	-	-	-	82	628	-	-	628	-	-	-	-	-	-	1,292	-
3b 1.4	Final report to NRC	-	-	-	-	-	-	-	1	101	101	-	-	-	-	-	-	-	-	-	608
3b 1	<b>Subtotal Period 3b Activity Costs</b>	-	<b>26,172</b>	-	-	-	-	-	<b>90</b>	<b>1,919</b>	<b>101</b>	-	<b>90</b>	<b>90</b>	-	-	-	-	-	<b>270,914</b>	<b>668</b>
<b>Period 3b Additional Costs</b>																					
3b 2.1	Concrete Crushing	-	1,673	-	-	-	-	10	252	1,936	-	-	1,936	-	-	-	-	-	-	7,271	-
3b 2.2	Circulating Water Cofferdam	-	465	-	-	-	-	-	70	535	-	-	535	-	-	-	-	-	-	1,941	-
3b 2.3	Screen Water Cofferdam	-	450	-	-	-	-	-	68	518	-	-	518	-	-	-	-	-	-	1,811	-
3b 2.4	Construction Debris Disposal	-	-	-	-	-	-	1,110	500	5,810	-	-	5,810	-	-	-	-	-	-	-	-
3b 2.5	Not Used	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3b 2	<b>Subtotal Period 3b Additional Costs</b>	-	<b>2,589</b>	-	-	-	-	<b>1,110</b>	<b>889</b>	<b>6,818</b>	-	-	<b>6,818</b>	-	-	-	-	-	-	<b>15,021</b>	-
<b>Period 3b Collateral Costs</b>																					
3b 3.1	Small tool allowance	-	115	-	-	-	-	-	22	167	-	-	167	-	-	-	-	-	-	-	-
3b 3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	996	104	800	-	-	800	-	-	-	-	-	-	-	-
3b 3	<b>Subtotal Period 3b Collateral Costs</b>	-	<b>115</b>	-	-	-	-	<b>996</b>	<b>126</b>	<b>967</b>	-	-	<b>967</b>	-	-	-	-	-	-	-	-
<b>Period 3b Period-Dependent Costs</b>																					
3b 4.1	Insurance	-	-	-	-	-	-	596	60	656	-	-	656	-	-	-	-	-	-	-	-
3b 4.2	Property Taxes	-	-	-	-	-	-	800	80	880	-	-	880	-	-	-	-	-	-	-	-
3b 4.3	Heavy equipment rental	-	5,998	-	-	-	-	-	900	6,898	-	-	6,898	-	-	-	-	-	-	-	-
3b 4.4	Plant energy budget	-	-	-	-	-	-	-	101	161	-	-	161	-	-	-	-	-	-	-	-
3b 4.5	NRC ISFSI Fees	-	-	-	-	-	-	-	169	166	-	-	166	-	-	-	-	-	-	-	-
3b 4.6	ISFSI Operating Costs	-	-	-	-	-	-	-	109	125	-	-	125	-	-	-	-	-	-	-	-
3b 4.7	Security Staff Cost	-	-	-	-	-	-	1,992	509	1,901	-	-	2,508	-	-	-	-	-	-	87,160	-
3b 4.8	DOC Staff Cost	-	-	-	-	-	-	9,801	1,170	11,271	-	-	11,271	-	-	-	-	-	-	-	-
3b 4.9	Utility Staff Cost	-	-	-	-	-	-	5,977	765	5,861	-	-	1,207	-	-	-	-	-	-	70,280	-
3b 4	<b>Subtotal Period 3b Period-Dependent Costs</b>	-	<b>5,998</b>	-	-	-	-	<b>20,965</b>	<b>1,876</b>	<b>40,273</b>	-	-	<b>4,027</b>	<b>26,211</b>	-	-	-	-	-	<b>267,800</b>	-
3b 0	<b>TOTAL PERIOD 3b COST</b>	-	<b>31,901</b>	-	-	-	-	<b>24,490</b>	<b>8,841</b>	<b>68,225</b>	<b>101</b>	<b>1,827</b>	<b>61,295</b>	-	-	-	-	-	-	<b>265,617</b>	<b>268,468</b>
<b>PERIOD 3c - Fuel Storage Operations/Shipping</b>																					
<b>Period 3c Direct Decommissioning Activities</b>																					
<b>Period 3c Collateral Costs</b>																					
3c 1.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,155	201	1,558	-	-	1,558	-	-	-	-	-	-	-	-
3c 1	<b>Subtotal Period 3c Collateral Costs</b>	-	-	-	-	-	-	<b>1,155</b>	<b>201</b>	<b>1,558</b>	-	-	<b>1,558</b>	-	-	-	-	-	-	-	-
<b>Period 3c Period-Dependent Costs</b>																					
3c 4.1	Insurance	-	-	-	-	-	-	1,151	115	1,266	-	-	1,266	-	-	-	-	-	-	-	-
3c 4.2	Property taxes	-	-	-	-	-	-	1,543	151	1,697	-	-	1,697	-	-	-	-	-	-	-	-
3c 4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c 4.4	NRC ISFSI Fees	-	-	-	-	-	-	111	11	188	-	-	188	-	-	-	-	-	-	-	-
3c 4.5	ISFSI Operating Costs	-	-	-	-	-	-	210	12	212	-	-	212	-	-	-	-	-	-	-	-



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 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	NRU Loc. 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 5c Period-Dependent Costs (continued)																						
% 4.6	Security Staff Cost	-	-	-	-	-	-	1,208	611	1,819	-	1,819	-	-	-	-	-	-	-	-	101,982	
% 4.7	Utility Staff Cost	-	-	-	-	-	-	2,029	304	2,333	-	2,333	-	-	-	-	-	-	-	-	27,099	
% 4	Subtotal Period 5c Period-Dependent Costs	-	-	-	-	-	-	9,585	1,281	10,866	-	10,866	-	-	-	-	-	-	-	-	131,181	
% 0	TOTAL PERIOD 5c COST	-	-	-	-	-	-	10,910	1,484	12,424	-	12,424	-	-	-	-	-	-	-	-	131,181	
PERIOD 5d - GTCC shipping																						
Period 5d Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal		-	-	1,000	-	-	10,077	-	1,762	12,839	12,839	-	-	-	-	-	-	2,061	401,971	-	-	
5d.1.1 Steel & Internals GTCC Disposal		-	-	1,000	-	-	10,077	-	1,762	12,839	12,839	-	-	-	-	-	-	2,061	401,971	-	-	
5d.1 Subtotal Period 5d Activity Costs		-	-	1,000	-	-	10,077	-	1,762	12,839	12,839	-	-	-	-	-	-	2,061	401,971	-	-	
Period 5d Period-Dependent Costs																						
5d.4.1 Insurance		-	-	-	-	-	-	11	1	11	11	-	-	-	-	-	-	-	-	-	-	
5d.4.2 Property Taxes		-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-	
5d.4.4 NRU TSPM Fees		-	-	-	-	-	-	3	0	3	-	4	-	-	-	-	-	-	-	-	-	
5d.4.5 ISFSI Operating Costs		-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-	
5d.4.6 Security Staff Cost		-	-	-	-	-	-	42	6	48	48	-	-	-	-	-	-	-	-	-	1,017	
5d.4.7 Utility Staff Cost		-	-	-	-	-	-	20	4	24	24	-	-	-	-	-	-	-	-	-	250	
5d.4 Subtotal Period 5d Period-Dependent Costs		-	-	-	-	-	-	94	13	107	101	6	-	-	-	-	-	-	-	-	1,406	
% 0	TOTAL PERIOD 5d COST	-	-	1,000	-	-	10,077	94	1,771	12,945	12,940	6	-	-	-	-	-	2,061	401,971	-	1,306	
PERIOD 5e - ISFSI Decommissioning																						
Period 5e Direct Decommissioning Activities																						
Period 5e Additional Costs		-	200	172	151	-	2,158	1,172	1,168	5,842	5,842	-	-	-	18,414	-	-	-	1,891,180	9,429	1,221	
% 2 Subtotal Period 5e Additional Costs		-	200	172	151	-	2,158	1,172	1,168	5,842	5,842	-	-	-	18,414	-	-	-	1,891,180	9,429	1,221	
Period 5e Period-Dependent Costs																						
% 1.1 Insurance		-	-	-	-	-	-	54	11	67	67	-	-	-	-	-	-	-	-	-	-	
% 1.2 Property Taxes		-	-	-	-	-	-	207	67	311	311	-	-	-	-	-	-	-	-	-	-	
% 1.3 Plant energy budget		-	-	-	-	-	-	7	2	8	8	-	-	-	-	-	-	-	-	-	-	
% 1.4 Security Staff Cost		-	-	-	-	-	-	61	16	79	79	-	-	-	-	-	-	-	-	-	1,730	
% 1.5 Utility Staff Cost		-	-	-	-	-	-	114	36	179	179	-	-	-	-	-	-	-	-	-	1,881	
% 1 Subtotal Period 5e Period-Dependent Costs		-	-	-	-	-	-	535	113	666	666	-	-	-	-	-	-	-	-	-	5,990	
% 0	TOTAL PERIOD 5e COST	-	200	172	151	-	2,158	2,003	3,302	6,508	6,508	-	-	-	18,414	-	-	-	1,891,180	9,429	1,811	
PERIOD 5f - ISFSI Site Restoration																						
Period 5f Direct Decommissioning Activities																						
Period 5f Additional Costs		-	3,126	-	-	-	-	153	532	4,211	-	-	4,211	-	-	-	-	-	-	35,216	80	
5f.2 Demolition and Site Restoration (ISFSI)		-	3,126	-	-	-	-	153	532	4,211	-	-	4,211	-	-	-	-	-	-	35,216	80	
Period 5f Collateral Costs		-	41	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-	
5f.1 Small tool allowance		-	41	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	-	-	
Period 5f Period-Dependent Costs																						
5f.4.2 Property Taxes		-	-	-	-	-	-	114	14	117	-	-	117	-	-	-	-	-	-	-	-	
5f.4.3 Plant energy budget		-	-	-	-	-	-	4	1	4	-	-	4	-	-	-	-	-	-	-	-	
5f.4.4 Security Staff Cost		-	-	-	-	-	-	14	2	14	-	-	14	-	-	-	-	-	-	-	312	
5f.4.5 Utility Staff Cost		-	-	-	-	-	-	38	9	67	-	-	67	-	-	-	-	-	-	-	769	
5f.4 Subtotal Period 5f Period-Dependent Costs		-	-	-	-	-	-	207	24	232	-	-	232	-	-	-	-	-	-	-	1,111	
% 0	TOTAL PERIOD 5f COST	-	3,570	-	-	-	-	562	583	1,515	-	-	4,513	-	-	-	-	-	-	35,216	1,191	
PERIOD 5 TOTALS																						
		-	38,471	1,172	151	-	12,515	18,092	13,974	101,618	19,550	17,257	67,810	-	18,114	-	-	2,061	2,291,151	110,262	107,257	
TOTAL COST TO DECOMMISSION																						
		11,632	106,575	22,017	6,761	-	61,937	702,806	155,800	1,067,529	722,096	268,762	76,371	-	109,119	501	406	2,061	27,511,080	1,194,499	7,351,842	



Table D-2  
Comanche Peak Nuclear Power Plant Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(Thousands of 2019 Dollars)

Activity Index	Activity Description	Decom 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			
	TOTAL COST TO DECOMMISSION WITH 19.69% CONTINGENCY					\$1,067,529															
	TOTAL NRC LICENSE TERMINATION COST IS \$7.67%, OR					\$722,196															
	SPENT FUEL MANAGEMENT COST IS 25.18%, OR					\$268,762															
	NON-NUCLEAR DEMOLITION COST IS 7.15%, OR					\$76,571															
	TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC)					410,256															
	TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED					2,061															
	TOTAL SCRAP METAL REMOVED					94,586															
	TOTAL CRAFT LABOR REQUIREMENTS					1,394,199															

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



**APPENDIX E**  
**DETAILED COST ANALYSIS**  
**ISFSI**



**Table E**  
**Comanche Peak Nuclear Power Plant**  
**ISFSI Decommissioning Cost Estimate**  
(thousands of 2019 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
<b>Decommissioning Contractor</b>									
Planning (characterization, specs and procedures)	-	-	-	-	466	466	-	-	1,288
Decontamination (activated disposition)	399	343	743	4,916	-	6,402	36,828	4,149	-
License Termination (radiological surveys)	-	-	-	-	2,024	2,024	-	14,709	-
<b>Subtotal</b>	<b>399</b>	<b>343</b>	<b>743</b>	<b>4,916</b>	<b>2,489</b>	<b>8,891</b>	<b>36,828</b>	<b>18,858</b>	<b>1,288</b>
<b>Supporting Costs</b>									
NRC and NRC Contractor Fees and Costs	-	-	-	-	455	455	-	-	1,153
Insurance	-	-	-	-	108	108	-	-	-
Property taxes	-	-	-	-	533	533	-	-	-
Plant energy budget	-	-	-	-	13	13	-	-	-
Security Staff Cost	-	-	-	-	126	126	-	-	3,419
Utility Staff Cost	-	-	-	-	286	286	-	-	3,761
<b>Subtotal</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,521</b>	<b>1,521</b>	<b>-</b>	<b>-</b>	<b>8,333</b>
<b>Total (w/o contingency)</b>	<b>399</b>	<b>343</b>	<b>743</b>	<b>4,916</b>	<b>4,011</b>	<b>10,413</b>	<b>36,828</b>	<b>18,858</b>	<b>9,621</b>
<b>Total (w/25% contingency)</b>	<b>499</b>	<b>429</b>	<b>929</b>	<b>6,146</b>	<b>5,013</b>	<b>13,016</b>	<b>-</b>	<b>-</b>	<b>-</b>

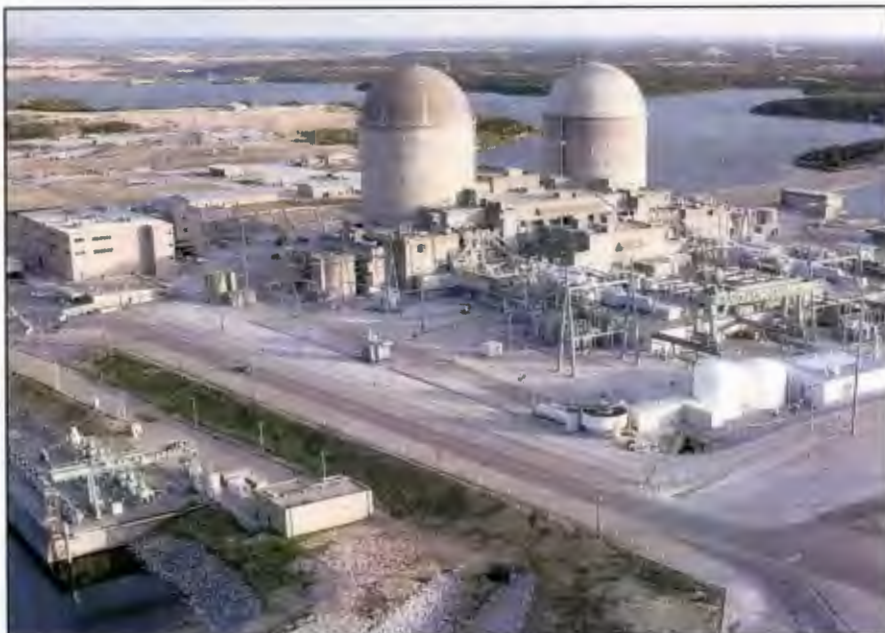
The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance,



# Attachment B



**FINANCIAL ESCALATION ANALYSIS**  
**for the**  
**COMANCHE PEAK NUCLEAR POWER PLANT**



*prepared for*

**Comanche Peak Power Company LLC**

*prepared by*

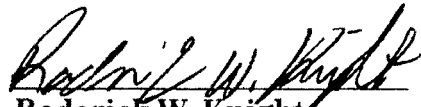
**TLG Services, Inc.**  
Bridgewater, Connecticut

**May 2020**



**APPROVALS**

**Project Manager**

  
Roderick W. Knight      5/11/2020  
Date

**Technical Manager**

  
Francis W. Seymore      5/14/2020  
Date



**REVISION LOG**

<b>No.</b>	<b>Date</b>	<b>Item Revised</b>	<b>Reason for Revision</b>
0	05-11-2020		Original Issue



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## **INTRODUCTION**

This report presents the results of an escalation of the costs to decommission the Comanche Peak Nuclear Power Plant (Comanche Peak) to the projected year of expenditure. Financial schedules are provided for the base case, in which the nuclear units are expected to operate for 40 years. The baseline estimates (in 2019 dollars)<sup>[1]</sup> were adjusted for the required contingency ceiling and escalated using IHS forecast information. A twenty-five year moving average was used for future years beyond the current forecast horizon of the IHS database. A single value effective escalation rate (composite value) is also identified for each of the nuclear units. The results are summarized in Table 1.

### **Order of Operations**

The process to escalate the decommissioning estimates was conducted in the following sequence:

- Source information was extracted from the latest decommissioning cost analyses (reproduced in Tables 2 and 3).
- The cost schedules were adjusted for the 10% ceiling value for contingency, as required by the Public Utility Commission of Texas' Substantive Rule §25.231(b)(1)(F)(i). The adjusted schedules are provided in Tables 4 and 5.
- The schedules of expenditures are presented in the following five categories: *Labor, Equipment and Materials, Energy, Waste Disposal*, and *Other*. The appropriate escalation index for each of the five escalation categories is identified, as summarized in Tables 6 and 7.
- The index values were applied against each of the unescalated schedules of expenditures to calculate a schedule of future value (Tables 7 and 8).
- An effective single value annual escalation rate was determined.

### **Escalation Factors**

The escalation indices selected for *Labor, Equipment and Materials, Energy* and *Other* cost categories are identified in Table 6 and were provided by IHS via their DataInsight-Web online service using first quarter 2020 projections.

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<sup>1</sup> "Decommissioning Cost Analysis for the Comanche Peak Nuclear Power Plant," Document No. L11-1774-001, TLG Services, Inc., May 2020



When the decommissioning schedule extended beyond the forecast database, the escalation was determined using a twenty-five year moving average logic.

A disposal agreement with Waste Control Specialists for disposal services includes a provision for the future adjustment in rates. The IHS index equivalent to the index identified in this agreement was used to escalate low-level radioactive waste disposal costs to the year of expenditure.



**TABLE 1**  
**ESCALATION SUMMARY**  
(millions of dollars)

<b>Unit</b>	<b>Decommissioning</b>		<b>Baseline</b>	<b>Adjusted</b>	<b>Escalated</b>	<b>Effective</b>
	<b>Start</b>	<b>End</b>	<b>Cost</b>	<b>Cost *</b>	<b>Value</b>	<b>Escalation</b>
			<b>(2019 \$)</b>	<b>(2019 \$)</b>	<b>(Year of</b>	<b>Rate</b>
					<b>Expenditure \$)</b>	
<b>40 Year Operating Life</b>						
Unit 1	2030	2096	906.903	850.529	1,794.504	2.668%
Unit 2	2033	2096	939.062	878.768	1,896.826	2.640%

\* Decommissioning costs adjusted for the 10% ceiling value required by Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 2**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	55,641	12,806	2,065	23	8,408	78,943
2031	68,548	22,837	3,415	14,593	24,929	134,323
2032	62,171	27,663	2,196	34,336	13,184	139,549
2033	51,681	30,623	1,878	13,162	7,865	105,210
2034	46,751	32,074	1,729	3,091	5,342	88,987
2035	31,238	19,337	1,729	1,861	5,002	59,167
2036	7,991	233	1,734	16	4,505	14,478
2037	7,969	232	1,729	16	4,492	14,438
2038	8,896	1,246	940	1,525	4,303	16,910
2039	15,049	815	274	13	2,208	18,359
2040	13,709	5,985	268	3	1,057	21,022
2041	11,879	6,850	231	0	925	19,884
2042	3,423	1,070	36	0	966	5,494
2043	1,858	0	0	0	973	2,831
2044	1,863	0	0	0	976	2,839
2045	1,858	0	0	0	973	2,831
2046	1,858	0	0	0	973	2,831
2047	1,858	0	0	0	973	2,831
2048	1,863	0	0	0	976	2,839
2049	1,858	0	0	0	973	2,831
2050	1,858	0	0	0	973	2,831
2051	1,858	0	0	0	973	2,831
2052	1,863	0	0	0	976	2,839
2053	1,858	0	0	0	973	2,831
2054	1,858	0	0	0	973	2,831
2055	1,858	0	0	0	973	2,831
2056	1,963	300	0	0	976	3,239
2057	1,958	300	0	0	973	3,231
2058	1,958	300	0	0	973	3,231
2059	1,958	300	0	0	973	3,231



**TABLE 2 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	1,963	300	0	0	976	3,239
2061	1,958	300	0	0	973	3,231
2062	1,958	300	0	0	973	3,231
2063	1,958	300	0	0	973	3,231
2064	1,963	300	0	0	976	3,239
2065	1,958	300	0	0	973	3,231
2066	1,958	300	0	0	973	3,231
2067	1,958	300	0	0	973	3,231
2068	1,963	300	0	0	976	3,239
2069	1,958	300	0	0	973	3,231
2070	1,958	300	0	0	973	3,231
2071	1,958	300	0	0	973	3,231
2072	1,963	300	0	0	976	3,239
2073	1,958	300	0	0	973	3,231
2074	1,958	300	0	0	973	3,231
2075	1,958	300	0	0	973	3,231
2076	1,963	300	0	0	976	3,239
2077	1,958	300	0	0	973	3,231
2078	1,958	300	0	0	973	3,231
2079	1,958	300	0	0	973	3,231
2080	1,963	300	0	0	976	3,239
2081	1,958	300	0	0	973	3,231
2082	1,958	300	0	0	973	3,231
2083	1,958	300	0	0	973	3,231
2084	1,963	300	0	0	976	3,239
2085	1,958	300	0	0	973	3,231
2086	1,958	300	0	0	973	3,231
2087	1,958	300	0	0	973	3,231
2088	1,963	300	0	0	976	3,239
2089	1,958	300	0	0	973	3,231



**TABLE 2 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	1,958	300	0	0	973	3,231
2091	1,958	300	0	0	973	3,231
2092	1,963	300	0	0	976	3,239
2093	1,958	300	0	0	973	3,231
2094	1,958	300	0	0	973	3,231
2095	1,958	1,550	0	0	12,560	16,068
2096	3,466	1,344	12	3,073	3,260	11,156
Total	490,950	176,367	18,234	71,711	149,642	906,903



**TABLE 3**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	50,370	13,041	2,103	23	5,329	70,867
2034	63,674	21,279	3,407	12,622	16,776	117,757
2035	63,826	27,907	2,190	27,892	9,173	130,988
2036	61,932	32,427	1,876	12,316	5,976	114,527
2037	60,841	34,318	1,729	5,311	4,525	106,723
2038	50,430	23,008	1,391	5,596	7,192	87,617
2039	31,093	3,960	648	2,440	7,139	45,279
2040	17,545	12,983	268	3	3,127	33,926
2041	15,568	15,074	231	0	2,843	33,716
2042	3,999	2,354	36	0	1,265	7,654
2043	1,858	0	0	0	973	2,831
2044	1,863	0	0	0	976	2,839
2045	1,858	0	0	0	973	2,831
2046	1,858	0	0	0	973	2,831
2047	1,858	0	0	0	973	2,831
2048	1,863	0	0	0	976	2,839
2049	1,858	0	0	0	973	2,831
2050	1,858	0	0	0	973	2,831
2051	1,858	0	0	0	973	2,831
2052	1,863	0	0	0	976	2,839
2053	1,858	0	0	0	973	2,831
2054	1,858	0	0	0	973	2,831
2055	1,858	0	0	0	973	2,831
2056	1,963	300	0	0	976	3,239
2057	1,958	300	0	0	973	3,231
2058	1,958	300	0	0	973	3,231
2059	1,958	300	0	0	973	3,231
2060	1,963	300	0	0	976	3,239
2061	1,958	300	0	0	973	3,231
2062	1,958	300	0	0	973	3,231



**TABLE 3 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,958	300	0	0	973	3,231
2064	1,963	300	0	0	976	3,239
2065	1,958	300	0	0	973	3,231
2066	1,958	300	0	0	973	3,231
2067	1,958	300	0	0	973	3,231
2068	1,963	300	0	0	976	3,239
2069	1,958	300	0	0	973	3,231
2070	1,958	300	0	0	973	3,231
2071	1,958	300	0	0	973	3,231
2072	1,963	300	0	0	976	3,239
2073	1,958	300	0	0	973	3,231
2074	1,958	300	0	0	973	3,231
2075	1,958	300	0	0	973	3,231
2076	1,963	300	0	0	976	3,239
2077	1,958	300	0	0	973	3,231
2078	1,958	300	0	0	973	3,231
2079	1,958	300	0	0	973	3,231
2080	1,963	300	0	0	976	3,239
2081	1,958	300	0	0	973	3,231
2082	1,958	300	0	0	973	3,231
2083	1,958	300	0	0	973	3,231
2084	1,963	300	0	0	976	3,239
2085	1,958	300	0	0	973	3,231
2086	1,958	300	0	0	973	3,231
2087	1,958	300	0	0	973	3,231
2088	1,963	300	0	0	976	3,239
2089	1,958	300	0	0	973	3,231
2090	1,958	300	0	0	973	3,231
2091	1,958	300	0	0	973	3,231
2092	1,963	300	0	0	976	3,239



**TABLE 3 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	1,958	300	0	0	973	3,231
2094	1,958	300	0	0	973	3,231
2095	1,958	1,550	0	0	12,560	16,068
2096	3,466	1,212	12	3,073	3,260	11,023
Total	525,281	200,813	13,890	69,276	129,802	939,062



**TABLE 4**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	52,581	12,085	1,951	21	8,077	74,716
2031	64,211	20,852	3,227	13,250	23,656	125,197
2032	57,747	24,944	2,075	31,154	12,500	128,420
2033	48,427	28,480	1,775	11,960	7,467	98,109
2034	44,050	30,202	1,634	2,831	5,079	83,795
2035	29,442	18,207	1,634	1,704	4,758	55,744
2036	7,551	214	1,638	14	4,288	13,705
2037	7,531	213	1,634	14	4,276	13,668
2038	8,325	1,152	888	1,396	4,093	15,855
2039	14,082	743	259	12	2,113	17,209
2040	12,917	5,649	253	3	1,016	19,838
2041	11,226	6,473	218	0	888	18,805
2042	3,235	1,011	34	0	928	5,207
2043	1,756	0	0	0	935	2,691
2044	1,761	0	0	0	937	2,698
2045	1,756	0	0	0	935	2,691
2046	1,756	0	0	0	935	2,691
2047	1,756	0	0	0	935	2,691
2048	1,761	0	0	0	937	2,698
2049	1,756	0	0	0	935	2,691
2050	1,756	0	0	0	935	2,691
2051	1,756	0	0	0	935	2,691
2052	1,761	0	0	0	937	2,698
2053	1,756	0	0	0	935	2,691
2054	1,756	0	0	0	935	2,691
2055	1,756	0	0	0	935	2,691
2056	1,855	284	0	0	937	3,076
2057	1,850	284	0	0	935	3,069
2058	1,850	284	0	0	935	3,069
2059	1,850	284	0	0	935	3,069



**TABLE 4 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	1,855	284	0	0	937	3,076
2061	1,850	284	0	0	935	3,069
2062	1,850	284	0	0	935	3,069
2063	1,850	284	0	0	935	3,069
2064	1,855	284	0	0	937	3,076
2065	1,850	284	0	0	935	3,069
2066	1,850	284	0	0	935	3,069
2067	1,850	284	0	0	935	3,069
2068	1,855	284	0	0	937	3,076
2069	1,850	284	0	0	935	3,069
2070	1,850	284	0	0	935	3,069
2071	1,850	284	0	0	935	3,069
2072	1,855	284	0	0	937	3,076
2073	1,850	284	0	0	935	3,069
2074	1,850	284	0	0	935	3,069
2075	1,850	284	0	0	935	3,069
2076	1,855	284	0	0	937	3,076
2077	1,850	284	0	0	935	3,069
2078	1,850	284	0	0	935	3,069
2079	1,850	284	0	0	935	3,069
2080	1,855	284	0	0	937	3,076
2081	1,850	284	0	0	935	3,069
2082	1,850	284	0	0	935	3,069
2083	1,850	284	0	0	935	3,069
2084	1,855	284	0	0	937	3,076
2085	1,850	284	0	0	935	3,069
2086	1,850	284	0	0	935	3,069
2087	1,850	284	0	0	935	3,069
2088	1,855	284	0	0	937	3,076
2089	1,850	284	0	0	935	3,069



**TABLE 4 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	1,850	284	0	0	935	3,069
2091	1,850	284	0	0	935	3,069
2092	1,855	284	0	0	937	3,076
2093	1,850	284	0	0	935	3,069
2094	1,850	284	0	0	935	3,069
2095	1,850	1,428	0	0	11,884	15,163
2096	3,261	1,264	11	2,814	3,004	10,354
Total	461,484	163,974	17,231	65,173	142,667	850,529

\* Decommissioning costs adjusted for the 10% ceiling value required by  
Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 5**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	47,544	12,293	1,985	21	5,113	66,956
2034	59,571	19,392	3,216	11,416	15,884	109,478
2035	59,164	25,095	2,067	25,202	8,657	120,186
2036	57,939	30,106	1,771	11,167	5,660	106,643
2037	57,162	32,226	1,632	4,854	4,299	100,173
2038	47,309	21,578	1,313	5,114	6,816	82,129
2039	28,956	3,664	612	2,230	6,763	42,225
2040	16,491	12,246	253	3	2,968	31,961
2041	14,694	14,228	218	0	2,699	31,839
2042	3,775	2,222	34	0	1,210	7,240
2043	1,754	0	0	0	934	2,688
2044	1,759	0	0	0	937	2,695
2045	1,754	0	0	0	934	2,688
2046	1,754	0	0	0	934	2,688
2047	1,754	0	0	0	934	2,688
2048	1,759	0	0	0	937	2,695
2049	1,754	0	0	0	934	2,688
2050	1,754	0	0	0	934	2,688
2051	1,754	0	0	0	934	2,688
2052	1,759	0	0	0	937	2,695
2053	1,754	0	0	0	934	2,688
2054	1,754	0	0	0	934	2,688
2055	1,754	0	0	0	934	2,688
2056	1,853	283	0	0	937	3,073
2057	1,848	283	0	0	934	3,065
2058	1,848	283	0	0	934	3,065
2059	1,848	283	0	0	934	3,065
2060	1,853	283	0	0	937	3,073
2061	1,848	283	0	0	934	3,065
2062	1,848	283	0	0	934	3,065



**TABLE 5 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,848	283	0	0	934	3,065
2064	1,853	283	0	0	937	3,073
2065	1,848	283	0	0	934	3,065
2066	1,848	283	0	0	934	3,065
2067	1,848	283	0	0	934	3,065
2068	1,853	283	0	0	937	3,073
2069	1,848	283	0	0	934	3,065
2070	1,848	283	0	0	934	3,065
2071	1,848	283	0	0	934	3,065
2072	1,853	283	0	0	937	3,073
2073	1,848	283	0	0	934	3,065
2074	1,848	283	0	0	934	3,065
2075	1,848	283	0	0	934	3,065
2076	1,853	283	0	0	937	3,073
2077	1,848	283	0	0	934	3,065
2078	1,848	283	0	0	934	3,065
2079	1,848	283	0	0	934	3,065
2080	1,853	283	0	0	937	3,073
2081	1,848	283	0	0	934	3,065
2082	1,848	283	0	0	934	3,065
2083	1,848	283	0	0	934	3,065
2084	1,853	283	0	0	937	3,073
2085	1,848	283	0	0	934	3,065
2086	1,848	283	0	0	934	3,065
2087	1,848	283	0	0	934	3,065
2088	1,853	283	0	0	937	3,073
2089	1,848	283	0	0	934	3,065
2090	1,848	283	0	0	934	3,065
2091	1,848	283	0	0	934	3,065
2092	1,853	283	0	0	937	3,073



**TABLE 5 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2019 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	1,848	283	0	0	934	3,065
2094	1,848	283	0	0	934	3,065
2095	1,848	1,426	0	0	11,871	15,145
2096	3,257	1,137	11	2,808	2,998	10,213
Total	492,648	186,657	13,110	62,816	123,537	878,768

\* Decommissioning costs adjusted for the 10% ceiling value required by  
Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 6  
ESCALATION BASES**

