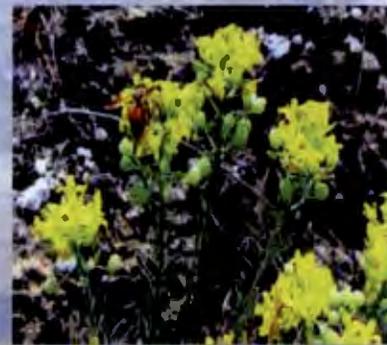


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2014 Hanford Lifecycle Scope, Schedule and Cost Report



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2014 HANFORD LIFECYCLE SCOPE, SCHEDULE AND COST REPORT

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ENERGY

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EXECUTIVE SUMMARY

Purpose

This *Hanford Lifecycle Scope, Schedule and Cost Report* (Lifecycle Report [LCR]) describes the scope, schedule and cost estimates for Hanford Site cleanup. This LCR reflects all cleanup work that is to be completed by the U.S. Department of Energy (DOE), including the Richland Operations Office (RL) and Office of River Protection (ORP).

The LCR will be prepared and submitted to the U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology) annually by January 31, in time to support DOE's annual budget process and to help inform decision makers about schedule and work prioritization.

The LCR will serve as an agreed upon foundation for preparing budget requests and for informational briefings to affected Tribal Nations, the State of Oregon, and Hanford stakeholders. The LCR supports continued discussions with EPA and Ecology on how and when RL and ORP will complete cleanup, and how milestone changes and adjustments will affect lifecycle scope, schedule and cost.

While it is important to understand what this report will do, it is just as important to understand what it does not do. This report does not make or replace any cleanup decisions, nor is it a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (42 USC 9601) or *Resource Conservation and Recovery Act of 1976* (42 USC 6901) document. This report does not substitute for, nor preempt, the cleanup decision processes as set forth in the *Hanford Federal Facility Agreement and Consent Order*¹ (commonly referred to as the Tri-Party Agreement or TPA), the Consent Decree in *State of Washington v. Department of Energy*, Case No 08-5085-FVS (E.D. Wa. October 25, 2010) (DOE and Ecology, 2010) (the "Consent Decree"), and other legal requirements.

Background

On October 25, 2010², DOE, EPA, and Ecology (Tri-Party Agencies) agreed to modify the TPA to incorporate a new milestone, M-036-01, requiring annual submittal of a LCR. The LCR reflects all actions necessary for DOE to meet all applicable environmental obligations.

The 2014 LCR is the fourth version and information reflects scope, schedule and cost status that is current as of December 1, 2013 (exceptions, such as for the ORP certified baseline, are noted in the relevant sections of the LCR). Changes to cleanup obligations and related costs that have occurred after this date are noted in Section 1.5 and will be incorporated into future reports.

Public Involvement Process

The Tri-Party Agencies encourage and support public participation, and believe it is essential to the cleanup process (Ecology et al. 2012, *Hanford Public Involvement Plan*). The Tri-Party Agencies will make the 2014 LCR available to all interested parties on the DOE website at www.hanford.gov. Feedback regarding the 2014 LCR will be considered as future reports are developed. Feedback can be emailed to lcssc@rl.gov.

¹ Ecology et al. 1989, *Hanford Federal Facility Agreement and Consent Order*, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, as amended.

² Milestone M-036-01 was negotiated as part of broader negotiations that occurred between the parties, culminating in the above-referenced Consent Decree and a package of TPA modifications, all of which became effective when the Consent Decree was signed and entered into federal district court on October 25, 2010.

Milestone Requirements

TPA Milestone M-036-01 requires that the LCR include all cleanup, monitoring, and related actions necessary to complete cleanup, and that it takes critical resource availability and the practical limits of project acceleration into consideration. Information in the LCR is to be presented at the project baseline summary (PBS) level, with costs to be provided at one level below the PBS, and at levels below that for the next 2 to 5 years (near term). The appendices of this report explain the preparation of the LCR, including existing cleanup decisions, future cleanup actions, and detailed cost and schedule information.

Summary of Lifecycle Scope, Schedule and Cost

Hanford Site cleanup consists of three major components: River Corridor Cleanup, Central Plateau Cleanup, and Tank Waste Cleanup (located geographically within the Central Plateau). The cleanup also includes Mission Support activities that provide essential infrastructure and services to Hanford cleanup.

Hanford's remaining cleanup schedule covers activities for cleanup and waste management, leading to transition of portions of the Hanford Site to long-term stewardship (LTS). The active cleanup schedule is from fiscal year (FY)2014 to FY2060, and LTS extends through FY2090. Although the time period evaluated in this report ends at 2090, LTS extends longer because some waste sites and disposal facilities will have caps that require maintenance and institutional controls beyond that date. DOE plans on having a presence at Hanford well beyond FY2090.

This report presents RL and ORP configuration-controlled planning cases. The ORP planning case is the same as that presented in the 2013 LCR, and cost and schedule information are based on the *River Protection Project System Plan* (ORP-11242, Rev. 4) in order to remain consistent with ORP's last certified baseline and approved baseline change request.

The Hanford remaining estimated cleanup costs³ total approximately \$113.6 billion (Figure ES-1). This includes the estimated cost to complete cleanup within the River Corridor, Central Plateau, Tank Waste, and the Mission Support components, as well as reasonable allowances for cost and schedule uncertainties. Table ES-1 provides a summary of total costs by PBS.

The 2013 LCR total cost estimate was \$114.8 billion. The cost decrease of \$1.2 billion in the 2014 LCR is attributed to scope completed in FY2013 and planning estimate refinements in RL scope.

The remaining estimated cleanup costs do not include the upper bound cost estimates prepared for selected future cleanup actions in the prior LCRs. These costs are provided in Appendix B, Table B-5.

Cost Estimate Alternative Analyses for Selected Cleanup Actions

The Tri-Party Agencies reviewed the alternative analyses included in the 2011, 2012 and 2013 LCRs, the level of effort required to conduct those analyses and the benefits and insights gained from those analyses. After considering the remaining cleanup actions to be analyzed (Appendix B, Table B-6), the timing of anticipated regulatory decisions, the potential benefits and the effort required to conduct the analyses, the Tri-Party Agencies agreed that the 2014 LCR would not include an alternative analysis.

³ The expression "cleanup costs" is used to represent the costs for those remaining actions that are necessary for DOE to fully meet all applicable environmental obligations and complete the Hanford Site cleanup mission.

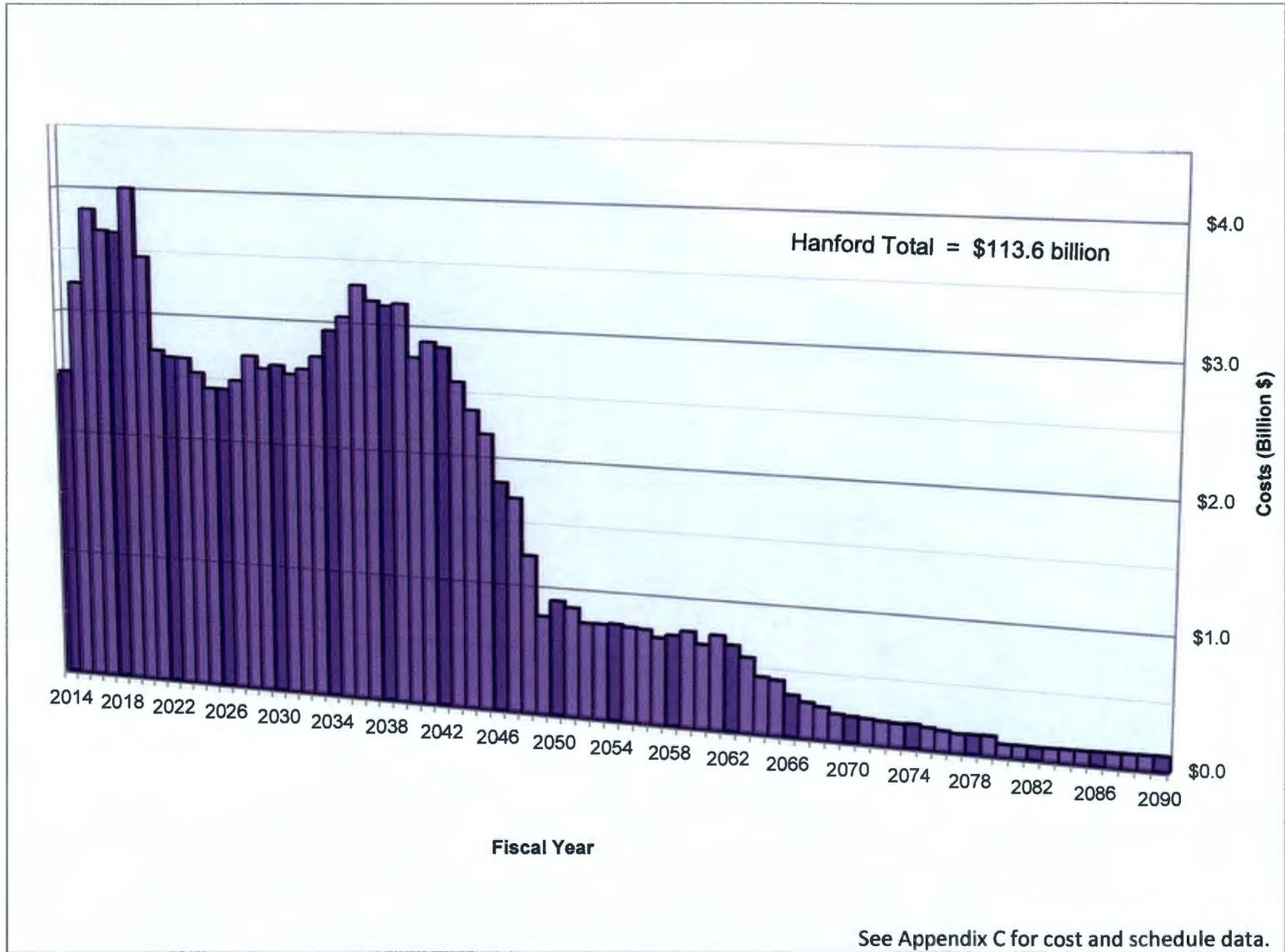


Figure ES-1. Hanford Site Remaining Estimated Cleanup Costs by Fiscal Year (includes both RL and ORP).

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TERMS

ABAR	aggregate barrier
CCP	Central Characterization Project
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CH	contact-handled
CSB	Canister Storage Building
CWC	Central Waste Complex
D&D	decontamination and decommission
D4	deactivation, decontamination, decommission, and demolition
DOE	U.S. Department of Energy
DQO	data quality objectives
DST	double-shell tank
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EM	U.S. Department of Energy, Office of Environmental Management
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ETF	Effluent Treatment Facility
FFTF	Fast Flux Test Facility
FY	fiscal year
G&A	General and Administrative
GSSC	General Support Services Contract
HAB	Hanford Advisory Board
HAMMER	Hazardous Materials Management and Emergency Response; also known as the Volpentest HAMMER Training and Education Center
HFFACO	<i>Hanford Federal Facility Agreement and Consent Order</i>
HLW	high-level waste
HQ	U.S. Department of Energy, Headquarters
HWMA	<i>Hazardous Waste Management Act (Washington State)</i>
IDF	Integrated Disposal Facility
IHLW	immobilized high-level waste
ISS	interim safe storage
LAW	low-activity waste
LCR	Lifecycle Report
LDR	Land Disposal Restrictions
LERF	Liquid Effluent Retention Facility
LM	Legacy Management
LTS	long-term stewardship
MLLW	mixed low-level waste
MSC	Mission Support Contract
NEPA	<i>National Environmental Policy Act</i>
NM	nuclear materials
NRDAR	Natural Resource Damage Assessment and Restoration
OMB	Office of Management and Budget

ORP	U.S. Department of Energy, Office of River Protection
OU	operable unit
PBS	project baseline summary
PFP	Plutonium Finishing Plant
PNNL	Pacific Northwest National Laboratory
PRC	Plateau Remediation Contract
PUREX	Plutonium Uranium Extraction (Plant)
RCCC	River Corridor Closure Contract
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
REDOX	Reduction-Oxidation Facility (S Plant)
RH	remote-handled
RI/FS	remedial investigation/feasibility study
RL	U.S. Department of Energy, Richland Operations Office
ROD	record of decision
RPP	River Protection Project
RTD	remove, treat and dispose
S&M	surveillance and maintenance
SAP	Service Assessment Pool
SNF	spent nuclear fuel
SST	single-shell tank
TBD	to be determined
TEDF	Treated Effluent Disposal Facility
TOC	Tank Operations Contract
TPA	Tri-Party Agreement
Tri-Party Agencies	U.S. Department of Energy, U.S. Environmental Protection Agency, and Washington State Department of Ecology
TRU	transuranic
TRUM	transuranic mixed (waste)
TSD	treatment, storage, and disposal
UBS	usage-based service
USDOE	U.S. Department of Energy
WBS	work breakdown structure
WCH	Washington Closure Hanford
WESF	Waste Encapsulation and Storage Facility
WIPP	Waste Isolation Pilot Plant
WMA	waste management area
WRAP	Waste Receiving and Processing (Facility)
WSCF	Waste Sampling and Characterization Facility
WTP	Waste Treatment and Immobilization Plant
WTPC	Waste Treatment and Immobilization Plant Contract

1.0 INTRODUCTION

In October 2010, the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), and Washington State Department of Ecology (Ecology) (Tri-Party Agencies) added a new milestone to the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989), commonly referred to as the Tri-Party Agreement (TPA). TPA Milestone M-036-01 requires that DOE submit a *Hanford Lifecycle Scope, Schedule and Cost Report* (Lifecycle Report [LCR]) to EPA and Ecology each year.

This document is the LCR for 2014. This report reflects scope, schedule and cost estimate information from fiscal year (FY)2014 to FY2090. The 2014 LCR information reflects scope, schedule and costs that are current as of December 1, 2013, and are configuration controlled. Changes that have occurred after this cutoff date are noted in Section 1.5 and will be incorporated into future reports. The costs shown have been escalated for inflation.

1.1 PURPOSE OF THE LIFECYCLE REPORT

To plan for the future and make the best use of each year's funding, the Tri-Party Agencies work together and share information about the scope, schedule and cost of cleaning up the Hanford Site. TPA Milestone M-036-01 states that the LCR should serve:

“...as an agreed upon foundation for preparing budget requests and for informational briefings of affected Tribal Governments and Hanford stakeholders.”

“...as the basis for annual discussions among USDOE, EPA, and Ecology on how and when the USDOE will complete cleanup, how Congressional appropriations for the Hanford Site for that year may affect assumptions presented in the report, and how milestone changes and adjustments will affect lifecycle scope, schedule and cost.”

TPA Milestone M-036-01 includes a number of requirements for the LCR. Table 1-1 provides the full text of the approved TPA Milestone M-036-01.

Detail regarding logic used by the Tri-Party Agencies to meet the intent of the milestone can be found in Section 1.5 of the 2013 LCR (DOE/RL-2012-13).

Table 1-1. Tri-Party Agreement Milestone M-036-01.**M-036-01A (Subsequent Annual Milestones to be Lettered B, C, D, etc.)**

Due date to submit the report to be January 31 and annually thereafter, except that the first report to be due no sooner than 9 months after incorporation of this milestone in TPA.

The USDOE shall prepare and submit to EPA and Ecology a report setting out the lifecycle scope, schedule and cost for completion of the Hanford Site cleanup mission. The report shall reflect all of those actions necessary for the USDOE to fully meet all applicable environmental obligations including those under the HFFACO, the consent decree in State of Washington V. Chu, Case No. 08-5085-FVS, and the Hanford RCRA/HWMA Permit. The report shall include scope, schedule and cost for completing work at each of the operable units and RCRA TSD groups/units that are listed in Appendixes B and C of the HFFACO, in the consent decree in State of Washington V. Chu, Case No. 08-5085-FVS and in the Hanford RCRA/HWMA Permit, including the Hanford Waste Treatment and Immobilization Plant. The report will include all other cleanup and monitoring activities (including post-closure activities) and all related actions necessary to complete the cleanup mission to provide a complete understanding of the resources necessary for the Hanford cleanup mission.

