ZION STATION RESTORATION PROJECT
LICENSE TERMINATION PLAN
SECTION 7, REVISION 1
UPDATE OF THE SITE-SPECIFIC DECOMMISSIONING COSTS

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LIST OF ACRONYMS AND ABBREVIATIONS

ComEd	Commonwealth Edison
Exelon	Exelon Corporation
~~FRS~~	~~Final Radiation Survey~~
FSAR	Final Safety Analysis Report
GTCC	Greater Than Class C
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
NRC	Nuclear Regulatory Commission
PSDAR	Post-Shutdown Decommissioning Activities Report
TLG	TLG Services, Inc.
WCS	Waste Control Specialists
ZNPS	Zion Nuclear Power Station
ZSRP	Zion Station Restoration Project

7. UPDATE OF THE SITE-SPECIFIC DECOMMISSIONING COSTS

7.1. Introduction

In accordance with 10 CFR 50.82(a)(9)(ii)(F) (Ref 7-1) and Regulatory Guide 1.179 (Ref 7-2), the updated site specific cost estimates and funding plans for the Zion Station Restoration Project (ZSRP) are provided. Regulatory Guide 1.179 provides guidance on the details of the information to be presented in the License Termination Plan (LTP).

The LTP must provide an estimate of the remaining decommissioning costs at the time of LTP submittal and also compare these estimated costs with the present funds set aside for decommissioning. If it is determined that there is a deficit in the present funding, the LTP must indicate the means for ensuring that adequate funds are available to complete the decommissioning.

The decommissioning cost estimate, at a minimum, needs to include an evaluation of the following cost elements:

- Cost assumptions used, including contingency factor;
- Major decommissioning activities and tasks;
- Unit cost factors;
- Estimated costs of decontamination and removal of equipment and structures;
- Estimated costs of waste disposal, including disposal site surcharges;
- Estimated Final ~~Radiation~~Status-Survey (~~FRS~~FSS) costs; and
- Estimated total costs.

The cost estimate should focus on the remaining work, detailed activity by activity, including costs of labor, materials, equipment, energy, and services. The cost estimate should include the cost of the planned remediation activities as well as the cost of the transportation and disposal of the waste generated by the remedial work conducted.

Historical Perspective

By 1998, Exelon Corporation (Exelon), formerly Commonwealth Edison Company, or ComEd, had completely shut down the two unit Zion Nuclear Power Station (ZNPS) and made plans to implement a delayed-DECON decommissioning scenario, with decommissioning expected to commence at the original license expiration date (November 14, 2013). As part of its post shutdown planning, Exelon contracted a specialty decommissioning consultant, TLG Services, Inc. (TLG) to develop a decommissioning cost estimate for the ZNPS Units 1 and 2. This cost estimate was provided with the Post-Shutdown Decommissioning Activities Report (PSDAR) (Ref 7-3) Exelon submitted in 2000 to the NRC.

Exelon later entered into discussions with Energy*Solutions* for the possible transfer of the ZNPS licenses and the decommissioning fund to Energy*Solutions* to accelerate the decommissioning of the plant. As part of its application for the license transfers, Zion*Solutions*, LLC, a wholly owned subsidiary of Energy*Solutions*, amended the PSDAR and submitted it to the NRC in 2008. This amended PSDAR provided significant decommissioning cost milestone changes and an estimate of expected decommissioning costs.

The license transfers were completed and Zion*Solutions* started decommissioning operations by September 2010. In compliance with 10 CFR 50.75(f)(1) (Ref 7-4) and 10 CFR 50.82(a)(8)(v)-(viii), Zion*Solutions* continues to demonstrate financial assurance on an annual basis.

7.1.1. Cost Estimates Previously Docketed with the NRC

Exelon submitted its PSDAR to the NRC on February 14, 2000. As previously noted, in accordance with 10 CFR 50.82(a)(8)(iii), a Zion site-specific decommissioning cost estimate was also prepared and submitted in a letter dated February 14, 2000 (Ref 7-5). This submittal, docketed with the NRC, included an Attachment, "Zion Nuclear Power Station Units 1 and 2 Site-Specific Decommissioning Cost Estimate" which was the cost estimate study prepared by TLG.