<b>Cost Category</b>	<b>Escalation Source</b>
Labor	ECI Total Compensation, Private Industry Workers (ECIPCTNS)
Equipment and Materials	Producer Price Index, Machinery & Equipment (WPIP11)
Energy	Producer Price Index, Fuels and Related Products and Power (WPIP05)
Other	Consumer Price Index, Services (CUSASNS)
Low-Level Radioactive Waste	As specified in the Disposal Agreement between Luminant Generation Company LLC and Waste Control Specialists LLC



**TABLE 7  
COMPONENT ESCALATION SUMMARY**

	Escalated Costs (\$ thousands)		Average Effective Escalation Rate	
	Unit 1	Unit 2	Unit 1	Unit 2
Labor	1,010,087	1,102,468	2.859%	2.854%
Equipment and Materials	206,862	241,720	1.193%	1.197%
Energy	26,728	21,043	2.987%	2.868%
Waste Disposal	98,469	101,093	2.206%	2.200%
Other	452,359	430,502	2.823%	2.819%
Total	1,794,504	1,896,826	2.668%	2.640%



**TABLE 8**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	73,960	13,655	2,822	27	11,304	101,768
2031	92,869	23,859	4,748	17,226	34,008	172,710
2032	85,674	28,890	3,101	41,369	18,447	177,481
2033	73,706	33,390	2,703	16,217	11,314	137,330
2034	68,793	35,844	2,535	3,921	7,902	118,995
2035	47,190	21,881	2,585	2,412	7,600	81,668
2036	12,424	260	2,650	21	7,033	22,388
2037	12,719	263	2,696	21	7,203	22,902
2038	14,434	1,438	1,492	2,109	7,080	26,553
2039	25,070	940	443	18	3,753	30,224
2040	23,613	7,240	440	4	1,853	33,150
2041	21,070	8,405	385	0	1,664	31,524
2042	6,234	1,330	61	0	1,784	9,409
2043	3,475	0	0	0	1,846	5,321
2044	3,577	0	0	0	1,901	5,478
2045	3,663	0	0	0	1,947	5,610
2046	3,768	0	0	0	2,003	5,771
2047	3,876	0	0	0	2,060	5,936
2048	3,996	0	0	0	2,124	6,120
2049	4,097	0	0	0	2,178	6,275
2050	4,212	0	0	0	2,240	6,452
2051	4,330	0	0	0	2,302	6,632
2052	4,462	0	0	0	2,373	6,835
2053	4,572	0	0	0	2,432	7,004
2054	4,698	0	0	0	2,499	7,197
2055	4,826	0	0	0	2,568	7,394
2056	5,237	446	0	0	2,646	8,329
2057	5,365	452	0	0	2,711	8,528
2058	5,511	458	0	0	2,785	8,754
2059	5,661	464	0	0	2,861	8,986



**TABLE 8 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	5,831	470	0	0	2,948	9,249
2061	5,974	476	0	0	3,021	9,471
2062	6,138	482	0	0	3,104	9,724
2063	6,306	488	0	0	3,189	9,983
2064	6,496	495	0	0	3,286	10,277
2065	6,656	501	0	0	3,367	10,524
2066	6,839	507	0	0	3,460	10,806
2067	7,027	514	0	0	3,556	11,097
2068	7,238	521	0	0	3,664	11,423
2069	7,418	527	0	0	3,755	11,700
2070	7,623	534	0	0	3,859	12,016
2071	7,833	541	0	0	3,966	12,340
2072	8,070	548	0	0	4,087	12,705
2073	8,270	555	0	0	4,189	13,014
2074	8,497	562	0	0	4,304	13,363
2075	8,731	569	0	0	4,423	13,723
2076	8,994	577	0	0	4,558	14,129
2077	9,216	584	0	0	4,671	14,471
2078	9,469	592	0	0	4,799	14,860
2079	9,728	599	0	0	4,932	15,259
2080	10,021	607	0	0	5,082	15,710
2081	10,269	615	0	0	5,208	16,092
2082	10,550	623	0	0	5,352	16,525
2083	10,839	631	0	0	5,499	16,969
2084	11,165	639	0	0	5,667	17,471
2085	11,441	647	0	0	5,807	17,895
2086	11,755	656	0	0	5,967	18,378
2087	12,077	664	0	0	6,132	18,873
2088	12,440	673	0	0	6,319	19,432
2089	12,747	681	0	0	6,475	19,903



**TABLE 8 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	13,097	690	0	0	6,654	20,441
2091	13,455	699	0	0	6,838	20,992
2092	13,860	708	0	0	7,046	21,614
2093	14,203	717	0	0	7,220	22,140
2094	14,592	726	0	0	7,420	22,738
2095	14,992	3,706	0	0	96,939	115,637
2096	27,148	3,323	67	15,123	25,175	70,836
Total	1,010,087	206,862	26,728	98,468	452,359	1,794,504

\* Decommissioning costs adjusted for the 10% ceiling value required by  
Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 8A**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	68,229	1,845	2,822	27	10,108	83,031
2031	90,138	22,379	4,748	17,225	32,798	167,288
2032	83,777	28,658	3,101	41,366	17,456	174,358
2033	63,965	14,300	2,703	16,215	10,301	107,484
2034	54,975	7,400	2,535	3,921	6,862	75,693
2035	38,681	4,599	2,585	2,412	6,533	54,810
2036	12,424	260	2,650	21	5,935	21,290
2037	12,719	263	2,696	21	6,078	21,777
2038	12,947	1,438	1,492	2,109	5,680	23,666
2039	22,381	940	443	18	3,648	27,430
2040	5,976	240	120	4	954	7,294
2041	213	0	0	0	591	804
2042	34	0	0	0	95	129
2043-94	0	0	0	0	0	0
2095	546	2,971	0	0	89,560	93,077
2096	3,800	537	45	15,123	20,763	40,268
Total	470,805	85,830	25,940	98,462	217,362	898,399

\* Decommissioning costs adjusted for the 10% ceiling value required by Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 8B**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	4,901	11,810	0	0	1,196	17,907
2031	586	1,390	0	0	1,209	3,185
2032	0	0	0	0	988	988
2033	8,210	18,973	0	0	1,012	28,195
2034	12,449	28,381	0	0	1,039	41,869
2035	7,666	17,244	0	0	1,067	25,977
2036	0	0	0	0	1,099	1,099
2037	0	0	0	0	1,125	1,125
2038	1,488	0	0	0	714	2,202
2039	2,689	0	0	0	105	2,794
2040	3,205	0	0	0	896	4,101
2041	3,295	0	0	0	1,070	4,365
2042	3,384	0	0	0	1,689	5,073
2043	3,475	0	0	0	1,846	5,321
2044	3,577	0	0	0	1,901	5,478
2045	3,663	0	0	0	1,947	5,610
2046	3,768	0	0	0	2,003	5,771
2047	3,876	0	0	0	2,060	5,936
2048	3,996	0	0	0	2,124	6,120
2049	4,097	0	0	0	2,178	6,275
2050	4,212	0	0	0	2,240	6,452
2051	4,330	0	0	0	2,302	6,632
2052	4,462	0	0	0	2,373	6,835
2053	4,572	0	0	0	2,432	7,004
2054	4,698	0	0	0	2,499	7,197
2055	4,826	0	0	0	2,568	7,394
2056	5,237	446	0	0	2,646	8,329
2057	5,365	452	0	0	2,711	8,528
2058	5,511	458	0	0	2,785	8,754
2059	5,661	464	0	0	2,861	8,986



**TABLE 8B (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	5,831	470	0	0	2,948	9,249
2061	5,974	476	0	0	3,021	9,471
2062	6,138	482	0	0	3,104	9,724
2063	6,306	488	0	0	3,189	9,983
2064	6,496	495	0	0	3,286	10,277
2065	6,656	501	0	0	3,367	10,524
2066	6,839	507	0	0	3,460	10,806
2067	7,027	514	0	0	3,556	11,097
2068	7,238	521	0	0	3,664	11,423
2069	7,418	527	0	0	3,755	11,700
2070	7,623	534	0	0	3,859	12,016
2071	7,833	541	0	0	3,966	12,340
2072	8,070	548	0	0	4,087	12,705
2073	8,270	555	0	0	4,189	13,014
2074	8,497	562	0	0	4,304	13,363
2075	8,731	569	0	0	4,423	13,723
2076	8,994	577	0	0	4,558	14,129
2077	9,216	584	0	0	4,671	14,471
2078	9,469	592	0	0	4,799	14,860
2079	9,728	599	0	0	4,932	15,259
2080	10,021	607	0	0	5,082	15,710
2081	10,269	615	0	0	5,208	16,092
2082	10,550	623	0	0	5,352	16,525
2083	10,839	631	0	0	5,499	16,969
2084	11,165	639	0	0	5,667	17,471
2085	11,441	647	0	0	5,807	17,895
2086	11,755	656	0	0	5,967	18,378
2087	12,077	664	0	0	6,132	18,873
2088	12,440	673	0	0	6,319	19,432
2089	12,747	681	0	0	6,475	19,903



**TABLE 8B (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	13,097	690	0	0	6,654	20,441
2091	13,455	699	0	0	6,838	20,992
2092	13,860	708	0	0	7,046	21,614
2093	14,203	717	0	0	7,220	22,140
2094	14,592	726	0	0	7,420	22,738
2095	14,446	736	0	0	7,379	22,561
2096	0	0	0	0	0	0
Total	472,510	100,972	0	0	229,888	803,370

\* Decommissioning costs adjusted for the 10% ceiling value required by  
Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 8C**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SITE RESTORATION EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	830	0	0	0	0	830
2031	2,145	90	0	0	1	2,236
2032	1,897	232	0	0	3	2,132
2033	1,530	118	0	0	1	1,649
2034	1,369	63	0	0	0	1,432
2035	843	38	0	0	0	881
2036	0	0	0	0	0	0
2037	0	0	0	0	0	0
2038	0	0	0	0	694	694
2039	0	0	0	0	0	0
2040	14,432	7,000	320	0	3	21,755
2041	17,562	8,405	385	0	3	26,355
2042	2,816	1,330	61	0	1	4,208
2043-95	0	0	0	0	0	0
2096	23,349	2,786	22	0	4,412	30,569
Total	66,773	20,062	788	0	5,118	92,741

\* Decommissioning costs adjusted for the 10% ceiling value required by Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 9**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	72,363	14,412	3,023	29	7,746	97,573
2034	93,032	23,014	4,989	15,812	24,711	161,558
2035	94,829	30,160	3,270	35,668	13,829	177,756
2036	95,326	36,643	2,865	16,146	9,285	160,265
2037	96,541	39,724	2,693	7,173	7,242	153,373
2038	82,024	26,940	2,205	7,724	11,791	130,684
2039	51,550	4,634	1,045	3,442	12,014	72,685
2040	30,146	15,695	440	4	5,414	51,699
2041	27,581	18,476	385	0	5,055	51,497
2042	7,275	2,923	61	0	2,327	12,586
2043	3,471	0	0	0	1,845	5,316
2044	3,573	0	0	0	1,900	5,473
2045	3,659	0	0	0	1,945	5,604
2046	3,764	0	0	0	2,001	5,765
2047	3,871	0	0	0	2,058	5,929
2048	3,992	0	0	0	2,122	6,114
2049	4,093	0	0	0	2,177	6,270
2050	4,207	0	0	0	2,238	6,445
2051	4,324	0	0	0	2,301	6,625
2052	4,456	0	0	0	2,371	6,827
2053	4,567	0	0	0	2,430	6,997
2054	4,692	0	0	0	2,497	7,189
2055	4,820	0	0	0	2,566	7,386
2056	5,231	446	0	0	2,643	8,320
2057	5,359	452	0	0	2,708	8,519
2058	5,505	457	0	0	2,783	8,745
2059	5,655	463	0	0	2,859	8,977
2060	5,824	469	0	0	2,945	9,238
2061	5,968	475	0	0	3,018	9,461
2062	6,131	481	0	0	3,101	9,713



**TABLE 9 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	6,299	488	0	0	3,186	9,973
2064	6,488	494	0	0	3,283	10,265
2065	6,648	500	0	0	3,364	10,512
2066	6,831	507	0	0	3,457	10,795
2067	7,018	513	0	0	3,553	11,084
2068	7,230	520	0	0	3,661	11,411
2069	7,410	527	0	0	3,752	11,689
2070	7,614	533	0	0	3,856	12,003
2071	7,824	540	0	0	3,963	12,327
2072	8,060	547	0	0	4,084	12,691
2073	8,260	554	0	0	4,185	12,999
2074	8,488	561	0	0	4,301	13,350
2075	8,721	569	0	0	4,419	13,709
2076	8,983	576	0	0	4,554	14,113
2077	9,205	583	0	0	4,667	14,455
2078	9,458	591	0	0	4,796	14,845
2079	9,717	599	0	0	4,928	15,244
2080	10,009	606	0	0	5,078	15,693
2081	10,257	614	0	0	5,204	16,075
2082	10,538	622	0	0	5,347	16,507
2083	10,826	630	0	0	5,495	16,951
2084	11,152	638	0	0	5,662	17,452
2085	11,428	647	0	0	5,802	17,877
2086	11,741	655	0	0	5,963	18,359
2087	12,063	663	0	0	6,127	18,853
2088	12,425	672	0	0	6,313	19,410
2089	12,732	681	0	0	6,470	19,883
2090	13,081	689	0	0	6,649	20,419
2091	13,440	698	0	0	6,832	20,970
2092	13,844	707	0	0	7,040	21,591



**TABLE 9 (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	14,186	716	0	0	7,215	22,117
2094	14,575	726	0	0	7,414	22,715
2095	14,974	3,700			96,828	115,502
2096	27,114	2,990	67	15,095	25,132	70,398
Total	1,102,468	241,720	21,043	101,093	430,502	1,896,826

\* Decommissioning costs adjusted for the 10% ceiling value required by  
Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 9A**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF LICENSE TERMINATION EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	66,578	1,947	3,023	29	6,429	78,006
2034	90,868	21,692	4,989	15,811	23,411	156,771
2035	92,385	29,890	3,270	35,665	12,760	173,970
2036	83,622	16,273	2,865	16,145	8,186	127,091
2037	80,358	10,085	2,693	7,173	6,118	106,427
2038	71,005	9,504	2,205	7,724	10,729	101,167
2039	48,381	4,634	1,045	3,442	11,563	69,065
2040	7,058	307	120	4	1,729	9,218
2041	91				590	681
2042	15				95	110
2043-94	0	0	0	0	0	0
2095	545	2,965			89,456	92,966
2096	3,793	536	45	15,095	20,725	40,194
Total	544,699	97,833	20,255	101,088	191,791	955,666

\* Decommissioning costs adjusted for the 10% ceiling value required by Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 9B**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	5,394	12,465	0	0	1,317	19,176
2034	532	1,213	0	0	1,299	3,044
2035	0	0	0	0	1,066	1,066
2036	9,091	20,176	0	0	1,097	30,364
2037	13,463	29,480	0	0	1,124	44,067
2038	9,376	17,342	0	0	713	27,431
2039	3,149	0	0	0	105	3,254
2040	3,202	0	0	0	896	4,098
2041	3,292	0	0	0	1,069	4,361
2042	3,380	0	0	0	1,687	5,067
2043	3,471	0	0	0	1,845	5,316
2044	3,573	0	0	0	1,900	5,473
2045	3,659	0	0	0	1,945	5,604
2046	3,764	0	0	0	2,001	5,765
2047	3,871	0	0	0	2,058	5,929
2048	3,992	0	0	0	2,122	6,114
2049	4,093	0	0	0	2,177	6,270
2050	4,207	0	0	0	2,238	6,445
2051	4,324	0	0	0	2,301	6,625
2052	4,456	0	0	0	2,371	6,827
2053	4,567	0	0	0	2,430	6,997
2054	4,692	0	0	0	2,497	7,189
2055	4,820	0	0	0	2,566	7,386
2056	5,231	446	0	0	2,643	8,320
2057	5,359	452	0	0	2,708	8,519
2058	5,505	457	0	0	2,783	8,745
2059	5,655	463	0	0	2,859	8,977
2060	5,824	469	0	0	2,945	9,238
2061	5,968	475	0	0	3,018	9,461
2062	6,131	481	0	0	3,101	9,713



**TABLE 9B (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	6,299	488	0	0	3,186	9,973
2064	6,488	494	0	0	3,283	10,265
2065	6,648	500	0	0	3,364	10,512
2066	6,831	507	0	0	3,457	10,795
2067	7,018	513	0	0	3,553	11,084
2068	7,230	520	0	0	3,661	11,411
2069	7,410	527	0	0	3,752	11,689
2070	7,614	533	0	0	3,856	12,003
2071	7,824	540	0	0	3,963	12,327
2072	8,060	547	0	0	4,084	12,691
2073	8,260	554	0	0	4,185	12,999
2074	8,488	561	0	0	4,301	13,350
2075	8,721	569	0	0	4,419	13,709
2076	8,983	576	0	0	4,554	14,113
2077	9,205	583	0	0	4,667	14,455
2078	9,458	591	0	0	4,796	14,845
2079	9,717	599	0	0	4,928	15,244
2080	10,009	606	0	0	5,078	15,693
2081	10,257	614	0	0	5,204	16,075
2082	10,538	622	0	0	5,347	16,507
2083	10,826	630	0	0	5,495	16,951
2084	11,152	638	0	0	5,662	17,452
2085	11,428	647	0	0	5,802	17,877
2086	11,741	655	0	0	5,963	18,359
2087	12,063	663	0	0	6,127	18,853
2088	12,425	672	0	0	6,313	19,410
2089	12,732	681	0	0	6,470	19,883
2090	13,081	689	0	0	6,649	20,419
2091	13,440	698	0	0	6,832	20,970
2092	13,844	707	0	0	7,040	21,591



**TABLE 9B (continued)**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	14,186	716	0	0	7,215	22,117
2094	14,575	726	0	0	7,414	22,715
2095	14,429	735			7,373	22,537
2096	0	0	0	0	0	0
Total	475,021	103,820	0	0	226,874	805,715

\* Decommissioning costs adjusted for the 10% ceiling value required by  
Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



**TABLE 9C**  
**COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2**  
**DECON ALTERNATIVE, CONTINGENCY ADJUSTED \***  
**SCHEDULE OF SITE RESTORATION EXPENDITURES**  
(thousands, year of expenditure dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	391	0	0	0	0	391
2034	1,632	110	0	0	1	1,743
2035	2,444	270	0	0	3	2,717
2036	2,613	194	0	0	1	2,808
2037	2,720	159	0	0	0	2,879
2038	1,642	94	0	0	353	2,089
2039	20	0	0	0	350	370
2040	19,887	15,388	319	0	2,790	38,384
2041	24,199	18,476	385	0	3,395	46,455
2042	3,880	2,923	61	0	545	7,409
2043-95	0	0	0	0	0	0
2096	23,321	2,454	22	0	4,408	30,205
Total	82,749	40,068	787	0	11,846	135,450

\* Decommissioning costs adjusted for the 10% ceiling value required by Public Utility Commission of Texas' Substantive Rule 25.231(b)(1)(F)(i)



# Attachment C



**Comanche Peak Power Company LLC**

# **Funding Analysis**

**for**

**Comanche Peak Nuclear Power Plant**

**Nuclear Decommissioning Trust**

**June 2020**



# Funding Analysis for Comanche Peak Nuclear Power Plant

Nuclear Decommissioning Trust  
June 2020

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**COMANCHE PEAK POWER COMPANY LLC**  
**HISTORIC ASSETS & FEES AND FORECAST MARKET ASSUMPTIONS**  
**2020 Funding Analysis**

**I. BEGINNING BALANCE FOR CP1 AND CP2**

Line	December 31, 2019	CP 1	CP 2	Total
1	Market Value	\$ 688,618,908	\$ 762,704,159	\$ 1,451,323,067
2	Tax Cost to Trust	\$ 365,285,048	\$ 411,726,049	\$ 777,011,096
3	Taxable Gain (Line 1 - Line 2)	\$ 323,333,861	\$ 350,978,110	\$ 674,311,971
4	Current Tax liability on Gain (Line 3 * 20% tax rate)	\$ 64,666,772	\$ 70,195,622	\$ 134,862,394
5	Market Value (Line 1)	\$ 688,618,908	\$ 762,704,159	\$ 1,451,323,067
6	Less tax due on the gains (Line 4)	\$ (64,666,772)	\$ (70,195,622)	\$ (134,862,394)
7	<b>Net After-Tax Value (Line 5 - Line 6)</b>	<b>\$ 623,952,136</b>	<b>\$ 692,508,537</b>	<b>\$ 1,316,460,673</b>

NOTES: (Exhibit 1, Part I)

Source BNY Mellon Trust Statements

CP1 = Comanche Peak Nuclear Power Plant Unit #1

CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**HISTORIC ASSETS & FEES AND FORECAST MARKET ASSUMPTIONS**  
**2020 Funding Analysis**

**II. ANNUAL ADMINISTRATIVE FEES AND EXPENSES - CP1 AND CP2**  
(Qualified & Non-Qualified Trusts for Years 1990 through 2019)

Line	Year	Total Fees & Expenses (A)	After-Tax Fund Accumulation (B)	Total Fees & Expenses (C)	Cumulative Average (D)
0	1990	\$ -	\$ 2,692,810		
1	1991	63,011	12,027,168	2 3400%	2 3400%
2	1992	68,248	21,938,028	0 5674%	1 4537%
3	1993	72,680	35,384,304	0 3313%	1 0796%
4	1994	137,200	54,498,992	0 3877%	0 9066%
5	1995	157,686	85,640,823	0 2893%	0 7831%
6	1996	230,398	113,357,508	0 2690%	0 6975%
7	1997	268,106	152,218,016	0 2365%	0 6316%
8	1998	411,554	198,212,817	0 2704%	0 5865%
9	1999	360,497	236,580,092	0 1819%	0 5415%
10	2000	428,491	251,966,537	0 1811%	0 5055%
11	2001	497,961	264,792,098	0 1976%	0 4775%
12	2002	703,708	260,881,442	0 2658%	0 4598%
13	2003	736,915	311,625,106	0 2825%	0 4462%
14	2004	696,090	346,568,619	0 2234%	0 4303%
15	2005	710,142	373,699,075	0 2049%	0 4153%
16	2006	741,938	424,867,663	0 1985%	0 4017%
17	2007	729,487	458,904,241	0 1717%	0 3882%
18	2008	801,677	385,153,952	0 1747%	0 3763%
19	2009	745,464	460,901,056	0 1935%	0 3667%
20	2010	943,790	515,612,651	0 2048%	0 3586%
21	2011	938,635	551,817,706	0 1820%	0 3502%
22	2012	928,159	621,538,919	0.1682%	0 3419%
23	2013	369,200	737,409,484	0 0594%	0 3296%
24	2014	1,951,004	827,285,193	0 2646%	0.3269%
25	2015	1,284,926	854,877,095	0.1553%	0.3201%
26	2016	1,432,847	938,026,084	0.1676%	0 3142%
27	2017	1,814,560	1,087,543,749	0 1934%	0 3097%
28	2018	1,937,855	1,080,584,463	0.1782%	0 3050%
29	2019	1,854,543	1,316,460,673	0 1716%	0 3004%
30	Avg Annual	759,199 10	402,296,748	0.19%	0.30%

0.17% Average over the last 10 years.

(Average over last 29 years )

31	Avg Annual				0.1745%
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(Average over last 10 years )

**NOTES (Exhibit 1, Part II)**

- (A) Total Fees & Expenses reported by BNY Mellon, as custodian  
Payments each year include some amounts for previous year accruals
- (B) Net After-Tax Fund Accumulation is the Market Value less tax liability
- (C) Fee as a percentage of the After Tax Accumulation at the beginning of the year
- (D) Simple cumulative average of column (C)

CP1 = Comanche Peak Nuclear Power Plant Unit #1  
CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**HISTORIC ASSETS & FEES AND FORECAST MARKET ASSUMPTIONS**  
**2020 Funding Analysis**

III. FORECAST LONG-TERM CAPITAL MARKET ASSUMPTIONS

Line	Forecast (A)	Rates (B)
1	<b>Long-term Capital Market Return Assumptions</b>	
2	Equity	6.26%
3	Fixed Income (Bonds)	3.05%
4	Cash	2.20%
5	Federal Income Tax Rate	20.0%
6	Month to begin proposed collections in 2020 The contribution will occur in the following month	9

NOTES (Exhibit 1, Part III)

Assumption Sources:

- Lines 1-4 Average of two forecasts
  - (A) JP Morgan Long-Term Capital Market Return Assumptions, 2020 Edition
  - (B) Aon Hewitt Long-Term Capital Market Assumptions (30 Years) - 2020 Q1
- Line 5 Based on the current Federal Income Tax rate of 20% with no State Income Tax
- Line 6 Timing assumption for initial collections based on this Funding Analysis



**COMANCHE PEAK POWER COMPANY LLC**  
**HISTORIC ASSETS & FEES AND FORECAST MARKET ASSUMPTIONS**  
**2020 Funding Analysis**

**IV. ANNUAL CONTRIBUTION COLLECTIONS - CP1 AND CP2**  
(Collections deposited in the Trust each year)

Line	Year	CP 1 (A)	CP 2 (B)	Total (C)
1	2015	\$ 7,853,901	\$ 8,999,964	\$ 16,853,865
2	2016	11,247,797	7,751,860	18,999,657
3	2017	11,765,107	8,108,384	19,873,491
4	2018	12,805,945	8,825,719	21,631,664
5	2019	13,090,718	9,021,981	22,112,700
6	Avg Annual	11,352,694	8,541,582	19,894,275

NOTES (Exhibit 1, Part IV)

(A) & (B) & (C) Nuclear Decommissioning Collections deposited in the Trust each year  
Reported in the annual Status of Nuclear Decommissioning Funds -  
Transferee Company Annual Report by Luminant Generation Company LLC

CP1 = Comanche Peak Nuclear Power Plant Unit #1  
CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

I. WEIGHTED AVERAGE LIFE - CP1

Line (A)	Year (B)	Spending (C)	Remaining Life (D)	Dollars to go (E)	Time Weighting (F)	Weighted Avg Life (G)	Trigger Points (H)
1	2019	-	77.5	1,794,504,000			<u>Trigger Point:</u> Equity limited to 30% at license expiration (2030 for Unit #1)
2	2020	-	76.5	1,794,504,000	0.00	71.8	
3	2021	-	75.5	1,794,504,000	0.00	71.8	
4	2022	-	74.5	1,794,504,000	0.00	71.8	
5	2023	-	73.5	1,794,504,000	0.00	71.8	
6	2024	-	72.5	1,794,504,000	0.00	71.8	
7	2025	-	71.5	1,794,504,000	0.00	71.8	
8	2026	-	70.5	1,794,504,000	0.00	71.8	
9	2027	-	69.5	1,794,504,000	0.00	71.8	
10	2028	-	68.5	1,794,504,000	0.00	71.8	
11	2029	-	67.5	1,794,504,000	0.00	71.8	
12	2030	101,768,000	66.5	1,692,736,000	3.77	71.8	<u>Trigger Point:</u> Equity limited to 30% at license expiration (2030 for Unit #1)
13	2031	172,710,000	65.5	1,520,026,000	6.68	68.0	
14	2032	177,481,000	64.5	1,342,545,000	7.53	61.4	
15	2033	137,330,000	63.5	1,205,215,000	6.50	53.8	
16	2034	118,995,000	62.5	1,086,220,000	6.17	47.3	
17	2035	81,668,000	61.5	1,004,552,000	4.62	41.2	
18	2036	22,388,000	60.5	982,164,000	1.35	36.5	
19	2037	22,902,000	59.5	959,262,000	1.39	35.2	
20	2038	26,553,000	58.5	932,709,000	1.62	33.8	
21	2039	30,224,000	57.5	902,485,000	1.86	32.2	
22	2040	33,150,000	56.5	869,335,000	2.08	30.3	
23	2041	31,524,000	55.5	837,811,000	2.01	28.3	
24	2042	9,409,000	54.5	828,402,000	0.61	26.2	
25	2043	5,321,000	53.5	823,081,000	0.34	25.6	
26	2044	5,478,000	52.5	817,603,000	0.35	25.3	
27	2045	5,610,000	51.5	811,993,000	0.35	24.9	
28	2046	5,771,000	50.5	806,222,000	0.36	24.6	
29	2047	5,936,000	49.5	800,286,000	0.36	24.2	
30	2048	6,120,000	48.5	794,166,000	0.37	23.9	
31	2049	6,275,000	47.5	787,891,000	0.38	23.5	
32	2050	6,452,000	46.5	781,439,000	0.38	23.1	
33	2051	6,632,000	45.5	774,807,000	0.39	22.7	
34	2052	6,835,000	44.5	767,972,000	0.39	22.3	
35	2053	7,004,000	43.5	760,968,000	0.40	22.0	



**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

I. WEIGHTED AVERAGE LIFE - CP1

Line (A)	Year (B)	Spending (C)	Remaining Life (D)	Dollars to go (E)	Time Weighting (F)	Weighted Avg Life (G)	Trigger Points (H)
36	2054	7,197,000	42.5	753,771,000	0.40	21.6	
37	2055	7,394,000	41.5	746,377,000	0.41	21.2	
38	2056	8,329,000	40.5	738,048,000	0.45	20.7	
39	2057	8,528,000	39.5	729,520,000	0.46	20.3	
40	2058	8,754,000	38.5	720,766,000	0.46	19.8	
41	2059	8,986,000	37.5	711,780,000	0.47	19.4	
42	2060	9,249,000	36.5	702,531,000	0.47	18.9	
43	2061	9,471,000	35.5	693,060,000	0.48	18.4	
44	2062	9,724,000	34.5	683,336,000	0.48	18.0	
45	2063	9,983,000	33.5	673,353,000	0.49	17.5	
46	2064	10,277,000	32.5	663,076,000	0.50	17.0	
47	2065	10,524,000	31.5	652,552,000	0.50	16.5	
48	2066	10,806,000	30.5	641,746,000	0.51	16.0	
49	2067	11,097,000	29.5	630,649,000	0.51	15.5	
50	2068	11,423,000	28.5	619,226,000	0.52	15.0	
51	2069	11,700,000	27.5	607,526,000	0.52	14.5	
52	2070	12,016,000	26.5	595,510,000	0.52	13.9	
53	2071	12,340,000	25.5	583,170,000	0.53	13.4	
54	2072	12,705,000	24.5	570,465,000	0.53	12.9	
55	2073	13,014,000	23.5	557,451,000	0.54	12.3	
56	2074	13,363,000	22.5	544,088,000	0.54	11.8	
57	2075	13,723,000	21.5	530,365,000	0.54	11.3	
58	2076	14,129,000	20.5	516,236,000	0.55	10.7	
59	2077	14,471,000	19.5	501,765,000	0.55	10.2	
60	2078	14,860,000	18.5	486,905,000	0.55	9.6	
61	2079	15,259,000	17.5	471,646,000	0.55	9.1	
62	2080	15,710,000	16.5	455,936,000	0.55	8.5	
63	2081	16,092,000	15.5	439,844,000	0.55	8.0	
64	2082	16,525,000	14.5	423,319,000	0.54	7.4	
65	2083	16,969,000	13.5	406,350,000	0.54	6.9	
66	2084	17,471,000	12.5	388,879,000	0.54	6.4	
67	2085	17,895,000	11.5	370,984,000	0.53	5.8	
68	2086	18,378,000	10.5	352,606,000	0.52	5.3	
69	2087	18,873,000	9.5	333,733,000	0.51	4.8	
70	2088	19,432,000	8.5	314,301,000	0.49	4.3	
71	2089	19,903,000	7.5	294,398,000	0.47	3.8	
72	2090	20,441,000	6.5	273,957,000	0.45	3.3	
73	2091	20,992,000	5.5	252,965,000	0.42	2.8	
74	2092	21,614,000	4.5	231,351,000	0.38	2.4	<u>Trigger Point:</u> Equity limited to 0% when the Weighted Average Life reaches two and a half years, which occurs in 2092 for Unit #1.
75	2093	22,140,000	3.5	209,211,000	0.33	2.0	
76	2094	22,738,000	2.5	186,473,000	0.27	1.7	
77	2095	115,637,000	1.5	70,836,000	0.93	1.4	
78	2096	70,836,000	0.5	-	0.50	0.5	
79							
80	Total	\$ 1,794,504,000					



**COMANCHE PEAK POWER COMPANY LLC  
DETERMINATION OF EXPECTED ASSET ALLOCATION  
2020 Funding Analysis**

I. WEIGHTED AVERAGE LIFE - CP1

Line (A)	Year (B)	Spending (C)	Remaining Life (D)	Dollars to go (E)	Time Weighting (F)	Weighted Avg Life (G)	Trigger Points (H)
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NOTES. (Exhibit 2, Part I and II)

- (E) Sum of column (C) spending in all subsequent years.
- (D) Assume remaining life for next years expenditure is one half year
- (F) The time weighted life at the end of the year in column (B).  
Formula:
- (G) The weighted average life at the end of the year in column (B).  
Formula:
- (H) Trigger Points are based on weighted average life defined in Substantive Rule §25 303 (e)(3)(B)(vi).