This report shall take into account circumstances existing as of the end of the fiscal year preceding the month of the report, including funds appropriated by Congress for the Hanford cleanup, but shall not assume any limitation on funding for future years. However, the report will take into consideration critical resource availability not based upon assumed future funding limitations and the practical limits of project acceleration when developing an executable plan. USDOE may also include costs other than those directly related to environmental obligations (such as security costs) but shall clearly distinguish expenditures for environmental obligations from other expenditures. Costs shall be displayed by program baseline summary. Additional levels of detail will appear in appendixes to the report. Cost information will provide sufficient detail to validate consistency with the scope and schedule for individual cleanup projects. Reporting in the appendixes will typically be one level below the PBS for the lifecycle, and at levels below that for the next two to five years beyond the execution year (usually at the activity level within the budget assigned to a specific project, e.g., RL-0011, WBS element 011.04.01, Nuclear Material Stabilization and Disposition – PFP, Disposition PFP, Transition 234 5Z). EPA and Ecology project managers may request additional levels of detail be provided by their DOE counterparts.

In circumstances where final cleanup decisions have not yet been made, the report shall be based upon the reasonable upper bound of the range of plausible alternatives or may set forth a range of alternative costs including such a reasonable upper bound. In making assumptions for the purpose of preparing the initial report, USDOE shall take into account the views of EPA and Ecology and shall also take into account the values expressed by the affected Tribal Governments and Hanford stakeholders regarding work scope, priorities and schedule. The report shall include the scope, schedule and cost for each such PBS level two element and shall set forth the bases and assumptions for each cleanup activity.

After USDOE submits the report, the USDOE will revise the report based upon EPA and Ecology comments to reflect a common vision of the scope, schedule and budget for the remainder of the cleanup mission. If the agencies are unable to reach resolution on specific aspects of the scope of cleanup actions, the revised document will present a range of potential actions with the associated schedule and budget, thereby completing the milestone. DOE, EPA and Ecology shall attempt to reach agreement on the report so it can serve as an agreed upon foundation for preparing budget requests and for informational briefings of affected Tribal Governments and Hanford stakeholders. The report shall also serve as the basis for annual discussions among USDOE, EPA and Ecology on how and when the USDOE will complete cleanup, how Congressional appropriations for the Hanford Site for that year may affect assumptions presented in the report, and how milestone changes and adjustments will affect lifecycle scope, schedule and cost.

Without limiting any DOE obligation under any other provisions of this agreement, and without limiting any DOE obligation to disclose information that is otherwise publicly available, nothing in this milestone shall be construed, either alone or in combination with any other provision of the HFFACO, to require disclosures related to internal federal budget deliberations.

1.2 PREPARING THE LIFECYCLE REPORT

DOE considers input from numerous affected parties, as discussed in the following sections.

1.2.1 Tribal Involvement

Four Tribal Nations are involved in the Hanford Site cleanup:

- The Confederated Tribes of the Umatilla Indian Reservation is made up of the Cayuse, Umatilla, and Walla Walla people, and is federally recognized under the *Treaty with the Walla Walla, Cayuse and Umatilla, 1855*.
- The Confederated Tribes and Bands of the Yakama Nation are descendants of 14 tribes and bands that were federally recognized under the *Treaty with the Yakama, 1855*.
- The Nez Perce Tribe is federally recognized under the *Treaty with the Nez Perces, 1855*.
- The Wanapum Band is a non-federally recognized tribe that historically resided on Hanford lands, and participates in discussions regarding Hanford cleanup.

Representatives from the Tribal Nations work in a government-to-government relationship with DOE officials on decisions affecting cleanup of Hanford and protection of the land. DOE consults with the Tribal Nations regularly and will continue to update relevant LCR information about their values.

1.2.2 Oregon Department of Energy

DOE recognizes the State of Oregon's interests in Hanford cleanup and protection of the Columbia River and its uses. Consistent with legal and other agreements, DOE has committed to share information and sustain an active dialogue with Oregon representatives about decisions and activities affecting cleanup at Hanford.

1.2.3 Hanford Advisory Board

The Hanford Advisory Board (HAB) is a non-partisan and broadly representative body consisting of a balanced mix of the diverse interests that are affected by Hanford cleanup issues. The primary mission of the HAB is to provide informed recommendations and advice to the Tri-Party Agencies on selected major policy issues related to cleanup. The HAB is a DOE Office of Environmental Management (EM) Site-Specific Advisory Board, a stakeholder board that provides DOE's Assistant Secretary for EM and designees with independent advice, information, and recommendations on issues affecting the EM program at Hanford.

The HAB recommended that DOE prepare information similar to the LCR. HAB Consensus Advice No. 223, "Lifecycle Cost and Schedule Report of the Proposed Consent Decree and the Tri-Party Agreement (TPA) Modifications," was issued November 6, 2009; HAB Consensus Advice No. 252 was issued November 4, 2011; and No. 267 was issued June 7, 2013.

The HAB has prepared advice that relates to cleanup decisions throughout the Hanford Site. The HAB advice and the Tri-Party Agencies' responses to advice can be found on DOE's website at www.hanford.gov/?page=453. That advice was considered in the development of this report.

1.3 HANFORD CLEANUP OVERVIEW

The 586-square-mile Hanford Site is located along the Columbia River in southeastern Washington State (Figure 1-1). Beginning in the 1940s with the Manhattan Project, Hanford played a pivotal role in the Nation's defense, eventually producing approximately 74 tons of plutonium — nearly two-thirds of all the plutonium recovered for government purposes in the United States. Today, the Hanford Site includes numerous former nuclear material production areas, active and closed research facilities, waste storage and disposal sites, and large areas of natural habitat and buffer zones all underlain by groundwater.

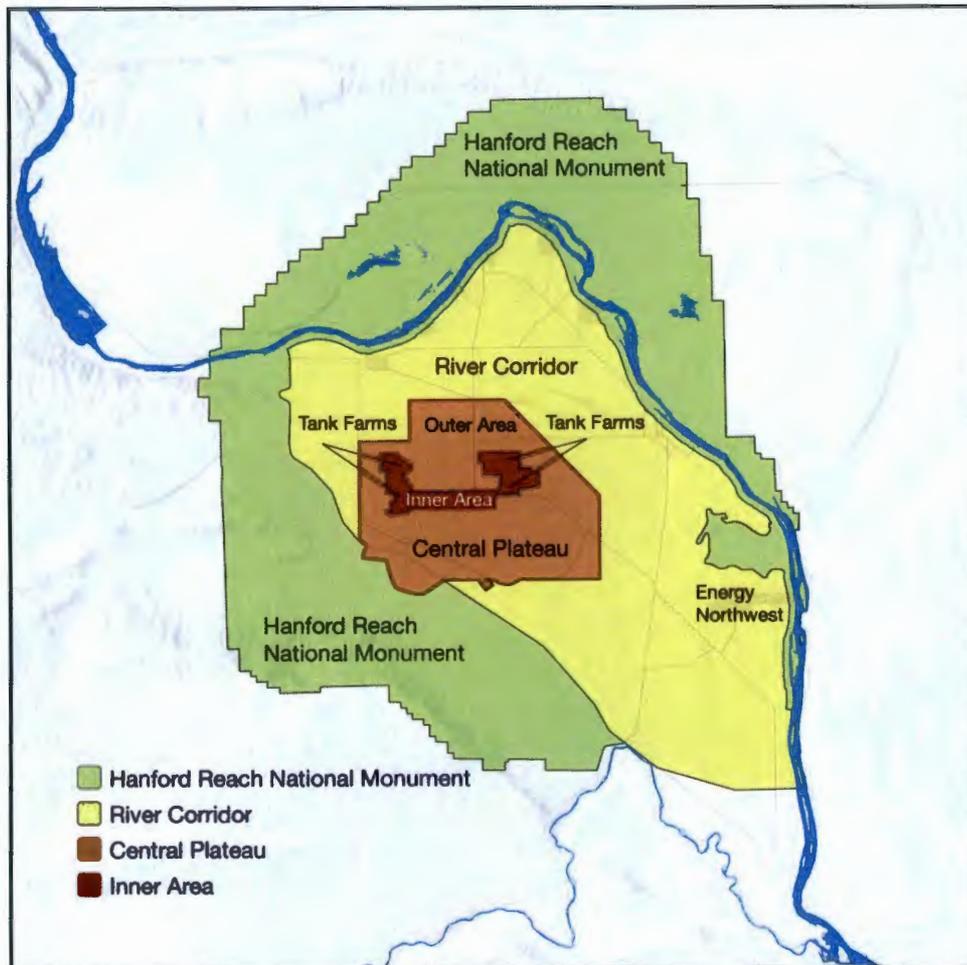


Figure 1-1. Hanford Site Map Showing Principal Areas Designated for Cleanup.

Under the direction of DOE, the Hanford workforce is now engaged in the environmental cleanup of contaminated facilities, groundwater, and soil. Hanford cleanup is further described in *Hanford Site Cleanup Completion Framework* (DOE/RL-2009-10).

1.3.1 Hanford Cleanup Goals

The overarching goals for cleanup are stated in Table 1-2. These goals embody more than 20 years of dialogue among the Tri-Party Agencies, Tribal Nations, State of Oregon, stakeholders, and the public. They carry forward key values captured in earlier forums such as

the Hanford Future Site Uses Working Group, Tank Waste Task Force, Hanford Summits, and HAB Exposure Scenario Workshops, as well as more than 270 advice letters issued by the HAB (<http://www.hanford.gov/page.cfm/hab>). These goals help guide all aspects of cleanup. Cleanup activities at various areas of the site support the achievement of one or more of these goals. These goals help set priorities to apply resources and sequence cleanup efforts for the greatest benefit.

Table 1-2. Cleanup Goals Identified for the Hanford Site.¹

Goals for Cleanup	
Goal 1:	Protect the Columbia River.
Goal 2:	Restore groundwater to its beneficial use to protect human health, the environment, and the Columbia River.
Goal 3:	Clean up River Corridor waste sites and facilities to: <ul style="list-style-type: none"> • Protect groundwater and the Columbia River • Shrink the active cleanup footprint to the Central Plateau • Support anticipated future land uses.
Goal 4:	Clean up Central Plateau waste sites and facilities to: <ul style="list-style-type: none"> • Protect groundwater and the Columbia River • Minimize the footprint of areas requiring long-term waste management activities • Support anticipated future land uses.
Goal 5:	Safely mitigate and remove the threat of Hanford's tank waste: <ul style="list-style-type: none"> • Safely store tank waste until it is retrieved for treatment • Safely and effectively immobilize tank waste • Close tank farms and mitigate the impacts from past releases of tank waste to the ground.
Goal 6:	Safely manage and transfer legacy materials scheduled for offsite disposition, including special nuclear material (including plutonium), spent nuclear fuel, transuranic waste, and immobilized high-level waste.
Goal 7:	Consolidate waste treatment, storage, and disposal operations on the Central Plateau.
Goal 8:	Develop and implement institutional controls and long-term stewardship activities that protect human health, the environment, and Hanford's unique cultural, historical, and ecological resources after cleanup activities are completed.
¹ DOE/RL-2009-10, 2013, <i>Hanford Site Cleanup Completion Framework</i> , Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.	

These goals reflect DOE's recognition that the Columbia River is a critical resource for the people and ecology of the Pacific Northwest. The 50-mile stretch of the river known as the Hanford Reach is the last free-flowing section of the Columbia River in the United States. As one of the largest rivers in North America, its waters support a multitude of uses that are vital to the economic and environmental wellbeing of the region and it is particularly important in sustaining the culture of Native Americans.

1.3.2 Hanford Cleanup and Management Areas

Hanford cleanup is overseen at DOE Headquarters (HQ) by the EM, and is directed and implemented locally by two DOE field offices: the Richland Operations Office (RL) and the Office of River Protection (ORP).⁴ RL manages cleanup of most of the Hanford Site, and provides human resource, administration, and security services, as well as physical infrastructure necessary to perform the cleanup. ORP was established in response to Section 3139 of the *Strom Thurmond National Defense Authorization Act for Fiscal Year 1999* to manage the River Protection Project (RPP). The RPP is responsible for the safe storage, retrieval, and transfer of

⁴ In addition to the ongoing cleanup mission, numerous research and environmental support activities are conducted at Hanford by the Pacific Northwest National Laboratory, which is overseen by DOE's Office of Science, Pacific Northwest Site Office.

tank waste currently stored in the 200 Area Tank Farms; construction of the Waste Treatment and Immobilization Plant (WTP) to process and immobilize the tank waste in a process known as vitrification; and associated tank farm operation, maintenance, engineering, and construction activities.

Hanford cleanup focuses on two broad geographic areas: The River Corridor and the Central Plateau. Tank Waste Cleanup is a separate cleanup component located in the Central Plateau.

The River Corridor includes approximately 220 square miles of the Hanford Site, encompassing the 100 and 300 Areas along the south shore of the Columbia River, portions of the 400 and 600 Areas, and the contiguous lands that extend to the Central Plateau boundaries. This includes a considerable land area not directly affected by production operations (non-operational areas). The 100 Area contains nine retired plutonium production reactors, numerous support facilities, solid and liquid waste disposal sites that have contaminated soil and groundwater. The 300 Area, located north of the city of Richland, contains fuel fabrication facilities, nuclear research and development facilities, and associated solid and liquid waste disposal sites that have contaminated soil and groundwater. The non-operational areas include substantial land area adjacent to the 100 and 300 Areas and extending to the Central Plateau that was never used for production operations.

For sites in the River Corridor, the goal of remedial action is to restore groundwater to drinking water standards wherever practicable, and to achieve ambient water quality standards in the groundwater prior to it discharging into the Columbia River. In those instances where remedial action objectives are not achievable in a reasonable time frame, or are determined to be technically impracticable, programs will be implemented to limit contaminant migration and prevent exposure to contaminated groundwater. River Corridor Cleanup work also removes sources of contamination, which are close to the Columbia River, to the Central Plateau for final disposal. The intent is to shrink the footprint of active cleanup to within the 75-square-mile area of the Central Plateau by removing excess facilities and remediating waste sites. Cleanup actions will support anticipated future land uses consistent with the Hanford Reach National Monument, where applicable, and the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* (DOE/EIS-0222-F).

The River Corridor has been divided into six geographic decision areas to achieve source and groundwater remedy decisions. These decisions will provide comprehensive coverage for all areas within the River Corridor and will incorporate ongoing interim action cleanup activities. Cleanup levels will be achieved that support the anticipated land uses of conservation and preservation for most of this area and industrial use for the 300 Area. At the conclusion of cleanup actions, the Federal Government will retain ownership of most land in the River Corridor and will implement long-term stewardship (LTS) activities to ensure protection of human health and the environment.

The Central Plateau consists of about 75 square miles in the central portion of the Hanford Site, which includes the Inner Area (~10 square miles) and the Outer Area (~65 square miles). The Inner Area contains the major nuclear fuel processing, waste management, and disposal facilities. The Inner Area will be dedicated to long-term waste management and containment of residual contamination. The Outer Area is that portion of the Central Plateau outside the boundary of the Inner Area. The Outer Area will be remediated to be protective of human health, the environment and groundwater. Cleanup levels will support future reasonably anticipated land

uses. Cleanup of the Outer Area is planned to be completed in the 2016 to 2020 time period as funding allows. Completing cleanup of the Outer Area will shrink the footprint of active cleanup by an additional 65 square miles leaving just the Inner Area remaining.

Cleanup of the Central Plateau is a highly complex activity because of the large number of waste sites, surplus facilities, active treatment and disposal facilities, and areas of deep soil contamination. Past discharges of more than 450 billion gallons of liquid waste and cooling water to the soil have resulted in about 59 square miles of contaminated groundwater across the site. Today, some plumes extend far beyond the plateau. Containing and remediating these plumes remains a high priority. For areas of groundwater contamination in the Central Plateau, the goal is to restore the aquifer to achieve drinking water standards. In those instances where remediation goals are not achievable in a reasonable time frame, programs will be implemented to contain the plumes, prevent exposure to contaminated groundwater, and evaluate further risk reduction opportunities as new technologies become available. Near-term actions will be taken to control plume migration until remediation goals are achieved.

At the completion of cleanup efforts, some residual hazardous and radioactive contamination will remain, both in surface disposal facilities and in subsurface media within portions of the Inner Area. DOE's goal is to minimize the area used for long-term waste management activities that require institutional controls to ensure protection of human health and the environment.

Tank Waste Cleanup focuses on retrieving and treating Hanford's tank waste, and closing or remediating tank farms. The tank farms comprise 18 distinct waste storage units that include a total of 177 underground storage tanks (149 single-shell tanks [SSTs] and 28 double-shell tanks [DSTs]) located in the Inner Area of the Central Plateau. The storage tanks range in capacity from about 55,000 to 1,250,000 gallons and contain approximately 56 million gallons of chemically hazardous radioactive waste from past processing operations. Sixty-seven of the SSTs are confirmed or presumed to have collectively leaked up to 1 million gallons of contamination into the ground. In some areas, releases from some SST farms have reached groundwater. DOE expects these impacts to groundwater could increase in the future unless near-term actions are taken.