During the process of Zion*Solutions*, LLC's application to take over the licenses of Zion Units 1 and 2 from Exelon, Zion*Solutions* submitted an Amended PSDAR, including an estimate of expected decommissioning costs, on March 18, 2008. This submittal was also docketed with the NRC.

7.2. Decommissioning Cost Estimate

The decommissioning cost estimate presented herein represents the cost to complete the remaining decommissioning work as of the end of the 3rd quarter 2014. This estimate was prepared based upon the schedule of the remaining work, incorporating the experience that has been gained while performing similar decommissioning tasks over the past four years. To a large extent, this decommissioning cost estimate is based upon an existing and operating decommissioning organization, in which actual contracts for services are already in place. As such, there is a high degree of certainty regarding expected work productivity, the cost of labor and the cost of services required to support the remainder of the project. The decommissioning cost estimate also includes application of contingency, as specific provision for unforeseeable elements of cost within the defined project scope. Contingencies are particularly important where previous experience has shown that unforeseeable events, which may increase costs, are likely to occur. The contingency, as used in this estimate, does not account for price escalation and inflation in the costs of decommissioning over the remaining project duration.

The cost estimate was prepared to include all costs associated with the decommissioning and unrestricted release of the Zion site other than the area bounded by the Independent Spent Fuel Storage Installation (ISFSI), and includes radiological decommissioning (i.e., those costs required to accomplish such unrestricted release), spent fuel management (transfer of the spent fuel to the ISFSI and operation of the ISFSI until the partial site release is achieved, at which time the released portion of the site and the remaining ISFSI will be transferred back to Exelon), and site restoration (i.e., non-radiological remediation aimed at leaving the site in a safe and stable condition). As was reflected in the Application relating to the transfer of the Zion licenses to Zion*Solutions*, Exelon has retained title to the spent fuel and Greater Than Class C (GTCC) waste, as well as the obligation for ultimate disposition of the spent fuel and the GTCC waste in the ISFSI and the decommissioning of the ISFSI.

The site-specific decommissioning cost estimate provided with this LTP has been prepared as a collaborative effort by Zion*Solutions* and TLG and presents a breakdown of the remaining costs

to complete the decommissioning process and release all portions of the site for unrestricted release, with the exception of the area bounded by the ISFSI.

The following subsections present a description of how the cost estimate was prepared and a summary and breakdown of the estimated costs.

7.2.1. Cost Estimate Description and Methodology

During the summer and fall of 2014, the Zion*Solutions* decommissioning project organization undertook an effort to update the baseline schedule, risks and the costs to complete the decommissioning project. This resulted in a revised work breakdown structure that provided a detailed listing of the remaining work activities and support services needed to complete the project. Task durations, crew compositions and material and contracted services needs were derived from the results of detailed process planning carried out by each of the decommissioning and support organizations (e.g., decommissioning operations, engineering, security, radiation protection, radiological engineering, waste management, safety, ~~FRS~~FSS, etc.).

Additionally, Zion*Solutions* performed a contingency and risk analysis so that the potential additional costs due to expected but undefined risks and uncertainties could be addressed and included in the cost estimate.

The resulting information was then compiled into a decommissioning cost estimate by TLG. The following sections provide a summary of those results.

7.2.2. Summary of the Site-Specific Decommissioning Cost Estimate

The overall remaining decommissioning cost (including scope risk contingency) was estimated to be $389 Million (in year of expenditure dollars), with a base estimated cost of $358 Million (without the scope risk contingency). The cost estimates include provisions for cost escalation based upon the following assumptions:

- Labor costs are assumed to escalate at 1.992% per year, this cost escalation factor being based on the forecast of the Consumer Price Index, Services, CUSASNS as published by Global Insight Company, and applied per the Zion project Asset Sale Agreement.
- Non-Labor costs that are not covered by fixed prices, fixed rates or escalation provisions in contractual agreements, are similarly assumed to escalate at 1.992% per year, this cost escalation factor being based on the Consumer Price Index, Services, CUSASNS as published by Global Insight Company, and applied per the Zion project Asset Sale Agreement.
- For Class A and Class B&C waste costs, Zion*Solutions* has largely mitigated this escalation risk by having a fixed price arrangement with Energy*Solutions* (Class A) and contractually defined costs for B/C waste.