CP1 = Comanche Peak Nuclear Power Plant Unit #1

CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

II. WEIGHTED AVERAGE LIFE - CP2

Line (A)	Year (B)	Spending (C)	Remaining Life (D)	Dollars to go (E)	Time Weighting (F)	Weighted Avg Life (G)	Trigger Points (H)
1	2019	-	77.5	1,896,826,000			
2	2020	-	76.5	1,896,826,000	0.00	72.8	
3	2021	-	75.5	1,896,826,000	0.00	72.8	
4	2022	-	74.5	1,896,826,000	0.00	72.8	
5	2023	-	73.5	1,896,826,000	0.00	72.8	
6	2024	-	72.5	1,896,826,000	0.00	72.8	
7	2025	-	71.5	1,896,826,000	0.00	72.8	
8	2026	-	70.5	1,896,826,000	0.00	72.8	
9	2027	-	69.5	1,896,826,000	0.00	72.8	
10	2028	-	68.5	1,896,826,000	0.00	72.8	
11	2029	-	67.5	1,896,826,000	0.00	72.8	
12	2030	-	66.5	1,896,826,000	0.00	72.8	
13	2031	-	65.5	1,896,826,000	0.00	72.8	
14	2032	-	64.5	1,896,826,000	0.00	72.8	
15	2033	97,573,000	63.5	1,799,253,000	3.27	72.8	<b>Trigger Point:</b> Equity limited to 30% at license expiration. (2033 for Unit #2)
16	2034	161,558,000	62.5	1,637,695,000	5.61	69.5	
17	2035	177,756,000	61.5	1,459,939,000	6.68	63.9	
18	2036	160,265,000	60.5	1,299,674,000	6.64	57.2	
19	2037	153,373,000	59.5	1,146,301,000	7.02	50.6	
20	2038	130,684,000	58.5	1,015,617,000	6.67	43.6	
21	2039	72,685,000	57.5	942,932,000	4.12	36.9	
22	2040	51,699,000	56.5	891,233,000	3.10	32.8	
23	2041	51,497,000	55.5	839,736,000	3.21	29.7	
24	2042	12,586,000	54.5	827,150,000	0.82	26.5	
25	2043	5,316,000	53.5	821,834,000	0.34	25.6	
26	2044	5,473,000	52.5	816,361,000	0.35	25.3	
27	2045	5,604,000	51.5	810,757,000	0.35	25.0	
28	2046	5,765,000	50.5	804,992,000	0.36	24.6	
29	2047	5,929,000	49.5	799,063,000	0.36	24.2	
30	2048	6,114,000	48.5	792,949,000	0.37	23.9	
31	2049	6,270,000	47.5	786,679,000	0.38	23.5	
32	2050	6,445,000	46.5	780,234,000	0.38	23.1	
33	2051	6,625,000	45.5	773,609,000	0.39	22.7	
34	2052	6,827,000	44.5	766,782,000	0.39	22.4	
35	2053	6,997,000	43.5	759,785,000	0.40	22.0	



**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

II. WEIGHTED AVERAGE LIFE - CP2

Line (A)	Year (B)	Spending (C)	Remaining Life (D)	Dollars to go (E)	Time Weighting (F)	Weighted Avg Life (G)	Trigger Points (H)
36	2054	7,189,000	42.5	752,596,000	0.40	21.6	
37	2055	7,386,000	41.5	745,210,000	0.41	21.2	
38	2056	8,320,000	40.5	736,890,000	0.45	20.8	
39	2057	8,519,000	39.5	728,371,000	0.46	20.3	
40	2058	8,745,000	38.5	719,626,000	0.46	19.9	
41	2059	8,977,000	37.5	710,649,000	0.47	19.4	
42	2060	9,238,000	36.5	701,411,000	0.47	18.9	
43	2061	9,461,000	35.5	691,950,000	0.48	18.4	
44	2062	9,713,000	34.5	682,237,000	0.48	18.0	
45	2063	9,973,000	33.5	672,264,000	0.49	17.5	
46	2064	10,265,000	32.5	661,999,000	0.50	17.0	
47	2065	10,512,000	31.5	651,487,000	0.50	16.5	
48	2066	10,795,000	30.5	640,692,000	0.51	16.0	
49	2067	11,084,000	29.5	629,608,000	0.51	15.5	
50	2068	11,411,000	28.5	618,197,000	0.52	15.0	
51	2069	11,689,000	27.5	606,508,000	0.52	14.5	
52	2070	12,003,000	26.5	594,505,000	0.52	13.9	
53	2071	12,327,000	25.5	582,178,000	0.53	13.4	
54	2072	12,691,000	24.5	569,487,000	0.53	12.9	
55	2073	12,999,000	23.5	556,488,000	0.54	12.4	
56	2074	13,350,000	22.5	543,138,000	0.54	11.8	
57	2075	13,709,000	21.5	529,429,000	0.54	11.3	
58	2076	14,113,000	20.5	515,316,000	0.55	10.7	
59	2077	14,455,000	19.5	500,861,000	0.55	10.2	
60	2078	14,845,000	18.5	486,016,000	0.55	9.6	
61	2079	15,244,000	17.5	470,772,000	0.55	9.1	
62	2080	15,693,000	16.5	455,079,000	0.55	8.6	
63	2081	16,075,000	15.5	439,004,000	0.55	8.0	
64	2082	16,507,000	14.5	422,497,000	0.55	7.5	
65	2083	16,951,000	13.5	405,546,000	0.54	6.9	
66	2084	17,452,000	12.5	388,094,000	0.54	6.4	
67	2085	17,877,000	11.5	370,217,000	0.53	5.8	
68	2086	18,359,000	10.5	351,858,000	0.52	5.3	
69	2087	18,853,000	9.5	333,005,000	0.51	4.8	
70	2088	19,410,000	8.5	313,595,000	0.50	4.3	
71	2089	19,883,000	7.5	293,712,000	0.48	3.8	
72	2090	20,419,000	6.5	273,293,000	0.45	3.3	
73	2091	20,970,000	5.5	252,323,000	0.42	2.8	
74	2092	21,591,000	4.5	230,732,000	0.39	2.4	<u>Trigger Point:</u> Equity limited to 0% when the Weighted Average Life reaches two and a half years, which occurs in 2092 for Unit 2
75	2093	22,117,000	3.5	208,615,000	0.34	2.0	
76	2094	22,715,000	2.5	185,900,000	0.27	1.7	
77	2095	115,502,000	1.5	70,398,000	0.93	1.4	
78	2096	70,398,000	0.5	-	0.50	0.5	
79	0	-	-	-			
80	Total	\$ 1,896,826,000					



**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

**II WEIGHTED AVERAGE LIFE - CP2**

Line (A)	Year (B)	Spending (C)	Remaining Life (D)	Dollars to go (E)	Time Weighting (F)	Weighted Avg Life (G)	Trigger Points (H)
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**NOTES: (Exhibit 2, Part I and II)**

- (E) Sum of column (C) spending in all subsequent years.
- (D) Assume remaining life for next years expenditure is one half year.
- (F) The time weighted life at the end of the year in column (B).  
 Formula: Column (F) = column (C) / (previous year column (E) ) X column (D)
- (G) The weighted average life at the end of the year in column (B).  
 Formula. Column (G) = sum of remaining values in column (F)
- (H) Trgger Points are based on weighted average life defined in Substantive Rule §25.303 (e)(3)(B)(vi)

CP1 = Comanche Peak Nuclear Power Plant Unit #1

CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

III. ASSET ALLOCATION AND EXPECTED RETURNS - CP1 AND CP2

Line (A)	Year (B)	Spending		End of Year NDT Balance (E)	Asset Allocation			Returns		
		from Trust (C)	% of Balance (D)		Equity (F)	Bonds (G)	Cash (H)	Composite (I)	After Fees (J)	After Tax (K)
1	2019	-		1,316,460,673						
2	2020	-	0.0%	1,387,166,718	60%	40%	0%	4.976%	4.801%	3.841%
3	2021	-	0.0%	1,460,174,416	60%	40%	0%	4.976%	4.801%	3.841%
4	2022	-	0.0%	1,535,986,480	60%	40%	0%	4.976%	4.801%	3.841%
5	2023	-	0.0%	1,614,710,631	60%	40%	0%	4.976%	4.801%	3.841%
6	2024	-	0.0%	1,696,458,728	60%	40%	0%	4.976%	4.801%	3.841%
7	2025	-	0.0%	1,781,346,926	60%	40%	0%	4.976%	4.801%	3.841%
8	2026	-	0.0%	1,869,495,842	60%	40%	0%	4.976%	4.801%	3.841%
9	2027	-	0.0%	1,961,030,728	60%	40%	0%	4.976%	4.801%	3.841%
10	2028	-	0.0%	2,051,020,869	50%	50%	0%	4.655%	4.480%	3.584%
11	2029	-	0.0%	2,138,944,740	40%	60%	0%	4.334%	4.159%	3.328%
12	2030	101,768,000	4.8%	2,109,613,448	30%	65%	5%	3.973%	3.798%	3.038%
13	2031	172,710,000	8.2%	2,003,347,453	30%	62%	8%	3.943%	3.769%	3.015%
14	2032	177,481,000	8.9%	1,888,946,817	30%	61%	9%	3.938%	3.763%	3.011%
15	2033	234,903,000	12.4%	1,708,304,614	30%	58%	12%	3.907%	3.733%	2.986%
16	2034	280,553,000	16.4%	1,474,151,390	30%	54%	16%	3.873%	3.699%	2.959%
17	2035	259,424,000	17.6%	1,254,403,468	30%	52%	18%	3.863%	3.689%	2.951%
18	2036	182,653,000	14.6%	1,106,314,528	30%	55%	15%	3.889%	3.715%	2.972%
19	2037	176,275,000	15.9%	960,202,452	30%	54%	16%	3.878%	3.703%	2.962%
20	2038	157,237,000	16.4%	829,055,394	30%	54%	16%	3.874%	3.699%	2.959%
21	2039	102,909,000	12.4%	749,368,550	30%	58%	12%	3.907%	3.733%	2.986%
22	2040	84,849,000	11.3%	685,684,023	30%	59%	11%	3.917%	3.742%	2.994%
23	2041	83,021,000	12.1%	621,913,886	30%	58%	12%	3.910%	3.736%	2.988%
24	2042	21,995,000	3.5%	618,531,936	30%	66%	4%	3.983%	3.808%	3.047%
25	2043	10,637,000	1.7%	626,653,736	30%	68%	2%	3.998%	3.824%	3.059%
26	2044	10,951,000	1.7%	634,704,011	30%	68%	2%	3.998%	3.824%	3.059%
27	2045	11,214,000	1.8%	642,732,690	30%	68%	2%	3.998%	3.823%	3.059%
28	2046	11,536,000	1.8%	650,678,810	30%	68%	2%	3.998%	3.823%	3.059%
29	2047	11,865,000	1.8%	658,532,682	30%	68%	2%	3.998%	3.823%	3.058%
30	2048	12,234,000	1.9%	666,250,592	30%	68%	2%	3.997%	3.823%	3.058%
31	2049	12,545,000	1.9%	673,887,643	30%	68%	2%	3.997%	3.822%	3.058%
32	2050	12,897,000	1.9%	681,399,451	30%	68%	2%	3.997%	3.822%	3.058%
33	2051	13,257,000	1.9%	688,773,993	30%	68%	2%	3.996%	3.822%	3.058%
34	2052	13,662,000	2.0%	695,961,063	30%	68%	2%	3.996%	3.822%	3.057%
35	2053	14,001,000	2.0%	703,022,360	30%	68%	2%	3.996%	3.821%	3.057%



**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

III. ASSET ALLOCATION AND EXPECTED RETURNS - CP1 AND CP2

Line	Year	Spending		End of Year NDT Balance	Asset Allocation			Returns		
		from Trust	% of Balance		Equity	Bonds	Cash	Composite	After Fees	After Tax
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
36	2054	14,386,000	2.0%	709,907,008	30%	68%	2%	3.996%	3.821%	3.057%
37	2055	14,780,000	2.1%	716,600,387	30%	68%	2%	3.995%	3.821%	3.057%
38	2056	16,649,000	2.3%	721,589,168	30%	68%	2%	3.993%	3.819%	3.055%
39	2057	17,047,000	2.4%	726,324,381	30%	68%	2%	3.993%	3.818%	3.055%
40	2058	17,499,000	2.4%	730,743,053	30%	68%	2%	3.993%	3.818%	3.054%
41	2059	17,963,000	2.5%	734,823,202	30%	68%	2%	3.992%	3.818%	3.054%
42	2060	18,487,000	2.5%	738,493,115	30%	67%	3%	3.992%	3.817%	3.054%
43	2061	18,932,000	2.6%	741,820,934	30%	67%	3%	3.991%	3.817%	3.053%
44	2062	19,437,000	2.6%	744,734,837	30%	67%	3%	3.991%	3.816%	3.053%
45	2063	19,956,000	2.7%	747,207,809	30%	67%	3%	3.990%	3.816%	3.053%
46	2064	20,542,000	2.7%	749,157,840	30%	67%	3%	3.990%	3.815%	3.052%
47	2065	21,036,000	2.8%	750,662,897	30%	67%	3%	3.989%	3.815%	3.052%
48	2066	21,601,000	2.9%	751,636,758	30%	67%	3%	3.989%	3.814%	3.051%
49	2067	22,181,000	3.0%	752,047,788	30%	67%	3%	3.988%	3.813%	3.051%
50	2068	22,834,000	3.0%	751,804,105	30%	67%	3%	3.987%	3.813%	3.050%
51	2069	23,389,000	3.1%	750,985,761	30%	67%	3%	3.987%	3.812%	3.050%
52	2070	24,019,000	3.2%	749,498,467	30%	67%	3%	3.986%	3.811%	3.049%
53	2071	24,667,000	3.3%	747,303,295	30%	67%	3%	3.985%	3.811%	3.048%
54	2072	25,396,000	3.4%	744,295,737	30%	67%	3%	3.984%	3.810%	3.048%
55	2073	26,013,000	3.5%	740,565,311	30%	67%	3%	3.983%	3.809%	3.047%
56	2074	26,713,000	3.6%	736,005,009	30%	66%	4%	3.982%	3.808%	3.046%
57	2075	27,432,000	3.7%	730,569,941	30%	66%	4%	3.981%	3.807%	3.045%
58	2076	28,242,000	3.9%	724,140,264	30%	66%	4%	3.980%	3.806%	3.045%
59	2077	28,926,000	4.0%	716,814,208	30%	66%	4%	3.979%	3.805%	3.044%
60	2078	29,705,000	4.1%	708,467,183	30%	66%	4%	3.978%	3.803%	3.043%
61	2079	30,503,000	4.3%	699,048,440	30%	66%	4%	3.976%	3.802%	3.042%
62	2080	31,403,000	4.5%	688,420,859	30%	66%	4%	3.975%	3.800%	3.040%
63	2081	32,167,000	4.7%	676,686,316	30%	65%	5%	3.973%	3.799%	3.039%
64	2082	33,032,000	4.9%	663,707,638	30%	65%	5%	3.972%	3.797%	3.038%
65	2083	33,920,000	5.1%	649,423,150	30%	65%	5%	3.970%	3.795%	3.036%
66	2084	34,923,000	5.4%	633,675,287	30%	65%	5%	3.967%	3.793%	3.034%
67	2085	35,772,000	5.6%	616,576,511	30%	64%	6%	3.965%	3.791%	3.032%
68	2086	36,737,000	6.0%	597,966,866	30%	64%	6%	3.962%	3.788%	3.030%
69	2087	37,726,000	6.3%	577,775,497	30%	64%	6%	3.959%	3.785%	3.028%
70	2088	38,842,000	6.7%	555,824,154	30%	63%	7%	3.956%	3.781%	3.025%
71	2089	39,786,000	7.2%	530,858,352	20%	73%	7%	3.631%	3.457%	2.765%
72	2090	40,860,000	7.7%	502,783,830	10%	82%	8%	3.306%	3.131%	2.505%
73	2091	41,962,000	8.3%	471,631,750	0%	92%	8%	2.979%	2.805%	2.244%
74	2092	43,205,000	9.2%	438,498,849	0%	91%	9%	2.972%	2.798%	2.238%
75	2093	44,257,000	10.1%	403,534,239	0%	90%	10%	2.964%	2.790%	2.232%
76	2094	45,453,000	11.3%	366,549,636	0%	89%	11%	2.954%	2.780%	2.224%
77	2095	231,139,000	63.1%	140,107,974	0%	37%	63%	2.514%	2.339%	1.872%
78	2096	141,234,000	100.0%	0	0%	0%	100%	2.200%	2.025%	1.620%
79	0	-	0.0%	-	0%	100%	0%	3.050%	2.875%	2.300%
80	Total	\$ 3,691,330,000								

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**COMANCHE PEAK POWER COMPANY LLC**  
**DETERMINATION OF EXPECTED ASSET ALLOCATION**  
**2020 Funding Analysis**

III. ASSET ALLOCATION AND EXPECTED RETURNS - CP1 AND CP2

Line (A)	Year (B)	Spending		End of Year NDT Balance (E)	Asset Allocation			Returns		
		from Trust (C)	% of Balance (D)		Equity (F)	Bonds (G)	Cash (H)	Composite (I)	After Fees (J)	After Tax (K)

NOTES: (Exhibit 2, Part III)

- (D) Column (C) divided by the Previous year's Column (E)  
Spending for year divided by the Previous year's Ending of Year NDT Balance
- (F)-(H) Asset Allocation each year
- (I) Return composite based on the year's asset allocation [Returns from Exhibit 1, Part III, Lines 2-4]  
(Equity return x Equity allocation) + (Bond return x Bond allocation) + (Cash return x Cash allocation)
- (J) Column (I) - Fees & Expenses [Fees & Expenses from Exhibit 1, Part II, Line 26]
- (K) Column (J) X (1 - Income Tax Rate) [Income Tax rate from Exhibit 1, Part 3, Line 5]

CP1 = Comanche Peak Nuclear Power Plant Unit #1

CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**ESTIMATED ANNUAL DECOMMISSIONING EXPENDITURES**  
**2020 Funding Analysis**

I. CURRENT DOLLAR DECOMMISSIONING COST (Including 10% Contingency)

Line	Period	2019 Dollar Decommissioning Cost (1)		
		CP 1 (A)	CP 2 (B)	Total Cost (C) = (A) + (B)
1	2030	74,716,000	\$ -	\$ 74,716,000
2	2031	125,197,000	-	125,197,000
3	2032	128,420,000	-	128,420,000
4	2033	98,109,000	66,956,000	165,065,000
5	2034	83,795,000	109,478,000	193,273,000
6	2035	55,744,000	120,186,000	175,930,000
7	2036	13,705,000	106,643,000	120,348,000
8	2037	13,668,000	100,173,000	113,841,000
9	2038	15,855,000	82,129,000	97,984,000
10	2039	17,209,000	42,225,000	59,434,000
11	2040	19,838,000	31,961,000	51,799,000
12	2041	18,805,000	31,839,000	50,644,000
13	2042	5,207,000	7,240,000	12,447,000
14	2043	2,691,000	2,688,000	5,379,000
15	2044	2,698,000	2,695,000	5,393,000
16	2045	2,691,000	2,688,000	5,379,000
17	2046	2,691,000	2,688,000	5,379,000
18	2047	2,691,000	2,688,000	5,379,000
19	2048	2,698,000	2,695,000	5,393,000
20	2049	2,691,000	2,688,000	5,379,000
21	2050	2,691,000	2,688,000	5,379,000
22	2051	2,691,000	2,688,000	5,379,000
23	2052	2,698,000	2,695,000	5,393,000
24	2053	2,691,000	2,688,000	5,379,000
25	2054	2,691,000	2,688,000	5,379,000
26	2055	2,691,000	2,688,000	5,379,000
27	2056	3,076,000	3,073,000	6,149,000
28	2057	3,069,000	3,065,000	6,134,000
29	2058	3,069,000	3,065,000	6,134,000
30	2059	3,069,000	3,065,000	6,134,000
31	2060	3,076,000	3,073,000	6,149,000
32	2061	3,069,000	3,065,000	6,134,000
33	2062	3,069,000	3,065,000	6,134,000
34	2063	3,069,000	3,065,000	6,134,000
35	2064	3,076,000	3,073,000	6,149,000
36	2065	3,069,000	3,065,000	6,134,000
37	2066	3,069,000	3,065,000	6,134,000
38	2067	3,069,000	3,065,000	6,134,000
39	2068	3,076,000	3,073,000	6,149,000
40	2069	3,069,000	3,065,000	6,134,000



**COMANCHE PEAK POWER COMPANY LLC**  
**ESTIMATED ANNUAL DECOMMISSIONING EXPENDITURES**  
**2020 Funding Analysis**

I. CURRENT DOLLAR DECOMMISSIONING COST (Including 10% Contingency)

Line	Period	2019 Dollar Decommissioning Cost (1)		
		CP 1 (A)	CP 2 (B)	Total Cost (C) = (A) + (B)
41	2070	3,069,000	3,065,000	6,134,000
42	2071	3,069,000	3,065,000	6,134,000
43	2072	3,076,000	3,073,000	6,149,000
44	2073	3,069,000	3,065,000	6,134,000
45	2074	3,069,000	3,065,000	6,134,000
46	2075	3,069,000	3,065,000	6,134,000
47	2076	3,076,000	3,073,000	6,149,000
48	2077	3,069,000	3,065,000	6,134,000
49	2078	3,069,000	3,065,000	6,134,000
50	2079	3,069,000	3,065,000	6,134,000
51	2080	3,076,000	3,073,000	6,149,000
52	2081	3,069,000	3,065,000	6,134,000
53	2082	3,069,000	3,065,000	6,134,000
54	2083	3,069,000	3,065,000	6,134,000
55	2084	3,076,000	3,073,000	6,149,000
56	2085	3,069,000	3,065,000	6,134,000
57	2086	3,069,000	3,065,000	6,134,000
58	2087	3,069,000	3,065,000	6,134,000
59	2088	3,076,000	3,073,000	6,149,000
60	2089	3,069,000	3,065,000	6,134,000
61	2090	3,069,000	3,065,000	6,134,000
62	2091	3,069,000	3,065,000	6,134,000
63	2092	3,076,000	3,073,000	6,149,000
64	2093	3,069,000	3,065,000	6,134,000
65	2094	3,069,000	3,065,000	6,134,000
66	2095	15,163,000	15,145,000	30,308,000
67	2096	10,354,000	10,213,000	20,567,000
68	2097			-
69	Totals	\$ 850,550,000	\$ 878,768,000	\$ 1,729,318,000

NOTES: (Exhibit 3, Part I)

(1) As found in Table 4 and 5 of Comanche Peak Nuclear Power Plant Financial Escalation Analysis prepared by TLG Services Inc. Includes an allowance for contingency of 10% of the cost of decommissioning in compliance with Substantive Rule §25.231(b)(1)(F)(i).

CP1 = Comanche Peak Nuclear Power Plant Unit #1

CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**ESTIMATED ANNUAL DECOMMISSIONING EXPENDITURES**  
**2020 Funding Analysis**

II. FUTURE DOLLAR DECOMMISSIONING COST (Including 10% Contingency)

Line	Period	Future Dollar Decommissioning Cost (1)		
		CP 1 (A)	CP 2 (B)	Total Cost (C) = (A) + (B)
1	2030	101,768,000	\$ -	\$ 101,768,000
2	2031	172,710,000	-	172,710,000
3	2032	177,481,000	-	177,481,000
4	2033	137,330,000	97,573,000	234,903,000
5	2034	118,995,000	161,558,000	280,553,000
6	2035	81,668,000	177,756,000	259,424,000
7	2036	22,388,000	160,265,000	182,653,000
8	2037	22,902,000	153,373,000	176,275,000
9	2038	26,553,000	130,684,000	157,237,000
10	2039	30,224,000	72,685,000	102,909,000
11	2040	33,150,000	51,699,000	84,849,000
12	2041	31,524,000	51,497,000	83,021,000
13	2042	9,409,000	12,586,000	21,995,000
14	2043	5,321,000	5,316,000	10,637,000
15	2044	5,478,000	5,473,000	10,951,000
16	2045	5,610,000	5,604,000	11,214,000
17	2046	5,771,000	5,765,000	11,536,000
18	2047	5,936,000	5,929,000	11,865,000
19	2048	6,120,000	6,114,000	12,234,000
20	2049	6,275,000	6,270,000	12,545,000
21	2050	6,452,000	6,445,000	12,897,000
22	2051	6,632,000	6,625,000	13,257,000
23	2052	6,835,000	6,827,000	13,662,000
24	2053	7,004,000	6,997,000	14,001,000
25	2054	7,197,000	7,189,000	14,386,000
26	2055	7,394,000	7,386,000	14,780,000
27	2056	8,329,000	8,320,000	16,649,000
28	2057	8,528,000	8,519,000	17,047,000
29	2058	8,754,000	8,745,000	17,499,000
30	2059	8,986,000	8,977,000	17,963,000
31	2060	9,249,000	9,238,000	18,487,000
32	2061	9,471,000	9,461,000	18,932,000
33	2062	9,724,000	9,713,000	19,437,000
34	2063	9,983,000	9,973,000	19,956,000
35	2064	10,277,000	10,265,000	20,542,000
36	2065	10,524,000	10,512,000	21,036,000
37	2066	10,806,000	10,795,000	21,601,000
38	2067	11,097,000	11,084,000	22,181,000
39	2068	11,423,000	11,411,000	22,834,000
40	2069	11,700,000	11,689,000	23,389,000



**COMANCHE PEAK POWER COMPANY LLC**  
**ESTIMATED ANNUAL DECOMMISSIONING EXPENDITURES**  
**2020 Funding Analysis**

II. FUTURE DOLLAR DECOMMISSIONING COST (Including 10% Contingency)

Line	Period	Future Dollar Decommissioning Cost (1)		
		CP 1 (A)	CP 2 (B)	Total Cost (C) = (A) + (B)
41	2070	12,016,000	12,003,000	24,019,000
42	2071	12,340,000	12,327,000	24,667,000
43	2072	12,705,000	12,691,000	25,396,000
44	2073	13,014,000	12,999,000	26,013,000
45	2074	13,363,000	13,350,000	26,713,000
46	2075	13,723,000	13,709,000	27,432,000
47	2076	14,129,000	14,113,000	28,242,000
48	2077	14,471,000	14,455,000	28,926,000
49	2078	14,860,000	14,845,000	29,705,000
50	2079	15,259,000	15,244,000	30,503,000
51	2080	15,710,000	15,693,000	31,403,000
52	2081	16,092,000	16,075,000	32,167,000
53	2082	16,525,000	16,507,000	33,032,000
54	2083	16,969,000	16,951,000	33,920,000
55	2084	17,471,000	17,452,000	34,923,000
56	2085	17,895,000	17,877,000	35,772,000
57	2086	18,378,000	18,359,000	36,737,000
58	2087	18,873,000	18,853,000	37,726,000
59	2088	19,432,000	19,410,000	38,842,000
60	2089	19,903,000	19,883,000	39,786,000
61	2090	20,441,000	20,419,000	40,860,000
62	2091	20,992,000	20,970,000	41,962,000
63	2092	21,614,000	21,591,000	43,205,000
64	2093	22,140,000	22,117,000	44,257,000
65	2094	22,738,000	22,715,000	45,453,000
66	2095	115,637,000	115,502,000	231,139,000
67	2096	70,836,000	70,398,000	141,234,000
68				
69		\$ 1,794,504,000	\$ 1,896,826,000	\$ 3,691,330,000

NOTES: (Exhibit 3, Part II)

(1) As found in Table 8 and 9 of Comanche Peak Nuclear Power Plant Financial Escalation Analysis prepared by TLG Services Inc. Includes an allowance for contingency of 10% of the cost of decommissioning in compliance with Substantive Rule §25.231(b)(1)(F)(i).