Today, actions are being taken to slow the movement of those contaminants that were previously released. DOE is also containing and recovering those contaminants once they reach groundwater. A key step in reducing the risk that tank waste poses to human health and the environment is to retrieve as much waste from SSTs as possible and put it into DSTs. Then, the waste must be fed to the WTP for processing and converted by a process called vitrification into solid glass waste forms. A number of associated tank waste facilities, including additional underground tanks, waste transfer lines, the 242-A Evaporator, and the WTP (under construction) are associated with the Tank Waste Cleanup component. This component of cleanup is one of Hanford's most challenging legacies.

Significant portions of the Hanford Site have been designated and preserved as part of the Hanford Reach National Monument (Figure 1-1). Much cleanup work has been accomplished within the designated monument area, and remaining work is expected to be completed within the next few years either as part of the River Corridor or Central Plateau cleanup projects. DOE is coordinating with the U.S. Department of Interior, U.S. Fish and Wildlife Service, and other agencies to provide care and maintenance of the national monument lands.

DOE leases Hanford Site land to several non-DOE entities, such as the Laser Interferometer Gravitational Wave Observatory and the State of Washington, which in turn leases land to US Ecology, Inc., a private firm that operates burial grounds for commercial radioactive low-level waste. DOE leases land to Energy Northwest (a consortium of public utility companies), which operates Washington's only operating commercial nuclear power reactor, the Columbia Generating Station. These operations are not part of cleanup at Hanford and are not included in the LCR.

1.4 CLEANUP DECISIONS AND ALTERNATIVES

Cleanup is achieved through an ongoing process for making and then implementing cleanup decisions in accordance with approved work plans and procedures, which are the bases for performing cleanup actions. When making cleanup decisions, the Tri-Party Agencies ensure compliance with applicable laws and regulations, compare various cleanup alternatives, consider the interests of the public and other affected parties, consult with Tribal Nations, and document selected cleanup actions in legally binding records.

In portions of the cleanup, the Tri-Party Agencies have agreed to schedule final cleanup decisions to be made at a time when more information and experience can be gained, or after certain facilities are no longer needed. For example, decisions on cleaning up the T Plant Canyon Building in the Central Plateau will not be made until the Tri-Party Agencies have determined when T Plant will not be needed to support Hanford cleanup.

The LCR is required to include scope, schedule and cost information for the entire Hanford Site regardless of whether final cleanup decisions have been made. Where cleanup decisions are not known or only partially defined (i.e., not final), the LCR is based on the reasonable upper bound for the range of plausible alternatives, or a range of alternative costs, including a reasonable upper bound or a basis of existing estimates. These bases introduce several concepts that are not fully defined in TPA Milestone M-036-01:

- **Cleanup decisions.** How are cleanup decisions made and when are they considered to be final decisions?
- **Alternatives.** How are alternatives considered when making cleanup decisions and determining what cleanup actions should be performed?
- **Reasonable upper bound.** How is a reasonable upper bound defined for a range of alternatives and how are an upper bound cost and schedule calculated?

Appendix A describes the multiple kinds of cleanup decisions made at Hanford and identifies decisions that are considered to be final for the site. Appendix B describes future actions required to complete Hanford cleanup and presents information on plausible alternatives for the future cleanup actions. Table 1-3 lists the cleanup actions for which final cleanup decisions have not yet been made.

The LCR includes many assumptions about future cleanup actions and decisions, considers the ranges of plausible alternatives for specific cleanup actions, and what would be reasonable upper bounds for the ranges of alternatives. Alternatives and upper bounds for future cleanup actions contemplate potential decisions, events, contingencies, and cost and/or schedule uncertainties, and take into account the views and values of regulators, Tribal Nations, and stakeholders.

Table 1-3. Cleanup Actions for which Final Decisions Have Not Been Made.

River Corridor Cleanup Actions	
<ul style="list-style-type: none"> • Disposition N Reactor. • Disposition 100 Area K West Basin. • Remediate 100 Area Contaminated Soil Sites. • Restore 100-BC-5 Groundwater OU to Beneficial Use. • Restore 100-KR-4 Groundwater OU to Beneficial Use. • Restore 100-NR-2 Groundwater OU to Beneficial Use. 	<ul style="list-style-type: none"> • Restore 100-HR-3 Groundwater OU to Beneficial Use. • Restore 100-FR-3 Groundwater OU to Beneficial Use. • Disposition 300 Area Facilities Retained by PNNL. • Disposition 100 Area former Orchard Contaminated Soil Sites (100-OL-1 OU).
Central Plateau Cleanup Actions	
<ul style="list-style-type: none"> • Disposition Remaining Outer Area Buildings and Facilities (200-OA-1 OU). • Remediate Remaining Outer Area Contaminated Soil Sites (200-OA-1, 200-CW-1, 200-CW-3 OUs). • Disposition Below-Grade Portions of Plutonium Finishing Plant. • Disposition B Plant Canyon Building/Associated Waste Sites (200-CB-1 OU). • Disposition PUREX Canyon Building/Associated Waste Sites (200-CP-1 OU). • Disposition PUREX Storage Tunnels (200-CP-1 OU). • Disposition REDOX Canyon Building/Associated Waste Sites (200-CR-1 OU). • Disposition T Plant Canyon Building/Associated Waste Sites. • Disposition Cesium/Strontium Capsules. • Remediate 200-SW-1 OU. • Disposition Remaining Liquid Waste Disposal Facilities. 	<ul style="list-style-type: none"> • Disposition Remaining Waste Treatment, Storage, and Disposal Facilities. • Remediate Pipelines, Pits, Diversion Boxes and Associated Tanks (200-IS-1 OU). • Remediate Land Disposal Units (200-SW-2 OU). • Remediate Remaining 200 West Inner Area Contaminated Soil Sites (200-WA-1 OU). • Remediate Remaining 200 East Inner Area Contaminated Soil Sites (200-EA-1 OU). • Disposition FFTF Complex. • Disposition Remaining Buildings and Facilities within FFTF Complex. • Disposition Remaining Inner Area Buildings and Facilities. • Remediate Contaminated Deep Vadose Zone (200-DV-1 OU). • Restore 200 West Groundwater (200-UP-1 OU) to Beneficial Use. • Restore 200 East Groundwater (200-PO-1/200-BP-5 OUs) to Beneficial Use.
Tank Waste Cleanup Actions	
<ul style="list-style-type: none"> • Tank Retrieval and Single-Shell Tank Farm Closure. • Tank Waste Treatment. • Secondary Waste Treatment. 	<ul style="list-style-type: none"> • Double-Shell Tank Closure. • Waste Treatment and Immobilization Plant Closure.
FFTF = Fast Flux Test Facility. OU = operable unit. PNNL = Pacific Northwest National Laboratory.	PUREX = Plutonium Uranium Extraction (Plant). REDOX = Reduction-Oxidation Facility (S Plant).

The Tri-Party Agencies have agreed the LCR should consider development of in-depth information about some of the future cleanup actions (for which final decisions have not been made). The Tri-Party Agencies identified approximately 37 cleanup actions for which final cleanup decisions are still needed (Table 1-3), and Appendix B (Table B-6) proposes a schedule for preparing cost estimate alternative analyses for these cleanup actions.

The Tri-Party Agencies reviewed the alternative analyses included in the 2011, 2012 and 2013 LCRs, the level of effort required to conduct those analyses and the benefits and insights gained from those analyses. After considering the remaining cleanup actions to be analyzed (Appendix B, Table B-6), the timing of anticipated regulatory decisions, the potential benefits and the effort required to conduct the analyses, the Tri-Party Agencies agreed that the 2014 LCR would not include an alternative analysis.

1.5 CHANGES FROM PREVIOUS REPORT

1.5.1 Incorporated Changes

Written feedback related to this LCR and prior LCRs was considered when preparing this report. Comments received on the 2013 LCR are available on the DOE website at www.hanford.gov.

Significant changes made in the 2014 LCR include the following:

- Updated cost and schedule planning basis for each project baseline summary (PBS) to incorporate updated scope, regulatory changes, and contract changes so this information reflects the RL and ORP configuration-controlled planning cases that are current as of December 1, 2013.
- Clarified that when PBS RL-0041 Nuclear Facility D&D–River Corridor Closure Project ends in FY2019 the remaining work scope (including B Reactor support) will transition to PBS RL-0040 Nuclear Facility D&D–Remainder of Hanford.
- Descriptions for the work elements RL Directed Activities, Usage-Based Services Distributions, and Usage-Based Services, General and Administrative (G&A), Direct Distributions have been added to the scope summary tables for each PBS and in Appendix C.
- Added the prime contract responsibility to the PBS summaries in Table 2-1.
- Clarified that T Plant is acceptable for interim sludge storage in Section 3.2.
- Clarified in Section 6.1 that when PBS RL-0020 Safeguards and Security ends in 2059, then protection of human health and the environment transfers to long-term stewardship (PBS RL-LTS).
- Reduced the size of the report and made it easier to read.

1.5.2 Future Report Changes

The scope, schedule and cost information presented in this LCR is current as of December 1, 2013. This section summarizes regulatory decisions and other changes that may have occurred or been completed after the December 1, 2013 cutoff date. Other pending changes that are not reflected in this LCR but will be incorporated in future reports are also noted.

The report presents the RL and ORP current configuration-controlled planning cases. The ORP planning case is the same as that presented in the 2013 LCR. Any future changes to the planning cases will be incorporated in future reports.

The Tri-Party Agencies discussed revisions to various TPA milestone due dates. Approved revised milestones that have been incorporated into the planning cases are presented in this LCR. Any future changes to the planning cases will be included in future reports.

Decision documents have recently been released for the 300 Area Record of Decision (ROD) and the first in a series of RODs pursuant to the *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington* (TC&WM EIS, DOE/EIS-0391, December 2013). The scope, schedule and costs of these decisions will be integrated in future LCRs.

1.6 LIFECYCLE REPORT AND HANFORD BUDGET SCHEDULE

In developing the LCR milestone, the Tri-Party Agencies sought to align submittal of the report with the annual Federal budget planning process. For most fiscal years, Federal planning begins about 2 years before the funded work is executed (Figure 1-2). The cycle begins when DOE field offices receive fiscal year budget planning guidance from the President of the United States, HQ, and the Office of Management and Budget (OMB). During the next 12 to 15 months, the DOE field offices develop their budgets, submit to HQ and OMB for review, and then the budgets are provided as part of the President's budget that is submitted annually to Congress. Approximately 8 months later, under normal circumstances, before the start of the new Federal fiscal year (October 1), Congress approves a budget, funding is made available, and DOE begins executing work to the approved budget.

As shown in Figure 1-2, the Tri-Party Agencies scheduled the LCR to be completed in time to support the field offices' budget planning process each year. Each LCR will have the latest information available when planning begins for the next 2-year budget cycle. The period of time for developing the LCR each year overlaps with the funding approval process for the current budget execution year and with the HQ and OMB review of funding requests for the next fiscal year.

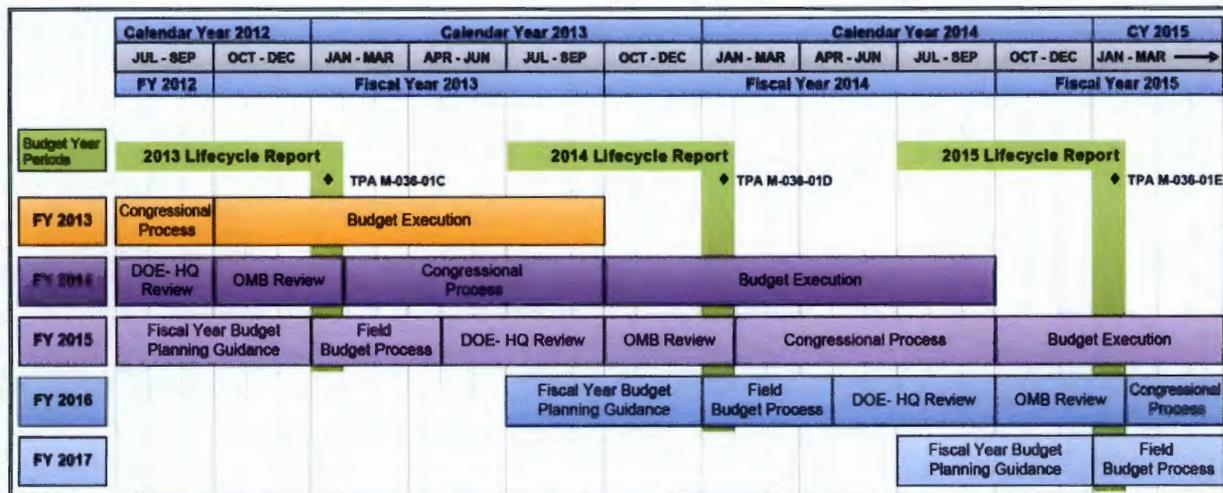


Figure 1-2. Relationship Between DOE Budget Planning and LCR Schedule.

1.7 PLANNING AND INTEGRATION OVERVIEW

This section introduces the Federal budget formulation process and DOE's overall planning and budget development practices. A general understanding of common terms and methodology will be useful later in this LCR, particularly where information about project costs is presented.

1.7.1 Annual Budget Formulation Process

Each year, DOE formulates budget requests for Congressional appropriations. The planning cycle begins between December and January, nearly 2 years before the start of a budgeted fiscal year. The process begins with budget formulation where funding requirements are analyzed, prioritized, requested and received. Budget requests are submitted by the field offices to HQ in early spring and continue with post-formulation monitoring and responding to questions to

estimate impacts of actual or potential changes to budget requests. The process ends with receipt of Congressional appropriations. DOE's budget process occurs in four distinct phases:

1. **Field Budget Process.** This is the first phase of DOE's annual budget formulation process. RL and ORP submit field budget data to HQ for use in the corporate review budget process.
2. **HQ Corporate Review Budget Process.** The HQ organizations use field budget data and spring planning decisions to develop initial organizational budget requests that are jointly evaluated and considered in DOE's internal budget review.
3. **OMB Budget Review Process.** This process is the principal mechanism for preparing DOE's annual budget submission to the OMB, which is responsible for assembling the President's annual budget request to Congress.
4. **Congressional Budget Review Process.** This process determines DOE's final appropriations for the next Federal fiscal year, based on final Presidential funding and policy determinations in conjunction with Federal budget deliberations by Congress.

Annual budgets developed by DOE and appropriated for spending by Congress are allocated to the responsible DOE projects. Congressional budgets commonly provide different allocations, include additional requirements, or provide other directions that can affect project planning. If adjustments are required, DOE goes through a scheduling and resource-leveling process to adjust plans and accommodate the authorized budget. Sometimes this can result in cost and schedule changes to reconfigure activities resulting from budget or other constraints. DOE must determine the appropriations that will be used to fund each task to comply with applicable budget direction. Based on final Congressional appropriations, budget formulation, project planning and re-planning are intertwined and involve iterative processes with similar steps. DOE's process for defining and managing projects and their baseline summaries are described below.

1.7.2 U.S. Department of Energy Project Formulation Process

DOE follows a structured approach that organizes all EM activities into discrete projects. The following summarizes key components of DOE's cleanup project management approach.

Project Baseline Summary (PBS). EM projects that have common attributes, such as geographic location or activity type, typically are grouped as a PBS. Congressional funding authorizations typically are also allocated by PBS. Each PBS contains a logical grouping of work activities organized in discrete projects or activities by establishing technical scope, schedule and cost baselines; defining performance metrics; and providing financial history, budget request justification, and other information such as programmatic risk and compliance drivers. DOE may define a cleanup project as the entire PBS, or a project may be a portion of a single or multiple PBSs. A PBS or project may include operations and facility support activities such as surveillance and maintenance (S&M).

Work Breakdown Structure (WBS). The work scope associated with each PBS is further organized into discrete WBS elements. The WBS provides a product/activities-oriented system to arrange, define, and depict all work in a structured framework. This step is essential to developing comprehensive bases for planning and managing project-specific scope, schedule and cost. Whether the government or a contractor performs the elements, the structure must be compatible with cost estimating and scheduling requirements.

Resource Allocation. The next step is to define the resources necessary to execute each WBS element. Resources include labor, materials, and equipment. These resources are a part of work packages, which define the work for each WBS element. Planning packages are used when the work has not been completely defined. Budget is assigned to planning packages based on a mature estimate, until such time as a work package can be developed.