The cost estimate includes the costs for radiological decommissioning, spent fuel management, and site restoration. A breakout of the cost for each part of the decommissioning program is provided in Table 7-1.

Table 7-1 Cost for Radiological Decommissioning, Spent Fuel Management, and Site Restoration

	Radiological Decommissioning	Spent Fuel Management*	Site Restoration*
Base Amount	$284.3 Million	$37.4 Million	$36.2 Million
Contingency	$24.7 Million	$3.3 Million	$3.2 Million
Total	**$309.0 Million**	**$40.7 Million***	**$39.4 Million***

*included for completeness, but not required for license termination funding purposes.

Detailed breakdowns of the estimated costs for radiological decommissioning, spent fuel management and site restoration programs are provided in sections 7.2.3, 7.2.4 and 7.2.5, respectively. Section 7.2.6 presents the estimated contingency costs for each of these programs.

7.2.3. Radiological Decommissioning Costs

Consistent with the NRC definition of decommissioning under 10 CFR 50.2, the radiological decommissioning costs under this category consider only those costs associated with normal decommissioning activities necessary for release of the site (other than the ISFSI) for unrestricted use. It does not include costs associated with the disposal of non-radiological materials or structures beyond those necessary to terminate the Part 50 license or the costs associated with construction or operation of an ISFSI.

As summarized in section 7.2.2 above, the total estimated cost for radiological decommissioning, including contingency is $309 Million. The estimated cost for the anticipated base work scope is $284.3 Million. Application of a contingency of $24.7 Million results in a total estimated cost of $309 Million.

The remaining decommissioning scope of work included in this estimate is described in detail in other chapters of this LTP. Overall, that work scope includes completion of the removal, transportation and disposal of the major components; completion of the removal, transportation and disposal of the remaining equipment; decontamination and/or bulk demolition of radiological impacted structures and transportation and disposal of the resulting radioactive wastes; performance of the ~~FRS~~ FSS and associated license termination activities. The estimated costs include the labor, equipment, materials, services and fees needed to conduct the work. The estimated cost also includes all of the program support activities and services necessary to manage and safely carry out a large scale dismantlement and demolition project. These program support activities include project management, work controls and site administration; technical support services, such as radiation protection, safety, engineering, security, QA/QC, environmental monitoring, waste management and decommissioning subject matter experts needed to support the project.

A high level breakdown of the estimated base radiological decommissioning cost, by major resource category, is provided in Table 7-2.

Table 7-2 Estimated Base Radiological Decommissioning Cost by Resource Category

Labor	[redacted]	$119.8 Million (b)
Equipment, Materials and Supplies		$24.9 Million
Fixed- Price Contracts, Services & Fees		$55.5 Million
Radioactive Waste Packaging, Transportation & Disposal		$84.1 Million
Total (c)		**$284.3 Million**

[redacted]

(b) Includes contracted specialty labor costs
(c) Columns may not add due to rounding

A high level breakdown of the estimated radiological decommissioning cost, alternatively by major project activity, is provided in Table 7-3.

Table 7-3 Estimated Radiological Decommissioning Cost by Major Project Activity

Major Component Removal	$30.8 Million
Equipment and Structure Decontamination / Removal	$63.8 Million
Waste Disposition	$84.1 Million
Program Management and Support Services (excluding Final Status Survey and License Termination Activities)	$75.7 Million
Final ~~Radiation~~ Status Survey and License Termination Activities	$8.0 Million
Other Lump-Sum Costs (e.g., regulatory fees, financing)	$21.9 Million
Total (a)	**$284.3 Million**

(a) Columns may not add due to rounding

A more detailed breakdown of the costs by resource requirements (e.g., labor, materials, services, etc.) and by decommissioning activity (e.g., component removal, structural decontamination, program support functions, waste management functions, etc.) are provided in Tables 7-6 and 7-7 respectively.