CP1 = Comanche Peak Nuclear Power Plant Unit #1

CP2 = Comanche Peak Nuclear Power Plant Unit #2



**COMANCHE PEAK POWER COMPANY LLC**  
**ANNUAL PROJECTED FUNDING REQUIREMENT**  
**2020 Funding Analysis**

**I. PROJECTED ANNUAL SUMMARY - CP1**

Line	Year (A)	Contributions (B)	Net Fund Earnings (C)	Decommissioning Outlays (D)	Fund Accumulation (E)	Weighted Avg Life (F)	Net Return (G)
1	2019		<b>Balance at 12/31/19 =====&gt;</b>		623,952,136		
2	2020	<b>12,012,715</b>	24,197,915	-	660,162,766	71.8	3.841%
3	2021	13,992,779	25,626,864	-	699,782,410	71.8	3.841%
4	2022	13,992,779	27,148,731	-	740,923,920	71.8	3.841%
5	2023	13,992,779	28,729,055	-	783,645,754	71.8	3.841%
6	2024	13,992,779	30,370,083	-	828,008,616	71.8	3.841%
7	2025	13,992,779	32,074,145	-	874,075,541	71.8	3.841%
8	2026	13,992,779	33,843,665	-	921,911,985	71.8	3.841%
9	2027	13,992,779	35,681,154	-	971,585,918	71.8	3.841%
10	2028	13,992,779	35,076,226	-	1,020,654,923	71.8	3.584%
11	2029	13,992,779	34,196,043	-	1,068,843,745	71.8	3.328%
12	2030	<b>3,498,195</b>	30,983,227	101,768,000	1,001,557,167	71.8	3.038%
13	2031		27,594,459	172,710,000	856,441,626	68.0	3.015%
14	2032		23,112,021	177,481,000	702,072,647	61.4	3.011%
15	2033		18,915,006	137,330,000	583,657,653	53.8	2.986%
16	2034		15,510,509	118,995,000	480,173,162	47.3	2.959%
17	2035		12,965,445	81,668,000	411,470,606	41.2	2.951%
18	2036		11,895,330	22,388,000	400,977,937	36.5	2.972%
19	2037		11,539,517	22,902,000	389,615,454	35.2	2.962%
20	2038		11,137,523	26,553,000	374,199,977	33.8	2.959%
21	2039		10,723,749	30,224,000	354,699,726	32.2	2.986%
22	2040		10,122,769	33,150,000	331,672,495	30.3	2.994%
23	2041		9,440,856	31,524,000	309,589,352	28.3	2.988%
24	2042		9,289,057	9,409,000	309,469,409	26.2	3.047%
25	2043		9,385,585	5,321,000	313,533,993	25.6	3.059%
26	2044		9,506,935	5,478,000	317,562,929	25.3	3.059%
27	2045		9,627,745	5,610,000	321,580,674	24.9	3.059%
28	2046		9,747,570	5,771,000	325,557,244	24.6	3.059%
29	2047		9,866,045	5,936,000	329,487,288	24.2	3.058%
30	2048		9,982,666	6,120,000	333,349,954	23.9	3.058%
31	2049		10,097,858	6,275,000	337,172,812	23.5	3.058%
32	2050		10,211,352	6,452,000	340,932,164	23.1	3.058%
33	2051		10,322,824	6,632,000	344,622,989	22.7	3.058%
34	2052		10,431,689	6,835,000	348,219,678	22.3	3.057%
35	2053		10,538,406	7,004,000	351,754,084	22.0	3.057%
36	2054		10,642,688	7,197,000	355,199,772	21.6	3.057%
37	2055		10,744,156	7,394,000	358,549,927	21.2	3.057%
38	2056		10,826,451	8,329,000	361,047,379	20.7	3.055%
39	2057		10,898,760	8,528,000	363,418,139	20.3	3.055%
40	2058		10,966,585	8,754,000	365,630,724	19.8	3.054%
41	2059		11,029,422	8,986,000	367,674,146	19.4	3.054%
42	2060		11,086,390	9,249,000	369,511,536	18.9	3.054%
43	2061		11,137,924	9,471,000	371,178,459	18.4	3.053%
44	2062		11,183,549	9,724,000	372,638,009	18.0	3.053%
45	2063		11,222,669	9,983,000	373,877,678	17.5	3.053%
46	2064		11,254,280	10,277,000	374,854,958	17.0	3.052%



**COMANCHE PEAK POWER COMPANY LLC**  
**ANNUAL PROJECTED FUNDING REQUIREMENT**  
**2020 Funding Analysis**

**I. PROJECTED ANNUAL SUMMARY - CP1**

Line	Year (A)	Contributions (B)	Net Fund Earnings (C)	Decommissioning Outlays (D)	Fund Accumulation (E)	Weighted Avg Life (F)	Net Return (G)
47	2065		11,278,861	10,524,000	375,609,818	16.5	3.052%
48	2066		11,295,841	10,806,000	376,099,659	16.0	3.051%
49	2067		11,304,497	11,097,000	376,307,156	15.5	3.051%
50	2068		11,303,707	11,423,000	376,187,863	15.0	3.050%
51	2069		11,293,960	11,700,000	375,781,823	14.5	3.050%
52	2070		11,274,564	12,016,000	375,040,387	13.9	3.049%
53	2071		11,244,690	12,340,000	373,945,077	13.4	3.048%
54	2072		11,203,057	12,705,000	372,443,135	12.9	3.048%
55	2073		11,150,170	13,014,000	370,579,304	12.3	3.047%
56	2074		11,085,287	13,363,000	368,301,591	11.8	3.046%
57	2075		11,007,468	13,723,000	365,586,059	11.3	3.045%
58	2076		10,915,206	14,129,000	362,372,265	10.7	3.045%
59	2077		10,809,046	14,471,000	358,710,311	10.2	3.044%
60	2078		10,688,099	14,860,000	354,538,410	9.6	3.043%
61	2079		10,551,285	15,259,000	349,830,696	9.1	3.042%
62	2080		10,396,898	15,710,000	344,517,594	8.5	3.040%
63	2081		10,225,434	16,092,000	338,651,027	8.0	3.039%
64	2082		10,035,876	16,525,000	332,161,904	7.4	3.038%
65	2083		9,826,973	16,969,000	325,019,877	6.9	3.036%
66	2084		9,596,779	17,471,000	317,145,656	6.4	3.034%
67	2085		9,345,816	17,895,000	308,596,472	5.8	3.032%
68	2086		9,072,873	18,378,000	299,291,345	5.3	3.030%
69	2087		8,776,487	18,873,000	289,194,832	4.8	3.028%
70	2088		8,454,452	19,432,000	278,217,284	4.3	3.025%
71	2089		7,418,401	19,903,000	265,732,685	3.8	2.765%
72	2090		6,400,204	20,441,000	251,691,888	3.3	2.505%
73	2091		5,411,567	20,992,000	236,111,455	2.8	2.244%
74	2092		5,042,537	21,614,000	219,539,991	2.4	2.238%
75	2093		4,652,551	22,140,000	202,052,543	2.0	2.232%
76	2094		4,240,418	22,738,000	183,554,961	1.7	2.224%
77	2095		2,353,280	115,637,000	70,271,241	1.4	1.872%
78	2096		564,759	70,836,000	(0)	0.5	1.620%
79							
80	Totals	141,445,923	1,029,105,941	1,794,504,000			

**NOTES. (Exhibit 4, Part I)**

- Line 1 Net After-tax Market Value of the Trust at December 31, 2019. (See Exhibit 1, Part I, line 7)  
Line 2 Current contributions for 9 months with new rates implemented on September 1, 2020  
(Contributions lag by one month)

**Columns**

- (B) Assumes new rates are implemented and continue until the end of each unit's license.  
(C) Fund earnings are net of projected expenses and taxes. (C) = [ previous (E) + [ (B) - (D) ] / 2 ] \* Return  
(D) Decommissioning Cost from Exhibit 3, Part II.  
(E) Column (E) = Previous year (E) + Current year (B) + Current year (C) - Current year (D).  
(F) Weighted Average Life (See Column (G) on Exhibit 2, Part I & II)  
(G) Net after-tax and fee Return from Exhibit 2, Part III



**COMANCHE PEAK POWER COMPANY LLC**  
**ANNUAL PROJECTED FUNDING REQUIREMENT**  
**2020 Funding Analysis**

II. PROJECTED ANNUAL SUMMARY - CP2

Line	Year (A)	Contributions (B)	Net Fund Earnings (C)	Decommissioning Outlays (D)	Fund Accumulation (E)	Weighted Avg Life (F)	Net Return (G)
1	2019		<b>Balance at 12/31/19 =====&gt;</b>		692,508,537		
2	2020	7,746,062	26,749,353	-	727,003,952	72.8	3.841%
3	2021	5,359,503	28,028,552	-	760,392,007	72.8	3.841%
4	2022	5,359,503	29,311,051	-	795,062,560	72.8	3.841%
5	2023	5,359,503	30,642,814	-	831,064,877	72.8	3.841%
6	2024	5,359,503	32,025,732	-	868,450,112	72.8	3.841%
7	2025	5,359,503	33,461,771	-	907,271,385	72.8	3.841%
8	2026	5,359,503	34,952,970	-	947,583,858	72.8	3.841%
9	2027	5,359,503	36,501,450	-	989,444,810	72.8	3.841%
10	2028	5,359,503	35,561,633	-	1,030,365,946	72.8	3.584%
11	2029	5,359,503	34,375,546	-	1,070,100,995	72.8	3.328%
12	2030	5,359,503	32,595,784	-	1,108,056,281	72.8	3.038%
13	2031	5,359,503	33,490,043	-	1,146,905,827	72.8	3.015%
14	2032	5,359,503	34,608,840	-	1,186,874,170	72.8	3.011%
15	2033	1,339,876	34,005,916	97,573,000	1,124,646,961	72.8	2.986%
16	2034		30,889,267	161,558,000	993,978,229	69.5	2.959%
17	2035		26,710,633	177,756,000	842,932,862	63.9	2.951%
18	2036		22,668,730	160,265,000	705,336,592	57.2	2.972%
19	2037		18,623,407	153,373,000	570,586,998	50.6	2.962%
20	2038		14,952,419	130,684,000	454,855,417	43.6	2.959%
21	2039		12,498,407	72,685,000	394,668,824	36.9	2.986%
22	2040		11,041,703	51,699,000	354,011,527	32.8	2.994%
23	2041		9,810,007	51,497,000	312,324,534	29.7	2.988%
24	2042		9,323,993	12,586,000	309,062,528	26.5	3.047%
25	2043		9,373,215	5,316,000	313,119,742	25.6	3.059%
26	2044		9,494,340	5,473,000	317,141,082	25.3	3.059%
27	2045		9,614,934	5,604,000	321,152,016	25.0	3.059%
28	2046		9,734,550	5,765,000	325,121,566	24.6	3.059%
29	2047		9,852,827	5,929,000	329,045,393	24.2	3.058%
30	2048		9,969,244	6,114,000	332,900,637	23.9	3.058%
31	2049		10,084,194	6,270,000	336,714,831	23.5	3.058%
32	2050		10,197,455	6,445,000	340,467,287	23.1	3.058%
33	2051		10,308,717	6,625,000	344,151,004	22.7	3.058%
34	2052		10,417,381	6,827,000	347,741,386	22.4	3.057%
35	2053		10,523,891	6,997,000	351,268,276	22.0	3.057%
36	2054		10,627,960	7,189,000	354,707,236	21.6	3.057%
37	2055		10,729,223	7,386,000	358,050,459	21.2	3.057%
38	2056		10,811,330	8,320,000	360,541,789	20.8	3.055%
39	2057		10,883,453	8,519,000	362,906,242	20.3	3.055%
40	2058		10,951,087	8,745,000	365,112,330	19.9	3.054%
41	2059		11,013,727	8,977,000	367,149,057	19.4	3.054%
42	2060		11,070,523	9,238,000	368,981,580	18.9	3.054%
43	2061		11,121,895	9,461,000	370,642,475	18.4	3.053%
44	2062		11,167,354	9,713,000	372,096,829	18.0	3.053%
45	2063		11,206,302	9,973,000	373,330,131	17.5	3.053%
46	2064		11,237,751	10,265,000	374,302,882	17.0	3.052%



**COMANCHE PEAK POWER COMPANY LLC**  
**ANNUAL PROJECTED FUNDING REQUIREMENT**  
**2020 Funding Analysis**

**II. PROJECTED ANNUAL SUMMARY - CP2**

Line	Year (A)	Contributions (B)	Net Fund Earnings (C)	Decommissioning Outlays (D)	Fund Accumulation (E)	Weighted Avg Life (F)	Net Return (G)
47	2065		11,262,196	10,512,000	375,053,078	16.5	3.052%
48	2066		11,279,021	10,795,000	375,537,099	16.0	3.051%
49	2067		11,287,533	11,084,000	375,740,632	15.5	3.051%
50	2068		11,286,610	11,411,000	375,616,242	15.0	3.050%
51	2069		11,276,695	11,689,000	375,203,938	14.5	3.050%
52	2070		11,257,142	12,003,000	374,458,080	13.9	3.049%
53	2071		11,227,137	12,327,000	373,358,217	13.4	3.048%
54	2072		11,185,385	12,691,000	371,852,602	12.9	3.048%
55	2073		11,132,404	12,999,000	369,986,007	12.4	3.047%
56	2074		11,067,411	13,350,000	367,703,418	11.8	3.046%
57	2075		10,989,464	13,709,000	364,983,882	11.3	3.045%
58	2076		10,897,117	14,113,000	361,767,999	10.7	3.045%
59	2077		10,790,898	14,455,000	358,103,897	10.2	3.044%
60	2078		10,669,876	14,845,000	353,928,773	9.6	3.043%
61	2079		10,532,971	15,244,000	349,217,744	9.1	3.042%
62	2080		10,378,521	15,693,000	343,903,266	8.6	3.040%
63	2081		10,207,023	16,075,000	338,035,288	8.0	3.039%
64	2082		10,017,446	16,507,000	331,545,734	7.5	3.038%
65	2083		9,808,539	16,951,000	324,403,273	6.9	3.036%
66	2084		9,578,358	17,452,000	316,529,631	6.4	3.034%
67	2085		9,327,409	17,877,000	307,980,040	5.8	3.032%
68	2086		9,054,481	18,359,000	298,675,521	5.3	3.030%
69	2087		8,758,144	18,853,000	288,580,665	4.8	3.028%
70	2088		8,436,206	19,410,000	277,606,871	4.3	3.025%
71	2089		7,401,797	19,883,000	265,125,668	3.8	2.765%
72	2090		6,385,274	20,419,000	251,091,942	3.3	2.505%
73	2091		5,398,353	20,970,000	235,520,295	2.8	2.244%
74	2092		5,029,563	21,591,000	218,958,858	2.4	2.238%
75	2093		4,639,838	22,117,000	201,481,696	2.0	2.232%
76	2094		4,227,979	22,715,000	182,994,676	1.7	2.224%
77	2095		2,344,057	115,502,000	69,836,733	1.4	1.872%
78	2096		561,267	70,398,000	0	0.5	1.620%
79							
80	Totals	73,399,969	1,130,917,494	1,896,826,000			

NOTES (Exhibit 4, Part II)

Line 1 Net After-tax Market Value of the Trust at December 31, 2019 (See Exhibit 1, Part I, line 7)

Line 2 Current contributions for 9 months with new rates implemented on September 1, 2020  
(Contributions lag by one month)

Columns

(B) Assumes new rates are implemented and continue until the end of each unit's license.

(C) Fund earnings are net of projected expenses and taxes.  $(C) = [ \text{previous (E)} + [ (B) - (D) ] / 2 ] * \text{Return}$

(D) Decommissioning Cost from Exhibit 3, Part II

(E) Column (E) = Previous year (E) + Current year (B) + Current year (C) - Current year (D).

(F) Weighted Average Life (See Column (G) on Exhibit 2, Part I & II)

(G) Net after-tax and fee Return from Exhibit 2, Part III



**COMANCHE PEAK POWER COMPANY LLC**  
**2020 Funding Analysis**

**III. CONTRIBUTION SUMMARY**

Line	Description	CP 1	CP 2	Total
1	Average annual amounts currently being collected	11,352,694	8,541,582	19,894,275
2	Current Contribution Allocation	57.1%	42.9%	100.0%
3	Annual funding amount determined in this nuclear decommissioning Funding Analysis	13,992,779	5,359,503	19,352,282
4	Contribution Allocation	72.3%	27.7%	100.0%
5	Change in annual contributions determined in this Analysis	2,640,086	(3,182,079)	(541,993)
6	Funding Analysis Conclusions:			
7	(A) Change the allocation of collections between CP 1 and CP 2 as shown above.			
8	(B) Maintain the same collection factor			

NOTES: (Exhibit 4, Part III)

Line 1-2 represents the average annual collections over the last five years (See Exhibit 1, Part IV)  
Line 3-4 represents the new collection rate calculated in this Funding Analysis and the allocation between units  
Line 5 shows a change in required annual collection rates of -\$541,993 or (2.7%)  
Line 6-8 Funding Analysis conclusions

CP1 = Comanche Peak Nuclear Power Plant Unit #1  
CP2 = Comanche Peak Nuclear Power Plant Unit #2





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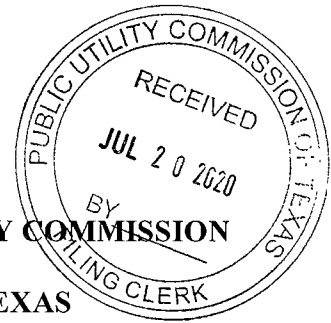


**DOCKET NO. 50945**

**APPLICATION OF COMMANCHE  
PEAK POWER COMPANY LLC FOR  
REVIEW OF NUCLEAR  
DECOMMISSIONING COST STUDY  
AND FUNDING ANALYSIS UNDER 16  
TAC § 25.303(f)(2)**

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**PUBLIC UTILITY COMMISSION  
OF TEXAS**



**ORDER NO. 1  
REQUIRING COMMISSION STAFF'S COMMENTS**

This Order addresses Comanche Peak Power Company LLC's June 17, 2020 application for a review of a nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code § 25.303(f)(2).

By August 7, 2020, Commission Staff must file comments on the application, including recommendations on the sufficiency of the application and notice. Commission Staff must also file a procedural schedule for further processing of the application.

**Signed at Austin, Texas the 20th day of July 2020.**

**PUBLIC UTILITY COMMISSION OF TEXAS**

**HUNTER BURKHALTER  
CHIEF ADMINISTRATIVE LAW JUDGE**





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**DOCKET NO. 50945**

**APPLICATION OF COMMANCHE §  
PEAK POWER COMPANY LLC FOR §  
REVIEW OF NUCLEAR §  
DECOMMISSIONING COST STUDY §  
AND FUNDING ANALYSIS UNDER §  
16 TAC § 25.303(f)(2) §**

**PUBLIC UTILITY COMMISSION  
OF TEXAS**

**COMMISSION STAFF'S SUFFICIENCY RECOMMENDATION**

**COMES NOW** the Staff (Staff) of the Public Utility Commission of Texas (Commission), representing the public interest, and files this Sufficiency Recommendation. In support thereof, Staff would show the following:

**I. BACKGROUND**

On June 16, 2020, Comanche Peak Power Company LLC (Comanche Peak) filed an application for review of a nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code § 25.303(f)(2).

On July 20, 2020, the Administrative Law Judge (ALJ) issued Order No. 1, directing Commission Staff to file a recommendation regarding the sufficiency of the application and notice and providing a proposed procedural schedule by August 20, 2018. Therefore, the pleading is timely filed.

**II. COMMENTS REGARDING SUFFICIENCY AND NOTICE**

Staff has reviewed the application and recommends that the application and notice be found sufficient.



### **III. PROPOSED PROCEDURAL SCHEDULE**

Staff recommends the following procedural schedule:

<b>Event</b>	<b>Date</b>
Deadline for Comanche Peak to file proof of notice	August 24, 2020
Deadline to file motions to intervene	September 1, 2020
Deadline for intervenors to request hearing, or deadline for intervenor comments on the merits, if not requesting a hearing	September 11, 2020
Deadline for Staff to request a hearing, or deadline for Staff to file recommendation if not requesting a hearing	September 21, 2020
Deadline for Comanche Peak to respond to intervenor or Staff recommendations and to request a hearing, or deadline for parties to file proposed findings of fact, conclusions of law, and ordering paragraphs.	September 28, 2020

### **IV. CONCLUSION**

Staff respectfully requests the entry of an order finding the application and notice sufficient and adopting the above referenced procedural schedule.



**Dated: August 7, 2020**

Respectfully submitted,

**PUBLIC UTILITY COMMISSION OF TEXAS  
LEGAL DIVISION**

Rachelle Nicolette Robles  
Division Director

Eleanor D'Ambrosio  
Managing Attorney

/s/ John Harrison  
\_\_\_\_\_  
John Harrison  
State Bar No. 24097806  
1701 N. Congress Avenue  
P.O. Box 13326  
Austin, Texas 78711-3326  
(512) 936-7277  
(512) 936-7268 (facsimile)  
John.Harrison@puc.texas.gov

**DOCKET NO. 50945**

**CERTIFICATE OF SERVICE**

I certify that, unless otherwise ordered by the presiding officer, notice of the filing of this document was provided to all parties of record via electronic mail on August 7, 2020, in accordance with the Order Suspending Rules, issued in Project No. 50664.

/s/ John Harrison  
\_\_\_\_\_  
John Harrison





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**PUC DOCKET NO. 50945**

**APPLICATION OF COMANCHE PEAK  
POWER COMPANY LLC FOR REVIEW  
OF NUCLEAR DECOMMISSIONING  
COST STUDY AND FUNDING  
ANALYSIS UNDER 16 TAC § 25.303(f)(2)**

**BEFORE THE  
PUBLIC UTILITY COMMISSION  
OF TEXAS**

**AFFIDAVIT REGARDING PROOF OF NOTICE**

STATE OF TEXAS

COUNTY OF DALLAS

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§  
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BEFORE ME, the undersigned authority appeared, being first duly sworn, deposed and stated:

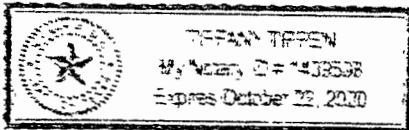
1. "My name is Gary L. Moor. I am Director of Legal Operations. I am the authorized legal representative of Comanche Peak Power Company LLC ("Comanche Peak"), having its principal place of business at 6555 Sierra Drive, Irving, TX 75039. I am the authorized legal representative of Comanche Peak for Docket No. 50945. I have personal knowledge of the facts stated in this Affidavit. I am over the age of twenty-one and am competent to make the following statements.
2. On June 16, 2020, Comanche Peak filed with the Public Utility Commission of Texas its decommissioning cost study and funding analysis for the Comanche Peak Nuclear Power Plant pursuant to the requirements of Tex. Util. Code § 39.206 and 16 Tex. Admin. Code § 25.303.
3. Following the filing, Comanche Peak sent via FedEx a copy of the nuclear decommissioning cost study and funding analysis to the Office of Public Utility Counsel in accordance with the requirements of 16 Tex. Admin Code § 25.303(f)(2).
4. Following the filing of the application, Comanche Peak emailed a copy of the decommissioning cost study and funding analysis to Matt Tronkle, Mike Sherburne, and Clayton Zachary at Oncor Electric Delivery Company, LLC.



The foregoing statements offered by me are true and correct to the best of my knowledge and belief."

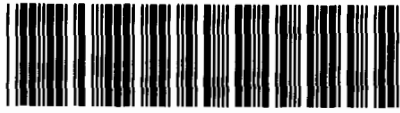
Harry Z Moor

SUBSCRIBED AND SWORN TO BEFORE ME on this 12 day of August 2001, by  
Harry Z Moor - Affiant named herein.



Tiffany Tipton  
Notary Public, State of Texas





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**DOCKET NO. 50945**

**APPLICATION OF COMMANCHE  
PEAK POWER COMPANY LLC FOR  
REVIEW OF NUCLEAR  
DECOMMISSIONING COST STUDY  
AND FUNDING ANALYSIS UNDER  
16 TAC § 25.303(f)(2)**

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**PUBLIC UTILITY COMMISSION  
OF TEXAS**



**COMMISSION STAFF'S FINAL RECOMMENDATION**

**COMES NOW** the Staff (Staff) of the Public Utility Commission of Texas (Commission), representing the public interest, and files this Final Recommendation. In support thereof, Staff would show the following:

**I. BACKGROUND**

On June 16, 2020, Comanche Peak Power Company LLC (Comanche Peak) filed an application for review of a nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code (TAC) § 25.303(f)(2).

On August 10, 2020, the Administrative Law Judge (ALJ) issued Order No. 2, directing Staff to file a final recommendation by September 21, 2020. Therefore, the pleading is timely filed.

**II. FINAL RECOMMENDATION**

As detailed in the attached memorandum of Darryl Tietjen of the Commission's Rate Regulation Division, Staff recommends approval of the application. The evidence provided by Comanche Peak demonstrates compliance with 16 TAC § 25.303(f)(4).

**III. CONCLUSION**

Staff respectfully requests the entry of an order approving the application.



**Dated: September 21, 2020**

Respectfully submitted,

**PUBLIC UTILITY COMMISSION OF TEXAS  
LEGAL DIVISION**

Rachelle Nicolette Robles  
Division Director

Eleanor D'Ambrosio  
Managing Attorney

/s/ John Harrison

John Harrison  
State Bar No. 24097806  
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P.O. Box 13326  
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(512) 936-7277  
(512) 936-7268 (facsimile)  
John.Harrison@puc.texas.gov

**DOCKET NO. 50945**

**CERTIFICATE OF SERVICE**

I certify that, unless otherwise ordered by the presiding officer, notice of the filing of this document was provided to all parties of record via electronic mail on September 21, 2020, in accordance with the Order Suspending Rules, issued in Project No. 50664.

/s/ John Harrison

John Harrison



# *Public Utility Commission of Texas*

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## **Memorandum**

To: John Harrison, Legal Division

From: Darryl Tietjen, Rate Regulation Division

Date: September 21, 2020

Re: Docket No. 50945—*Application of Comanche Peak Power Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis Under 16 TAC § 25.303(f)(2)*

---

### **Recommendation**

I recommend approval of the request by Comanche Peak Power Company LLC (CPPC) to maintain at current annual funding levels the amount of estimated decommissioning expense for Units 1 and 2 of the Comanche Peak Nuclear Power Plant (Comanche Peak). Additionally, I recommend approval of CPPC's request to adjust the allocations between the Unit 1 and Unit 2 decommissioning funds from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% percent for Unit 2.

### **Background and General Information**

Both Units 1 and 2 of Comanche Peak have operating license terms of 40 years. Consistent with the expiration dates of the licenses, the expected dates for ceasing operations and beginning decommissioning expenditures are 2030 for Unit 1 and 2033 for Unit 2.

On behalf of CPPC, the engineering firm TLG Services, Inc. (TLG) issued in May 2020 an updated analysis of the cost of decommissioning Units 1 and 2. TLG developed a cost estimate (expressed in year-2019 dollars) of \$1.729 billion, an amount that reflects a contingency rate of 10 percent as required by 16 Texas Administrative Code (TAC) § 25.303(f)(2). Based on this cost estimate, and as further discussed below, an annual funding amount of \$19.4 million over the remaining operating life of CPPC is necessary to fully fund the estimated future decommissioning costs.

CPPC states in its application that the five-year average of decommissioning fund collections from 2015-2019 was \$19.9 million annually. CPPC further states (on page 2 of its filing) that the assumptions in the decommissioning study, financial escalation analysis, and funding analysis "likely have inherent and considerable uncertainty based on the predictability of long-term costs and market conditions." As a result of these considerations, CPPC proposes no change in the current funding rate.

### **Discussion**

The determination of an annual funding amount for future decommissioning expense requires various inputs and assumptions, including the rate at which the amount of decommissioning costs will escalate, the investment returns that the decommissioning trust fund will earn over time, the timing of the actual expenditures, and the overall time period over which the entire decommissioning process will occur. Based on the information in the current filing related to



Comanche Peak's updated decommissioning cost estimates, projected cost escalation, and anticipated investment returns, CPPC proposes no change in current collection levels, which, as noted above, have averaged \$19.9 million per year over the last five years. CPPC does, however, propose an adjustment in the allocation between the Unit 1 and Unit 2 decommissioning funds from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% for Unit 2.

I have reviewed the funding model and the information provided by CPPC in its filing and in response to informal discovery; this information includes the rates of return estimated by JP Morgan and Aon Hewitt,<sup>1</sup> the tax and fee information provided by BNY Mellon, and the estimated decommissioning cost escalation rates as estimated by TLG. I believe that the types of investments and the expected rates of return assumed by the investment advisors over the investment horizon are reasonable and consistent with the provisions of 16 TAC § 25.303 (which establishes the investment guidelines for nuclear decommissioning trust funds), and I find that the composite cost escalation rate of approximately 2.65%, as estimated by TLG, is generally consistent with the escalation rates approved by the Commission in other recent proceedings involving decommissioning-expense funding.<sup>2</sup>

Incorporating the inputs described above into CPPC's decommissioning-expense funding model results in an annual funding amount of approximately \$19.4 million. For purposes of collecting an appropriate amount of annual decommissioning-expense funding for Comanche Peak, and as a conservative approach to ensuring adequate funding levels given the degree of inherent uncertainty in long-term financial and economic projections, I believe that CPPC's request to maintain funding at the current levels is reasonable. Additionally, to achieve a proper balancing of funds for Units 1 and 2, I believe it is reasonable to approve CPPC's request to adjust the allocation between the Unit 1 and Unit 2 decommissioning funds from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% for Unit 2. Accordingly, I recommend that the Commission approve CPPC's requests in this proceeding.

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<sup>1</sup> Aon Hewitt manages the trust investments, with Comanche Peak providing overall investment trust management oversight along with managers PIMCO, NISA Investment Advisors, Northern Trust, and BNY Mellon.

<sup>2</sup> See, *Application of NRG South Texas LP for Review of the Cost of Decommissioning Units 1 and 2 of the South Texas Project*, Docket No. 48447, Order (Dec. 20, 2018); *Notice by the San Antonio City Public Service Board of Receipt of Updated Decommissioning Study and Filing Under 16 TAC § 25.303(f)*, Docket No. 48556, Order (Mar. 1, 2019).





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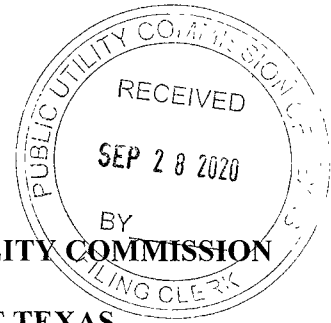


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**DOCKET NO. 50945**



**APPLICATION OF COMANCHE PEAK §  
POWER COMPANY LLC FOR REVIEW §  
OF NUCLEAR DECOMMISSIONING §  
COST STUDY AND FUNDING §  
ANALYSIS UNDER 16 TAC § 25.303(f)(2) §**

**PUBLIC UTILITY COMMISSION  
OF TEXAS**

**JOINT PROPOSED ORDER AND  
REQUEST TO ADMIT EVIDENCE**

**COMES NOW** Comanche Peak Power Company LLC (Comanche Peak), together with the Staff (Staff) of the Public Utility Commission of Texas (Commission), representing the public interest, and files this Joint Proposed Order and Request to Admit Evidence of Comanche Peak for review of nuclear decommissioning cost study and funding analysis pursuant to 16 Texas Administrative Code (TAC) § 25.303(f). The Proposed Order includes proposed findings of fact, conclusions of law, and ordering paragraphs, in compliance with Order No. 2. In accordance with Order No. 2, this filing is timely on September 28, 2020.

**I. REQUEST TO ADMIT EVIDENCE**

The parties jointly request to admit the following evidence into the record of this proceeding:

- (a) Comanche Peak's application for review of nuclear decommissioning cost study and funding analysis under 16 TAC § 25.303(f)(2) filed on June 16, 2020 (AIS Item No. 1);
- (b) Staff's sufficiency recommendation filed on August 7, 2020 (AIS Item No. 3);
- (c) Comanche Peak's Affidavit Regarding Proof of Notice filed on August 12, 2020 (AIS Item No. 5); and
- (d) Staff's final recommendation filed on September 21, 2020 (AIS Item No. 6).

**II. PROPOSED ORDER**

The Proposed Order would approve Comanche Peak's recommendation regarding its nuclear decommissioning cost study and funding analysis pursuant to 16 TAC § 25.303 to adjust the allocation of collections between the Unit 1 and Unit 2 decommissioning funds but make no change in the current collection rate. The docket was processed in accordance with applicable

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statutes and Commission rules. Notice of the application was provided to interested parties. No protests and no requests for hearing were filed. Therefore, Comanche Peak and Staff are the only parties to this proceeding.

### **III. CONCLUSION**

Staff has reviewed Comanche Peak's filing and recommends its approval, and therefore, the parties respectfully request that the Commission adopt the attached findings of fact and conclusions of law as well as grant the admittance of the specified pieces of evidence.

Respectfully submitted,

/s/ Kirk D. Rasmussen

Kirk D. Rasmussen  
State Bar No. 24013374  
Jackson Walker LLP  
100 Congress Avenue, Suite 1100  
Austin, Texas 78701  
(512) 236-2000  
(512) 691-4427 (fax)  
Email: krasmussen@jw.com

**ATTORNEYS FOR COMANCHE PEAK POWER  
COMPANY LLC**

### **CERTIFICATE OF SERVICE**

I certify that a copy of this document was served on all parties of record on this date via the Commission's Interchange in accordance with the Commission's order in Docket No. 50664 suspending PUC Procedural Rule 22.74.

/s/ Kirk D. Rasmussen

Kirk D. Rasmussen



**DOCKET NO. 50945**

<b>APPLICATION OF COMANCHE PEAK</b>	<b>§</b>	<b>PUBLIC UTILITY COMMISSION</b>
<b>POWER COMPANY LLC FOR REVIEW</b>	<b>§</b>	
<b>OF NUCLEAR DECOMMISSIONING</b>	<b>§</b>	<b>OF TEXAS</b>
<b>COST STUDY AND FUNDING</b>	<b>§</b>	
<b>ANALYSIS UNDER 16 TAC § 25.303(f)(2)</b>	<b>§</b>	

**PROPOSED ORDER**

This Order addresses the nuclear decommissioning cost study and funding analysis filing of Comanche Peak Power Company LLC (Comanche Peak) for review of the annual cost of decommissioning Comanche Peak Nuclear Power Plant Units 1 and 2 (CPNPP), pursuant to PURA<sup>1</sup> § 39.205 and 16 Texas Administrative Code (TAC) § 25.303. Public Utility Commission of Texas (Commission) Staff recommended that the Commission approve the continuation of the current annual funding amounts for the cost of nuclear decommissioning related to CPNPP and authorizes Comanche Peak to make an adjustment in the allocation of collections between the Unit 1 and Unit 2 decommissioning funds that was shown as necessary through the cost study and funding analysis.

**I. Findings of Fact**

The Commission makes the following findings of fact.

**Applicant**

1. Comanche Peak is a power generation company registered with the Commission under power generation company number 20407.
2. Comanche Peak is a power generation company that generates electricity that is intended to be sold at wholesale.

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<sup>1</sup> Public Utility Regulatory Act, Tex. Util. Code §§ 11.001-66.016 (PURA).



### **Application**

3. On June 16, 2020, Comanche Peak filed a study of the decommissioning costs of CPNPP, a financial escalation analysis of the decommissioning costs of CPNPP, and an updated funding analysis of CPNPP.
4. Comanche Peak requested no change to the current annual funding amounts for the cost of nuclear decommissioning related to CPNPP.
5. Comanche Peak requested an adjustment in the allocation of collections between the Unit 1 and Unit 2 decommissioning funds.
6. In Order No. 2 filed on August 10, 2020, the administrative law judge (ALJ) found the application sufficient.

### **Decommissioning Costs and Funding**

7. Comanche Peak administers a nuclear decommissioning trust fund for CPNPP, for which Oncor Electric Delivery Company, LLC (Oncor) is the collecting utility.
8. Comanche Peak's current annual funding amount approved in Docket No. 44845<sup>2</sup> is \$20,077,165.
9. The contribution allocation approved in Docket No. 44845 is 57.1% for Unit 1 and 42.9% for Unit 2.

### **Notice**

10. Comanche Peak sent via FedEx a copy of the nuclear decommissioning cost study and funding analysis to the Office of Public Utility Counsel in accordance with the requirements of 16 TAC § 25.303(f)(2).

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<sup>2</sup> *Application of Luminant Generation Company LLC or Review of Nuclear Decommissioning Cost Study and Funding Analysis*, Docket No. 44845, Ordering Paragraph No. 2 (Nov. 6, 2015).



11. Comanche Peak emailed a copy of the decommissioning cost study and funding analysis to Oncor.
12. In Order No. 2 filed on August 10, 2020, the ALJ found the proposed notice sufficient.
13. On August 12, 2020, Comanche Peak filed the affidavit of Gary L. Moor, Director of Legal Operations, attesting to the provision of notice as described in findings of fact 10 and 11.