Project Master Schedule. With a solid WBS and well-developed work packages in place, DOE can develop a master schedule that contains a reliable estimate of the total time required to accomplish each task and the sequence of execution. The master schedule should reveal tasks that must be completed or partially completed before other tasks begin. These interrelationships help define the project's critical path (the sequence of activities that must be completed on schedule for the entire project to be completed on schedule). Task schedules evolve by balancing the work to be done against the required completion date to achieve project milestones.

Resource Leveling. All resources are finite and not all work can be accomplished simultaneously, so work must be organized to ensure existing resources are not overtaxed or underutilized; e.g., an engineering or craft labor individual cannot be scheduled to accomplish more than one work package simultaneously, and the same piece of equipment cannot be operated in more than one location at a time. The sequencing of tasks, therefore, addresses not only the order of things to be accomplished, but the availability and optimal use of resources. Resource leveling may result in the need to revise or update a project's master schedule.

Uncertainty and Project Risk. Risk management is essential for project management. Cost and schedule uncertainty are included in the development of Total Project Cost and the approved DOE planning case and are reserved to accommodate additional work scope related to risk events that may occur from conditions and events that were not known during project planning and other unanticipated changes or uncertainties. This includes estimates for cost and schedule uncertainty based on risk analysis methods that comply with DOE guidelines and orders. These estimates are identified as "cost and/or schedule uncertainty" in the Appendix C tables.

Uncertainty addresses cost-based and schedule-based impacts on a project. Cost uncertainty is the portion of the project budget that is available for risk uncertainty related to the project, but is held outside the contract budget and is part of the government's planning case estimate. Schedule uncertainty is the risk-based, quantitatively derived portion of the overall project schedule duration that is estimated to allow for time-related risk impacts and other project uncertainties.

Cost and schedule uncertainty is established to manage or cover the cost of unexpected events (e.g., changed conditions discovered by environmental sampling and characterization as cleanup proceeds). Money and time that has been reserved to address risks may be used to account for their effects or the handling actions necessary to mitigate or avoid risk events, but may not be used for work that is outside the scope of the planning case. Uncertainty is calculated based on DOE risks that are contained in a centralized risk register for each project. The risks are derived from various sources including project team members, project documentation, review teams and other sources. These risks are documented and are used in calculating cost uncertainty.

To identify the required amount of uncertainty, a quantitative risk analysis (using a Monte Carlo methodology) is performed using the project schedule, complete with the costs of each work activity and applying risks and uncertainty to the schedule. Stochastic modeling is used to develop a probability distribution and to calculate project cost and schedule uncertainty.

Escalation. In a budget request, cost is represented in escalated dollars. Escalation is the provision in a cost estimate for increases in cost of equipment, material, labor, etc., due to

Table 1-5. Example Cleanup Project Baseline Summary and Work Breakdown to Level 3.

PBS (Level 1)	RL-0012 SNF Stabilization and Disposition
Level 2	RL-12.12 K Basins Closure Project
Level 3	RL-12.12.01 100-K Safe and Compliant
	RL-12.12.02 K Basins Operations and Maintenance
	RL-12.12.03 Facility Operations
	RL-12.12.11 100-K Facilities Deactivation
	RL-12.12.15 105-K West Basin Deactivation and Demolition
	RL-12.12.16 Sludge Treatment Project
PBS = project baseline summary. SNF = spent nuclear fuel.	
RL = U.S. Department of Energy, Richland Operations Office.	

Depending on the complexity of work scope, project maturity, contract period of performance, etc., DOE's contractors typically plan their near-term work down to Level 6 and further to manage and schedule designs, approvals, and resources needed for their projects. This scope, schedule and cost information rolls up and is included in the upper tier planning information. Table 1-6 is an example of work planning to Level 6 and how it rolls up to Levels 1 through 5.

Table 1-6. Example of a Level 6 Work Breakdown Structure.

PBS (Level 1)	RL-0041 Nuclear Facility D&D–River Corridor
Level 2	041.03 Field Remediation Closure
Level 3	041.03.02 Field Remediation – 100 D Area
Level 4	041.03.02.02 Field Remediation – 100-DR-1
Level 5	041.03.02.02.06 Field Remediation – Burial Grounds – 100-DR-1
Level 6	041.03.02.02.06.01 Remediate Burial Ground – 100-D-32
	041.03.02.02.06.02 Remediate Burial Ground – 100-D-33
	041.03.02.02.06.04 Remediate Burial Ground – 100-D-41
	041.03.02.02.06.05 Remediate Burial Ground – 100-D-45
	041.03.02.02.06.06 Remediate Burial Ground – 126-D-2
D&D = decontamination and decommission.	
PBS = project baseline summary	
RL = U.S. Department of Energy, Richland Operations Office.	

For years beyond the contractor's near-term work, DOE maintains out-year planning estimates for the remaining cleanup. Out-year planning estimates are not as well developed as near-term planning (typically no further than Level 3 or Level 4).

Cost information will be updated each year to reflect work completion, recent decision making, and other changes affecting the lifecycle scope (e.g., upgrades or infrastructure modernization to support major projects). Chapters 3.0 through 6.0 summarize information at PBS Level 2, including work breakdown for each PBS, descriptions of the lifecycle work scope and associated work elements, and schedules for completing the work elements.

Each chapter provides estimated cleanup costs for corresponding work elements, and includes costs that are not work elements directly performed under the respective PBS; e.g., Site-wide Services is not a work element directly performed in each PBS, but an estimated support cost for the entire PBS lifecycle (see Section 6.3.2).

Appendix C provides more detail at Level 3 for near-term work and at Level 2 for all Hanford cleanup.

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2.0 HANFORD LIFECYCLE SUMMARY

This chapter presents the overall Hanford cleanup scope, schedule and cost. Chapters 3.0 through 6.0 and Appendix C present additional details on the PBSs that cover the lifecycle cleanup work scope in the three major cleanup components and Mission Support.

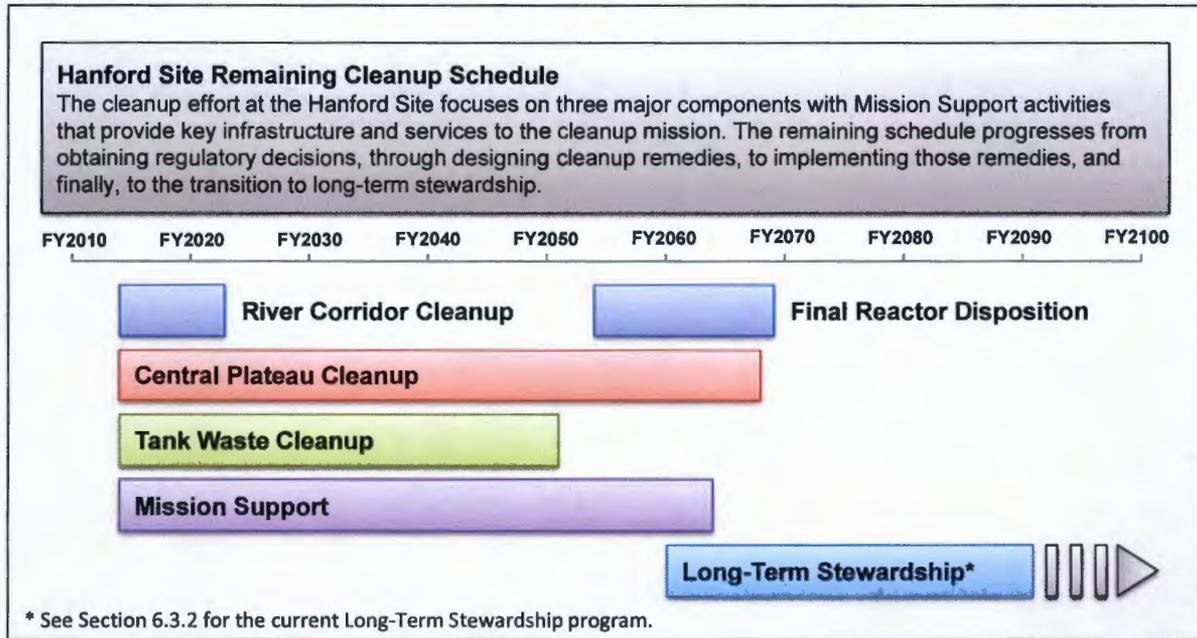
2.1 HANFORD SITE LIFECYCLE SCOPE

Cleanup consists of three major scope components: River Corridor, Central Plateau, and Tank Waste (the Tank Waste component is contained geographically within the Central Plateau). Cleanup includes Mission Support activities that provide key infrastructure and services for Hanford. Cleanup is a complex task that involves multiple contractors performing discrete, yet interdependent, scopes of work. The prime contract related to each PBS is noted in Table 2-1. The scope of cleanup work is broken down into a series of PBSs. Table 2-1 describes the general scope of each PBS and where in the LCR each PBS is addressed.

Table 2-1. Hanford Project Baseline Summaries (PBS)–RL and ORP Contractors. (2 pages)

LCR Section	PBS	Official Title	Alternate Titles	General Scope	Prime Contract
CHAPTER 3.0 – RIVER CORRIDOR CLEANUP					
River Corridor (Section 3.1)	RL-0041	Nuclear Facility D&D–River Corridor Closure Project	None	Cleanup of the River Corridor waste sites and facilities, including placing the reactors in interim safe storage (this scope excludes groundwater remediation, which is addressed through PBS RL-0030). Includes 105-KW SNF Basin deactivation and removal work scope which was shifted from RL-0012 in FY2012.	RCCC
River Corridor (Section 3.2)	RL-0012	SNF Stabilization and Disposition	K Basins Closure Project	Removal of the K Basin sludges, found SNF and fuel scrap.	PRC
River Corridor (Section 3.3)	TBD	TBD	Final Reactor Disposition	Disposition of 100 Area production reactors (excluding B Reactor).	TBD
CHAPTER 4.0 – CENTRAL PLATEAU CLEANUP					
Central Plateau (Section 4.1)	RL-0011	NM Stabilization and Disposition–PFP	PFP Closure Project	Demolition of aboveground facilities and structures at PFP.	PRC
Central Plateau (Section 4.2)	RL-0030	Soil and Water Remediation–Groundwater / Vadose Zone	Groundwater Project	Decision-making process for groundwater and waste sites and Hanford Site-wide groundwater remediation.	PRC
Central Plateau (Section 4.3) and Mission Support (Section 6.3)	RL-0040	Nuclear Facility D&D–Remainder of Hanford	This PBS has two parts:	1. Cleanup of the Central Plateau waste sites and facilities, including canyon facilities.	PRC
			1. RL-0040.01.1 Central Plateau Remediation		
			2. RL-0040.01.2 Infrastructure and Services or Mission Support Site-wide Services		

Figure 2-1 shows River Corridor Cleanup complete by FY2024, Final Reactor Disposition complete by FY2068, Tank Waste Cleanup complete by FY2050, and Central Plateau Cleanup complete by FY2067 (including schedule uncertainty).



Scale dates represent start of fiscal year

Figure 2-1. Hanford Site Remaining Cleanup Schedule.

To support cleanup, RL has responsibility for Mission Support activities related to safeguards and security, community and regulatory support, and Hanford Site infrastructure and site-wide services. These activities align with the cleanup through FY2063. RL also has planned for an LTS period that runs from FY2060 through FY2090 as part of Mission Support.

2.3 HANFORD SITE ESTIMATED CLEANUP COSTS

The remaining cleanup costs⁵ are estimated to be about \$113.6 billion to complete the scope for the River Corridor, Final Reactor Disposition, Central Plateau, Tank Waste, Mission Support activities, and LTS. RL's scope accounts for about \$55.5 billion of the total costs and ORP's scope accounts for about \$58.1 billion. These estimates include cost uncertainty because many of the final cleanup decisions have not been made. Once these decisions are made, estimates will be revised.

⁵ The expression "cleanup costs" is used to represent the costs for those remaining actions that are necessary for DOE to fully meet all applicable environmental obligations and complete the Hanford Site cleanup mission.

Figure 2-2 summarizes the estimated remaining cleanup cost distribution between RL and ORP. Figure 2-3 shows the remaining cleanup costs by year for RL and ORP. Figure 2-4 summarizes the estimated cleanup costs by RL and ORP PBSs. Table 2-2 provides a summary of total estimated cleanup costs for each PBS.

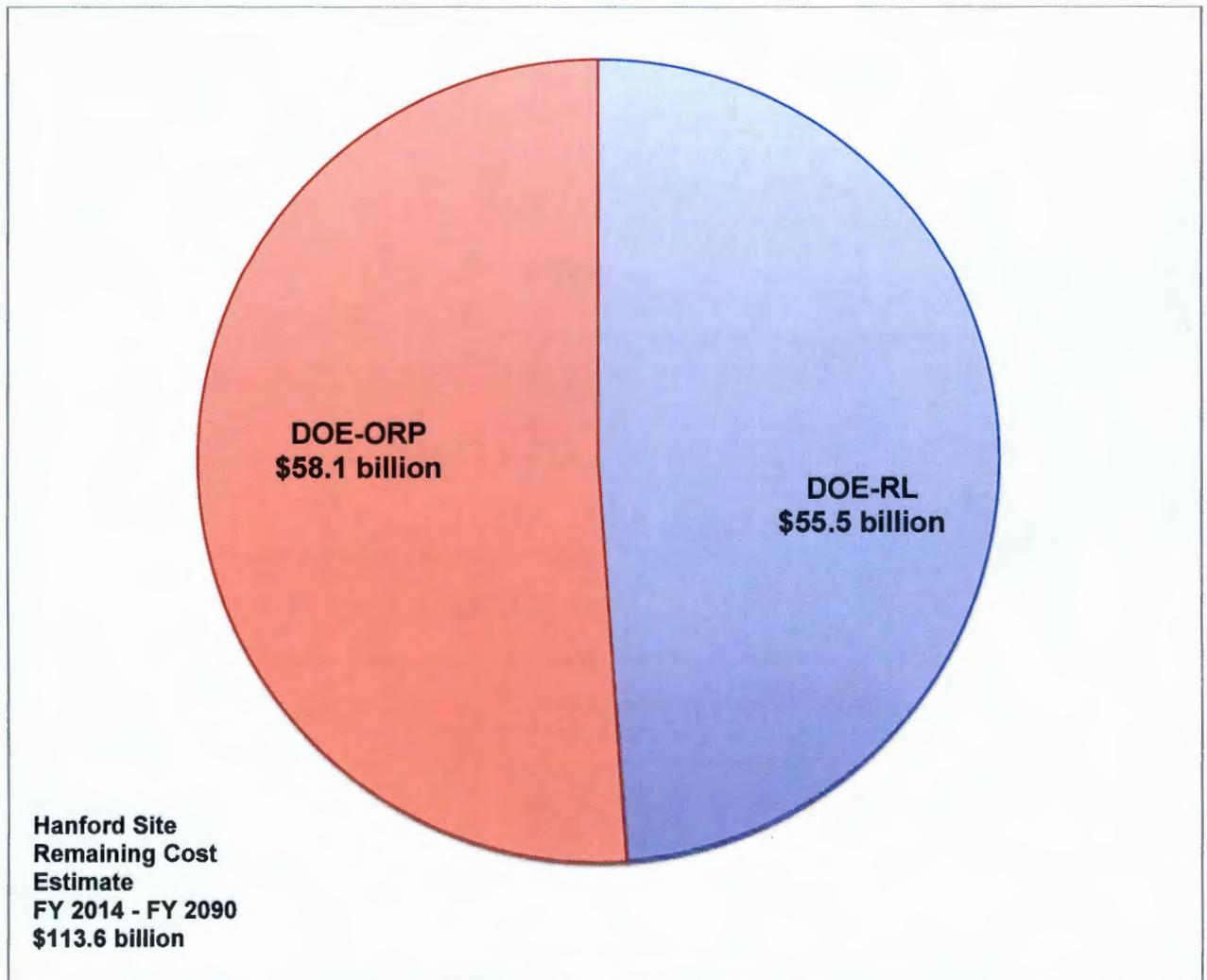


Figure 2-2. Hanford Site Estimated Cleanup Cost Distribution by DOE Field Office.