The total estimated cost for radioactive waste disposition (containers, transportation and disposal) is $84.1 Million. As presented in Table 7-7, these waste management costs are comprised of four distinct categories; Class A Large Components, Class B/C Waste, Class A Containerized Wastes and Class A Bulk Materials. Costs for on-site handling of GTCC waste (i.e., reactor vessel internals) are included in the "Major Component Removal" category shown

on Table 7-7. However, no costs for disposal of this waste is included in the estimate, as it is assumed that disposal of this waste will be included as a part of spent fuel disposition.

The project has in place a unique contracting approach for disposal of the resulting radioactive wastes that eliminates much of the cost uncertainty and waste volume estimation risk that is often associated with decommissioning projects. As such, the reported waste management costs are unlikely to vary due to waste volume uncertainties. The resulting radioactive waste streams and the disposal and transportation contracts that are in place can be categorized by the following:

7.2.3.1. Class A Large Components

This category of waste includes equipment that will be transported and disposed of intact, enclosed in rail cars or prepared to serve as its own waste container. These items have been radiologically and physically characterized. As such, the inventory of these items and their disposal volumes are known. The associated waste management costs are covered by existing fixed-price contracts with Energy*Solutions*. Therefore, the waste management costs for these items are well known and not likely to vary. [redacted]

7.2.3.2. Class A Bulk Materials

This category of waste primarily consists of concrete rubble or similar materials contaminated with very low levels of radioactivity (and large components described above). This material will be transported in covered gondola rail cars to the Energy*Solutions* disposal site in Clive, Utah. The cost for disposal and transportation of this material is covered by a fixed-price contract that covers any and all material of this type from this decommissioning project, without regard to the total mass or volume. Therefore, these costs are known and are unlikely to vary. This category of waste comprises > 95% of the total volume and mass and > 80% of the estimated waste management costs for all radioactive waste expected to be generated by this decommissioning effort. [redacted]

7.2.3.3. Class A Containerized Wastes

This category of waste primarily consists of material that will need to be packaged in strong-tight / Industrial containers, such as intermodals or steel boxes. Typically, this would include small pieces of contaminated equipment, pipe or debris which require containerization to meet DOT regulations or mitigate radiological handling concerns. This material will be transported by rail, for disposal at the Energy*Solutions* disposal site in Clive, Utah. [redacted]

7.2.3.4. Class B/C Waste

This category of waste is primarily composed of segmented pieces of the activated reactor internals and, to a much lesser extent, higher radioactivity level resins, filters, sludge and cutting fines. These materials will require packing in liners or high integrity containers, and transported

in shielded licensed transportation casks by truck to the Waste Control Specialists (WCS) facility in Andrews, Texas. The volume (or mass) of this waste material is well known, characterized, and will be generated from a limited set of reactor components. [redacted] Disposal cost variability for this category of waste has been largely mitigated by established contractual terms in place with WCS.

7.2.4. Spent Fuel Management Costs

Zion*Solutions* acknowledges that the costs to construct and operate an ISFSI (previously defined) and other spent fuel related management costs are not considered by the NRC staff as part of decommissioning costs. Nevertheless, as there is significant interest by many stakeholders in these costs, they are presented herein. As presented in Section 7.2.2 above, the estimated cost for the anticipated base work scope is $37.4 Million. A contingency of $3.3 Million was applied resulting in total spent fuel management costs of $40.7 Million.

Overall, the spent fuel management work scope includes transfer of the remaining spent fuel to the ISFSI and operation of the ISFSI until termination of the reactor license, with the exception of the area bounded by the ISFSI, projected to take place in 2019.

Construction of the ISFSI was completed in April 2013 and spent fuel transfer operations were started by December 2013 with the first spent fuel cask being placed on the ISFSI in early January 2014. As of the end of September 2014, approximately 64% of the spent fuel has been transferred to the ISFSI, contained in 39 dry storage casks on the ISFSI pad. Note that spent fuel transfer was completed on January 10, 2015.