**CPNPP Nuclear Decommissioning Trusts**

14. As of December 31, 2019, the Net After-Tax Value of the trusts for CPNPP Units 1 and 2 was \$1,316,460,673, with \$623,952,136 for Unit 1 and \$692,508,537 for Unit 2.
15. The Decommissioning Cost Analysis for Comanche Peak Nuclear Power Plant, prepared by TLG Services, Inc. (TLG) dated May 2020 (Decommissioning Study) and Financial Escalation Analysis for the Comanche Peak Nuclear Power Plant (Financial Escalation Analysis), prepared by TLG in May 2020, estimate the total cost to decommission and completely dismantle CPNPP at \$1,729 million in 2019 dollars assuming a ten percent contingency.
16. Based on the results of the Decommissioning Study and Financial Escalation Analysis, Comanche Peak performed a Funding Analysis for Comanche Peak Nuclear Power Plant (Funding Analysis) in June 2020.
17. The Funding Analysis shows a -2.7 percent difference between the required funding levels of \$19.4 million and the five-year average CPNPP decommissioning fund collections from 2015-2019 of \$19.9 million annually.
18. Because of the small difference in the required funding levels and five-year average collections and the inherent and considerable uncertainty of the predictability of long-term costs and market conditions, Comanche Peak proposed no change in the current collection rate.



19. Based on the results of the Funding Analysis, Comanche Peak proposed an adjustment in the allocation between the Unit 1 and Unit 2 decommissioning funds from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% for Unit 2.
20. On September 21, 2020, Commission Staff recommended approval of Comanche Peak's application.

### **Evidence**

21. On September 28, 2020, Commission Staff and Comanche Peak filed a joint request to admit evidence.
22. In Order No. 3 filed on \_\_\_\_\_, the ALJ granted the joint request and admitted the following evidence into the record of this proceeding: (a) Comanche Peak's application for review of nuclear decommissioning cost study and funding analysis under 16 TAC § 25.303(f)(2) filed on June 16, 2020; (b) Commission Staff's sufficiency recommendation filed on August 7, 2020; (c) Comanche Peak's Affidavit Regarding Proof of Notice filed on August 12, 2020; and (d) Commission Staff's final recommendation filed on September 21, 2020.

### **Informal Disposition**

23. More than 15 days have passed since the completion of the notice provided in this docket.
24. Commission Staff and Comanche Peak are the only parties to this proceeding.
25. No party filed protests or requests for hearing.
26. The decision is not adverse to any party.



## **II. Conclusions of Law**

The Commission makes the following conclusions of law.

1. The Commission has jurisdiction over the application under PURA §§ 14.001, 14.002, and 39.205.
2. Notice of this proceeding complies with 16 TAC § 22.55 and 25.303(f)(2).
3. The Commission processed this application in accordance with PURA, the Administrative Procedure Act<sup>3</sup> and Commission rules.
4. The remaining costs associated with nuclear decommissioning obligations continue to be subject to cost of service regulation under PURA § 39.205.
5. Under PURA § 39.205, the Commission is authorized to adopt rules to ensure that decommissioning funds are prudently collected, managed, and spent for the intended purpose of such funds and that any surplus is returned to retail customers.
6. Comanche Peak filed its periodic study of the decommissioning costs for CPNPP and its updated decommissioning funding analysis in accordance with 16 TAC § 25.303(f).
7. Comanche Peak has demonstrated that the funds in its nuclear decommissioning trusts are being invested prudently and in compliance with the investment guidelines set forth in 16 TAC § 25.303(e).
8. Comanche Peak has demonstrated efforts to achieve optimum tax efficiency, including efforts to achieve “qualified” status in accordance with Internal Revenue Code § 468A.
9. The annual funding amounts proposed by Comanche Peak for its nuclear decommissioning trust are necessary to ensure sufficient funds to decommission Comanche Peak Units 1 and 2 at the end of their useful life.

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<sup>3</sup> Administrative Procedure Act, Tex. Gov't Code §§ 2001.001—.902.



10. The requirements for informal disposition set forth in 16 TAC § 22.35 have been met in this proceeding.

### **III. Ordering Paragraphs**

In accordance with these findings of fact and conclusions of law, the Commission issues the following Order:

1. The Commission approves the annual funding amounts for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in CPNPP Units 1 and 2.
2. The Commission approves maintaining the annual funding amount of \$20,077,165 through 2025 effective the date of this Order.
3. The Commission approves an adjustment in the allocation of the decommissioning funds of 72.3% for Unit 1 and 27.7% for Unit 2.
4. All other motions, requests for entry of specific findings of fact and conclusions of law, and any other requests for general or specific relief, if not expressly granted herein, are hereby denied.

Signed at Austin, Texas the \_\_\_\_\_ day of \_\_\_\_\_ 2020.

**PUBLIC UTILITY COMMISSION OF TEXAS**

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**DEANN T. WALKER, CHAIRMAN**

---

**ARTHUR C. D'ANDREA, COMMISSIONER**

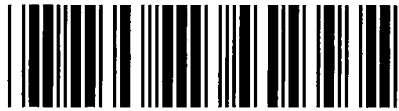
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**SHELLY BOTKIN, COMMISSIONER**





Control Number: 50945



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**DOCKET NO. 50945**

**APPLICATION OF COMMANCHE  
PEAK POWER COMPANY LLC FOR  
REVIEW OF NUCLEAR  
DECOMMISSIONING COST STUDY  
AND FUNDING ANALYSIS UNDER 16  
TAC § 25.303(f)(2)**

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**PUBLIC UTILITY COMMISSION  
OF TEXAS**

**ORDER NO. 3  
ADMITTING EVIDENCE**

This Order addresses the September 28, 2020, joint request to admit evidence filed by Commission Staff and Comanche Peak Power Company LLC. The following evidence is admitted into the record of this proceeding:

1. Comanche Peak's application, including all attachments, filed on June 16, 2020;
2. Commission Staff's sufficiency recommendation filed on August 7, 2020;
3. Comanche Peak's affidavit regarding proof of notice filed on August 12, 2020; and
4. Commission Staff's final recommendation filed on September 21, 2020.

**Signed at Austin, Texas the 30th day of September 2020.**

**PUBLIC UTILITY COMMISSION OF TEXAS**

**HUNTER BURKHALTER  
CHIEF ADMINISTRATIVE LAW JUDGE**





Control Number: 50945



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DeAnn T. Walker  
Chairman

Arthur C. D'Andrea  
Commissioner

Shelly Botkin  
Commissioner

John Paul Urban  
Executive Director



Greg Abbott  
Governor

## Public Utility Commission of Texas



TO: DeAnn T. Walker, Chairman  
Arthur C. D'Andrea, Commissioner  
Shelly Botkin, Commissioner

All Parties of Record

A handwritten signature, likely of Hunter Burkhalter, in dark ink.

FROM: Hunter Burkhalter  
Chief Administrative Law Judge

RE: **Open Meeting of November 5, 2020**  
**Docket No. 50945** – *Application of Comanche Peak Power Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis Under 16 TAC § 25.303(f)(2)*

DATE: October 6, 2020

**Because of the COVID-19 state of disaster, the Commission has moved to a work at a home environment and is working to maintain operations as normally as possible. However, all known challenges have not yet been overcome and the dates provided in this notice are subject to change.**

Enclosed is a copy of the Proposed Order in the above-referenced docket. The Commission will consider this docket at an open meeting currently scheduled to begin at 9:30 a.m. on Thursday, November 5, 2020, at the Commission's offices, 1701 North Congress Avenue, Austin, Texas. The parties must file corrections or exceptions to the Proposed Order by Tuesday, October 27, 2020.

**If there are no corrections or exceptions, no response is necessary.**

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**DOCKET NO. 50945**

<b>APPLICATION OF COMMANCHE</b>	<b>§</b>	<b>PUBLIC UTILITY COMMISSION</b>
<b>PEAK POWER COMPANY LLC FOR</b>	<b>§</b>	
<b>REVIEW OF NUCLEAR</b>	<b>§</b>	<b>OF TEXAS</b>
<b>DECOMMISSIONING COST STUDY</b>	<b>§</b>	
<b>AND FUNDING ANALYSIS UNDER 16</b>	<b>§</b>	
<b>TAC § 25.303(f)(2)</b>	<b>§</b>	

**PROPOSED ORDER**

This Order addresses the application of Comanche Peak Power Company LLC for review of its nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code (TAC) § 25.303(f)(2). The Commission approves (a) continuation of the annual funding amount of \$20,077,165 for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025; and (b) adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.

**I. Findings of Fact**

The Commission makes the following findings of fact.

**Applicant**

1. Comanche Peak is a foreign limited liability company registered with the secretary of state under filing number 802412555.
2. Comanche Peak is a power generation company registered with the Commission under power generation company number 20407.
3. Through Comanche Peak Nuclear Power Plant, Comanche Peak generates electricity that is intended to be sold at wholesale.

**Application**

4. On June 16, 2020, Comanche Peak filed an application for review of a study of the decommissioning costs of Comanche Peak Nuclear Power Plant, a financial escalation analysis of the decommissioning costs, and an updated funding analysis.



5. In the application, Comanche Peak requested no change to the current annual funding amounts for the cost of nuclear decommissioning related to Comanche Peak Nuclear Power Plant.
6. In the application, Comanche Peak requested an adjustment in the allocation of decommissioning funds between the Unit 1 and Unit 2.
7. In Order No. 2 filed on August 10, 2020, the administrative law judge (ALJ) found the application administratively complete.

**Decommissioning Costs and Funding**

8. Comanche Peak administers a nuclear decommissioning trust fund for Comanche Peak Nuclear Power Plant, for which Oncor Electric Delivery Company, LLC is the collecting utility.
9. Comanche Peak's current annual funding amount approved in Docket No. 44845<sup>1</sup> is \$20,077,165.
10. Comanche Peak Nuclear Power Plant consists of two units, Unit 1 and Unit 2, and the annual amount collected to cover the cost of nuclear decommissioning is allocated between the two units.
11. The annual amount collected to cover the cost of nuclear decommissioning has, since 2015, been allocated between Unit 1 and Unit 2 at an average rate of 57.1% for Unit 1 and 42.9% for Unit 2.

**Comanche Peak Nuclear Power Plant Nuclear Decommissioning Trusts**

12. As of December 31, 2019, the net after-tax value of the trusts for Units 1 and 2 totaled \$1,316,460,673, consisting of \$623,952,136 for Unit 1 and \$692,508,537 for Unit 2.
13. The Decommissioning Cost Analysis for Comanche Peak Nuclear Power Plant prepared by TLG Services, Inc. dated May 2020 and the Financial Escalation Analysis for the Comanche Peak Nuclear Power Plant prepared by TLG in May 2020 estimate the total cost to decommission and completely dismantle Comanche Peak Nuclear Power Plant at \$1.729 billion, in 2019 dollars, assuming a ten percent contingency.

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<sup>1</sup> *Application of Luminant Generation Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis*, Docket No. 44845, Order at Ordering Paragraph No. 2 (Nov. 6, 2015).



14. Based on the results of the Decommissioning Study and Financial Escalation Analysis, Comanche Peak performed a Funding Analysis for Comanche Peak Nuclear Power Plant in June 2020.
15. The Funding Analysis shows a -2.7 percent difference between the required funding level of \$19.4 million annually and the five-year average Comanche Peak Nuclear Power Plant decommissioning fund collections from 2015-2019 of \$19.9 million annually.
16. No change to the current annual collection rate is warranted because (a) there is only a small difference between the required annual funding rate and the five-year average actual annual collection rate, and (b) there is inherent and considerable uncertainty as to the predictability of long-term costs and market conditions.
17. Based on the results of the Funding Analysis, the allocation between the Unit 1 and Unit 2 decommissioning funds should be adjusted from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% for Unit 2.

#### Notice

18. On June 15, 2020, Comanche Peak provided a copy of its nuclear decommissioning cost study and funding analysis to the Commission's Financial Review Division.
19. On August 12, 2020, Comanche Peak filed the affidavit of Gary L. Moor, Comanche Peak's Director of Legal Operations, attesting that, subsequent to filing its application, Comanche Peak provided copies of its nuclear decommissioning cost study and funding analysis to the Office of Public Utility Counsel and Oncor.
20. In Order No. 2 filed on August 10, 2020, the ALJ found the notice sufficient.

#### Evidence

21. On September 28, 2020, Commission Staff and Comanche Peak filed a joint request to admit evidence.
22. In Order No. 3 filed on September 30, 2020, the ALJ admitted the following evidence into the record of this proceeding: (a) Comanche Peak's application, including all attachments, filed on June 16, 2020; (b) Commission Staff's sufficiency recommendation filed on August 7, 2020; (c) Comanche Peak's affidavit regarding proof of notice filed on August 12, 2020; and (d) Commission Staff's final recommendation filed on September 21, 2020.



**Informal Disposition**

23. More than 15 days have passed since the completion of the notice provided in this docket.
24. No person filed a protest or motion to intervene.
25. Commission Staff and Comanche Peak are the only parties to this proceeding.
26. No party requested a hearing and no hearing is needed.
27. Commission Staff recommended approval of the application.
28. This decision is not adverse to any party.

**II. Conclusions of Law**

The Commission makes the following conclusions of law.

1. The Commission has authority over the application under PURA<sup>2</sup> §§ 14.001, 14.002, and 39.205.
2. Notice of this proceeding was provided in compliance with 16 TAC § 22.55 and 25.303(f)(2).
3. The Commission processed this application in accordance with PURA, the Administrative Procedure Act,<sup>3</sup> and Commission rules.
4. The remaining costs associated with nuclear decommissioning obligations continue to be subject to cost of service regulation under PURA § 39.205.
5. Under PURA § 39.205, the Commission is authorized to adopt rules to ensure that decommissioning funds are prudently collected, managed, and spent for the intended purpose of such funds and that any surplus is returned to retail customers.
6. Comanche Peak filed its periodic study of the decommissioning costs for Comanche Peak Nuclear Power Plant and its updated decommissioning funding analysis in accordance with 16 TAC § 25.303(f).

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<sup>2</sup> Public Utility Regulatory Act, Tex. Util. Code §§ 11.001-66.016.

<sup>3</sup> Tex. Gov't Code §§ 2001.001-.903.



7. Comanche Peak demonstrated that the funds in its nuclear decommissioning trusts are being invested prudently and in compliance with the investment guidelines in 16 TAC § 25.303(e).
8. Comanche Peak demonstrated efforts to achieve optimum tax efficiency, including efforts to achieve “qualified” status in accordance with Internal Revenue Code § 468A.
9. The annual funding amounts proposed by Comanche Peak for its nuclear decommissioning trusts are necessary to ensure sufficient funds to decommission Comanche Peak Units 1 and 2 at the end of their useful life.
10. The requirements for informal disposition under 16 TAC § 22.35 have been met in this proceeding.

### **III. Ordering Paragraphs**

In accordance with these findings of fact and conclusions of law, the Commission issues the following orders.

1. The Commission approves continuation of the annual funding amount of \$20,077,165 for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025.
2. The Commission approves adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.
3. The Commission denies all other motions and any other requests for general or specific relief that have not been expressly granted.



Signed at Austin, Texas the \_\_\_\_\_ day of November 2020.

**PUBLIC UTILITY COMMISSION OF TEXAS**

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**DEANN T. WALKER, CHAIRMAN**

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**ARTHUR C. D'ANDREA, COMMISSIONER**

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**SHELLY BOTKIN, COMMISSIONER**

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Control Number: 50945



Item Number: 10

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DOCKET NO. 50945

2020 OCT 27 AM 10:29

APPLICATION OF COMANCHE  
PEAK POWER COMPANY LLC  
FOR REVIEW OF NUCLEAR  
DECOMMISSIONING COST  
STUDY AND FUNDING ANALYSIS  
UNDER 16 TAC § 25.303(f)(2)

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PUBLIC UTILITY COMMISSION  
OF TEXAS

**COMMISSION STAFF'S NOTICE OF NO EXCEPTIONS OR CORRECTIONS**

Staff of the Public Utility Commission of Texas will not be filing exceptions or corrections to the findings of the Proposed Order filed on October 6, 2020.

**Dated: October 27, 2020**

Respectfully Submitted,

**PUBLIC UTILITY COMMISSION OF TEXAS  
LEGAL DIVISION**

Rachelle Nicolette Robles  
Division Director

Eleanor D'Ambrosio  
Managing Attorney

/s/ John Harrison  
John Harrison  
State Bar No. 24097806  
1701 N. Congress Avenue  
P.O. Box 13326  
Austin, Texas 78711-3326  
(512) 936-7277  
(512) 936-7268 (facsimile)  
John.Harrison@puc.texas.gov



**DOCKET NO. 50945**

**CERTIFICATE OF SERVICE**

I certify that, unless otherwise ordered by the presiding officer, notice of the filing of this document was provided to all parties of record via electronic mail on October 27, 2020, in accordance with the Order Suspending Rules, issued in Project No. 50664.

/s/ John Harrison  
John Harrison





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# *Public Utility Commission of Texas*

## **Commissioner Memorandum**

2020 NOV -3 PM 2:47

**TO:** Commissioner Arthur C. D'Andrea  
Commissioner Shelly Botkin

**FROM:** Chairman DeAnn T. Walker 

**DATE:** November 3, 2020

**RE:** November 5, 2020 Open Meeting – Item No. 18  
Docket No. 50945 – *Application of Comanche Peak Power Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis Under 16 TAC § 25.303(f)(2)*

---

I have attempted to find compliance in the record of this case with 16 TAC § 25.303(f)(4)(A), (B), and (D), but I have been unable to find the required evidence. In particular, I have not been able to find compliance with the following requirements:

- 16 TAC § 25.303(f)(4)(A) – “The cost study and funding analysis shall be accompanied by a report or testimony supporting the analyses and the requested annual funding amount.”
- 16 TAC § 25.303(f)(4)(B) – “The Nuclear Decommissioning Trust Funds administrator shall demonstrate that the decommissioning funds are being invested prudently and in compliance with the investment guidelines in subsection (e) of this section.”
- 16 TAC § 25.303(f)(4)(D) – “The Transferee Company (or the funds administrator and the Transferee Company, if different) shall demonstrate efforts to achieve optimum tax efficiency as defined in subsection (e)(3)(B)(iii) of this section, including, as applicable, maintenance of tax-exempt status or efforts to achieve “qualified” status in accordance with Internal Revenue Code §468A (or any successor thereto) with respect to its taxable nuclear decommissioning trust funds.”

Therefore, I request that the applicant submit references to the record in which compliance with the above requirements are met. If the applicant is unable to provide references to evidence that proves compliance with the Commission’s rules, then I believe the docket should be remanded to Docket Management to address the issues.

If the Commission receives the necessary information to address the above issues, then I recommend that the Commission make the following changes to the order in this proceeding.



New findings of fact 18, 19, and 20 should be added to support proposed conclusions of law 6, 7, and 8 respectively. All subsequent findings of fact should be renumbered.

18. Comanche Peak's cost study and funding analysis was accompanied by a report or testimony supporting its analysis and the requested annual funding amount.
19. Comanche Peak has established investment policies to ensure that nuclear decommissioning funds collected, plus the amounts earned from investment of the funds, will be available at the time of decommissioning.
20. Comanche Peak has demonstrated efforts to achieve optimum tax efficiency to maximize the net earnings on the nuclear decommissioning trust funds.

Conclusion of law 1 should be modified for accuracy.

1. The Commission has authority over the application under PURA §§ 14.001, ~~14.002~~, and 39.205.

A new conclusion of law 7 should be added to document Comanche Peak's compliance with 16 TAC § 25.303(f)(4)(A). All subsequent conclusions of law should be renumbered.

7. Comanche Peak's cost study and funding analysis was accompanied by a report or testimony supporting its analysis and the requested annual funding amount under 16 TAC § 25.303(f)(4)(A).

Proposed conclusions of law 7, 8, and 9 should be modified for completeness.

- ~~78~~. Comanche Peak demonstrated that the funds in its nuclear decommissioning funds are being invested prudently and in compliance with the investment guidelines in 16 TAC § 303(e) under 16 TAC § 25.303(f)(4)(B).
- ~~89~~. Comanche Peak demonstrated efforts to achieve optimum tax efficiency, including efforts to achieve "qualified" status in accordance with Internal Revenue Code § 468A under 16 TAC § 25.303(f)(4)(D).
- ~~910~~. The annual funding amounts proposed by Comanche Peak for nuclear decommissioning trusts are necessary to ensure sufficient funds to decommission Comanche Peak Units 1 and 2 at the end of their useful life in accordance with 16 TAC § 25.303(f)(2).

In addition, I propose delegating to the Office of Policy and Docket Management staff the authority to modify the order to conform to the *Citation and Style Guide for the Public Utility Commission of Texas* and to make other non-substantive changes to the order for such matters as capitalization, spelling, grammar, punctuation, style, correction of numbering, and readability.

I look forward to discussing this matter with you at the open meeting.





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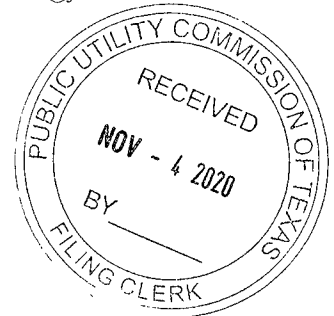


Kirk D. Rasmussen  
(512) 236-2310 (Direct Dial)  
(512) 391-2120 (Direct Fax)  
krasmussen@jw.com

November 4, 2020

**Via Interchange Filing**

Chairman DeAnn T. Walker  
Commissioner Arthur C. D'Andrea  
Commissioner Shelly Botkin  
1701 N. Congress Avenue  
PO Box 13326  
Austin, Texas 78711



Re: PUC Docket No. 50945; *Application of Comanche Peak Power Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis Under 16 TAC §25.303(f)(2)*

Dear Commissioners:

On June 16, 2020, in compliance with 16 Tex. Admin. Code (TAC) § 25.303(f)(2), Comanche Peak Power Company LLC (Comanche Peak), as Transferee Company (as defined in 16 TAC § 25.303(c)(2)), of the Comanche Peak Nuclear Power Plant (CPNPP) assets, filed a cover letter along with the *Decommissioning Cost Analysis for the Comanche Peak Power Plant*, the *Financial Escalation Analysis for the Comanche Peak Nuclear Power Plant*, and the *Funding Analysis for Comanche Peak Nuclear Power Plant*. Based on the results of the studies and analysis, Comanche Peak is not requesting a change to the established decommissioning funding levels for CPNPP. The filing package made in this docket was consistent with the filing Comanche Peak's predecessor transferee company made in 2010 in Docket No. 34277 (the last filing in which no change to the funding levels was requested).

We believe the filing package contains sufficient information in the reports and analysis included for the Public Utility Commission of Texas (Commission) to find the filing compliant with 16 TAC § 25.303(f). However, to the extent the Chairman and the Commissioners feel further evidence is necessary to evaluate the current status of Comanche Peak's decommissioning fund, we will be happy to file and offer additional testimony, affidavit, or report from an appropriate company official specifically addressing any additional information the Commission would like.

I will be available at the open meeting on November 5, 2020, to answer any additional questions the Commission may have regarding this filing.

Sincerely,

/s/ Kirk Rasmussen

Kirk D. Rasmussen

Counsel for Comanche Peak  
Power Company LLC





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DOCKET NO. 50945

APPLICATION OF COMANCHE PEAK  
POWER COMPANY LLC FOR  
REVIEW OF NUCLEAR  
DECOMMISSIONING COST STUDY  
AND FUNDING ANALYSIS UNDER 16  
TAC § 25.303(f)(2)

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PUBLIC UTILITY COMMISSION

2020 NOV -5 AM 10:48

OF TEXAS

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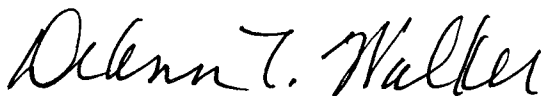
ORDER REMANDING PROCEEDING TO DOCKET MANAGEMENT

On June 16, 2020, Comanche Peak Power Company, LLC filed an application for review and approval of a nuclear decommissioning cost study and funding analysis. At the November 5, 2020 open meeting, the Commission determined the application and subsequent filings did not include evidence required by 16 Texas Administrative Code § 25.303(f)(4)(A), (B), and (D), and that the application should be remanded to address the requirements of the rule.

The Commission remands this proceeding to Docket Management for further processing consistent with its discussion at the November 5, 2020 open meeting.

Signed at Austin, Texas the 5th day of November 2020.

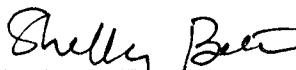
PUBLIC UTILITY COMMISSION OF TEXAS



DEANN T. WALKER, CHAIRMAN



ARTHUR C. D'ANDREA, COMMISSIONER



SHELLY BOTKIN, COMMISSIONER





Control Number: 50945



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OFFICE OF POLICY & DOCKET MANAGEMENT  
OUTGOING COMMISSION-SIGNED ORDER  
MAIL LOG

2020 NOV -5 AM 11:48

OPEN MEETING DATE: 11/5/20

DOCKET NO.	STAFF	NO. OF PAGES	DATE ORDER SIGNED
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50945	David H	1	11/5/20
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TYPE OF ORDER: ORDER REMANDING PROCEEDING TO DOCKET MGMT

FILE STAMP DATE: 11/5/20 FILE STAMP TIME 11:48 A.M. \_\_\_\_ P.M.

*NOTE: IF THE ORDER IS PLACED IN THE MAIL AFTER 2:00 PM, ENTER THE NEXT BUSINESS DAY  
AS THE DATE THE ORDER WAS MAILED  
FIRST CLASS MAIL ONLY -- NO FED EX, AIRBORNE, UPS*

CADM OUTGOING MAILBOX

DATE: 11/5/20 TIME \_\_\_\_ A.M. 1:30 P.M.

SIGNATURE

DATE



## SERVICE LIST

**DOCKET NO. 50945**

**APPLICATION OF COMMANCHE PEAK POWER COMPANY LLC FOR REVIEW OF  
NUCLEAR DECOMMISSIONING COST STUDY AND FUNDING ANALYSIS UNDER 16 TAC §  
25.303(f)(2)**

<b>PARTIES</b>	<b>REPRESENTATIVE/ADDRESS</b>
PUBLIC UTILITY COMMISSION	LEGAL DIVISION PUBLIC UTILITY COMMISSION 1701 N CONGRESS AVE STE 8-110 AUSTIN TX 78711 512-936-7260 512-936-7268 FAX
COMMANCHE PEAK POWER COMPANY LLC	STEPHANIE ZAPATA MOORE ESQ VISTRA ENERGY 6555 SIERRA DRIVE IRVING TX 75039 214-875-8183 214-875-9478 FAX

-Verified: 061820; 072020 ms; 081020 MS; 093020 ms, 10062020 dg; 11/5/20 rdh





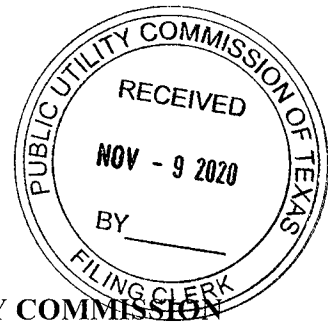
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DOCKET NO. 50945

APPLICATION OF COMMANCHE §  
PEAK POWER COMPANY LLC FOR §  
REVIEW OF NUCLEAR §  
DECOMMISSIONING COST STUDY §  
AND FUNDING ANALYSIS UNDER 16 §  
TAC § 25.303(f)(2) §

PUBLIC UTILITY COMMISSION  
OF TEXAS

**ORDER NO. 4  
REQUESTING ADDITIONAL INFORMATION AND ESTABLISHING PROCEDURAL  
SCHEDULE**

In light of the Commission's Order Remanding Proceeding to Docket Management filed on November 5, 2020, the administrative law judge adopts the following procedural schedule to provide Comanche Peak Power Company LLC the opportunity to cure the deficiencies identified by the Commission:

Deadline for Comanche Peak to supplement the application	November 30, 2020
Deadline for Commission Staff to file a recommendation on the supplemented application	December 11, 2020
Deadline for the parties to file a revised proposed order, if appropriate	December 18, 2020

**Signed the 9th day of November 2020.**

PUBLIC UTILITY COMMISSION OF TEXAS

  
HUNTER BURKHALTER  
CHIEF ADMINISTRATIVE LAW JUDGE



**DOCKET NO. 50945**

<b>APPLICATION OF COMMANCHE</b>	<b>§</b>	<b>PUBLIC UTILITY COMMISSION</b>
<b>PEAK POWER COMPANY LLC FOR</b>	<b>§</b>	
<b>REVIEW OF NUCLEAR</b>	<b>§</b>	<b>OF TEXAS</b>
<b>DECOMMISSIONING COST STUDY</b>	<b>§</b>	
<b>AND FUNDING ANALYSIS UNDER 16</b>	<b>§</b>	
<b>TAC § 25.303(f)(2)</b>	<b>§</b>	

**ORDER NO. 4**  
**REQUESTING ADDITIONAL INFORMATION AND ESTABLISHING PROCEDURAL**  
**SCHEDULE**

In light of the Commission's Order Remanding Proceeding to Docket Management filed on November 5, 2020, the administrative law judge adopts the following procedural schedule to provide Comanche Peak Power Company LLC the opportunity to cure the deficiencies identified by the Commission:

Deadline for Comanche Peak to supplement the application	November 30, 2020
Deadline for Commission Staff to file a recommendation on the supplemented application	December 11, 2020
Deadline for the parties to file a revised proposed order, if appropriate	December 18, 2020

**Signed the 9th day of November 2020.**

**PUBLIC UTILITY COMMISSION OF TEXAS**

  
**HUNTER BURKHALTER**  
**CHIEF ADMINISTRATIVE LAW JUDGE**





Control Number: 50945



Item Number: 16

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DOCKET NO. 50945 2020 NOV 30 PM 2: 53

PUBLIC UTILITY COMMISSION  
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APPLICATION OF COMANCHE PEAK §  
POWER COMPANY LLC FOR REVIEW §  
OF NUCLEAR DECOMMISSIONING §  
COST STUDY AND FUNDING §  
ANALYSIS UNDER 16 TAC §  
25.303(f)(2) §

BEFORE THE

PUBLIC UTILITY COMMISSION

OF TEXAS

Direct Testimony of

Kristopher Moldovan

on Behalf of

Comanche Peak Power Company LLC

November 30, 2020



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OF KRISTOPHER MOLDOVAN, WITNESS FOR  
COMANCHE PEAK POWER COMPANY LLC**

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1                                   **DIRECT TESTIMONY OF KRISTOPHER MOLDOVAN**

2                                   **I.       POSITION AND QUALIFICATIONS**

3    Q.     PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

4    A.     My name is Kristopher Moldovan. My business address is 6555 Sierra  
5            Drive, Irving, Texas 75039.

6    Q.     BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

7    B.     I am Senior Vice President & Treasurer of Vistra Corp. (Vistra) and its  
8            subsidiaries, including Comanche Peak Power Company LLC (Comanche  
9            Peak or Company), the owner of Comanche Peak Nuclear Power Plant  
10           (CPNPP) as well as its associated Nuclear Decommissioning Fund (NDF).

11   Q.     PLEASE OUTLINE YOUR EDUCATIONAL QUALIFICATIONS AND  
12            PROFESSIONAL EXPERIENCE.

13   C.     I have an undergraduate degree in Engineering from the University of  
14            Illinois at Urbana-Champaign and a law degree from the Duke University  
15            School of Law. I have been employed at Vistra and its predecessor  
16            companies, Energy Future Holdings Corp. (EFH) and TXU Corp. (TXU)  
17            since 2006. I have previously served Vistra as Senior Counsel and as Vice  
18            President & Assistant Treasurer. Prior to joining TXU, I was an attorney in  
19            private practice for nearly 10 years.

20   Q.     WHAT ARE THE PRIMARY RESPONSIBILITIES OF YOUR POSITION  
21            AS SENIOR VICE PRESIDENT AND TREASURER?

22   A.     I am accountable for all treasury-related activities for Vistra and its  
23            subsidiaries. In doing so, I consult and work closely with the Vistra Chief  
24            Financial Officer to 1) develop general financial strategies, 2) direct the  
25            financing activities of Vistra and its subsidiaries in order to assure the  
26            availability of adequate funds, access to capital, proper capitalization and  
27            credit rating and efficient funding for the Companies' business activities, 3)  
28            ensure the adequate and proper communication and the accurate and

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1 timely disclosure of financial information regarding Vistra to credit rating  
2 agencies and commercial banks, 4) direct the overall cash management  
3 activities of Vistra and its subsidiaries, 5) manage Vistra's interest rate  
4 risks, 6) ensure financial and legal compliance with all of the terms,  
5 conditions and covenants of the Companies' financing arrangements, and  
6 7) direct the management of Vistra's insurance portfolio. As Treasurer, I  
7 serve on Vistra's Management Committee, Risk Committee and the  
8 Retirement Plan Committee, and I serve as chairman of the Thrift  
9 Committee and the Nuclear Decommissioning Trust Committee.