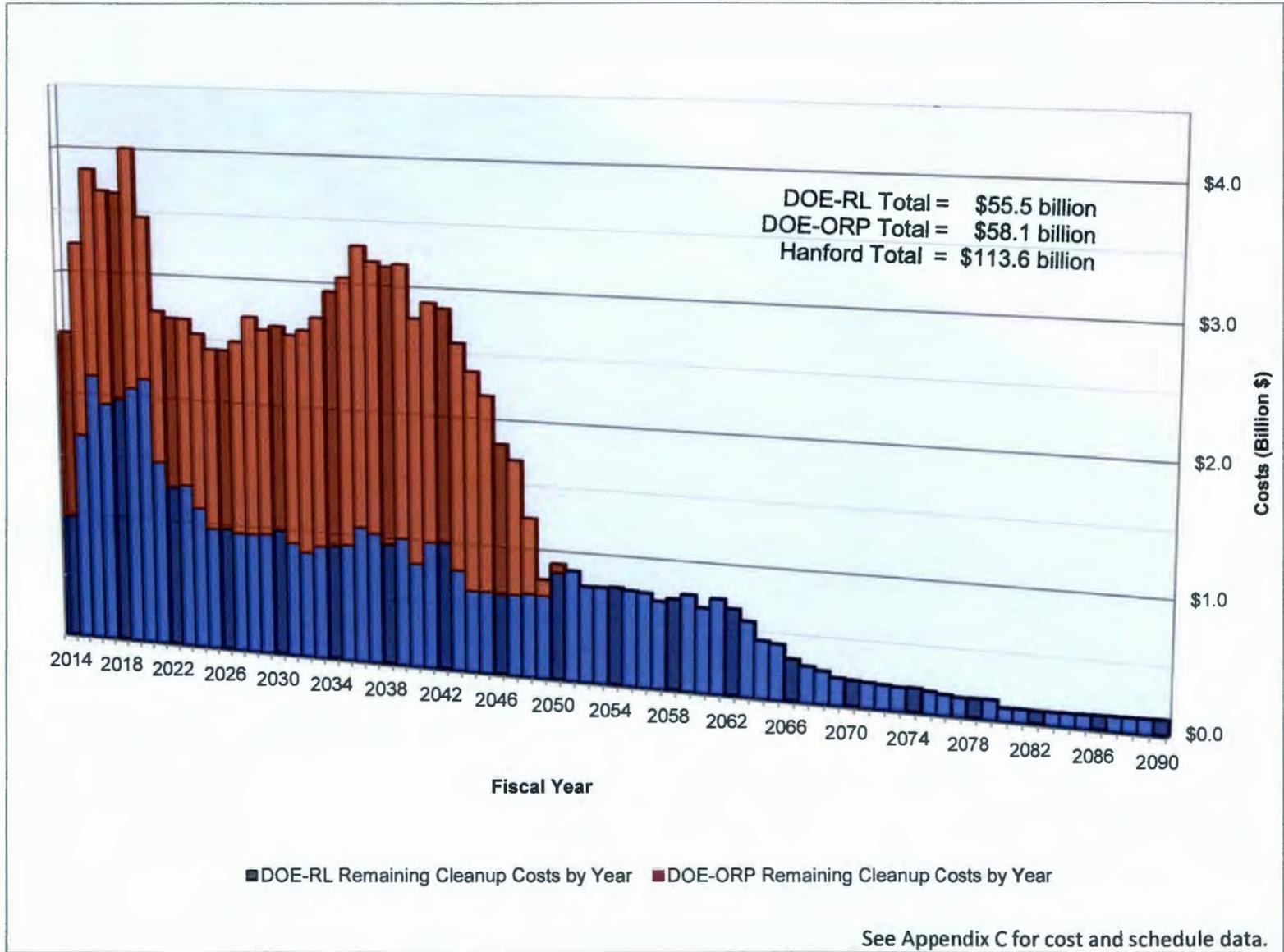


Figure 2-3. Hanford Site Remaining Cleanup Costs by Fiscal Year.

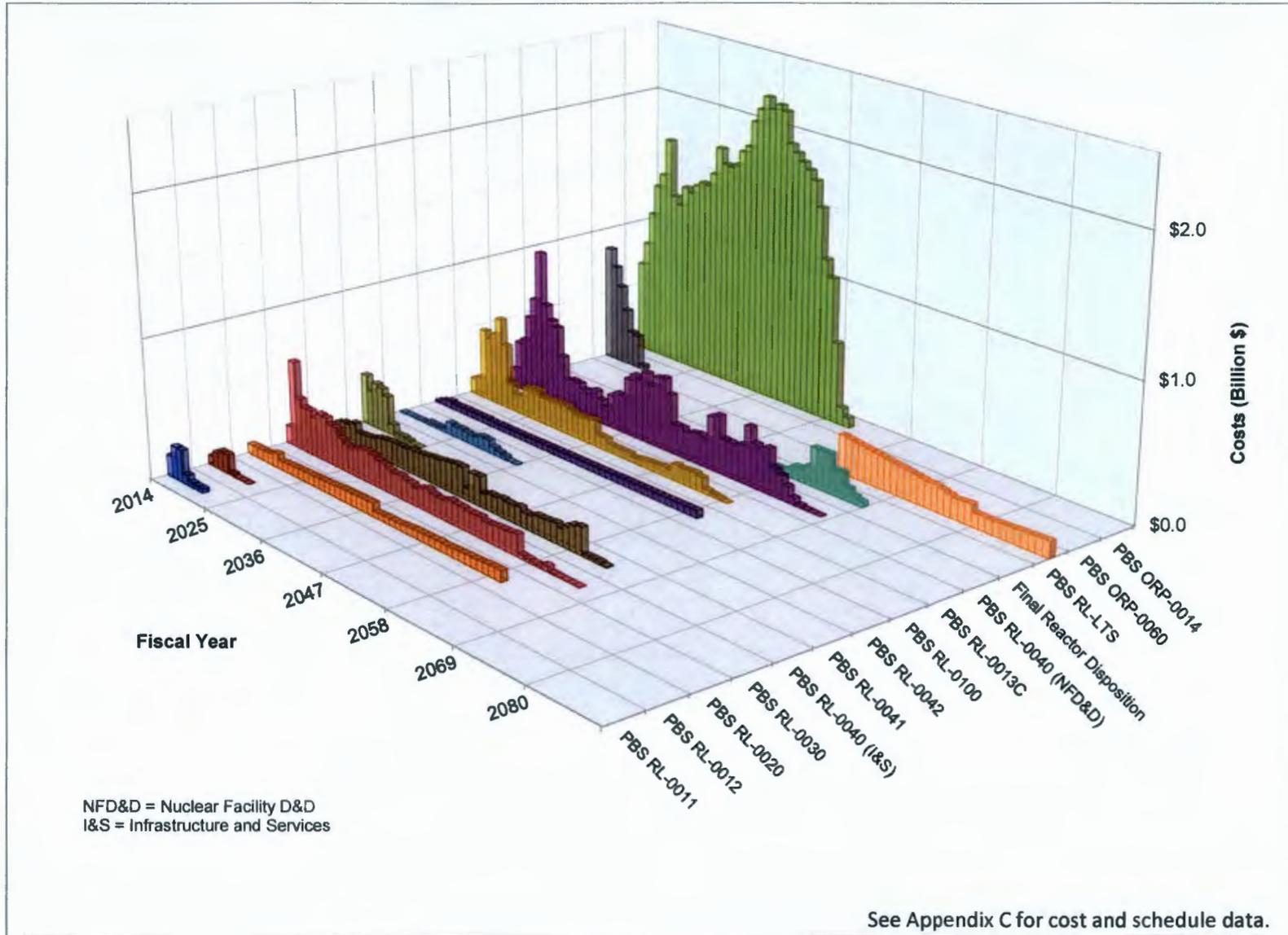


Figure 2-4. Hanford Site Remaining Cleanup Costs by Project Baseline Summary.

Table 2-2. Hanford Site Remaining Cleanup Cost Estimates by PBS.

Project Work Scope	Estimated Cleanup Costs ¹ (Billion \$)
RL Total Remaining Estimated Costs	\$51.1 - \$55.5
NM Stabilization and Disposition – PFP (PBS RL-0011)	\$0.4 - \$0.8
SNF Stabilization and Disposition (PBS RL-0012)	\$0.5
Solid Waste Stabilization and Disposition - 200 Area (PBS RL-0013C)	\$7.0 - \$7.2
Safeguards and Security (PBS RL-0020)	\$3.2
Soil and Water Remediation - Groundwater/Vadose Zone (PBS RL-0030)	\$8.1 - \$8.6
Nuclear Facility D&D - Remainder of Hanford (PBS RL-0040)	\$13.3 - \$16.7
Infrastructure and Services (PBS RL-0040)	\$6.8 - \$6.9
Nuclear Facility D&D - River Corridor Closure Project (PBS RL-0041)	\$1.7
Nuclear Facility D&D - Fast Flux Test Facility Project (PBS RL-0042)	\$0.8
Richland Community and Regulatory Support (PBS RL-0100)	\$2.0
Long-Term Stewardship (PBS RL-LTS)	\$5.4
Final Reactor Disposition	\$1.9
ORP Total Remaining Estimated Costs	\$58.1
Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014)	\$55.0
Major Construction – Waste Treatment Plant (PBS ORP-0060)	\$3.1
Total Remaining Estimated Costs	\$109.2 - \$113.6
¹ Cost ranges have been shown in this table to reflect cost and schedule uncertainty; the higher number is used throughout this report. Values are rounded, see Appendix C for details. D&D = decontamination and decommission. PBS = project baseline summary. LTS = long-term stewardship. PFP = Plutonium Finishing Plant. NM = nuclear materials. RL = U.S. Department of Energy, Richland Operations Office. ORP = U.S. Department of Energy, Office of River Protection. SNF = spent nuclear fuel.	
NOTE: The remaining estimated cleanup cost does not include the upper bound cost estimates prepared for selected future cleanup actions. These are summarized in Appendix B, Table B-5.	

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3.0 RIVER CORRIDOR CLEANUP

The River Corridor, the area of the Hanford Site along the Columbia River, includes four production and operations areas:

- **100 Areas** – Location of nine former production reactors, associated support facilities, and related waste sites.
- **300 Area** – Location of research, development, and fuel fabrication facilities, and related waste sites.
- **400 Area** – Buildings and waste sites other than operating facilities, Fuels and Materials Examination Facility, and the Fast Flux Test Facility (FFTF).
- **600 Area** – Location of two major burial grounds (618-10 and -11) with some soil and debris sites.

The majority of the River Corridor Cleanup is on track for completion by FY2020. Final remedial activities (excluding final reactor disposition) may extend until FY2024. DOE manages the River Corridor Cleanup through two projects, which are planned and funded under separate PBSs:

1. Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041) addresses cleanup of waste sites, burial grounds, and facilities in the 100, 300, 400, and 600 Areas and the interim safe storage (ISS) of the C, D, DR, F, H, KE, KW, and N Reactors. This project is currently responsible for operating and maintaining the Environmental Restoration Disposal Facility (ERDF), located on the Central Plateau, which is the disposal location for the remediation waste from the River Corridor and other Hanford cleanup operations. Section 3.1 discusses the scope of this project.
2. SNF Stabilization and Disposition (PBS RL-0012) addresses removal of fuel and sludge from the K Basins. The 105-KW Basin deactivation and removal work scope has been transferred to PBS RL-0041. Section 3.2 discusses the scope of this project.

Although currently not considered to be a project, Final Reactor Disposition will address cleanup of the 100 Area surplus production reactors. Section 3.3 discusses the scope of this activity.

Groundwater cleanup is underway in the River Corridor. RL manages the groundwater cleanup through Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030), which covers groundwater remediation for the entire Hanford Site. Groundwater associated with the River Corridor is discussed in the Central Plateau Cleanup in Section 4.2. Cleanup is conducted in accordance with interim and final records of decision (RODs) and action memoranda as listed in Appendix A. Work schedule milestones and target dates are listed in Appendix D of the TPA Action Plan (see <http://www.hanford.gov/files.cfm/ap-App-D.pdf>). These TPA milestones provide the structure that the Tri-Party Agencies have agreed to for Hanford priorities and scope sequencing.

3.1 NUCLEAR FACILITY D&D–RIVER CORRIDOR CLOSURE PROJECT (PBS RL-0041)

The Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041) will clean up the areas of Hanford located in the Columbia River Corridor in accordance with existing RODs (see Appendix A). Anticipated land uses for the River Corridor are described in DOE/EIS-0222-F and in the pursuant ROD. The River Corridor Closure Project established the following cleanup objectives:

- Remediate waste sites.
- Deactivation, decontamination, decommission, and demolition (D4) of facilities.
- Place eight plutonium production reactors into ISS. Figure 3-1 and Figure 3-2 depict C Reactor before and after the ISS process. Table 3-1 provides the status of the reactors. Note B Reactor's status as a National Historic Landmark.
- Operate ERDF to support disposal of waste generated during D4, field remediation, ISS, and support to other Hanford waste generators.
- Complete substantive remediation to allow the 100 and 300 Areas to be deleted from the National Priorities List.
- The River Corridor Closure Project includes remediation of the 600 Area burial sites 618-10 and 618-11.



Figure 3-1. C Reactor Before Interim Safe Storage.



Figure 3-2. C Reactor in Interim Safe Storage.

Table 3-1. Reactor Status. (2 pages)

Reactor	Status	Remaining Activity
B	Named National Historic Landmark by U.S. Department of Interior in 2008. Reactor open for escorted public tours.	In July 2011, the National Park Service recommended to Congress inclusion of B Reactor into a Manhattan Project National Historic Park.
C	Reactor placed in ISS.	Final disposition of reactor block.
D	Reactor placed in ISS.	Final disposition of reactor block.
DR	Reactor placed in ISS.	Final disposition of reactor block.
F	Reactor placed in ISS.	Final disposition of reactor block.
H	Reactor placed in ISS.	Final disposition of reactor block.
KE	Fuel storage basin demolished; continued deactivation, decommissioning, and demolition activities in preparation for emplacement of safe	Reactor ISS was started in 2011 and is scheduled for completion by 2019; final disposition of reactor block.

Table 3-1. Reactor Status. (2 pages)

Reactor	Status	Remaining Activity
	storage enclosure.	
KW	Awaiting sludge removal to proceed with demolition of adjacent buildings and installation of safe storage enclosure to complete ISS activities.	ISS is scheduled for completion by 2022; final disposition of reactor block.
N	Reactor placed in ISS.	Final end state of the reactor has not been determined.

ISS = interim safe storage.

Figure 3-3 depicts the primary Level 2 work elements within the Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041) remaining cleanup schedule. Table 3-2 summarizes the scope for the Level 2 work elements.

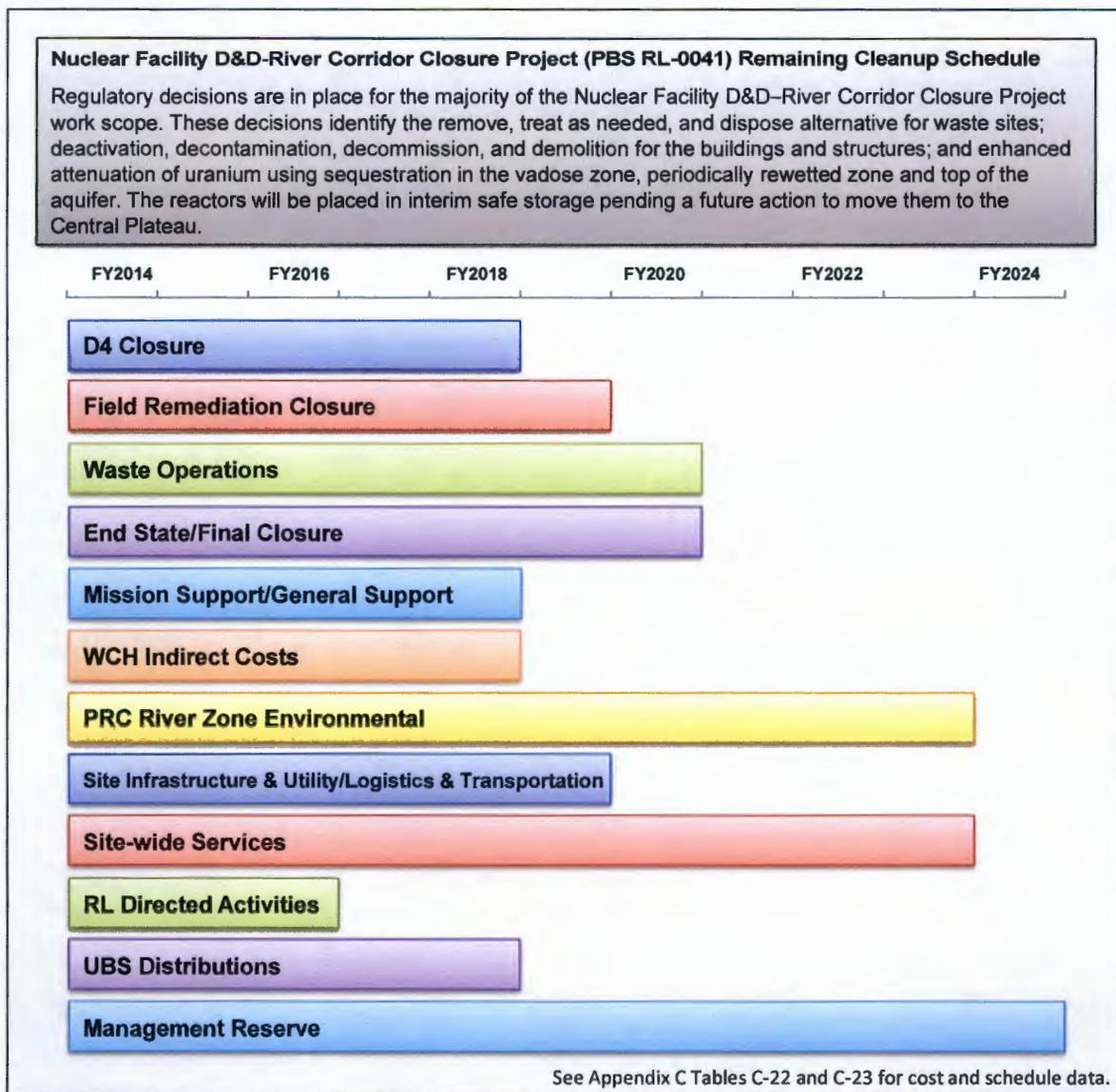


Figure 3-3. Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041) Remaining Cleanup Schedule.