The estimated costs include the labor, equipment, materials, services, fees, and program support activities necessary to safely manage the spent nuclear fuel. ISFSI operational costs are estimated through mid-year 2019, when partial site release and the transfer of the site and ISFSI back to Exelon are expected, and subsequent management of the spent fuel is consistent with the Irradiated Fuel Management Plan for Zion under 10 CFR 50.54 (bb) (Ref 7-6). Exelon has provided a decommissioning funding plan to the NRC for the Zion ISFSI (Ref 7-7).

A high level breakdown of the estimated base spent fuel management cost, by major resource category, is provided in Table 7-4.

Table 7-4 Estimated Base Spent Fuel Management Cost by Major Resource

Labor	[redacted]	$29.9 Million (b)
Equipment, Materials and Supplies		$1.3 Million
Fixed- Price Contracts, Services & Fees		$6.2 Million
Radioactive Waste Packaging, Transportation & Disposal		$0
Total (c)		**$37.4 Million**

[redacted]

(b) Includes contracted specialty labor costs
(c) Columns may not add due to rounding

A more detailed breakdown of the cost by resource requirements (e.g., labor, materials, services, etc.) is provided in Table 7.8.

7.2.5. Site Restoration Costs

Zion*Solutions* acknowledges that the costs to restore the Zion Plant property are not considered by the NRC staff as part of decommissioning costs. Nevertheless, there is significant interest by many stakeholders in these costs and they are presented herein. The estimated cost for the anticipated work scope is $36.2 Million. A contingency of $3.2 Million was estimated, bringing the total to $39.4 Million. Overall, that work scope includes removal of any remaining hazardous materials, demolition of remaining structures, backfilling of any open excavations or void spaces, and final grading and stabilization against erosion.

The estimated costs include the labor, equipment, materials, services and fees needed to conduct the work. In general, most of this work is anticipated to be performed by contractors; however the estimated cost also includes all of the program support activities and services necessary to manage and safely carry out project.

A high level breakdown of the estimated site restoration cost, by major resource category, is provided in Table 7-5.

Table 7-5 Estimated Site Restoration Cost by Major Resource Category

Labor	[redacted]	$58.8 Million (b)
Equipment, Materials and Supplies		$0.71 Million
Fixed- Price Contracts, Services & Fees		$29.7 Million
Radioactive Waste Packaging, Transportation & Disposal		$0
Total (c)		$36.2 Million

(a [redacted]
(b) Includes contracted specialty labor costs
(c) Columns may not add due to rounding

A more detailed breakdown of the cost by resource requirements (e.g., labor, materials, services, etc.) is provided in Table 7.8.

7.2.6. Contingency

Uncertainty associated with the decommissioning cost estimate, and the need to allocate additional funding to cover contingency for this project has been included in this estimate. Accounting for contingency has been evaluated from two standpoints, operational efficiency and scope expansion risk. Within the context of this cost estimate, operational efficiency contingency is defined as the occurrence of events or circumstances that can prolong project duration or make the execution of a given work scope more difficult. Examples of these types of events include weather related delays, equipment or tool breakage or unavailability, and interferences from other work activities. Scope expansion risk within the context of this estimate is defined as the need to perform unplanned work activities or expansion of the work activities that were planned. Examples of this type of project risk would be discovering new or additional contaminated media requiring remediation, or a need to perform work in a different manner due to unforeseen conditions or changes in requirements.

As was initially shown in section 7.2.2, contingency was estimated at $31.1 Million; apportioned as $24.7 Million for radiological decommissioning, $3.3 Million for spent fuel management and $3.2 Million for site restoration. This contingency was estimated using a quantitative Monte Carlo type probability analysis, with the $31.1 Million amount corresponding to the resulting 85 percent confidence level amount.

7.3. Decommissioning Funding Plan

As indicated in section 7.2, the estimated cost to complete the radiological decommissioning of the Zion nuclear station, including contingency, is $309 Million (year of expenditure dollars) as of Sept 30, 2014. These decommissioning costs will be paid for with funds from the station's nuclear decommissioning trust fund (NDT). Discounting those escalated costs at the rate of cost inflation described in section 7.2.2 yields a cost of radiological decommissioning at constant 2014 dollars of [redacted].