## 10 II. PURPOSE OF TESTIMONY

11 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

12 A. The purpose of my testimony is to demonstrate that the Company is in  
13 compliance with the Public Utility Commission of Texas (PUCT)  
14 Substantive Rule applicable to nuclear decommissioning at 16 Tex.  
15 Admin. Code (TAC) § 25.303.

16 Q. WHAT IS THE PURPOSE OF ANNUAL FUNDING OF THE  
17 DECOMMISSIONING TRUST?

18 A. The purpose of funding an external trust is to ensure that adequate funds  
19 are available to pay for the safe dismantlement of the facility at the end of  
20 the useful life of both generating units and to comply with the U.S. Nuclear  
21 Regulatory Commission (NRC) and PUCT requirements. This funding of  
22 future costs allocates the expense of retiring the plants to the customers  
23 who are receiving the benefits of its generation during its useful life.  
24 Excess funding, if any, will be returned to ratepayers after the completion  
25 of the plant's decommissioning or as otherwise allowed by NRC and  
26 PUCT guidelines.

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1                                   **III.     COMANCHE PEAK DECOMMISSIONING**

2   **A. Funding Requirements**

3    Q.     WHAT AMOUNT IS BEING REQUESTED FOR DECOMMISSIONING  
4           EXPENSE IN THIS FILING?

5    A.     Comanche Peak's current annual funding amounts approved in Docket  
6           No. 44845 is \$20,077,165. Comanche Peak proposes no change in the  
7           current collection rate in this proceeding.

8           The *Decommissioning Cost Analysis for Comanche Peak Nuclear*  
9           *Power Plant*, prepared by TLG Services, Inc. (TLG) dated May 2020  
10          (Decommissioning Study) and *Financial Escalation Analysis for the*  
11          *Comanche Peak Nuclear Power Plant* (Financial Escalation Analysis),  
12          prepared by TLG in May 2020, estimate the total cost to decommission  
13          and completely dismantle CPNPP at \$1,729 million in 2019 dollars  
14          assuming a 10 percent contingency. As of December 31, 2019, the Net  
15          After-Tax Value of the trusts for CPNPP Units 1 and 2 was  
16          \$1,316,460,673, with \$623,952,136 for Unit 1 and \$692,508,537 for Unit 2.  
17          Based on the results of the Decommissioning Study and Financial  
18          Escalation Analysis, Comanche Peak performed a *Funding Analysis for*  
19          *Comanche Peak Nuclear Power Plant* (Funding Analysis) in June 2020.  
20          The Funding Analysis shows a -2.7 percent difference between the  
21          required funding levels of \$19.4 million and the five-year average CPNPP  
22          decommissioning fund collections from 2015-2019 of \$19.9 million  
23          annually. Because of the small difference in the required funding levels  
24          and five-year average collections and the inherent and considerable  
25          uncertainty of the predictability of long-term costs and market conditions,  
26          Comanche Peak proposed no change in the current collection rate.

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1 Q. IS COMANCHE PEAK PROPOSING AN ADJUSTMENT IN THE  
2 ALLOCATION OF THE DECOMMISSIONING FUNDS BETWEEN CPNPP  
3 UNITS 1 AND 2?

4 A. Yes. Based on the results of the Funding Analysis, Comanche Peak  
5 proposes an adjustment in the allocation between the Unit 1 and Unit 2  
6 decommissioning funds from 57.1 percent for Unit 1 and 42.9 percent for  
7 Unit 2 to 72.3 percent for Unit 1 and 27.7 percent for Unit 2.

8 **B. Compliance with PUCT Rules**

9 Q. ARE THERE SPECIFIC GUIDELINES FOR THE ESTABLISHMENT AND  
10 FUNDING OF DECOMMISSIONING TRUSTS RELATED TO NUCLEAR  
11 POWER PLANTS SUCH AS COMANCHE PEAK?

12 A. Yes. The NRC has established guidelines to ensure the adequacy of  
13 funds for the safe dismantlement, decontamination, and disposal of the  
14 generating units at the end of their useful lives. These guidelines apply to  
15 both the amounts of fund contributions and the methods for funding for the  
16 ultimate decommissioning of the units. The PUCT has also adopted rules  
17 establishing certain requirements for nuclear decommissioning trusts.

18 Q. WHAT DOES THE PUCT'S SUBSTANTIVE RULE SPECIFY  
19 CONCERNING THE MANAGEMENT OF THE DECOMMISSIONING  
20 TRUST?

21 A. In general terms, 16 TAC § 25.303 specifies Comanche Peak's duties in  
22 the selection of trustees and managers of decommissioning trust funds,  
23 outlines what must be contained in the agreements between Comanche  
24 Peak and these parties, and limits what investments may be included in  
25 the portfolios of decommissioning trusts.



1 Q. HAS COMANCHE PEAK FOLLOWED THE GUIDELINES ADOPTED BY  
2 THE PUCT IN THE SELECTION OF THE TRUSTEE AND MANAGER OF  
3 THE COMANCHE PEAK NDF?

4 A. Yes. The Bank of New York Mellon has served as trustee for the NDF  
5 since its inception in 1990. Dresdner RCM Global Investors, who has  
6 served as the fixed income investment manager since the fund's inception  
7 in 1990 was merged into Pacific Investment Management Company  
8 (PIMCO) in 2002. In 1994, after rule changes allowed for equity  
9 investments, Mellon's Nuclear Decommissioning Trust Stock Index Fund  
10 (now DT DV Stock Index Fund) was first used to manage the equity  
11 investments in the trust. This commingled equity fund was selected after  
12 developing an investment strategy, evaluating alternatives, and  
13 conducting a search. In 1998, after additional changes in the  
14 Commission's investment rules and a new manager search, Northern  
15 Trust Quantitative Advisors (now Northern Trust Investments, Inc.) was  
16 hired to manage an additional separate account S&P 500 index fund. In  
17 2017, after adoption of the most recent Investment Policy, the Northern  
18 Trust Investments account was assigned to their Tax Advantaged Equity  
19 team, with responsibility for both S&P 500 index and MSCI EAFE index  
20 separate accounts, thus diversifying equity investments to include some  
21 non-U.S. developed markets. In 2019, NISA Investment Advisors, LLC  
22 was hired as a second fixed income separate account manager, to  
23 complement and diversify from the fixed income management of PIMCO.  
24 Performance for the investment managers is reviewed quarterly, and the  
25 trustee is reviewed every few years, with formal reviews for the investment  
26 managers and the trustee occurring as needed.



1 Q. HAS COMANCHE PEAK COMPLIED WITH THE PUCT'S GUIDELINES  
2 CONCERNING THE MANAGER AND INVESTMENT AGREEMENTS?

3 A. Yes. Comanche Peak complied with those guidelines in the original  
4 agreements, and subsequent amendments, which have all been filed with  
5 the PUCT, most recently in Docket No. 45753.

6 Q. DOES THE MANAGEMENT AGREEMENT ADDRESS THE  
7 INVESTMENT RESTRICTIONS SET FORTH IN 16 TAC § 25.303(e)(3)?

8 A. Yes, it does. The fund managers and trustee have been instructed to  
9 follow the guidelines set forth in 16 TAC § 25.303, which limit the types of  
10 securities that may be purchased and which also limit the equity securities  
11 that can be held by the trust.

12 Q. DOES COMANCHE PEAK HAVE AN INVESTMENT POLICY THAT  
13 ENSURES COMPLIANCE WITH THE INVESTMENT GUIDELINES IN 16  
14 TAC § 25.303(e)?

15 A. Yes. Attached as Exhibit KM-1 is a copy of Comanche Peak's Nuclear  
16 Decommissioning Trust Investment Policy, that became effective  
17 September 1, 2017.

18 Q. HOW DOES COMANCHE PEAK MAKE CONTRIBUTIONS TO THE  
19 NDF?

20 A. Contributions are made monthly based on billings during the previous  
21 month.

22 Q. PLEASE EXPLAIN THE PROCESS.

23 A. Assume that the April billing cycle begins on March 28<sup>th</sup>. Meters are read  
24 that day, and the retail electric providers (REPs) are billed shortly  
25 thereafter; assume it is March 29<sup>th</sup>. Payments from REPs are not due until  
26 35 days later, or May 3<sup>rd</sup>. This process then continues for each day of the  
27 April billing cycle. On approximately May 15, Comanche Peak contributes  
28 the full amount billed by Oncor Electric Delivery Company LLC (Oncor) in

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1 April to the NDF. At that point, due to the 35-day payment period that  
2 REPs have, only up to half of the April billing month bills are due and  
3 monies have been collected from the REPs, at least half of the bills for the  
4 April billing month are not yet due and the Rider NDC - Nuclear  
5 Decommissioning Charges have not yet been received by Oncor or  
6 Comanche Peak. Since the contribution is made at about the midpoint in  
7 the collection period, effectively half of the contribution has been paid in  
8 arrears, but the other half has been paid in advance, so the net for the  
9 entire billing month is that the NDF effectively receives the contribution on  
10 the same day that Oncor receives the revenues. Near the end of May,  
11 Oncor remits to Comanche Peak the **entire** April billing month of the Rider  
12 NDC billings (not collections) along with its settlement of substantially all  
13 other intercompany accounts payable/receivable.

14 In sum, from a monthly net use of funds standpoint, the effect of  
15 Comanche Peak's approach is that the NDF receives the contribution as  
16 of the date the revenues are received by Oncor, without any delay. Thus,  
17 Comanche Peak's approach provides a superior result for the NDF as  
18 compared to waiting until Oncor has actually collected the revenues and  
19 then making a weekly deposit of those receipts (or a monthly deposit with  
20 imputed interest). This approach to deposits to the NDF is consistent with  
21 the intent of 16 TAC § 25.303(g)(2)(C).

22 This approach was presented to the Commission in 2005 in Docket  
23 No. 31252 (see Horton Testimony, pp. 8-9) and Order No. 2 approved the  
24 filing, noting that "the docket was initiated as a compliance filing and is not  
25 the proper forum for a contested case proceeding." In 2010, no separate  
26 docket was initiated for the five year compliance filing for CPNPP, which  
27 was placed by the Commission in Docket No. 34277. In 2015, the same  
28 implied interest approach was presented to the Commission for CPNPP in



1 Docket No. 44845 (see Frenzel Testimony, pp. 10-11) and approved by  
2 order of the Commission on November 6, 2015.

3 If the Commission orders a different approach to NDF deposits in  
4 this proceeding, Comanche Peak will of course comply with the  
5 Commission's order.

6 Q. WHAT FUNDING METHOD IS COMANCHE PEAK PROPOSING IN THIS  
7 FILING, AND DOES IT COMPLY WITH THE PUCT'S GUIDELINES?

8 A. Comanche Peak is proposing to continue the external sinking fund method  
9 used since the establishment of the NDF and that is required by the  
10 PUCT's Substantive Rules. This method requires monthly irrevocable  
11 deposits to an external trust to fund the future decommissioning of  
12 Comanche Peak. At the present time, Comanche Peak is making monthly  
13 contributions to the external, irrevocable trusts established in 1990. The  
14 fund balances are included on page 1 of Funding Analysis. The current  
15 funding amounts are based on a 1997 decommissioning study that was  
16 updated and redetermined in 2000 for use in the TXU Electric Company  
17 unbundled cost of service proceeding. The decommissioning study was  
18 subsequently updated in 2005, 2010, and 2015.

19 A review of decommissioning expense must be performed every  
20 five years as required by 16 TAC § 25.303(f)(2). Thus, Comanche Peak's  
21 filing in this docket accomplishes Comanche Peak's requirement to further  
22 update the decommissioning cost study and funding analysis. These  
23 periodic reviews are required to assure the adequacy of funds for the new  
24 technologies, decommissioning requirements, and other assumptions that  
25 may change over time. Comanche Peak is also in compliance with 16  
26 TAC § 25.303(c)(4), which requires the trust to be irrevocable and  
27 external.

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1 Q. WHAT EFFORTS DOES COMANCHE PEAK TAKE TO ACHIEVE  
2 OPTIMUM TAX EFFICIENCY AS DEFINED IN 16 TAC  
3 § 25.303(e)(3)(B)(iii)?

4 A. All decommissioning funds are deposited and invested in tax-qualified  
5 nuclear decommissioning trusts, as called for under 16 TAC  
6 § 25.303(e)(3)(B)(iii). In addition, Comanche Peak works with investment  
7 managers to achieve tax efficiency within the management of the NDF  
8 assets, as follows: (1) all managers are made aware of the taxable nature  
9 of qualified decommissioning trusts and invest accordingly, and they are  
10 evaluated on both a pre-tax and after tax basis; (2) rebalancing and other  
11 transaction activity is done thoughtfully so as to reduce realized taxable  
12 gains where possible, within the guidance provided by the Investment  
13 Policy; and (3) investment manager Northern Trust Investments, through  
14 their Tax Advantaged Equity team, makes trades explicitly for tax  
15 efficiency purposes (e.g., capturing tax losses to offset gains elsewhere in  
16 the portfolio) and assists in overall tax gain/loss positioning across the  
17 NDF.

18 **C. Assumed Escalation Rate**

19 Q. WHEN WILL DECOMMISSIONING FOR CPNPP BEGIN, AND HOW  
20 LONG WILL IT LAST?

21 A. Comanche Peak's operating license for CPNPP Units 1 & 2 is for 40  
22 years. Commercial operation began in 1990 and 1993 for units 1 & 2,  
23 respectively. Therefore, for CPNPP Unit 1, the 2020 decommissioning  
24 cost study projects that commercial operations will cease and  
25 decommissioning expenditures will begin in 2030. For CPNPP Unit 2, the  
26 study projects that commercial operations will cease and  
27 decommissioning expenditures will begin in 2033.



1 Q. HOW WERE THE COSTS USED TO DETERMINE THE FUNDING  
2 LEVELS DEVELOPED?

3 A. As previously mentioned, the current funding amounts are based on a  
4 1997 decommissioning study that was updated and re-determined in 2000  
5 for use in the TXU Electric Company unbundled cost of service  
6 proceeding. The decommissioning study was subsequently updated in  
7 2005, 2010, and 2015. This most recent update to the decommissioning  
8 costs was developed by TLG, the same industry expert that performed the  
9 previous studies.

10 **D. Trust Balance and Administration Cost**

11 Q. WHAT IS THE CURRENT BALANCE IN THE NUCLEAR  
12 DECOMMISSIONING TRUST?

13 A. The balance in the trust at December 31, 2019 is shown on page 3 of the  
14 Funding Analysis. Since the income and capital gains realized by the trust  
15 are taxed at 20 percent, it is necessary to adjust the balance for the  
16 current tax liability on the unrealized gains. The current tax liability is  
17 calculated by multiplying the tax rate of 20 percent times the difference  
18 between the market value and the tax cost of the assets in each trust. The  
19 net after-tax value of the trust, which is the market value less the tax  
20 liability, is \$623,952,136 for Unit 1 and \$692,508,537 for Unit 2. While the  
21 Trust has certain tax advantages, the income and capital gains obtained  
22 by the Trust are only tax-deferred, not tax exempt. Failure to reduce the  
23 balances to reflect the taxes owed on the income and capital gains  
24 realized by the Trust will result in the Trust having inadequate funds to  
25 meet the cost of decommissioning Comanche Peak.

26 Q. HOW WERE THE PROJECTED FEES AND ADMINISTRATION  
27 EXPENSES DETERMINED?

28 A. The actual total annual fees and administration expenses incurred by the  
29 trust are shown on page 4 of the Funding Analysis. This was used as the

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1 basis to forecast fees and administration expenses. Several factors  
2 influence these expenses and must be considered in forecasting future  
3 expenses. First, there is a timing issue, as most of the expenses are paid  
4 in arrears on a quarterly basis. Another significant factor is the allocation  
5 between active managers and passive managers. The cost for active  
6 managers is generally higher than for passive managers. At present, our  
7 equity segment is passively managed and our fixed income segment is  
8 actively managed. This allocation is expected to remain the same until the  
9 equity allocation is reduced in later years, at which time the additional  
10 allocations to cash should keep the fees relatively stable. Normal  
11 expenses were developed from an analysis of full-year expenses from the  
12 ten-year period 2010 to 2019. The average of the actual expenses over  
13 this ten-year period was 0.1745 percent of NDF assets, which was used  
14 for the pre-tax expense.

15 **E. Assumed Net Investment Return**

16 Q. WHAT NET INVESTMENT RETURNS (GROSS RETURN LESS  
17 EXPENSES, FEES AND TAXES) WERE USED IN YOUR ANALYSIS?

18 A. Net investment returns after expenses, fees, and taxes, which vary based  
19 upon asset allocation are detailed on pages 13-15 of the Funding Analysis  
20 based on the time periods corresponding to stipulated portfolio  
21 composition limits in 16 TAC § 25.303(e)(3)(B)(vi).

22 Q. PLEASE SUMMARIZE HOW THE NET INVESTMENT RETURNS WERE  
23 DETERMINED.

24 A. The net investment return for each year was derived in three stages. First,  
25 the long-term expected pre-tax gross investment return was determined  
26 for equity, fixed income, and cash. Next, the expected rate for fees,  
27 administration expenses and taxes was determined. Finally, asset  
28 allocation was established for different time periods during the NDF's life.  
29 The net investment return for the portfolio for each time period was

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1 determined by subtracting the expected rate for fees, administration  
2 expenses, and taxes from the combined equity, fixed income, and cash  
3 returns and weighting each asset class's return.

4 Q. HOW WERE THE FORECASTED INVESTMENT RETURNS FOR EACH  
5 ASSET CLASS DEVELOPED?

6 A. Forecasted investment returns for each asset class were sourced from JP  
7 Morgan and from Aon Investments as shown on page 5 of the Funding  
8 Analysis. Comanche Peak averaged the forecasted returns from these  
9 sources to derive the forecasted returns for each asset class. Pages 13-15  
10 of the Funding Analysis show the calculation of the projected returns.

11 Q. HOW DID YOU DETERMINE THE PORTFOLIO INVESTMENT MIX?

12 A. The portfolio investment mix between equity, fixed income, and cash was  
13 developed by considering the liability of the trust, diversification,  
14 preservation of assets, and the applicable provisions of the 16 TAC  
15 § 25.303(e). Equity returns are significantly higher than the fixed income  
16 and cash returns, so based on the future liabilities, the equity exposure  
17 should be at the maximum permitted exposure, especially early in the life  
18 of the trust when there is sufficient time to recover from any market  
19 downturns. Pursuant to the restrictions of 16 TAC § 25.303(e), Comanche  
20 Peak currently targets 60 percent of the NDF assets to be allocated to  
21 equity securities. In the early years, there will be very little cash, and any  
22 expenses can be covered with residual cash exposure while new  
23 contributions and dividends are being invested or through shorter term  
24 fixed income investments. Once decommissioning starts, Comanche Peak  
25 will allocate funds to cash based upon the requirements of 16 TAC  
26 § 25.303 and projected decommissioning expenditures as shown on  
27 pages 13-14 of the Funding Analysis. The remainder of the NDF  
28 (approximately 40 percent prior to the start of decommissioning) is  
29 invested in fixed income securities.



1 Q. WHEN DO YOU EXPECT TO REDUCE THE EQUITY EXPOSURE, AND  
2 WHY?

3 A. While a large allocation to equity investments is appropriate for long-term  
4 liabilities, as payment of decommissioning expenses draws closer, the  
5 volatility of equities requires a reduction in the equity exposure to preserve  
6 capital. 16 TAC § 25.303(e)(3)(B)(vi) limits the equity exposure to 30  
7 percent in years in which decommissioning expenditures occur. For Unit 1,  
8 this trigger point is reached in 2030, as shown on page 7 of the Funding  
9 Analysis. Beginning in 2027, Comanche Peak assumed an orderly three-  
10 year transition from 60 percent equity to 30 percent equity, adjusting the  
11 equity allocation by an average 10 percent each year to reach the required  
12 level by 2030. As shown on page 8 of the Funding Analysis, the second  
13 equity balance trigger point is reached in 2092, when the Weighted  
14 Average Life of the NDF reaches 2.5 years and no equity investments are  
15 allowed under 16 TAC § 25.303. Again, Comanche Peak assumed an  
16 orderly three-year transition from 30 percent equity to 0 percent equity  
17 beginning in 2089, adjusting the equity allocation by an average 10  
18 percent each year to reach the required level by 2092.

19 Q. HOW DID YOU DETERMINE THE ALLOCATION TO CASH WITHIN THE  
20 FIXED INCOME ALLOCATION?

21 A. During the collection period no cash is required as most cash needs can  
22 be covered with contributions and income. As decommissioning  
23 expenditures begin, the duration of the fixed income portfolio is shortened  
24 by adding a cash allocation. Pages 13-15 of the Funding Analysis shows  
25 the expenditures from the trust each year compared to the trust balance,  
26 and a calculation of the average during different time periods. To maintain  
27 sufficient liquid assets to meet the expected cash flow requirements, the  
28 cash component within the fixed income allocation for the period was  
29 assumed to be the percent required each year. Cash includes any fixed



1 income security with a maturity of less than one year, and these levels are  
2 consistent with Comanche Peak's investment strategy.

3 Q. PLEASE SUMMARIZE COMANCHE PEAK'S PORTFOLIO INVESTMENT  
4 MIX FOR EACH OF THE THREE TIME PERIODS YOU HAVE  
5 DISCUSSED?

6 A. The investment mix used in calculating the net investment returns detailed  
7 on pages 13-15 of the Funding Analysis are as follows:

- 8 • 60 percent Equities, 40 percent Fixed Income in 2019 through  
9 2027, then ramping down to 30 percent equity by 2030;
- 10 • 30 percent Equities, Cash in the percent required to meet  
11 expenditures for the year, and the remainder in Fixed Income in  
12 2030 through 2088, then ramping down to 0 percent equity by  
13 2091; and
- 14 • The percent required to meet expenditures in Cash and the  
15 remainder in Fixed Income for 2091 and thereafter.

16 Q. WHAT OTHER COSTS WERE INCLUDED IN THE FORECAST OF  
17 INVESTMENT RETURNS?

18 A. Federal income taxes must also be included. The current federal income  
19 tax rate of 20 percent is assumed to remain constant during the life of the  
20 trust. Additionally, it is assumed there will be no state income tax.

21 Q. WHAT ACTIONS WILL COMANCHE PEAK TAKE IN THE FUTURE TO  
22 ASSURE THE ADEQUACY OF THE DECOMMISSIONING FUNDING  
23 AMOUNTS?

24 A. The funding amounts being requested in this case have been carefully  
25 and thoughtfully derived. Nevertheless, of necessity, assumptions have  
26 been made regarding future economic conditions, including inflation rates,  
27 investment performance, investment alternatives, tax rates, and timing of  
28 expenditures. Furthermore, future changes in technology and regulatory



1 requirements can impact the decommissioning cost itself. Periodic reviews  
2 of all assumptions and cost estimates, in light of experienced and  
3 expected conditions, will therefore be conducted at least every five years  
4 throughout Comanche Peak's operating life, as required by 16 TAC  
5 § 25.303(f)(2). When appropriate, Comanche Peak will request  
6 adjustments to the funding amount to recognize needed changes.

7 Q. ARE ANY OF THE DECOMMISSIONING FUNDS DEPOSITED IN "NON-  
8 QUALIFIED" ACCOUNTS?

9 A. No.

10 **F. Decommissioning Funding Plan**

11 Q. PLEASE DESCRIBE THE FUNDING PLAN USED TO DERIVE THE  
12 EXPENSE LEVELS REQUESTED.

13 A. The funding plan shown on pages 20-24 of the Funding Analysis uses the  
14 assumptions described previously, and projects the trust investments and  
15 expenditures from January 1, 2015, through December 31, 2096, on an  
16 annual basis. The annual calculations for each unit are shown on pages  
17 20-24. Column (B) shows the funding levels (contributions to the trust)  
18 based on the current collection rate through 2033. Column (C) indicates  
19 the expected earnings of the fund based on the net investment return  
20 discussed earlier in my testimony. The investment return percentage is  
21 applied to the ending balance of the prior period plus one half the current  
22 period contributions, less the current period decommissioning outlays.  
23 Column (E) is the resulting balance of the fund at the end of each time  
24 period, taking into consideration fund contributions, earnings, and  
25 decommissioning expenditures. At the end of the assumed  
26 decommissioning period, the trust balance, or the sum of all contributions  
27 and earnings less expenditures nets to zero, for each unit.



1 Q. PLEASE SUMMARIZE YOUR DECOMMISSIONING FUNDING  
2 TESTIMONY.

3 A. Utilizing the assumptions detailed earlier, the latest site-specific update for  
4 Comanche Peak decommissioning, and the PUCT's 10 percent  
5 contingency limitation, a decommissioning expense of \$19,352,282 per  
6 year, shown on page 24 of the Funding Analysis, is appropriate and  
7 reasonable. Thus, no change to Oncor's Rider NDC – Nuclear  
8 Decommissioning Charge is necessary.

9 **IV. CONCLUSION**

10 Q. ARE THE COMANCHE PEAK NUCLEAR DECOMMISSIONING TRUST  
11 FUNDS INVESTED PRUDENTLY AND IN COMPLIANCE WITH 16 TAC  
12 § 25.303(e)?

13 A. Yes. The agreements, practices, and policy I described in this testimony  
14 ensure Comanche Peak's compliance with 16 TAC § 25.303(e).

15 Q. PLEASE SUMMARIZE YOUR TESTIMONY.

16 A. Comanche Peak's proposed costs of nuclear decommissioning are  
17 reasonable. These costs have been developed in compliance with the  
18 PUCT's rules and utilizing sound investment principles. The annual  
19 funding requirements have been calculated using reasonable projections  
20 as to investment returns, inflation levels, and administrative costs and  
21 fees. Collections from the current Rider NDC are consistent with the  
22 annual funding requirements that have been calculated by Comanche  
23 Peak, such that no increase to the collection rate is necessary at this time.

24 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

25 A. Yes, it does.

---

**Moldovan - Direct  
Comanche Peak Power Company  
2020 Nuclear Decommissioning Study**



1    **STATE OF TEXAS**        §  
2                                    §  
3    **COUNTY OF DALLAS**    §  
4

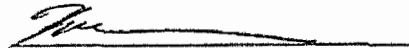
5

6            **BEFORE ME**, the undersigned authority, on this day personally appeared  
7    Kristopher Moldovan, who, having been placed under oath by me, did depose as  
8    follows:

9            My name is Kristopher Moldovan. I am of legal age and a resident of the  
10   State of Texas. The foregoing direct testimony and the attached exhibits offered  
11   by me are true and correct, and the opinions stated therein are, to the best of my  
12   knowledge and belief, accurate, true and correct.

13

14

  
Kristopher Moldovan

17

18

19

20            **SUBSCRIBED AND SWORN TO BEFORE ME** by the said Kristopher  
21    Moldovan this 30th day of November, 2020.

22

23

24

25



  
Notary Public, State of Texas



**COMANCHE PEAK POWER COMPANY LLC  
NUCLEAR DECOMMISSIONING TRUST**

**EFFECTIVE DATE: September 1, 2017**

**INVESTMENT POLICY**

**I. Statement of Purpose**

The purpose of this Investment Policy Statement (“IPS”) is to define the policies for the investment management and investment oversight of the Comanche Peak Power Company LLC (“Company”) Nuclear Decommissioning Trust (“Fund”). The IPS sets forth the objectives for the Fund and the strategies to achieve those objectives; overall investment policies for the Fund; procedures to monitor and control the portfolio; and the delineation of duties for those responsible for management, investment, and oversight.

The IPS is intended to comply with the prudent man investment standards. As such, investment managers are hereby instructed to act with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent man acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims. Additionally, the policy limits contained herein are not so absolute as to require the investment manager to take any action contrary to that dictated prudence.

This IPS may not be modified except by approval of the Company Nuclear Decommissioning Trust Committee (“Committee”).



## **II. Fund Objectives**

The Fund's primary objective is to satisfy Company nuclear decommissioning obligations and expenses in compliance with the requirements of the Nuclear Regulatory Commission ("NRC"), the Internal Revenue Service ("IRS"), the Public Utility Commission of Texas ("Commission") and the provisions of the Trust Agreement, as amended. Furthermore:

- Assets of the Fund shall be invested with a goal of earning a reasonable return commensurate with the need to preserve the value of the assets of the Fund;
- In keeping with prudent investment practices, the portfolio of securities held in the Fund shall be diversified to the extent reasonably feasible given the size of the Funds;
- In selecting investments, the impact of the investment on the volatility and expected return of the assets of the Funds, net of fees, commissions, expenses, and taxes should be considered;
- The assets of the Fund shall be allocated with an acceptable level of risk taking into account market conditions, remaining time horizon before commencement and completion of decommissioning, and the funding status of the Fund.

## **III. Responsibilities**

The Committee is responsible for the oversight and management of the Fund's investments. The Committee, may, at its discretion, retain the services of consultants and other service providers (an "Advisor") to assist the Committee in discharging its obligations for the plan.

The Committee agrees that in carrying out its responsibilities it will:

- Retain the right to replace an Advisor;
- Work with an Advisor to establish a framework for the management of the Fund's assets;
- Make determinations whether fee schedules of the Advisor are reasonable;
- Investigate and determine whether past administration of Fund by the Advisor has been reasonable and suitable;
- Review at least annually, and revise as appropriate, the provisions of this IPS;
- Ensure that total trustee and investment manager fees paid on an annual basis by the Fund for the entire portfolio, including any comingled funds, shall not exceed 0.7% of the entire portfolio's average annual balance;
- Ensure that Fund is managed so that funds are available at the time of decommissioning; and



**Page 3**

- Periodically review the performance of the Fund's investments.

Advisor is responsible for the following:

- Assumption of discretion over Fund assets for manager selection, rebalancing and implementation of this IPS, as approved;
- Asset and liability analysis;
- Advising the Committee regarding IPS development;
- Assisting the Committee with the maintenance of the IPS;
- Investment manager structure analysis;
- Investment manager search and selection, including investigation and determination of suitability and financial strength;
- Monitor and report to the Committee the total trustee and investment manager fees paid on an annual basis by the Fund for the entire portfolio, including any comingled funds, to help Committee ensure that such fees shall not exceed 0.7% of the entire portfolio's average annual balance;
- Performance measurement analysis and quarterly investment performance reports;
- Periodic meetings with the Committee.

The Advisor agrees that in carrying out its responsibilities it will act only within the framework established by the Committee and outlined in this IPS, and promptly inform the Committee of any recommended changes to the asset allocation, investment strategies, or investment managers.

**IV. Asset Allocation**

The table below outlines the Fund's target allocation for both equity and fixed income allocations. The Advisor will monitor the Fund's position with respect to the allocation outlined below, making asset allocation and manager/strategy changes to the Fund as appropriate. The Advisor will notify the Committee when asset allocation or manager/strategy changes have taken place. This is done to keep the Committee informed regarding the actions taken by the Advisor to execute the IPS.



<u>Asset Class</u>	<u>Asset Mix</u>		
	<u>Minimum</u>	<u>Normal</u>	<u>Maximum</u>
<b>Equity</b>	<b>0%</b>	<b>60%</b>	<b>60%</b>
-Domestic	0%	40%	60%
-Non US	0%	20%	25%
<b>Fixed Income</b>	<b>35%</b>	<b>40%</b>	<b>100%</b>
Cash	0%	0%	5%

The guidelines and objectives in this IPS outline an asset allocation that the Committee has determined is appropriate for managing the Fund assets. Furthermore, in developing this asset allocation, the Committee and its Advisor considered the following:

- Broad economic factors;
- Historical and prospective information regarding the capital market performance;
- Applicable investment strategies; and
- The current regulatory environment and liabilities of the Fund.

The Committee recognizes that as market, regulatory, and business conditions change, this allocation may require adjustments. The Advisor will, on an ongoing basis, monitor these conditions and may recommend amendments to the allocation.

#### Rebalancing

Execution of asset class rebalancing must account for the tax impact to the Fund. Rebalancing may be implemented through any combination of the following actions: a) purchase/sale of securities, b) allocation of new contributions. If market fluctuations raise the equity allocation above the maximum, new contributions are to be allocated to Fixed Income until the Asset Mix is back to the Normal allocation. Reallocation of current investments may also be considered for moving toward Normal allocations, if judged prudent.

#### **V. Performance Objectives**

The performance objective of the Fund is to provide a competitive, after-tax return on Fund assets, while at the same time preserving the value of the assets in the Fund within the risk tolerance established by the Committee.



The table below summarizes the performance targets for the investments relative to the market-based benchmarks indicated. In each case, the comparison of actual performance relative to benchmark is done on an after-tax, net of fees basis.