Table 3-2. Nuclear Facility D&D-River Corridor Closure Project (PBS RL-0041) Level 2 Scope. (2 pages)

Work Element	Scope Description
D4 Closure	Includes D4 of ~500 facilities, provision of utility and surveillance and maintenance services during D4, and closure of utilities located in the River Corridor. The D4 closure buildings are located throughout the River Corridor in the 100, 300, 400, and 600 Areas. Typical hazards associated with the buildings include radiological contamination (e.g., uranium, mixed fission products, activation products, plutonium), hazardous materials (e.g., asbestos, chemicals), and industrial hazards (e.g., elevated working locations, degraded roofs, biological hazards, electrical hazards, excavations). The D4 process includes obtaining regulatory approvals; characterizing hazards and waste; deactivating the facility by removing loose hazardous materials and equipment; decontaminating the facility to allow open-air demolition; and decommissioning the facility by disconnecting utilities and services. The structure is then demolished using heavy equipment (e.g., track hoe, processor, loader, cranes), explosives, cutting equipment, or other methods and the demolition debris is disposed, generally to ERDF. Following demolition, samples are collected to verify cleanup criteria are met, and the sites are backfilled and revegetated.
Field Remediation Closure	Includes performing CERCLA field remediation and closure of contaminated waste sites in the River Corridor (liquid waste disposal facilities, burial grounds, burn pits, disposal pits, unplanned release sites, and contaminated pipelines), including confirmatory sampling, remediation design, RTD activities, verification sampling, and closure documentation. RODs for the Field Remediation Closure work scope generally identify RTD as the preferred alternative (RODs are identified in Appendix A). In addition to RTD, sites were identified that require confirmatory sampling to determine the need for RTD. Following sampling, these sites become RTD sites or are closed as no-action sites. Contamination in the waste sites and burial grounds of the River Corridor include chemical and radioactive constituents, such as metals, hexavalent chromium, petroleum-related compounds, strontium, uranium, and cesium. The cleanup process involves sampling and analyzing the site to determine the extent and type of contamination, excavating contaminated waste materials, and restoring the landscape through site backfill, grading, and revegetation.
Waste Operations	Includes the transportation, disposal, and treatment (if required) of waste from the River Corridor Cleanup activities, as well as from other Hanford cleanup operators. Waste operations will expand and operate the ERDF, and transition the ERDF to a successor operator at the end of the Nuclear Facility D&D-River Corridor Closure Project.
End State/Final Closure	Includes preparing an integrated River Corridor work plan for a CERCLA baseline risk assessment; preparing a baseline risk assessment for 100 and 300 Areas; conducting a risk evaluation for River Corridor areas outside 100 and 300 Areas; conducting orphan site evaluations; conducting surface soil surveys; preparing remedial action reports that document completion of interim remedial actions for each geographic area; conducting closure reviews; preparing a remedial investigation/feasibility study and proposed plan for six River Corridor source and groundwater areas; and preparing transition and turnover packages for the six geographic areas for transition to Hanford Long-Term Stewardship.
Mission Support/General Support	Includes functional support and business operations necessary to achieve River Corridor Closure and field project objectives, providing trained and qualified staff, performance standards, facilities services, and office supplies. General support functions include safety, health and quality, regulatory and environmental management, project integration, project services, engineering services, and Office of the Project General Manager.
WCH Indirect Costs	Includes WCH performance and incentive fee.
Plateau Remediation Contract River Zone Environmental	Includes work remaining to complete 100-K Area remediation, demolition of K East Basin, disposition of K East and K West Reactors, and D4 of support structures. In K West Basin, near-term deactivation includes removal of containerized sludge and any found scrap/scrap fuel, and finally removal of the fuel basin.
Site Infrastructure & Utility/Logistics & Transportation (B Reactor)	Includes management and oversight for B Reactor facility activities, including planning, directing, and providing technical support to maintain, upgrade, and preserve the B Reactor facility in a safe condition. After PBS RL-0041 ends, this scope will transfer to PBS RL-0040.

Table 3-2. Nuclear Facility D&D-River Corridor Closure Project (PBS RL-0041) Level 2 Scope. (2 pages)

Work Element	Scope Description
Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Section 6.3.2 for details.
RL Directed Activities	Includes administrative and technical support provided to the project through the General Support Services Contract, service assessment pool, and other activities. Details are provided in Table C-21.
Usage-Based Service Distributions	Includes services that are charged based on predetermined rates, and services that are directly charged to Other Hanford Contractors. Details are provided in Table C-21.
Management Reserve	Includes contractor's fee, management reserve and Government & Administrative allocations.
<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601.</i> CERCLA= <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i> D4 = deactivation, decontamination, decommission, and demolition. D&D = decontamination and decommission. ERDF = Environmental Restoration Disposal Facility.	
ISS = interim safe storage. PBS = project baseline summary. ROD = record of decision. RTD = remove, treat, and dispose. RL = Richland Operations Office. WCH = Washington Closure Hanford.	

Figure 3-4 presents the remaining cleanup costs for PBS RL-0041 by fiscal year, and Figure 3-5 presents the remaining estimated costs by work element.

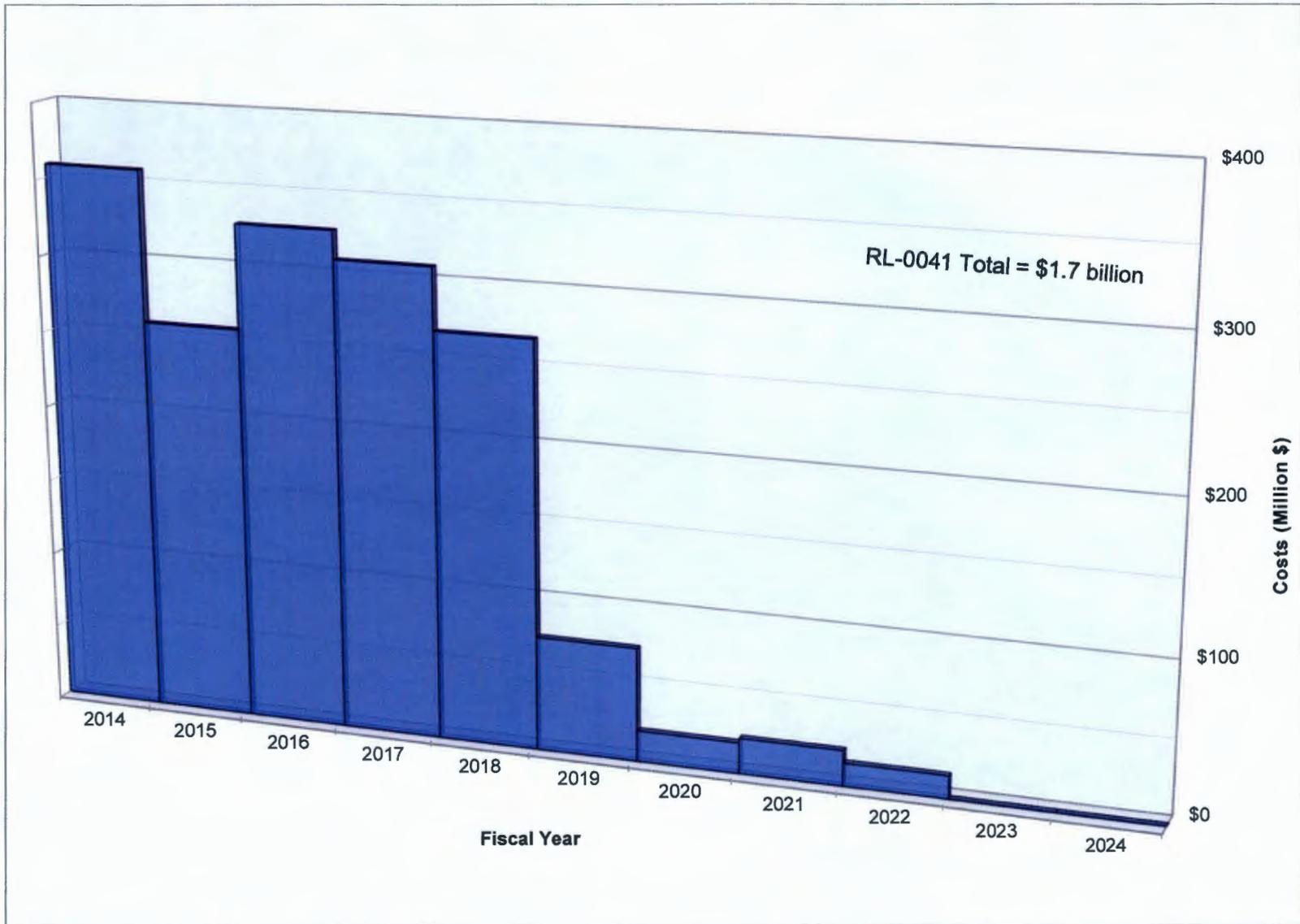


Figure 3-4. Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041) Remaining Estimated Cleanup Costs by Fiscal Year.

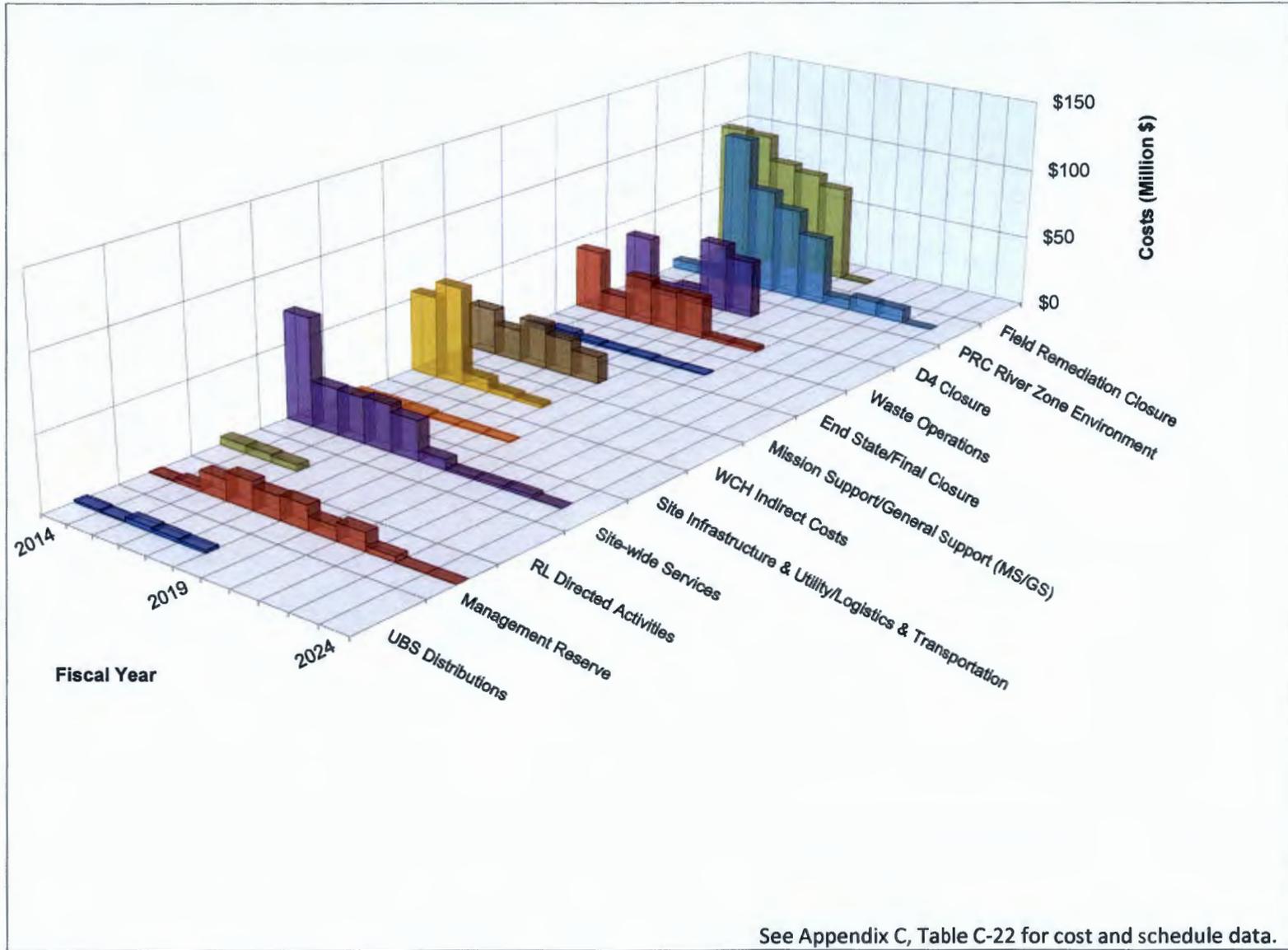


Figure 3-5. Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041) Remaining Estimated Cleanup Costs by Work Element.

3.2 SNF STABILIZATION AND DISPOSITION (PBS RL-0012)

The SNF Stabilization and Disposition Project (PBS RL-0012) provides for safe stabilization, packaging, and interim storage of SNF sludge. After removing sludges, the 105-KW Basin deactivation and removal work scope will be performed under PBS RL-0041. At the completion of this project, significant hazards to workers, the public, and the environment will have been eliminated. Major cleanup objectives for the SNF Stabilization and Disposition Project are:

- All SNF will be removed from K Basins and repackaged, dried, and transported to interim storage at the Canister Storage Building (CSB).
- Sludge material from K Basin knock-out pots will be pretreated, packaged, dried, and transported to interim storage at the CSB pending disposal at a future repository. Once stabilized and placed into storage, this waste stream and the remaining sludge will be handed off to another project (PBS RL-0013C, Solid Waste Stabilization and Disposition–200 Area; see Table 4-5 Sludge Disposition) for final disposition to the Waste Isolation Pilot Plant (WIPP) or other disposal facilities.
- The remaining sludge will be retrieved and shipped to an interim onsite storage facility (T Plant), then treated and packaged for shipment to an offsite disposal facility.
- Debris within the 105-KW Basin will be packaged and transported for disposal.

The work scope for SNF Stabilization and Disposition Project (PBS RL-0012) is organized into the work elements shown in Figure 3-6, which also presents the remaining cleanup schedule. Additional scope information on these work elements is provided in Table 3-3.