The actual cash balance of the NDT, as recorded by the Zion*Solutions* trustee as of Sept 30, 2014, was [redacted]. Recognizing that there were project costs incurred and recorded on Sept 30, 2014 that had not been paid for from the NDT (outstanding disbursements), plus other transactions in the last quarter of 2014 that have a bearing on these outstanding disbursements, the net balance of the NDT available to cover the future costs of radiological decommissioning was $317.1 Million.

Based on a time phased cash flow analysis of the radiological decommissioning costs, and assuming NDT returns at an annual 2% real, after tax rate of return, the required minimum funding assurance amount to fund the future radiological decommissioning costs equals $302.6 Million, which is below the $317.1 Million available balance described above.

This NDT position, together with Energy*Solutions* resources and the $200 Million Letter of Credit backup for the NDT agreed with Exelon in the Zion Nuclear Power Station Unit 1 and 2 Asset Sale Agreement, that are available but are not relied upon here, provides for sufficient funding and financial assurance for completion of radiological decommissioning of the Zion Project.

On or before March 31, 2015, as required by 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)-(viii), Zion*Solutions* will be submitting the annual demonstration of financial assurance for the year ending Dec 31, 2014. That submission will be based upon future project costs of radiological decommissioning and the NDT balance as of that date.

7.4. References

7-1 Code of Federal Regulations, Title 10, Part 50.82, "Termination of License"

7-2 US Nuclear Regulatory Commission Regulatory Guide 1.179, Revision 1, "Standard Format and Content of License Termination Plans for Nuclear Power Reactors", June 2011

7-3 Letter from Zion*Solutions* ,LLC to the U.S. Nuclear Regulatory Commission, "Notification of Amended Post-Shutdown Decommissioning Activities Report (PSDAR) for Zion Nuclear Power Station, Units 1 and 2 in Accordance with 10 CFR 50.82(a)(7)", dated March 18, 2008

7-4 Code of Federal Regulations, Title 10, Part 50.75, "Reporting and Recordkeeping for Decommissioning Planning"

7-5 Letter from Commonwealth Edison to the U.S. Nuclear Regulatory Commission, "Submittal of the Zion Nuclear Power Station Site-Specific Decommissioning Cost Estimate", dated February 14, 2000

7-6 Letter from Commonwealth Edison to the U.S. Nuclear Regulatory Commission, "Submittal of the Zion Nuclear Power Station Irradiated Fuel Management Plan", dated February 14, 2000

7-7 Letter from Exelon Generation to the U.S. Nuclear Regulatory Commission, "Proposed Independent Spent Fuel Storage Installation (ISFSI) Decommissioning Funding Plan for Zion", dated October 17, 2013

Table 7-6 Detailed Breakdown of Radiological Decommissioning Costs by Resource Requirement

Labor:	**TOTAL** [redacted]	**$119.8 Million**
	Craft [redacted]	$38.6 Million
	Technician [redacted]	$14.3 Million
	Professional (Sci. & Eng.) [redacted]	$36.8 Million
	Management [redacted]	$18.1 Million
	Other - contract service labor [redacted]	$11.9 Million
Equipment & Materials:	**TOTAL**	**$24.9 Million**
	Durable Equipment	$5.3 Million
	Consumable Supplies	$16.0 Million
	Utilities and Energy	$3.6 Million
Contracts, Services & Fees:	**TOTAL**	**$55.5 Million**
	Equipment Rental	<$0.1 Million
	Contracted Services	$27.9 Million
	Laboratory & Analytical Services	$1.8 Million
	Travel & Living	$1.5 Million
	Insurance and Finance Fees	$20.1 Million
	Licensee Fees & Permits	$4.2 Million
Radioactive Waste Packaging, Transportation & Disposal:	**TOTAL**	**$84.1 Million**
	Class A Waste	[redacted]
	Class B/C Waste	[redacted]
TOTAL		**$284.3 Million**

Columns may not add due to rounding

Table 7-7 Detailed Breakdown of Radiological Decommissioning Costs by Decommissioning Activity