*After-tax, net of fees performance targets for total fund and by asset class:*

	ANNUAL PERFORMANCE TARGET (BASIS POINT SPREAD OVER BENCHMARK)	BENCHMARK
Total Fund	+10	Weighted average of asset class benchmarks
Domestic Equity	+5	S&P 500
Non US Equity	+5	MSCI EAFE
Fixed Income and Cash	+25	Barclays Capital Govt/Credit

**VI. Selection and Retention Criteria for Investment Managers or Funds**

The Advisor will make all decisions regarding retention, replacement, or elimination of managers, funds, or investment strategies for the Fund; however, Committee shall retain the right to remove or replace investment managers, institutional trustees or Advisor at its discretion. The Advisor will incorporate an understanding of the Committee's short and long-term investment objectives, as well as the guidelines of this IPS, when making investment decisions. The Advisor will inform the Committee with respect to these decisions.

The Advisor recognizes that decisions regarding managers are always prospective. Factors considered when making changes to manager structure include (but are not limited to) the following:

- Investment results compared to appropriate benchmarks and peer groups;



**Page 6**

- Consistency of investment philosophy and process;
- Stability of portfolio management team, including research support;
- Change in firm ownership, management, and incentives for key professionals;
- Financial stability and strength for purposes of liability.

Other areas of consideration include the following:

- Legal or regulatory issues;
- Adherence to investment guidelines;
- Assets under management;
- Client service;
- Investment fees.

**VII. Investment Guidelines**

Each investment manager appointed by the Committee to execute the IPS will invest Fund assets as prescribed by the Committee in accordance with this IPS and its judgments concerning relative investment values. In particular, the investment manager is accorded full discretion, within policy limits contained herein and guidelines of the manager's investment management agreement, to (1) select individual securities, (2) make periodic adjustments to the proportions of investment mediums for which the investment manager is responsible and (3) diversify Fund assets, to best attain the investment objectives.

The investments are limited to common stocks; preferred stocks; collective trust funds; pooled investment funds, including real estate; government securities; corporate bonds, including convertibles; obligations of a state or local government; and short-term money market instruments. No investments shall be initiated in collective trust funds and pooled investment funds without prior approval by the Committee or its designated representative. Any other investment mediums that the investment manager deems appropriate, not previously permitted by this IPS, may be presented by the investment manager to the Committee. The investment managers are authorized to maintain cash equivalents in United States Treasury bills and/or interest bearing instruments, subject to rating requirements set out in the Fixed-Income Investments section of this IPS.

***Tax Considerations***



**Page 7**

1. The investment manager should manage the assets with the current and prospective tax rates and their impact taken into consideration with the objective of maximizing returns on an after-tax basis.
2. The applicable tax rate for the qualified trust is 20%. The tax rate is the same for both income and capital gains.
3. Tax deductible expenses incurred by the Fund may be offset by taxable investment income.

***General Considerations***

1. All trust investments must comply with the guidelines set forth by Commission Substantive Rule 25.303, which can be found at their web site: <https://www.puc.texas.gov/agency/rulesnlaws/subrules/electric/25.303/25.303.pdf>
2. There is no requirement for the investment managers to maintain significant liquid reserves. However, from time to time, as the Committee may determine, portions of an investment manager's account may be called upon for payment of decommissioning related expenses.
3. Security trades shall be made with an emphasis on highest net proceeds or lowest net cost.
4. The Fund should be diversified with at least 20 different issues of securities and, with the exception of securities issued by the United States Government, the securities of a single issuer shall not represent more than 5% of the market value of the total portfolio.
5. There shall be no investments in securities of the Company or any of its subsidiaries, nor shall the investment manager invest in any equity or debt instrument of its own or that of any of its affiliates; however, collective trust funds or pooled investment funds in which such securities are held are not so restricted.
6. There shall be no trading of warrants or other options, including puts, calls and straddles, except when acquired as a result of the purchase of another security, or in the case of options, when sold as part of a covered position.
7. The use of leverage to purchase securities or the purchase of securities on the margin is prohibited.

***Domestic Equity Investments***



**Page 8**

1. The objective of the equity investments is to match the performance of the S&P 500 Index through replicating the holdings and weightings of the S&P 500 Index.
2. Investments in issues convertible to common stock shall be considered equities for asset mix and performance measurement except as previously agreed to, in writing, by the investment manager and the Committee, or its designated representative.
3. At least 70% of the aggregate (domestic plus non-US) equity portfolio, based on market value, must have a quality ranking from a major rating service. The rated portion of the domestic portfolio must have a composite quality ranking at least equivalent to that of the S&P 500 index.
4. The Fund should not invest in equity securities of companies with capitalizations of less than \$100 million.

***Non US Equity Investments***

1. The objective of the equity investments is to match the performance of the MSCI EAFE Index through replicating the holdings and weightings of the MSCI EAFE Index.
2. Investments in issues convertible to common stock shall be considered equities for asset mix and performance measurement except as previously agreed to, in writing, by the investment manager and the Committee, or its designated representative.
3. At least 70% of the aggregate (domestic plus non-US) equity portfolio, based on market value, must have a quality ranking from a major rating service. The rated portion of the non-US portfolio must have a composite quality ranking at least equivalent to that of the MSCI EAFE index.
4. The Fund should not invest in equity securities of companies with capitalizations of less than \$100 million.

***Fixed-Income Investments***

1. The Fund shall not invest in corporate or municipal debt securities that have a bond rating below investment grade ("BBB-" by Standard & Poor's Corporation or "Baa3" by Moody's Investor's Service) at the time that the securities are purchased.
2. The overall portfolio of debt instruments shall have a quality level not below a "AA" grade by Standard & Poor's Corporation or "Aa2" by Moody's Investor's Service. In calculating the quality of the overall portfolio, debt securities issued by the Federal



**Page 9**

government shall be considered as having a "AAA" rating.

3. As a general rule, the municipal portfolio should be broadly diversified as to geography and issuer as well as security type.
4. Investment should be in investment grade, readily marketable fixed income securities including, but not limited to, obligations of the U.S. Government and its agencies, domestic and foreign corporations, municipalities and municipal agencies, supranational entities, mortgage related and asset-backed securities.
5. Foreign investments may include obligations of governments other than the United States, other foreign governmental and public sector agencies, international organizations and agencies, foreign corporations and banks, rate A or higher.
6. No more than 20% of the market value of the portfolio may be invested in non-dollar denominated fixed income securities. No more than 10% of the market value of the portfolio may be exposed to foreign currency fluctuation, i.e., any amount above 10% must be hedged into U.S. dollars.

***Cash Equivalents***

1. In addition to the applicable restrictions under fixed-income investments, diversification must be maintained. Cash-equivalent investments shall be made with concern for quality over return or yield.
2. Investments should be high quality, readily marketable money market securities including, but not limited to, Treasury bills, commercial paper rated A1 or P1, certificates of deposit and bankers' acceptance of domestic and foreign banks, and repurchase agreements purchased from primary dealers.
3. Investment in time or demand deposits must be with banks incorporated within the United States ranked in the top 100 and/or non-United States banks located in the United States of comparable size and quality. Such investments should be made in the short-term obligations of banks rated "P1" by Moody's Investor Service or an equivalent rating of any other nationally rated service.

***Derivatives***

1. The use of derivative securities in the Fund is limited to those whose purpose is to enhance returns of the Fund without a corresponding increase in risk or to reduce risk of the portfolio.
2. Derivatives may not be used to increase the value of the portfolio by any amount



greater than the value of the underlying securities.

3. Prohibited derivative securities include, but are not limited to, mortgage strips; inverse floating rate securities; leveraged investments or internally leveraged securities; residual and support tranches of collateralized mortgage obligations; tiered index bonds or other structured notes whose return characteristics are tied to non-market events; uncovered call/put options; large counter-party risk through over-the-counter options, forwards and swaps; and instruments with similar high-risk characteristics.

#### **VIII. Proxy Voting**

Investment managers have been given the responsibility for voting proxy issues on securities held in their respective portfolios and such votes should be commensurate with the objectives of the Fund and this IPS.

#### **IX. Brokerage**

Brokerage commissions, incurred in the normal course of trading securities, are expenses of the Fund, and as such, are subject to the total portfolio expense limitation set forth in this IPS. Investment managers will have discretion and should seek “best execution” services.

#### **X. Review Process**

##### Policy Review

It is recognized that changes to the investment objective and policies of the Fund may be in order from time to time to ensure that it accurately reflects the Committee's views.

##### Performance Review

The Committee, or its representative, shall meet with the representative(s) of the investment manager(s) at least annually to review performance.

##### Reporting

The investment manager shall keep accurate records of all investments and other transactions hereunder, and all records relating thereto shall be open at all reasonable times to inspection and audit by any person or persons designated by the Committee or by the Board of Directors of the Company.



The trustee shall submit quarterly reports detailing investment holdings, account transactions and performance results. Individual transactions advices will be sent as requested. The trustee shall keep accurate records of all investments, receipts and disbursements and other transactions hereunder, and all records relating thereto shall be open at all reasonable times to inspection and audit by any person or persons designated by the Committee or by the Board of Directors of the Company.

Within 60 days following the close of the Fund's fiscal year (or following the close of such other annual period as may be agreed upon by the investment manager and the Committee) the trustee shall file a written report setting forth all securities and other property purchased and sold; all receipts, disbursements and other transactions effected by it during such annual period; and showing the securities and other property held at the end of such period.





Control Number: 50945



Item Number: 17

Addendum StartPage: 0





**DOCKET NO. 50945**

<b>APPLICATION OF COMMANCHE</b>	<b>§</b>	<b>PUBLIC UTILITY COMMISSISON</b>
<b>PEAK POWER COMPANY LLC FOR</b>	<b>§</b>	
<b>REVIEW OF NUCLEAR</b>	<b>§</b>	<b>OF TEXAS</b>
<b>DECOMMISSIONING COST STUDY</b>	<b>§</b>	
<b>AND FUNDING ANALYSIS UNDER</b>	<b>§</b>	
<b>16 TAC § 25.303(f)(2)</b>	<b>§</b>	

**COMMISSION STAFF'S RECOMMENDATION ON THE SUPPLEMENTED APPLICATION**

**COMES NOW** the Staff (Staff) of the Public Utility Commission of Texas (Commission), representing the public interest, and files this Recommendation on the Supplemented Application. In support thereof, Staff would show the following:

**I. BACKGROUND**

On June 16, 2020, Comanche Peak Power Company LLC (Comanche Peak) filed an application for review of a nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code (TAC) § 25.303(f)(2).

On November 5, 2020, the Commission considered Comanche Peak's application and determined that the application and subsequent filings did not include evidence required by 16 Texas Administrative Code § 25.303(f)(4)(A), (B), and (D). The application was remanded to the Office of Policy and Docket Management, and on November 9, 2020, Order No. 4 was filed, which established a deadline of December 11, 2020 for Staff to file a recommendation on the supplemented application. Therefore, this pleading is timely filed.

**II. RECOMMENDATION ON SUPPLEMENTED APPLICATION**

As detailed in the attached testimony of Darryl Tietjen of the Commission's Rate Regulation Division, Staff recommends approval of the application. The supplemental evidence provided by Comanche Peak on November 30, 2020, demonstrates compliance with 16 TAC § 25.303(f)(4).

**III. CONCLUSION**

Staff respectfully requests the entry of an order approving the application.



Dated: December 11, 2020

Respectfully submitted,

**PUBLIC UTILITY COMMISSION OF TEXAS  
LEGAL DIVISION**

Rachelle Nicolette Robles  
Division Director

Eleanor D'Ambrosio  
Managing Attorney

/s/ John Harrison  
John Harrison  
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(512) 936-7277  
(512) 936-7268 (facsimile)  
John.Harrison@puc.texas.gov

**DOCKET NO. 50945**

**CERTIFICATE OF SERVICE**

I certify that, unless otherwise ordered by the presiding officer, notice of the filing of this document was provided to all parties of record via electronic mail on December 11, 2020, in accordance with the Order Suspending Rules, issued in Project No. 50664.

/s/ John Harrison  
John Harrison



**DOCKET NO. 50945**

<b>APPLICATION OF COMANCHE PEAK</b>	<b>§</b>	<b>PUBLIC UTILITY COMMISSION</b>
<b>POWER COMPANY LLC FOR</b>	<b>§</b>	
<b>REVIEW OF NUCLEAR</b>	<b>§</b>	<b>OF TEXAS</b>
<b>DECOMMISSIONING COST STUDY</b>	<b>§</b>	
<b>AND FUNDING ANALYSIS UNDER 16</b>	<b>§</b>	
<b>TAC § 25.303(f)(2)</b>	<b>§</b>	



**TESTIMONY OF DARRYL TIETJEN  
IN SUPPORT OF THE SUPPLEMENTED APPLICATION**

**RATE REGULATION DIVISION**

**PUBLIC UTILITY COMMISSION OF TEXAS**

**DECEMBER 11, 2020**



TESTIMONY OF DARRYL TIETJEN  
IN SUPPORT OF THE SUPPLEMENTED APPLICATION

TABLE OF CONTENTS

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III.	Recommendation.....	3
IV.	Discussion.....	4

Attachment DT-1

List of Testimonies by Darryl Tietjen



1           **I. INTRODUCTION**

2           **Q.     Please state your name and business address.**

3           A.     Darryl Tietjen, 1701 N. Congress Avenue, Austin, Texas.

5           **Q.     By whom are you employed and in what capacity?**

6           A.     I am employed by the Public Utility Commission of Texas (Commission) as the Director  
7                 of the Rate Regulation Division.

9           **Q.     What are your principal areas of responsibility?**

10          A.     In addition to the management of the Rate Regulation Division, I am responsible for  
11                 recommending fair rates of return on invested capital, evaluating financial integrity  
12                 requirements, conducting various financial analyses, leading or participating in various  
13                 rulemaking projects, and preparing testimony concerning various financial matters relevant  
14                 to public utilities regulated by the Commission.

16          **Q.     Please describe your educational background and professional qualifications.**

17          A.     I hold a Master of Business Administration degree with concentrations in finance and  
18                 accounting from The University of Texas at Austin (UT Austin), and a Bachelor of  
19                 Business Administration degree with a concentration in finance, also from UT Austin.  
20                 While earning my master's degree, I was employed by UT Austin as an instructor, teaching  
21                 two sections of undergraduate corporate finance. Prior to attending graduate school, I was  
22                 employed by a commercial bank, where I was principally involved in investment activities  
23                 and internal and external financial reporting.

24                 I am a Certified Public Accountant (CPA) licensed in the state of Texas and a  
25                 member of the Texas Society of Certified Public Accountants (TXCPA). I have twice  
26                 served as chairman of the annual TXCPA-sponsored Energy Conference, for which I have  
27                 been a committee member for approximately 20 years.

28                 I also hold the designation of Chartered Financial Analyst (CFA), which is awarded  
29                 by the CFA Institute after successful completion of its three-part examination process over



1 a minimum three-year period. The curriculum for the CFA charter covers a defined body  
2 of knowledge fundamental to the practice of investment management, and includes the  
3 areas of finance, accounting, economics, statistics, and ethical and professional conduct.  
4

5 **Q. Have you previously testified before this Commission?**

6 A. Yes. Attachment DT-1 provides a summary of the dockets in which I have filed direct or  
7 other testimony.  
8

9 **II. PURPOSE OF TESTIMONY**

10 **Q. What is the purpose of your testimony in this proceeding, Docket No. 50945,**  
11 ***Application of Comanche Peak Power Company LLC for Review of Nuclear***  
12 ***Decommissioning Cost Study and Funding Analysis Under 16 TAC § 25.303(f)(2)?***

13 A. The purpose of my testimony is to supplement my initial recommendation filed on  
14 September 21, 2020 in this docket and address the information provided in the testimony  
15 filed on November 30, 2020 by Kristopher Moldovan on behalf of Comanche Peak Power  
16 Company LLC (CPPC). Mr. Moldovan filed his testimony in response to Order No. 4,  
17 *Requesting Additional Information and Establishing Procedural Schedule*, to provide  
18 additional information necessary to cure the deficiencies the Commission identified in the  
19 application and subsequent filings.<sup>1</sup>  
20

21 **III. RECOMMENDATION**

22 **Q. Please state your recommendation in this proceeding.**

23 A. I recommend that the Commission approve CPPC's request. In my opinion, Mr.  
24 Moldovan's testimony includes the information necessary to satisfy the requirements of 16  
25 Texas Administrative Code § 25.303 (decommissioning rule). I discuss my  
26 recommendation in greater detail below.  
27

---

<sup>1</sup> Order Remaining Proceeding to Docket Management (Nov. 5, 2020).



1        **IV.    DISCUSSION**

2        **Q.    Please describe the key information Mr. Moldovan provides in his testimony and how**  
3        **you believe it addresses the evidentiary deficiencies identified by the Commission.**

4        A.    The Commission's *Order Remanding Proceeding to Docket Management* (filed November  
5        5, 2020) states that "...the application and subsequent filings did not include evidence  
6        required by 16 Texas Administrative Code § 25.303(f)(4)(A), (B), and (D)..."

7                With regard to the requirements of the referenced subparagraph (A) of subsection  
8        (f)(4) of the decommissioning rule,<sup>2</sup> it is my opinion that the filing of Mr. Moldovan's  
9        testimony and the information contained therein demonstrate the necessary compliance. I  
10       believe that Mr. Moldovan's testimony provides an appropriately detailed discussion of the  
11       decommissioning cost study, the related funding analysis, and the requested funding  
12       amount.

13               With regard to the referenced subparagraph (B) of subsection (f)(4) of the  
14       decommissioning rule,<sup>3</sup> Mr. Moldovan's testimony includes an attachment (Exhibit KM-  
15       1) containing CPPC's *Investment Policy* that, in my opinion, demonstrates the prudence of  
16       the decommissioning trust funds' investment policies and compliance with the rule's  
17       investment guidelines. In addition to a number of various other issues, CPPC's *Investment*  
18       *Policy* addresses key points such as the trust funds' asset allocations, tax considerations,  
19       performance objectives, and criteria for the selection and retention of the funds' investment  
20       managers.

21               With regard to the referenced subparagraph (D) of subsection (f)(4) of the  
22       decommissioning rule,<sup>4</sup> Mr. Moldovan states on page 11, lines 4 through 6 of his testimony

---

<sup>2</sup> The provisions of 16 TAC § 25.303(f)(4)(A) state that "The cost study and funding analysis shall be accompanied by a report or testimony supporting the analyses and the requested annual funding amount."

<sup>3</sup> The provisions of 16 TAC § 25.303(f)(4)(B) state that "The Nuclear Decommissioning Trust Funds administrator shall demonstrate that the decommissioning funds are being invested prudently and in compliance with the investment guidelines in subsection (e) of this section."

<sup>4</sup> The provisions of 16 TAC § 25.303(f)(4)(D) state that "The Transferee Company (or the funds administrator and the Transferee Company, if different) shall demonstrate efforts to achieve optimum tax efficiency as defined in subsection (e)(3)(B)(iii) of this section, including, as applicable, maintenance of tax-exempt status



1 that, “All decommissioning funds are deposited and invested in tax-qualified nuclear  
2 decommissioning trusts, as called for under 16 TAC § 25.303(e)(3)(B)(iii).” As a point of  
3 additional reference, I would note that his statement is consistent with the information  
4 contained in CPPC’s most recent annual nuclear decommissioning report that CPPC filed  
5 on May 13, 2020 in Project No. 34277, *Annual Report on the Status of Nuclear*  
6 *Decommissioning Funding*. Based on this information, I believe that CPPC has  
7 demonstrated compliance with the requirements of 16 TAC § 25.303(f)(4)(D).  
8

9 **Q. Do you believe that CPPC’s funding process flows through to ratepayers appropriate**  
10 **economic benefits?**

11 A. Yes. Mr. Moldovan discusses on pages 8 through 10 of his testimony the process by which  
12 CPPC makes monthly contributions to the decommissioning trust fund. As he explains,  
13 CPPC’s monthly funding process—which differs in funding frequency from the weekly  
14 funding period described in 16 TAC § 25.303(g)(2)(C)—reflects the fact that a certain  
15 portion of the funding contribution is essentially a pre-funding of amounts that have been  
16 billed to ratepayers but not yet actually paid, and the result is a time-value-of-money effect  
17 that replicates the imputation of interest. Mr. Moldovan indicates in his testimony (at the  
18 bottom of page 9) that CPPC and its predecessors have used (and the Commission has  
19 approved) this funding approach for at least the last 15 years.  
20

21 **Q. Do you generally agree with Mr. Moldovan’s statement on page 9, lines 14 through**  
22 **16 of his testimony that, “from a monthly net use of funds standpoint, the effect of**  
23 **Comanche Peak’s approach is that the NDF receives the contribution as of the date**  
24 **the revenues are received by Oncor, without any delay”?**

25 A. Yes. I would note, however, that I also agree with his statements on page 10, lines 3  
26 through 5 of his testimony, where he states, “If the Commission orders a different approach  
27 to NDF [Nuclear Decommissioning Fund] deposits in this proceeding, Comanche Peak

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or efforts to achieve ‘qualified’ status in accordance with Internal Revenue Code §468A (or any successor thereto) with respect to its taxable nuclear decommissioning trust funds.”



1 will of course comply with the Commission's order." As I indicated above, I believe that  
2 the process by which CPPC makes contributions to the trust fund appropriately takes into  
3 account the time value of money; nevertheless, I understand that the Commission may  
4 choose to direct CPPC to alter the funding process so as to more explicitly reflect the effect  
5 of imputed interest as provided for in 16 TAC § 25.303(g)(2)(C).  
6

7 **Q. Does this conclude your testimony?**

8 **A. Yes.**



**LIST OF TESTIMONIES  
BY DARRYL TIETJEN**

<u>P.U.C. Docket</u>	<u>Company</u>	<u>Subject</u>
10060	Brazos River Authority	Rate of Return
10462	Tex-La Electric Cooperative	Interim Rates/ROR
10325	Central Texas Electric Cooperative	Rate of Return
10744	Rayburn Country Electric Cooperative	Sale, Transfer, Merger
10820	Magic Valley Electric Cooperative	Rate of Return
11347	Johnson County Electric Cooperative	Rate of Return
11571	Fayette Electric Cooperative	Rate of Return
11520	Southwestern Public Service Company	Rate of Return
12065	Houston Lighting & Power Company	Decomm. Exp.
12700	El Paso Electric Company	Rate Moderation/ Mirror CWIP
12815	Pedernales Electric Cooperative	Rate of Return
12820	Central Power and Light Company	Decomm. Exp.
12852	Gulf States Utilities Company	Decomm. Expense/ Contra-AFUDC
13827	Southwestern Public Service	Notice of Intent
14965	Central Power and Light Company	ROR/ Decomm. Exp.
15638	Texas Utilities Electric Company	Transmission COS
16585	T&H Communications	SPCOA
16705	Entergy Gulf States	Rate of Return
16705	Entergy Gulf States	ROR on ECOM
18290	Entergy Gulf States	Int. on Tax Remand
18845	Central and South West Companies	Financial Condition of Resource Providers
21527	TXU Electric Company	Securitization
21528	Central Power and Light Company	Securitization
22344	Generic Unbundled Docket	Return on Equity
22355	Reliant Energy	ECOM Estimate
22352	Central Power and Light Company	Cost of Debt
22354	West Texas Utilities Company	Refinancing Costs
22350	TXU Electric Company	ECOM Estimate
26942	Texas-New Mexico Power Company	Reg Asset Treatment
29206	Texas-New Mexico Power Company	Stranded Costs & True-up Issues
29206	Texas-New Mexico Power Company	Int on Stranded Costs
29526	CenterPoint Energy Houston Electric	Stranded Costs & True-up Issues
29526	CenterPoint Energy Houston Electric	Int. on Stranded Costs
30485	CenterPoint Energy Houston Electric	Financing Order



**LIST OF TESTIMONIES  
BY DARRYL TIETJEN (cont.)**

30706	CenterPoint Energy Houston Electric	Comp. Transition Charge
31056	AEP Texas Central Company	Stranded Costs & True-up Issues
31994	Texas-New Mexico Power Company	Comp. Transition Charge
32475	AEP Texas Central	Financing Order
32907	Entergy Gulf States, Inc.	Interest on Storm Costs
33106	Texas-New Mexico Power Company	Interest Rate on CTC Financing Order
33586	Entergy Gulf States, Inc.	Interest Amount
32795	\$5 Billion Stranded-Cost Threshold	Financing Order
34448	CenterPoint Energy Houston Electric	Support of Stipulation
34077	Oncor Electric Delivery and Texas Energy Future Holdings Limited Partnership	
35038	Texas-New Mexico Power Company	Tariff Filing
33891	Southwestern Electric Power Co.	CCN Application
36918	CenterPoint Energy Houston Electric	Restoration Costs
36931	Entergy Texas	Restoration Costs
39504	CenterPoint Energy Houston Electric	Remanded True-up Costs
39722	AEP Texas Central Company	Remanded True-up Costs
40627	Austin Energy	Rate Issues
45188	Oncor Electric Delivery Company, et al.	Federal Inc. Taxes; Cost of Capital
46238	NextEra, Oncor	Federal Income Taxes
45414	Sharyland Utilities, et al.	Federal Income Taxes
46936	Southwestern Public Service Co.	Wind Facilities—Rate Treatment
46936	Southwestern Public Service Co.	Testimony in Support of Stipulation
46957	Oncor Electric Delivery Company	Testimony in Support of Stipulation (included in AIS item #420)
47527	Southwestern Public Service Company	Testimony in Support of Stipulation
48401	Texas-New Mexico Power Company	Testimony in Support of Stipulation



**LIST OF TESTIMONIES  
BY DARRYL TIETJEN (cont.)**

48439	Entergy Texas	Testimony in Support of Stipulation (Rate Case Exp) Rate-Related Issues
48929	Oncor Electric Delivery Company, Sharyland Utilities, LP, et al.	
49308	AEP Texas, Inc.	Testimony in Support of Stipulation (Financing Order)
49421	CenterPoint Energy Houston Electric, LLC	Financial Protection Measures; Securitization-Related ADFIT
49421	CenterPoint Energy Houston Electric, LLC	Testimony in Support of Stipulation
49494	AEP Texas	Financial Protection Measures; Securitization-Related ADFIT
49494	AEP Texas	Testimony in Support of Stipulation
49831	Southwestern Public Service Co.	Testimony in Support of Stipulation
49849	El Paso Electric Company, et al.	Accounting Issues;
49849	El Paso Electric Company, et al.	Testimony in Support of Stipulation





Control Number: 50945



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DOCKET NO. 50945

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APPLICATION OF COMANCHE PEAK § PUBLIC UTILITY COMMISSION  
POWER COMPANY LLC FOR REVIEW §  
OF NUCLEAR DECOMMISSIONING § FILING CLERK  
COST STUDY AND FUNDING § OF TEXAS  
ANALYSIS UNDER 16 TAC § 25.303(f)(2) §  
§

**JOINT REQUEST TO ADMIT ADDITIONAL EVIDENCE  
AND PROPOSED ORDER**

**COMES NOW** Comanche Peak Power Company LLC (Comanche Peak), together with the Staff (Staff) of the Public Utility Commission of Texas (Commission), representing the public interest, and files this Joint Request to Admit Additional Evidence related to the Commission's review of Comanche Peak's nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code (TAC) § 25.303(f). The Proposed Order includes revised proposed findings of fact, conclusions of law, and ordering paragraphs, in compliance with Order No. 4. In accordance with Order No. 4, this filing is timely on December 18, 2020.

**I. REQUEST TO ADMIT EVIDENCE**

The parties jointly request to admit the following additional evidence into the record of this proceeding:

- (a) Direct Testimony of Kristopher Moldovan on behalf of Comanche Peak, filed on November 30, 2020 (Interchange Item No. 16); and
- (b) Staff's Recommendation on the Supplemented Application, including the testimony of Darryl Tietjen, filed on December 11, 2020 (Interchange Item No. 17).

**II. PROPOSED ORDER**

The Proposed Order would approve Comanche Peak's recommendation regarding its nuclear decommissioning cost study and funding analysis under 16 TAC § 25.303 to make an adjustment in the allocation of collections between the Unit 1 and Unit 2 decommissioning funds but make no change in the current collection rate. The docket was processed in accordance with applicable statutes and Commission rules. Notice of the application was provided to interested

18



parties. No protests and no requests for hearing were filed. Therefore, Comanche Peak and Staff are the only parties to this proceeding.

### **III. CONCLUSION**

Staff has reviewed Comanche Peak's supplemental filing with the direct testimony of Kristopher Moldovan and, based on the testimony of Darryl Tietjen of the Commission's Rate Regulation Division, recommends its approval, and therefore, the parties respectfully request that the Commission adopt the attached findings of fact and conclusions of law as well as grant the admittance of the specified supplemental evidence.

Respectfully submitted,

/s/ Kirk D. Rasmussen

Kirk D. Rasmussen  
State Bar No. 24013374  
Jackson Walker LLP  
100 Congress Avenue, Suite 1100  
Austin, Texas 78701  
(512) 236-2000  
(512) 691-4427 (fax)  
Email: krasmussen@jw.com

**ATTORNEYS FOR COMANCHE PEAK POWER  
COMPANY LLC**

### **CERTIFICATE OF SERVICE**

I certify that a copy of this document was served on all parties of record on this date via the Commission's Interchange in accordance with the Commission's order in Docket No. 50664 suspending PUC Procedural Rule 22.74.

/s/ Kirk D. Rasmussen

Kirk D. Rasmussen



## EXHIBIT A – JOINT PROPOSED ORDER

DOCKET NO. 50945

APPLICATION OF COMANCHE PEAK	§	PUBLIC UTILITY COMMISSION
POWER COMPANY LLC FOR	§	
REVIEW OF NUCLEAR	§	OF TEXAS
DECOMMISSIONING COST STUDY	§	
AND FUNDING ANALYSIS UNDER 16	§	
TAC § 25.303(f)(2)	§	

### PROPOSED ORDER

This Order addresses the application of Comanche Peak Power Company LLC for review of its nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code (TAC) § 25.303(f)(2). The Commission approves (a) continuation of the annual funding amount of \$20,077,165 for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025; and (b) adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.

#### I. Findings of Fact

The Commission makes the following findings of fact.

##### Applicant

1. Comanche Peak is a foreign limited liability company registered with the secretary of state under filing number 802412555.
2. Comanche Peak is a power generation company registered with the Commission under power generation company number 20407.
3. Through Comanche Peak Nuclear Power Plant, Comanche Peak generates electricity that is intended to be sold at wholesale.

##### Application

4. On June 16, 2020, Comanche Peak filed an application for review of a study of the decommissioning costs of Comanche Peak Nuclear Power Plant, a financial escalation analysis of the decommissioning costs, and an updated funding analysis.



5. In the application, Comanche Peak requested no change to the current annual funding amounts for the cost of nuclear decommissioning related to Comanche Peak Nuclear Power Plant.
6. In the application, Comanche Peak requested an adjustment in the allocation of decommissioning funds between the Unit 1 and Unit 2.
7. On November 30, 2020, Comanche Peak supplemented its application with the direct testimony of Kristopher Moldovan.
8. In Order No. \_\_ filed on \_\_\_\_\_, the administrative law judge (ALJ) found the supplemented application administratively complete.

#### **Decommissioning Costs and Funding**

9. Comanche Peak administers a nuclear decommissioning trust fund for Comanche Peak Nuclear Power Plant, for which Oncor Electric Delivery Company, LLC is the collecting utility.
10. Comanche Peak's current annual funding amount approved in Docket No. 44845<sup>1</sup> is \$20,077,165.
11. Comanche Peak Nuclear Power Plant consists of two units, Unit 1 and Unit 2, and the annual amount collected to cover the cost of nuclear decommissioning is allocated between the two units.
12. The annual amount collected to cover the cost of nuclear decommissioning has, since 2015, been allocated between Unit 1 and Unit 2 at an average rate of 57.1% for Unit 1 and 42.9% for Unit 2.

#### **Comanche Peak Nuclear Power Plant Nuclear Decommissioning Trusts**

13. As of December 31, 2019, the net after-tax value of the trusts for Units 1 and 2 totaled \$1,316,460,673, consisting of \$623,952,136 for Unit 1 and \$692,508,537 for Unit 2.

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<sup>1</sup> *Application of Luminant Generation Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis*, Docket No. 44845, Order at Ordering Paragraph No. 2 (Nov 6, 2015).