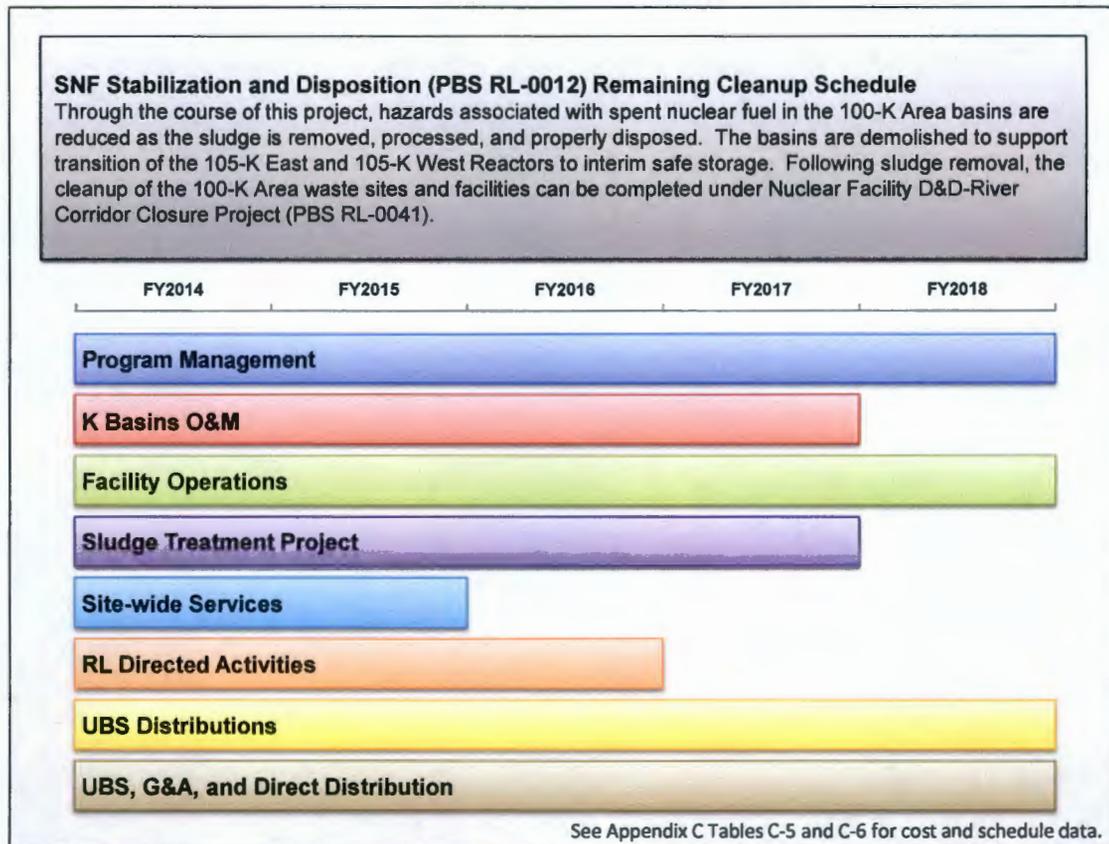


Figure 3-6. SNF Stabilization and Disposition Project (PBS RL-0012) Remaining Cleanup Schedule.

Table 3-3. SNF Stabilization and Disposition (PBS RL-0012) Level 2 Scope Summary.

Work Element	Scope Description
Program Management	Provides project management for 100-K Area work activities.
K Basins Operations and Maintenance	Includes dose data gathering and analysis; sampling and characterization of radioactive and hazardous waste to maintain compliance in 105-KW Basin (note that 105-KE Basin has been demolished); basic plant maintenance; and general duties and operations to keep 105-KW Basin and the Cold Vacuum Drying Facility in a safe and compliant condition.
Facility Operations	Includes auxiliary operations support, conduct of operations support, waste management support, and sample management support. Specific tasks include, but are not limited to, operational and environmental sampling, operation of potable and service water supplies, and conduct of operations.
Sludge Treatment Project	Includes the design, procurement, fabrication, installation, testing, startup, operation, deactivation, and decontamination of the equipment necessary to perform the functions to remove consolidated containerized sludge, then stabilize and package the sludge for interim storage at Hanford. Once stabilized and placed into storage, the waste stream will be handed off to another project area (PBS RL-0013C, Solid Waste Stabilization and Disposition–200 Area) for final disposition to WIPP or other disposal facilities.
Site-wide Services	Includes proportional share of costs for site-wide services and infrastructure. See Section 6.3.2 for details.
RL Directed Activities	Includes administrative and technical support provided to the project through the General Support Services Contract and other activities. Details are provided in Table C-4.
UBS Distributions	Includes services that are charged based on predetermined rates, and services that are directly charged to Other Hanford Contractors. Details are provided in Table C-4.
UBS, G&A and Direct Distribution	Includes contractor's fee and management reserve.
G&A = general and administrative. PBS = project baseline summary.	RL = U.S. Department of Energy, Richland Operations Office. UBS = usage-based services. WIPP = Waste Isolation Pilot Plant.

Figure 3-7 presents remaining estimated cleanup costs for SNF Stabilization and Disposition (PBS RL-0012) by fiscal year, and Figure 3-8 presents remaining estimated cleanup costs by work element.

3.3 FINAL REACTOR DISPOSITION

Final Reactor Disposition will address cleanup of the 100 Area surplus production reactors in accordance with TPA Milestone M-093-00. Disposition of the 100 Area reactors (except for B Reactor which has been recommended to Congress for inclusion in a Manhattan Project National Historic Park) was one of the cost estimate alternative analyses evaluated in the 2011 LCR (DOE/RL-2010-25). See summary in Appendix B, Table B-5, River Corridor - Disposition 100 Area Reactors.

Six reactors (C, D, DR, F, H, and N) have been placed in ISS configuration (Table 3-1). KE Reactor has completed interim ISS and is in a minimum safe state, KE Reactor is scheduled to complete ISS by 2019 and KW Reactor is scheduled to complete ISS by FY2022. After being placed in ISS, the reactors will undergo surveillance, monitoring, and maintenance for up to 75 years to allow radionuclides to decay. Following this period, the reactor blocks will be removed from their current locations and transported to the Central Plateau Inner Area for disposal.

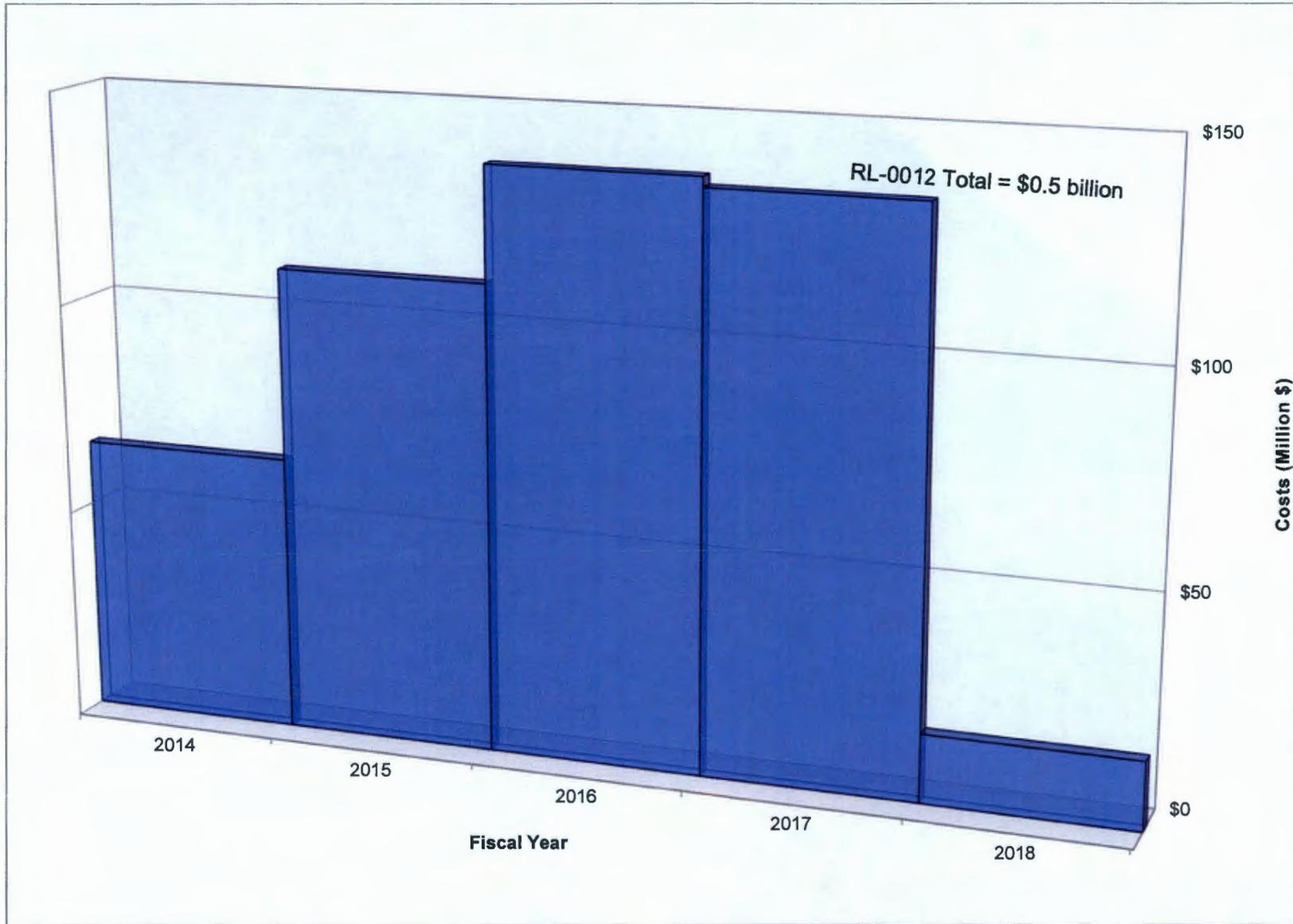


Figure 3-7. SNF Stabilization and Disposition (PBS RL-0012) Remaining Estimated Cleanup Costs by Fiscal Year.

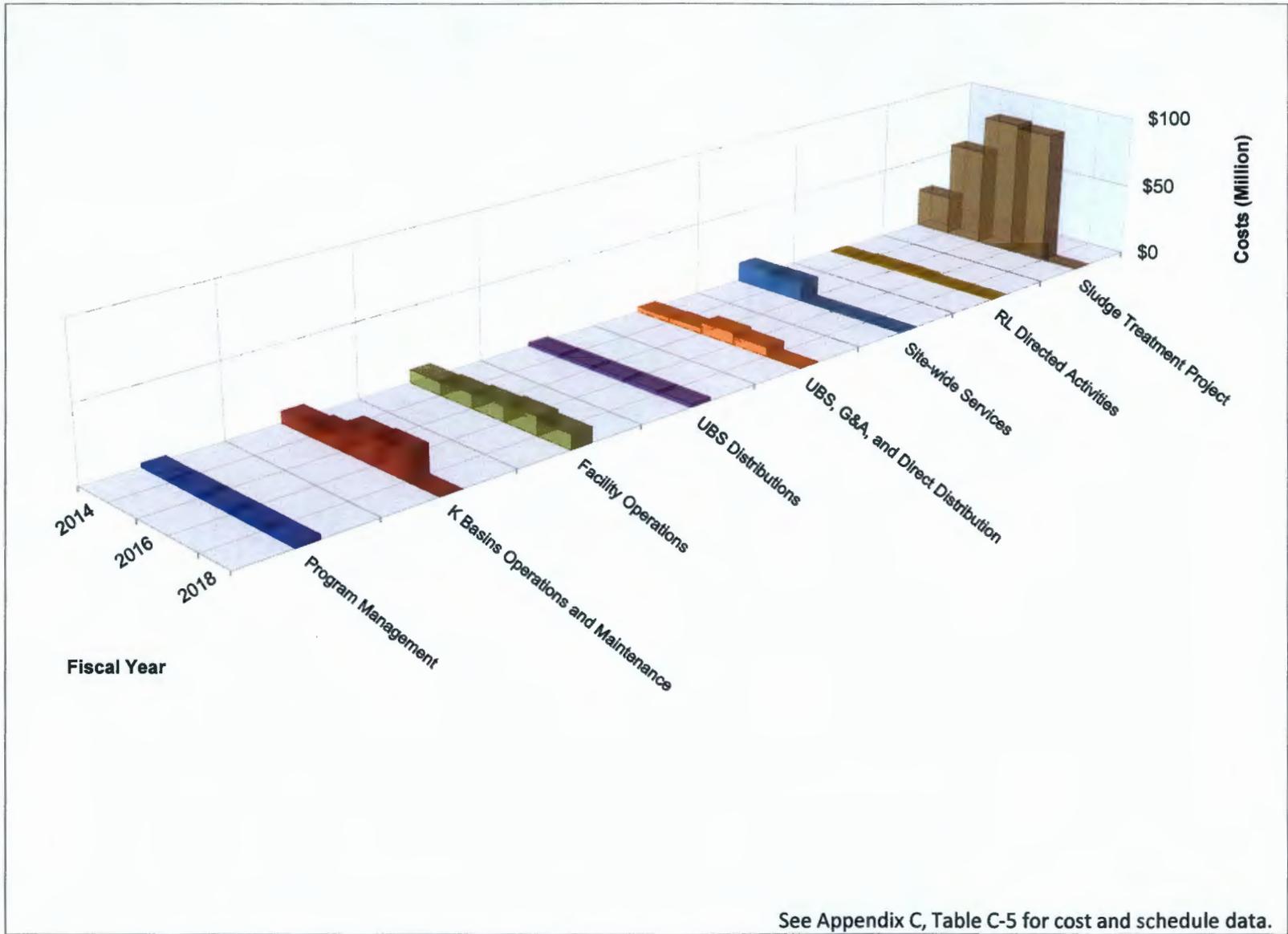
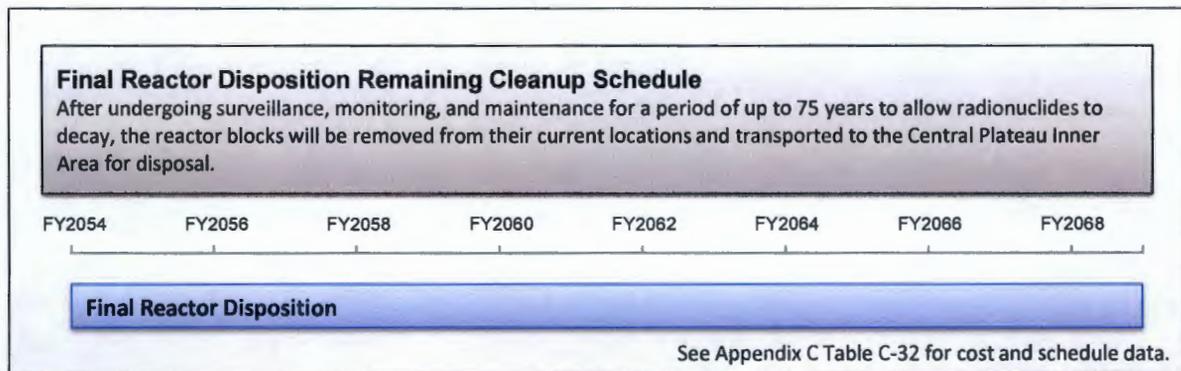


Figure 3-8. SNF Stabilization and Disposition (PBS RL-0012) Remaining Estimated Cleanup Costs by Work Element.

The 2011 LCR identified the most plausible alternative for the reactors as safe storage followed by deferred one-piece removal. This alternative was developed and evaluated in a final environmental impact statement (EIS) (DOE/EIS-0119F, *Final Environmental Impact Statement Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington*) and in a subsequent engineering evaluation (DOE/RL-2005-45, *Surplus Reactor Final Disposition Engineering Evaluation*). In September 1993, DOE issued 58 FR 48509, "Record of Decision: Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington," which implements the recommendation for safe storage followed by deferred one-piece removal of the surplus reactors. N Reactor was not included in the EIS because it was not available for decommissioning at the time of the *National Environmental Policy Act of 1969* (NEPA) EIS and ISS was approved through the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) process. Final disposition of N Reactor will be determined by a subsequent NEPA or CERCLA decision process. In the planning case presented in this report, N Reactor is assumed to undergo safe storage followed by deferred one-piece removal.

Figure 3-9 presents the remaining cleanup schedule and Figure 3-10 provides the remaining estimated costs by fiscal year. The schedule is based on a 14-year implementation period for one-piece removal work and completion of reactor removal by FY2068 based on the ROD issue date of 1993 and a maximum 75-year storage period. Reactor removal must start by FY2054. The estimated \$1.9 billion to complete Final Reactor Disposition by FY2068 is the escalated \$676 million removal cost (in 2010 constant dollars) presented in Table 4-5 of the 2011 LCR.



Scale dates represent start of fiscal year

Figure 3-9. Final Reactor Disposition Remaining Cleanup Schedule.