Major Component Removal	**TOTAL**	**$30.8 Million**
	Reactor Vessels and Internals	$21.1 Million
	Steam Generators	$9.0 Million
	Pressurizers	$0.7 Million
SSC Removal and Decontamination	**TOTAL**	**$27.2 Million**
	Equipment Removal / Structural Decontamination	$18.4 Million
	Bulk Structural Material Removal	$7.9 Million
	In-process Characterization and Remedial Action Support	$0.9 Million
Waste Management	**TOTAL**	**$84.1 Million**
	Class B/C Waste: Packaging, Transportation and Disposal Surveys and Sampling	[redacted]
	Class A Waste: Rail Car Preparation for Large Components	[redacted]
	Class A Bulk Waste: Rail Car Transportation and Disposal	[redacted]
	Class A Packaged Waste: Containers, Transportation and Disposal	[redacted]
Program Management and Support Services	**TOTAL**	**$120.3 Million**
	Program and Project Management and Site Administration	$32.1 Million
	Technical Services and Services- (e.g., Engineering, Rad. Protection, Environmental Monitoring, Site Characterization, Waste Mgmt, QA/QC, Safety, Worker Qualifications)	$47.9 Million
	Security	$7.7 Million
	Site O&M	$4.9 Million
	Special Projects (Cold & Dark, Bld. Mods.)	$8.5 Million
	Equipment, Materials, Consumable Supplies and Utilities	$11.2 Million
	FSS, LT and Material Release Program	$8.0 Million
Other Lump-Sum Costs	**TOTAL**	**$21.9 Million**
	Financing	$9.8 Million
	Regulatory Fees	$12.1 Million
TOTAL		**$284.3 Million**

Columns may not add due to rounding

Table 7-8 Detailed Breakdown of Spent Fuel Management Costs by Resource Requirement

Labor:	**TOTAL** [redacted]	**$29.9 Million**
	Craft [redacted]	$3.7 Million
	Technician [redacted]	$1.5 Million
	Professional (Sci. & Eng.) [redacted]	$3.7 Million
	Management [redacted]	$1.8 Million
	Other (contract service labor, primarily security - exclusive of management) [redacted]	$19.2 Million
Equipment & Materials:	**TOTAL**	**$1.7 Million**
	Durable Equipment	<$0.1 Million
	Consumable Supplies	$1.2 Million
	Utilities and Energy	$0.4 Million
Contracts, Services & Fees:	**TOTAL**	**$5.8 Million**
	Equipment Related Services	$1.3 Million
	Contracted Services (excluding security provided in labor above)	$2.2 Million
	Laboratory & Analytical Services	<$0.1 Million
	Travel & Living	<$ 0.1 Million
	Insurance, Finance, Licensee and Permit fees	$2.3 Million
Radioactive Waste Packaging, Transportation & Disposal:	**TOTAL**	**$0**
	Class A Waste	$0
	Class B/C Waste	$0
TOTAL		**$37.4 Million**

Columns may not add due to rounding

Table 7-9 Detailed Breakdown of Site Restoration Costs by Resource Requirement

Labor:	**TOTAL** [redacted]	**$5.8 Million**
	Craft [redacted]	$2.2 Million
	Technician [redacted]	$0.16 Million
	Management and Professional (Sci. & Eng.) [redacted]	$1.9 Million
	Other- contract service labor [redacted]	$1.6 Million
Equipment & Materials:	**TOTAL**	**$1.2 Million**
	Durable Equipment	<$0.1 Million
	Consumable Supplies	$0.7 Million
	Utilities and Energy	$0.5 Million
Contracts, Services & Fees:	**TOTAL**	**$29.2 Million**
	Equipment Rental	<$0.1 Million
	Contracted Services	$27.6 Million
	Laboratory & Analytical Services	<$0.1 Million
	Travel & Living	<$0.1 Million
	Insurance, Finance, Licensee & Permit fees,	$1.6 Million
Radioactive Waste Packaging, Transportation & Disposal:	**TOTAL**	**$0**
	Class A Waste	$0
	Class B/C Waste	$0
TOTAL		**$36.2 Million**

Columns may not add due to rounding