14. The Decommissioning Cost Analysis for Comanche Peak Nuclear Power Plant prepared by TLG Services, Inc. dated May 2020 and the Financial Escalation Analysis for the Comanche Peak Nuclear Power Plant prepared by TLG in May 2020 estimate the total cost to decommission and completely dismantle Comanche Peak Nuclear Power Plant at \$1.729 billion in 2019 dollars, assuming a ten percent contingency.
15. Based on the results of the Decommissioning Study and Financial Escalation Analysis, Comanche Peak performed a Funding Analysis for Comanche Peak Nuclear Power Plant in June 2020.
16. The Funding Analysis shows a -2.7 percent difference between the required funding levels of \$19.4 million annually and the five-year average Comanche Peak Nuclear Power Plant decommissioning fund collections from 2015-2019 of \$19.9 million annually.
17. No change to the current annual collection rate is warranted because (a) there is only a small difference between the required annual funding rate and the five-year average actual annual collection rate, and (b) there is inherent and considerable uncertainty as to the predictability of long-term costs and market conditions.
18. Based on the results of the Funding Analysis, the allocation between the Unit 1 and Unit 2 decommissioning funds should be adjusted from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% for Unit 2.
19. Comanche Peak's cost study and funding analysis was accompanied by testimony supporting its analysis and the requested annual funding amount.
20. Comanche Peak has established investment policies to ensure that nuclear decommissioning funds collected, plus the amounts earned from investment of the funds, will be available at the time of decommissioning.
21. Comanche Peak has demonstrated efforts to achieve optimum tax efficiency to maximize the net earnings on the nuclear decommissioning trust funds.

**Notice**

22. On June 15, 2020, Comanche Peak provided a copy of its nuclear decommissioning cost study and funding analysis to the Commission's Financial Review Division.



23. On August 12, 2020, Comanche Peak filed the affidavit of Gary L. Moor, Comanche Peak's Director of Legal Operations, attesting that, subsequent to filing its application, Comanche Peak provided copies of its nuclear decommissioning cost study and funding analysis to the Office of Public Utility Counsel and Oncor.
24. In Order No. 2 filed on August 10, 2020, the ALJ found the notice sufficient.

### **Evidence**

25. On September 28, 2020, Commission Staff and Comanche Peak filed a joint request to admit evidence.
26. In Order No. 3 filed on September 30, 2020, the ALJ admitted the following evidence into the record of this proceeding: (a) Comanche Peak's application, including all attachments, filed on June 16, 2020; (b) Commission Staff's sufficiency recommendation filed on August 7, 2020; (c) Comanche Peak's affidavit regarding proof of notice filed on August 12, 2020; and (d) Commission Staff's final recommendation filed on September 21, 2020.
27. In Order No. \_\_ filed on \_\_\_\_\_, the ALJ admitted the following evidence into the record of this proceeding: (a) the direct testimony of Kristopher Moldovan; and (b) Commission's Staff's recommendation on the supplemented application, including the testimony of Darryl Tietjen in support of the supplemented application, filed on December 11, 2020.

### **Informal Disposition**

28. More than 15 days have passed since the completion of the notice provided in this docket.
29. No person filed a protest or motion to intervene.
30. Commission Staff and Comanche Peak are the only parties to this proceeding.
31. No party requested a hearing and no hearing is needed.
32. Commission Staff recommended approval of the application.
33. This decision is not adverse to any party.

## **II. Conclusions of Law**

The Commission makes the following conclusions of law.



1. The Commission has authority over the application under PURA<sup>2</sup> §§ 14.001 and 39.205.
2. Notice of this proceeding was provided in compliance with 16 TAC § 22.55 and 25.303(f)(2).
3. The Commission processed this application in accordance with PURA, the Administrative Procedure Act<sup>3</sup> and Commission rules.
4. The remaining costs associated with nuclear decommissioning obligations continue to be subject to cost of service regulation under PURA § 39.205.
5. Under PURA § 39.205, the Commission is authorized to adopt rules to ensure that decommissioning funds are prudently collected, managed, and spent for the intended purpose of such funds and that any surplus is returned to retail customers.
6. Comanche Peak filed its periodic study of the decommissioning costs for Comanche Peak Nuclear Power Plant and its updated decommissioning funding analysis in accordance with 16 TAC § 25.303(f).
7. Comanche Peak's cost study and funding analysis was accompanied by testimony supporting its analysis and the requested annual funding amount under 16 TAC § 25.303(f)(4)A).
8. Comanche Peak demonstrated that the funds in its nuclear decommissioning trusts are being invested prudently and in compliance with the investment guidelines set forth in 16 TAC § 25.303(e) under 16 TAC § 25.303(f)(4)(B).
9. Comanche Peak demonstrated efforts to achieve optimum tax efficiency, including efforts to achieve "qualified" status in accordance with Internal Revenue Code § 468A under 16 TAC § 25.303(f)(4)(D).
10. The annual funding amounts proposed by Comanche Peak for nuclear decommissioning trusts are necessary to ensure sufficient funds to decommission Comanche Peak Units 1 and 2 at the end of their useful life in accordance with 16 TAC § 25.303(f)(2).

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<sup>2</sup> Public Utility Regulatory Act, Tex. Util. Code §§ 11.001-66.016.

<sup>3</sup> Tex. Gov't Code §§ 2001.001—903.



11. The requirements for informal disposition under 16 TAC § 22.35 have been met in this proceeding.

### **III. Ordering Paragraphs**

In accordance with these findings of fact and conclusions of law, the Commission issues the following orders.

1. The Commission approves continuation of the annual funding amount of \$20,077,165 for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025.
2. The Commission approves adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.
3. The Commission denies all other motions and any other requests for general or specific relief, if not expressly granted.





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**DeAnn T. Walker**  
Chairman  
**Arthur C. D'Andrea**  
Commissioner  
**Shelly Botkin**  
Commissioner  
**Thomas Gleeson**  
Executive Director



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PUBLIC UTILITY COMMISSION  
FILING CLERK

**Greg Abbott**  
Governor

***Public Utility Commission of Texas***

TO: DeAnn T. Walker, Chairman  
Arthur C. D'Andrea, Commissioner  
Shelly Botkin, Commissioner  
  
All Parties of Record  
  
FROM: Hunter Burkhalter *LB*  
Chief Administrative Law Judge  
  
RE: **Open Meeting of January 29, 2021**  
**Docket No. 50945** – *Application of Comanche Peak Power Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis Under 16 TAC § 25.303(f)(2)*  
  
DATE: December 31, 2020

**Because of the COVID-19 state of disaster, the Commission has moved to a work at a home environment and is working to maintain operations as normally as possible. However, all known challenges have not yet been overcome and the dates provided in this notice are subject to change.**

Enclosed is a copy of the Revised Proposed Order in the above-referenced docket. The Commission will consider this docket at an open meeting currently scheduled to begin at 9:30 a.m. on Friday, January 29, 2021, at the Commission's offices, 1701 North Congress Avenue, Austin, Texas. The parties must file corrections or exceptions to the Proposed Order by Monday, January 11, 2021.

**If there are no corrections or exceptions, no response is necessary.**

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**DOCKET NO. 50945**

<b>APPLICATION OF COMMANCHE</b>	<b>§</b>	<b>PUBLIC UTILITY COMMISSION</b>
<b>PEAK POWER COMPANY LLC FOR</b>	<b>§</b>	
<b>REVIEW OF NUCLEAR</b>	<b>§</b>	<b>OF TEXAS</b>
<b>DECOMMISSIONING COST STUDY</b>	<b>§</b>	
<b>AND FUNDING ANALYSIS UNDER 16</b>	<b>§</b>	
<b>TAC § 25.303(f)(2)</b>	<b>§</b>	

**REVISED PROPOSED ORDER**

This Order addresses the application of Comanche Peak Power Company LLC for review of its nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code (TAC) § 25.303(f)(2). The Commission approves (a) continuation of the annual funding amount of \$20,077,165 for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025; and (b) adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.

**I. Findings of Fact**

The Commission makes the following findings of fact.

**Applicant**

1. Comanche Peak is a Delaware limited liability company registered with the secretary of state under filing number 802412555.
2. Comanche Peak is a power generation company registered with the Commission under power generation company number 20407.
3. Through Comanche Peak Nuclear Power Plant, Comanche Peak generates electricity that is intended to be sold at wholesale.

**Application**

4. On June 16, 2020, Comanche Peak filed an application for review of a study of the decommissioning costs of Comanche Peak Nuclear Power Plant, a financial escalation analysis of the decommissioning costs, and an updated funding analysis.



5. In the application, Comanche Peak requested no change to the current annual funding amounts for the cost of nuclear decommissioning related to Comanche Peak Nuclear Power Plant.
6. In the application, Comanche Peak requested an adjustment in the allocation of decommissioning funds between the Unit 1 and Unit 2.
7. In Order No. 2 filed on August 10, 2020, the administrative law judge (ALJ) found the application administratively complete.
8. On November 5, 2020, the Commission considered a proposed order in this docket and determined the application and subsequent filings did not include evidence required by 16 Texas Administrative Code (TAC) § 25.303(f)(4)(A), (B), and (D), and remanded this proceeding to Docket Management for further processing.
9. On November 30, 2020, Comanche Peak supplemented its application with the direct testimony of Kristopher Moldovan.
10. On December 11, 2020, Commission Staff provided the direct testimony of Darryl Tietjen in support of the application.

**Decommissioning Costs and Funding**

11. Comanche Peak administers a nuclear decommissioning trust fund for Comanche Peak Nuclear Power Plant, for which Oncor Electric Delivery Company, LLC is the collecting utility.
12. Comanche Peak's current annual funding amount approved in Docket No. 44845<sup>1</sup> is \$20,077,165.
13. Comanche Peak Nuclear Power Plant consists of two units, Unit 1 and Unit 2, and the annual amount collected to cover the cost of nuclear decommissioning is allocated between the two units.

---

<sup>1</sup> *Application of Luminant Generation Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis*, Docket No. 44845, Order at Ordering Paragraph No. 2 ( Nov. 6, 2015).



14. The annual amount collected to cover the cost of nuclear decommissioning has, since 2015, been allocated between Unit 1 and Unit 2 at an average rate of 57.1% for Unit 1 and 42.9% for Unit 2.

**Comanche Peak Nuclear Power Plant Nuclear Decommissioning Trusts**

15. As of December 31, 2019, the net after-tax value of the trusts for Units 1 and 2 totaled \$1,316,460,673, consisting of \$623,952,136 for Unit 1 and \$692,508,537 for Unit 2.
16. The Decommissioning Cost Analysis for Comanche Peak Nuclear Power Plant prepared by TLG Services, Inc. dated May 2020 and the Financial Escalation Analysis for the Comanche Peak Nuclear Power Plant prepared by TLG in May 2020 estimate the total cost to decommission and completely dismantle Comanche Peak Nuclear Power Plant at \$1.729 billion, in 2019 dollars, assuming a ten percent contingency.
17. Based on the results of the Decommissioning Study and Financial Escalation Analysis, Comanche Peak performed a Funding Analysis for Comanche Peak Nuclear Power Plant in June 2020.
18. The Funding Analysis shows a -2.7 percent difference between the required funding level of \$19.4 million annually and the five-year average Comanche Peak Nuclear Power Plant decommissioning fund collections from 2015-2019 of \$19.9 million annually.
19. No change to the current annual collection rate is warranted because (a) there is only a small difference between the required annual funding rate and the five-year average actual annual collection rate, and (b) there is inherent and considerable uncertainty as to the predictability of long-term costs and market conditions.
20. Based on the results of the Funding Analysis, the allocation between the Unit 1 and Unit 2 decommissioning funds should be adjusted from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% for Unit 2.
21. Comanche Peak's cost study and funding analysis was accompanied by, and have been supplemented by, testimony supporting its analysis and the requested annual funding amount.



22. Comanche Peak has established investment policies to ensure that nuclear decommissioning funds collected, plus the amounts earned from investment of the funds, will be available at the time of decommissioning.
23. Comanche Peak has demonstrated efforts to achieve optimum tax efficiency to maximize the net earnings on the nuclear decommissioning trust funds.

**Notice**

24. On June 15, 2020, Comanche Peak provided a copy of its nuclear decommissioning cost study and funding analysis to the Commission's Financial Review Division.
25. On August 12, 2020, Comanche Peak filed the affidavit of Gary L. Moor, Comanche Peak's Director of Legal Operations, attesting that, subsequent to filing its application, Comanche Peak provided copies of its nuclear decommissioning cost study and funding analysis to the Office of Public Utility Counsel and Oncor.
26. In Order No. 2 filed on August 10, 2020, the ALJ found the notice sufficient.

**Evidence**

27. On September 28, 2020, Commission Staff and Comanche Peak filed a joint request to admit evidence.
28. In Order No. 3 filed on September 30, 2020, the ALJ admitted the following evidence into the record of this proceeding: (a) Comanche Peak's application, including all attachments, filed on June 16, 2020; (b) Commission Staff's sufficiency recommendation filed on August 7, 2020; (c) Comanche Peak's affidavit regarding proof of notice filed on August 12, 2020; and (d) Commission Staff's final recommendation filed on September 21, 2020.
29. On December 18, 2020 Commission Staff and Comanche Peak filed a joint request to admit additional evidence.
30. In Order No. 5 filed on December 31, 2020, the ALJ admitted the following evidence into the record of this proceeding: (a) direct testimony of Kristopher Moldovan on behalf of Comanche Peak filed on November 30, 2020; and (b) Commission Staff's recommendation on the supplemented application, including the testimony of Darryl Tietjen, filed on December 11, 2020.



**Informal Disposition**

31. More than 15 days have passed since the completion of the notice provided in this docket.
32. No person filed a protest or motion to intervene.
33. Commission Staff and Comanche Peak are the only parties to this proceeding.
34. No party requested a hearing and no hearing is needed.
35. Commission Staff recommended approval of the application.
36. This decision is not adverse to any party.

**II. Conclusions of Law**

The Commission makes the following conclusions of law.

1. The Commission has authority over the application under PURA<sup>2</sup> §§ 14.001 and 39.205.
2. Notice of this proceeding was provided in compliance with 16 TAC § 22.55 and 25.303(f)(2).
3. The Commission processed this application in accordance with PURA, the Administrative Procedure Act,<sup>3</sup> and Commission rules.
4. The remaining costs associated with nuclear decommissioning obligations continue to be subject to cost of service regulation under PURA § 39.205.
5. Under PURA § 39.205, the Commission is authorized to adopt rules to ensure that decommissioning funds are prudently collected, managed, and spent for the intended purpose of such funds and that any surplus is returned to retail customers.
6. Comanche Peak filed its periodic study of the decommissioning costs for Comanche Peak Nuclear Power Plant and its updated decommissioning funding analysis in accordance with 16 TAC § 25.303(f).
7. Comanche Peak's cost study and funding analysis was accompanied by, and supplemented by, testimony supporting its analysis and the requested annual funding amount under 16 TAC § 25.303(f)(4)(A).

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<sup>2</sup> Public Utility Regulatory Act, Tex. Util. Code §§ 11.001-66.016.

<sup>3</sup> Tex. Gov't Code §§ 2001.001-.903.



8. Comanche Peak demonstrated that the funds in its nuclear decommissioning trusts are being invested prudently and in compliance with the investment guidelines in 16 TAC § 25.303(e) under 16 TAC § 25.303(f)(4)(B).
9. Comanche Peak demonstrated efforts to achieve optimum tax efficiency, including efforts to achieve “qualified” status in accordance with Internal Revenue Code § 468A under 16 TAC § 25.303(f)(4)(D).
10. The annual funding amounts proposed by Comanche Peak for its nuclear decommissioning trusts are necessary to ensure sufficient funds to decommission Comanche Peak Units 1 and 2 at the end of their useful life in accordance with 16 TAC § 25.303(f)(2).
11. The requirements for informal disposition under 16 TAC § 22.35 have been met in this proceeding.

### **III. Ordering Paragraphs**

In accordance with these findings of fact and conclusions of law, the Commission issues the following orders.

1. The Commission approves continuation of the annual funding amount of \$20,077,165 for the cost of nuclear decommissioning related to Comanche Peak’s ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025.
2. The Commission approves adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.
3. The Commission denies all other motions and any other requests for general or specific relief that have not been expressly granted.



Signed at Austin, Texas the \_\_\_\_\_ day of January 2020.

**PUBLIC UTILITY COMMISSION OF TEXAS**

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**DEANN T. WALKER, CHAIRMAN**

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**ARTHUR C. D'ANDREA, COMMISSIONER**

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**SHELLY BOTKIN, COMMISSIONER**

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PEAK POWER COMPANY LLC FOR §  
REVIEW OF NUCLEAR §  
DECOMMISSIONING COST STUDY §  
AND FUNDING ANALYSIS UNDER 16 §  
TAC § 25.303(f)(2) §

20 DEC 31 PM 2:42  
PUBLIC UTILITY COMMISSION  
PUBLIC UTILITY COMMISSION  
FILING CLERK  
OF TEXAS

**ORDER NO. 5  
ADMITTING ADDITIONAL EVIDENCE**

This Order addresses the December 18, 2020, joint request to admit additional evidence filed by Commission Staff and Comanche Peak Power Company LLC. The following evidence is admitted into the record of this proceeding:

1. Direct testimony of Kristopher Moldovan on behalf of Comanche Peak filed on November 30, 2020; and
2. Commission Staff's recommendation on the supplemented application, including the testimony of Darryl Tietjen, filed on December 11, 2020.

**Signed at Austin, Texas the 31st day of December 2020.**

PUBLIC UTILITY COMMISSION OF TEXAS



HUNTER BURKHALTER  
CHIEF ADMINISTRATIVE LAW JUDGE





Control Number: 50945



Item Number: 21

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**DOCKET NO. 50945**

APPLICATION OF COMMANCHE § PUBLIC UTILITY COMMISSISON  
PEAK POWER COMPANY LLC FOR §  
REVIEW OF NUCLEAR § OF TEXAS  
DECOMMISSIONING COST STUDY §  
AND FUNDING ANALYSIS UNDER 16 §  
TAC § 25.303(f)(2) §



**COMMISSION STAFF'S NOTICE OF NO CORRECTIONS OR EXCEPTIONS TO THE  
PROPOSED ORDER**

Staff has reviewed the proposed order filed on December 31, 2020 and has not identified any corrections or exceptions. Therefore, Staff will not be filing corrections or exceptions to the proposed order.

Dated: January 11, 2021

Respectfully submitted,

**PUBLIC UTILITY COMMISSION OF TEXAS  
LEGAL DIVISION**

Rachelle Nicolette Robles  
Division Director

Eleanor D'Ambrosio  
Managing Attorney

/s/ John Harrison  
John Harrison  
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1701 N. Congress Avenue  
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(512) 936-7277  
(512) 936-7268 (facsimile)  
John.Harrison@puc.texas.gov



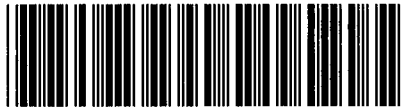
**DOCKET NO. 50945**

**CERTIFICATE OF SERVICE**

I certify that, unless otherwise ordered by the presiding officer, notice of the filing of this document was provided to all parties of record via electronic mail on January 11, 2021, in accordance with the Order Suspending Rules, issued in Project No. 50664.

/s/ John Harrison  
John Harrison





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# *Public Utility Commission of Texas*

## **Commissioner Memorandum**

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2021 JAN 28 AM 9:01  
PUBLIC UTILITY COMMISSION  
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**TO:** Commissioner Arthur C. D'Andrea  
Commissioner Shelly Botkin

**FROM:** Chairman DeAnn T. Walker *DTW*

**DATE:** January 28, 2021

**RE:** January 29, 2021 Open Meeting – Item No. 4  
Docket No. 50945 – *Application of Comanche Peak Power Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis Under 16 TAC § 25.303(f)(2)*

I recommend that the Commission make the following changes to the revised proposed order in this proceeding.

A new heading and findings of fact should be added after finding of fact 30 and a new conclusion of law should be added after conclusion of law 10 to address the need for a good cause exception. Subsequent findings of fact and conclusions of law should be renumbered accordingly.

### **Good Cause Exception**

31. It is Comanche Peak's practice is to make monthly deposits to the nuclear decommissioning trust funds. Comanche Peak does not use an imputed interest calculation in setting the decommissioning charge.
32. Every month at mid-month Comanche Peak deposits the amount of nuclear decommissioning charges that will be due from billings for the entire previous month to the nuclear decommissioning trust fund. At that mid-month point, about half of the previous month's bills are due from retail electric providers, so half of the contribution to the fund is paid in advance. The effect of Comanche Peak's process is that the nuclear decommissioning fund receives Comanche Peak's contribution the same day the collecting utility receives the revenues, without any delay or need to impute interest.

### **Conclusion of Law**

11. Under 16 TAC § 25.303(h), good cause exists to waive the requirement in 16 TAC § 25.303(g)(2)(C) that if deposits to the nuclear decommissioning trust funds are less frequent than weekly, an implied interest calculation shall be used in setting the decommissioning charge.

Finally, I propose delegating to the Office of Policy and Docket Management staff the authority to modify the order to conform to the *Citation and Style Guide for the Public Utility*



*Commission of Texas* and to make other non-substantive changes to the order for such matters as capitalization, spelling, grammar, punctuation, style, correction of numbering, and readability.

I look forward to discussing this matter with you at the open meeting.





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RECEIVED

APPLICATION OF COMANCHE PEAK §  
 POWER COMPANY LLC FOR §  
 REVIEW OF NUCLEAR §  
 DECOMMISSIONING COST STUDY §  
 AND FUNDING ANALYSIS UNDER 16 §  
 TAC § 25.303(f)(2) §

PUBLIC UTILITY COMMISSION

 2021 JAN 29 AM 10:47  
 PUBLIC UTILITY COMMISSION  
 OF TEXAS  
 FILING CLERK

## ORDER

This Order addresses the application of Comanche Peak Power Company LLC for review of its nuclear decommissioning cost study and funding analysis under 16 Texas Administrative Code (TAC) § 25.303(f)(2). The Commission approves continuation of the annual funding amount of \$20,077,165 for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025; and adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.

### I. Findings of Fact

The Commission makes the following findings of fact.

#### Applicant

1. Comanche Peak is a Delaware limited liability company registered with the secretary of state under filing number 802412555.
2. Comanche Peak is a power generation company registered with the Commission under power generation company number 20407.
3. Through Comanche Peak Nuclear Power Plant, Comanche Peak generates electricity that is intended to be sold at wholesale.

#### Application

4. On June 16, 2020, Comanche Peak filed an application for review of a study of the decommissioning costs of Comanche Peak Nuclear Power Plant, a financial escalation analysis of the decommissioning costs, and an updated funding analysis.



5. In the application, Comanche Peak requested no change to the current annual funding amounts for the cost of nuclear decommissioning related to Comanche Peak Nuclear Power Plant.
6. In the application, Comanche Peak requested an adjustment in the allocation of decommissioning funds between Unit 1 and Unit 2.
7. In Order No. 2 filed on August 10, 2020, the administrative law judge (ALJ) found the application administratively complete.
8. On November 5, 2020, the Commission considered a proposed order in this docket and determined the application and subsequent filings did not include evidence required by 16 Texas Administrative Code (TAC) § 25.303(f)(4)(A), (B), and (D), and remanded this proceeding to Docket Management for further processing.
9. On November 30, 2020, Comanche Peak supplemented its application with the direct testimony of Kristopher Moldovan.
10. On December 11, 2020, Commission Staff provided the direct testimony of Darryl Tietjen in support of the application.

**Decommissioning Trusts Costs and Funding**

11. Comanche Peak administers a nuclear decommissioning trust fund for Comanche Peak Nuclear Power Plant, for which Oncor Electric Delivery Company, LLC is the collecting utility.
12. Comanche Peak's current annual funding amount approved in Docket No. 44845<sup>1</sup> is \$20,077,165.
13. Comanche Peak Nuclear Power Plant consists of two units, Unit 1 and Unit 2, and the annual amount collected to cover the cost of nuclear decommissioning is allocated between the two units.

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<sup>1</sup> *Application of Luminant Generation Company LLC for Review of Nuclear Decommissioning Cost Study and Funding Analysis*, Docket No. 44845, Order at Ordering Paragraph No. 2 (Nov. 6, 2015).



14. The annual amount collected to cover the cost of nuclear decommissioning has, since 2015, been allocated between Unit 1 and Unit 2 at an average rate of 57.1% for Unit 1 and 42.9% for Unit 2.
15. As of December 31, 2019, the net after-tax value of the trusts for Units 1 and 2 totaled \$1,316,460,673, consisting of \$623,952,136 for Unit 1 and \$692,508,537 for Unit 2.
16. The decommissioning cost analysis for the Comanche Peak Nuclear Power Plant prepared by TLG Services, Inc. dated May 2020 and the financial escalation analysis for the Comanche Peak Nuclear Power Plant prepared by TLG in May 2020 estimate the total cost to decommission and completely dismantle Comanche Peak Nuclear Power Plant will be \$1.729 billion, in 2019 dollars, assuming a ten percent contingency.
17. Based on the results of the decommissioning study and financial escalation analysis. Comanche Peak performed a funding analysis for Comanche Peak Nuclear Power Plant in June 2020.
18. The funding analysis shows a -2.7 percent difference between the required funding level of \$19.4 million annually and the five-year average Comanche Peak Nuclear Power Plant decommissioning fund collections from 2015 through 2019 of \$19.9 million annually.
19. No change to the current annual collection rate is warranted because there is only a small difference between the required annual funding rate and the five-year average actual annual collection rate, and there is inherent and considerable uncertainty as to the predictability of long-term costs and market conditions.
20. Based on the results of the funding analysis, the allocation between the Unit 1 and Unit 2 decommissioning funds should be adjusted from 57.1% for Unit 1 and 42.9% for Unit 2 to 72.3% for Unit 1 and 27.7% for Unit 2.
21. Comanche Peak's cost study and funding analysis was accompanied by, and have been supplemented by, testimony supporting its analysis and the requested annual funding amount.
22. Comanche Peak has established investment policies to ensure that nuclear decommissioning funds collected, plus the amounts earned from investment of the funds, will be available at the time of decommissioning.



23. Comanche Peak has demonstrated efforts to achieve optimum tax efficiency to maximize the net earnings on the nuclear decommissioning trust funds.

**Notice**

24. On June 15, 2020, Comanche Peak provided a copy of its nuclear decommissioning cost study and funding analysis to the Commission's Financial Review Division.
25. On August 12, 2020, Comanche Peak filed the affidavit of Gary L. Moor, Comanche Peak's Director of Legal Operations, attesting that, subsequent to filing its application, Comanche Peak provided copies of its nuclear decommissioning cost study and funding analysis to the Office of Public Utility Counsel and Oncor.
26. In Order No. 2 filed on August 10, 2020, the ALJ found the notice sufficient.

**Evidence**

27. On September 28, 2020, Commission Staff and Comanche Peak filed a joint request to admit evidence.
28. In Order No. 3 filed on September 30, 2020, the ALJ admitted the following evidence into the record of this proceeding: Comanche Peak's application, including all attachments, filed on June 16, 2020; Commission Staff's sufficiency recommendation filed on August 7, 2020; Comanche Peak's affidavit regarding proof of notice filed on August 12, 2020; and Commission Staff's final recommendation filed on September 21, 2020.
29. On December 18, 2020, Commission Staff and Comanche Peak filed a joint request to admit additional evidence.
30. In Order No. 5 filed on December 31, 2020, the ALJ admitted the following evidence into the record of this proceeding: the direct testimony of Kristopher Moldovan on behalf of Comanche Peak filed on November 30, 2020; and Commission Staff's recommendation on the supplemented application, including the testimony of Darryl Tietjen, filed on December 11, 2020.

**Good Cause Exception**

31. It is Comanche Peak's practice to make monthly deposits to the nuclear decommissioning trust funds. Comanche Peak does not use an imputed interest calculation in setting the decommissioning charge.



32. Every month at mid-month Comanche Peak deposits the amount of nuclear decommissioning charges that will be due from billings for the entire previous month to the nuclear decommissioning trust fund. At that mid-month point, about half of the previous month's bills are due from retail electric providers, so half of the contribution to the fund is paid in advance. The effect of Comanche Peak's process is that the nuclear decommissioning fund receives Comanche Peak's contribution the same day the collecting utility receives the revenues, without any delay or need to impute interest.

**Informal Disposition**

33. More than 15 days have passed since the completion of the notice provided in this docket.
34. No person filed a protest or motion to intervene.
35. Commission Staff and Comanche Peak are the only parties to this proceeding.
36. No party requested a hearing and no hearing is needed.
37. Commission Staff recommended approval of the application.
38. This decision is not adverse to any party.

**II. Conclusions of Law**

The Commission makes the following conclusions of law.

1. The Commission has authority over the application under PURA<sup>2</sup> §§ 14.001 and 39.205.
2. Notice of this proceeding was provided in compliance with 16 TAC §§ 22.55 and 25.303(f)(2).
3. The Commission processed this application in accordance with PURA, the Administrative Procedure Act,<sup>3</sup> and Commission rules.
4. The remaining costs associated with nuclear decommissioning obligations continue to be subject to cost of service regulation under PURA § 39.205.

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<sup>2</sup> Public Utility Regulatory Act, Tex. Util. Code §§ 11.001-66.016.

<sup>3</sup> Tex. Gov't Code §§ 2001.001-.903.



5. Under PURA § 39.205, the Commission is authorized to adopt rules to ensure that decommissioning funds are prudently collected, managed, and spent for the intended purpose of such funds and that any surplus is returned to retail customers.
6. Comanche Peak filed its periodic study of the decommissioning costs for Comanche Peak Nuclear Power Plant and its updated decommissioning funding analysis in accordance with 16 TAC § 25.303(f).
7. Comanche Peak's cost study and funding analysis was accompanied by, and supplemented by, testimony supporting its analysis and the requested annual funding amount under 16 TAC §25.303(f)(4)(A).
8. Comanche Peak demonstrated that the funds in its nuclear decommissioning trusts are being invested prudently and in compliance with the investment guidelines in 16 TAC § 25.303(e) under 16 TAC § 25.303(f)(4)(B).
9. Comanche Peak demonstrated efforts to achieve optimum tax efficiency, including efforts to achieve "qualified" status in accordance with Internal Revenue Code § 468A under 16 TAC § 25.303(f)(4)(D).
10. The annual funding amounts proposed by Comanche Peak for its nuclear decommissioning trusts are necessary to ensure sufficient funds to decommission Comanche Peak Units 1 and 2 at the end of their useful life in accordance with 16 TAC § 25.303(f)(2).
11. Under 16 TAC § 25.303(h), good cause exists to waive the requirement in 16 TAC § 25.303(g)(2)(C) that if deposits to the nuclear decommissioning trust funds are less frequent than weekly, an implied interest calculation shall be used in setting the decommissioning charge.
12. The requirements for informal disposition under 16 TAC § 22.35 have been met in this proceeding.

### **III. Ordering Paragraphs**

In accordance with these findings of fact and conclusions of law, the Commission issues the following orders.

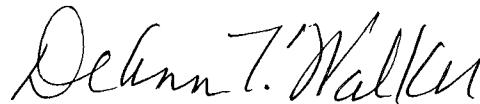


1. The Commission approves continuation of the annual funding amount of \$20,077.165 for the cost of nuclear decommissioning related to Comanche Peak's ownership interest in Comanche Peak Nuclear Power Plant Units 1 and 2, through 2025.
2. The Commission approves adjusting the allocation of the decommissioning funds to 72.3% for Unit 1 and 27.7% for Unit 2.
3. The Commission denies all other motions and any other requests for general or specific relief that have not been expressly granted.

4.

Signed at Austin, Texas the 29<sup>th</sup> day of January 2021.

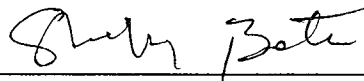
**PUBLIC UTILITY COMMISSION OF TEXAS**



**DEANN T. WALKER, CHAIRMAN**

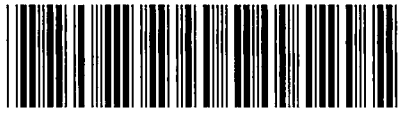


**ARTHUR C. D'ANDREA, COMMISSIONER**



**SHELLY BOTKIN, COMMISSIONER**





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OFFICE OF POLICY & DOCKET MANAGEMENT  
OUTGOING COMMISSION-SIGNED ORDER  
MAIL LOG

2021 JAN 29 10:17

OPEN MEETING DATE: 01/29/21

DOCKET NO.	STAFF	NO. OF PAGES	DATE ORDER SIGNED
50945	JUDY K	7	01/29/21

TYPE OF ORDER: FINAL ORDER

FILE STAMP DATE: 01/29/21 FILE STAMP TIME 10:47 A.M. P.M.

*NOTE: IF THE ORDER IS PLACED IN THE MAIL AFTER 2:00 PM, ENTER THE NEXT BUSINESS DAY  
AS THE DATE THE ORDER WAS MAILED  
FIRST CLASS MAIL ONLY -- NO FED EX, AIRBORNE, UPS*

CADM OUTGOING MAILBOX

DATE: \_\_\_\_\_ TIME \_\_\_\_\_ A.M. \_\_\_\_\_ P.M.

  
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1-29-21  
DATE