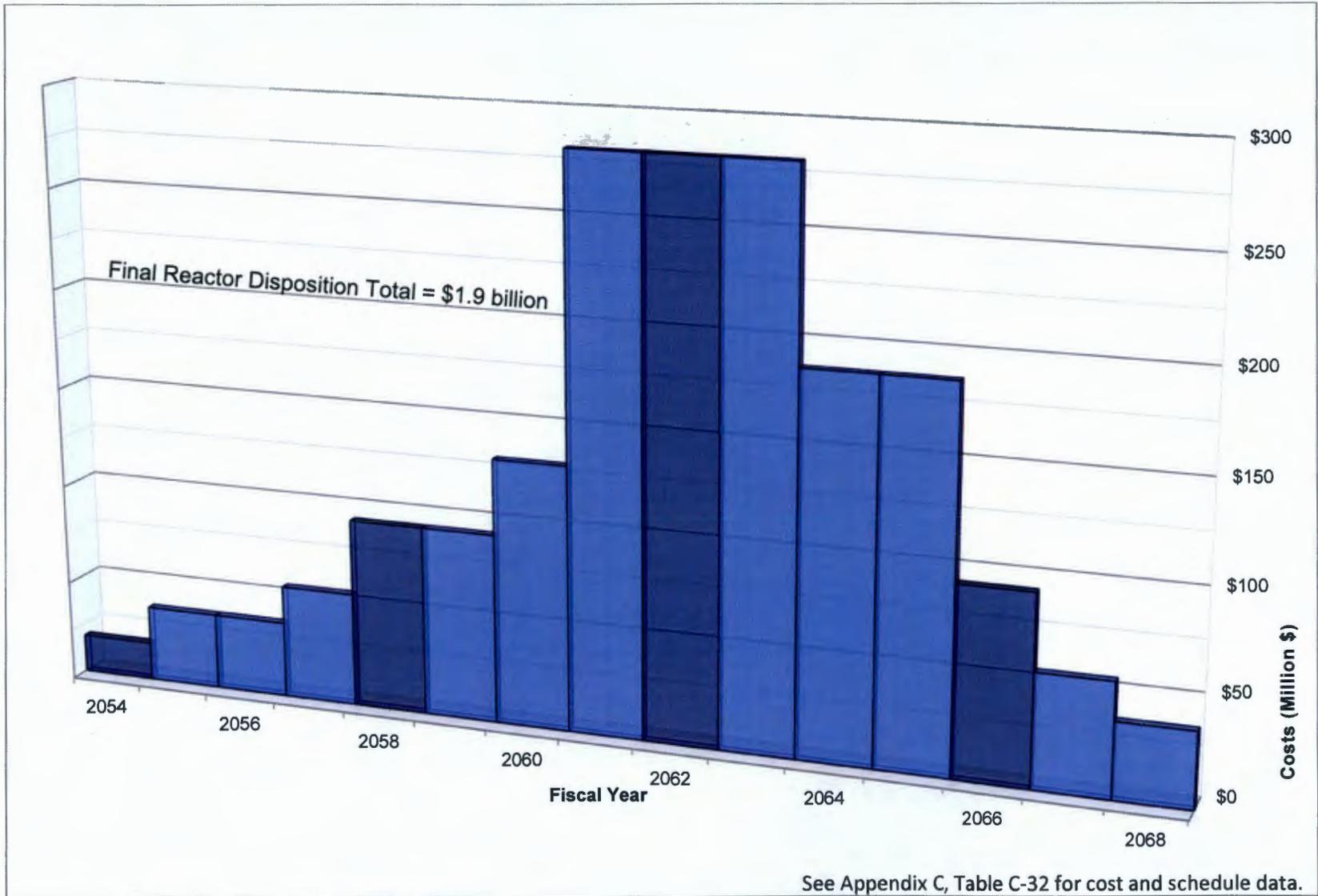


Figure 3-10. Final Reactor Disposition Remaining Estimated Cleanup Costs by Fiscal Year.

3.4 RIVER CORRIDOR CLEANUP ASSUMPTIONS AND UNCERTAINTIES

In planning for the Hanford Site lifecycle, there are uncertainties that are analyzed to estimate potential scope, schedule and cost changes. The following assumptions were identified for Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041) work scope:

- Regulatory changes will not require additional activities (e.g., document revisions, additional sampling) that would significantly impact costs or schedules.
- Pacific Northwest National Laboratory (PNNL) operating facilities will need to be available to support Office of Science missions. After PBS RL-0041 is completed, the facility D&D/waste site cleanup work will transfer to PBS RL-0040 Nuclear Facility D&D – Remainder of Hanford.
- The Natural Resource Damage Assessment and Restoration (NRDAR) and risk assessment litigation brought by the Yakama Nation will not significantly affect cost or schedule.
- The Hanford Natural Resource Trustee Council activities, including studies and NRDAR process will not significantly affect cost or schedule.

For SNF Stabilization and Disposition (PBS RL-0012), the following assumptions were identified:

- Compliance with regulatory standards and requirements will provide an adequate level of protection for the worker, public health, safety, and the environment during operations activities and after D4 is complete.
- ERDF waste acceptance criteria will not change substantially.
- T Plant is acceptable for interim sludge storage and no pretreatment for the sludge is needed before transfer. Subsequent treatment and packaging of the sludge will be done by work scope in PBS RL-0013C.
- Post-CERCLA ROD treatability studies and focused feasibility studies will not affect the sludge treatment process.

4.0 CENTRAL PLATEAU CLEANUP

The Central Plateau is a 75-square-mile area located near the center of Hanford and contains about 900 excess facilities, including five massive chemical processing facilities called canyons, and roughly 800 non-tank farm waste sites. The Central Plateau is home to ongoing waste management operations, such as the Mixed Waste Low-Level Burial Grounds, liquid waste facilities, and the Waste Receiving and Processing (WRAP) Facility. Infrastructure services (e.g., power, water, telecommunication lines), either existing or to be constructed, in the Central Plateau are needed to support cleanup. These facilities, waste sites, canyons, and ongoing waste management operations and infrastructure are spread across the Central Plateau. The tank waste and WTP facilities on the Central Plateau are discussed in Chapter 5.0 as part of ORP's scope.

During site operations, 450 billion gallons of liquid waste were discharged to the ground; most within the Central Plateau (TRAC-0151-VA, *Historical Perspective of Radioactively Contaminated Liquid and Solid Wastes Discharged or Buried in the Ground at Hanford*). These past releases have created extensive plumes of groundwater contamination with a combined area of approximately 59 square miles that exceeds drinking water standards (DOE/RL-2013-22, *Hanford Site Groundwater Monitoring Report for 2012*). A significant portion of contamination remains in the soil column above the water table and poses a potential threat to groundwater. Interim and final groundwater treatment is in place for contaminant plumes in the 200 West Area and in several locations in the 100 Areas. The ROD for the large carbon tetrachloride plume in the 200 West Area (200-ZP-1 Operable Unit [OU]) was signed in 2008 (EPA 2008, *Record of Decision Hanford 200 Area 200-ZP-1 Superfund Site, Benton County, Washington*) and operation of the expanded 200 West Pump-and-Treat Facility began in FY2012. The ROD for plutonium-contaminated and cesium-contaminated soil sites (200-PW-1/3/6 and 200-CW-5 OUs) was signed in FY2011 (EPA 2011, *Record of Decision Hanford 200 Area Superfund Site 200-CW-5 and 200-PW-1, 200-PW-3, and 200-PW-6 Operable Units*) and a new interim action ROD for 200-UP-1 groundwater OU was approved in 2012 (EPA 2012, *Record of Decision for Interim Remedial Action Hanford 200 Area Superfund Site, 200-UP-1 Operable Unit*). The Central Plateau cleanup is organized into the following three principal components (DOE/RL-2009-10):

- Inner Area – The footprint of the Central Plateau that will be dedicated to long-term waste management and containment of residual contamination and will remain under Federal ownership and control as long as a potential hazard exists. The Inner Area contains the majority of Hanford's active waste treatment, storage and disposal facilities, including hundreds of waste sites, surplus facilities, miles of buried pipelines, tank farms, and large canyon facilities. Cleanup of the Inner Area will make this footprint as small as practical.
- Outer Area – All areas of the Central Plateau beyond the boundary of the Inner Area. It is DOE's intent to clean up the Outer Area to a level comparable to the River Corridor (i.e., suitable for unrestricted surface use under continued Federal ownership and control and consistent with DOE's anticipated future land use of conservation/mining). Contaminated soil and debris removed as part of Outer Area cleanup will be placed within the Inner Area for final disposal. Completion of cleanup for the approximately 65-square-mile Outer Area will shrink the active footprint of cleanup for the Central Plateau to the Inner Area.
- Groundwater and Deep Vadose Zone Remediation – DOE's goal is to restore groundwater to its beneficial uses (Table 1-2, Goal 2), unless restoration is determined to be technically impracticable. An important element of groundwater protection and remediation is to develop

and implement ways to protect groundwater from continuing influx of contaminants from the deep vadose zone.

Cleanup work scope in the Central Plateau is managed through five projects:

- NM Stabilization and Disposition–PFP, PBS RL-0011 (Inner Area).
- Soil and Water Remediation–Groundwater/Vadose Zone, PBS RL-0030 (entire Hanford Site, including Inner and Outer Areas and the River Corridor).
- Nuclear Facility D&D–Remainder of Hanford, PBS RL-0040 (includes the geographical cleanup of waste sites and facilities, including the remaining canyon facilities [Inner and Outer Areas]).
- Nuclear Facility D&D–Fast Flux Test Facility Project, PBS RL-0042 (includes FFTF [located in River Corridor]).
- Solid Waste Stabilization and Disposition–200 Area, PBS RL-0013C (Inner Area).

Figure 4-1 presents the remaining cleanup schedule for the Central Plateau. Cleanup is being done in accordance with RODs and action memoranda as listed in Appendix A. Work schedule milestones and target dates are listed in Appendix D of the TPA Action Plan (see <http://www.hanford.gov/files.cfm/ap-App-D.pdf>).

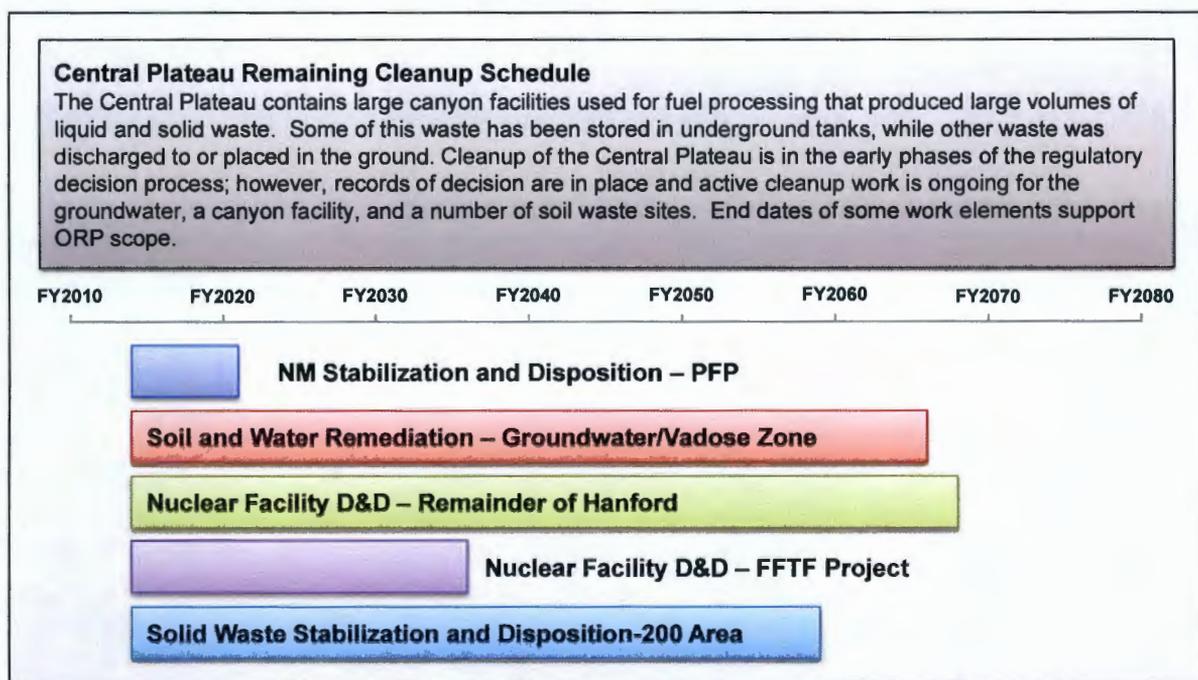


Figure 4-1. Central Plateau Remaining Cleanup Schedule.

4.1 NM STABILIZATION AND DISPOSITION–PFP (PBS RL-0011)

The Plutonium Finishing Plant (PFP) complex was constructed in the 200 West Area in the late 1940s. Its mission was to convert plutonium nitrate product to the more stable oxide, metal, and oxalate forms for safer shipment to nuclear weapons fabrication facilities. In 1989, plutonium production operations ended at PFP and removing the plutonium inventory and plant D4 were

assigned high national priority (HNF-EP-0924, *History and Stabilization of the Plutonium Finishing Plant (PFP) Complex Hanford Site*).

Cleanup and demolition to slab-on-grade of the PFP complex is being conducted as a closure project under NM Stabilization and Disposition–PFP (PBS RL-0011), also known as the PFP Closure Project (DOE/RL-2005-13, *Action Memorandum for the Plutonium Finishing Plant Above-Grade Structures Non-Time Critical Removal Action*). To begin the PFP closure process, about 20 tons of plutonium-bearing material stored at PFP required an integrated DOE-wide disposition strategy. In 2004, PFP completed the project to recover, stabilize, and package the inventory to meet updated safety standards in addition to shipping designated plutonium-bearing material to WIPP. Shipment of the remaining PFP plutonium inventory to DOE storage facilities was completed in 2009.

The PFP Closure Project scope requires D4 of PFP systems and structures to accomplish the defined project endpoint completion criteria in compliance with all applicable agreements, regulations, CERCLA, *Resource Conservation and Recovery Act of 1976* (RCRA), and other applicable processes. This effort eliminates significant hazards to workers, the public, and the environment, and additionally minimizes long-term risks and costs. Major cleanup objectives for PFP closure are to:

- Remove plutonium-bearing material and waste, including un-irradiated fuel, slightly irradiated fuel, and other nuclear materials from PFP facilities (removing the plutonium inventory was completed in 2009; residual plutonium is removed in the cleanup process).
- Eliminate the Protected Area at PFP (this scope was completed in 2009).
- Clean out and demolish facilities in the PFP complex (currently underway with two major and numerous minor facilities complete).
- Transfer the remainder of the PFP complex to RL-0040 for final remediation. Waste sites and subsurface facilities will be managed through the remediation of the 200-PW-1/3/6 and 200-CW-5 OUs and the new 200-WA-1 OU.

Table 4-1 provides a summary of the scope of each of these work elements.

Table 4-1. NM Stabilization and Disposition–PFP (PBS RL-0011) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description
Maintain Safe and Compliant PFP	Maintain building integrity and safety systems during D4 efforts. Tasks include maintaining worker/public health and environmental safety, an environmentally compliant facility, facility systems and components, the maintenance program, and special projects.
Disposition PFP Facility	Includes planning, preparing, engineering, sampling, procurement, and other tasks necessary to execute removal of plutonium holdup material (e.g., material in ducting), deactivation, and disposition of aboveground PFP facilities before transitioning the below-grade components (e.g., below-grade structures and waste sites) to Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040) for surveillance and maintenance and final remediation. D4 activities will be completed for buildings and facilities in the PFP area, reducing them to slab-on-grade. Slab-on-grade is defined as a concrete slab, typically the first floor of a building resting on grade (earth) that is free of dispersible radiological contamination.
Project Management and Support	Includes project management and support to PFP D4 activities including procurement and project controls. This also includes technical support, such as engineering, quality assurance, and procedure and document maintenance.
Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Section 6.3.2 for details.

Table 4-1. NM Stabilization and Disposition–PFP (PBS RL-0011) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description
UBS Distributions	Includes services that are charged based on predetermined rates, and services that are directly charged to Other Hanford Contractors. Details are provided in Table C-1.
UBS, G&A and Direct Distribution	Includes contractor’s fee and management reserve.
D4 = deactivation, decontamination, decommission, and demolition.	PBS = project baseline summary.
D&D = decontamination and decommission.	PFP = Plutonium Finishing Plant.
G&A = general and administrative.	RL = U.S. Department of Energy, Richland Operations Office.
	UBS = usage-based services.

Figure 4-2 presents the NM Stabilization and Disposition–PFP (PBS RL-0011) work elements and remaining cleanup schedule. PFP transition is planned to be complete in FY2016 per TPA Milestone M-083-00A. Cost and/or schedule uncertainty extends the schedule beyond FY2016.

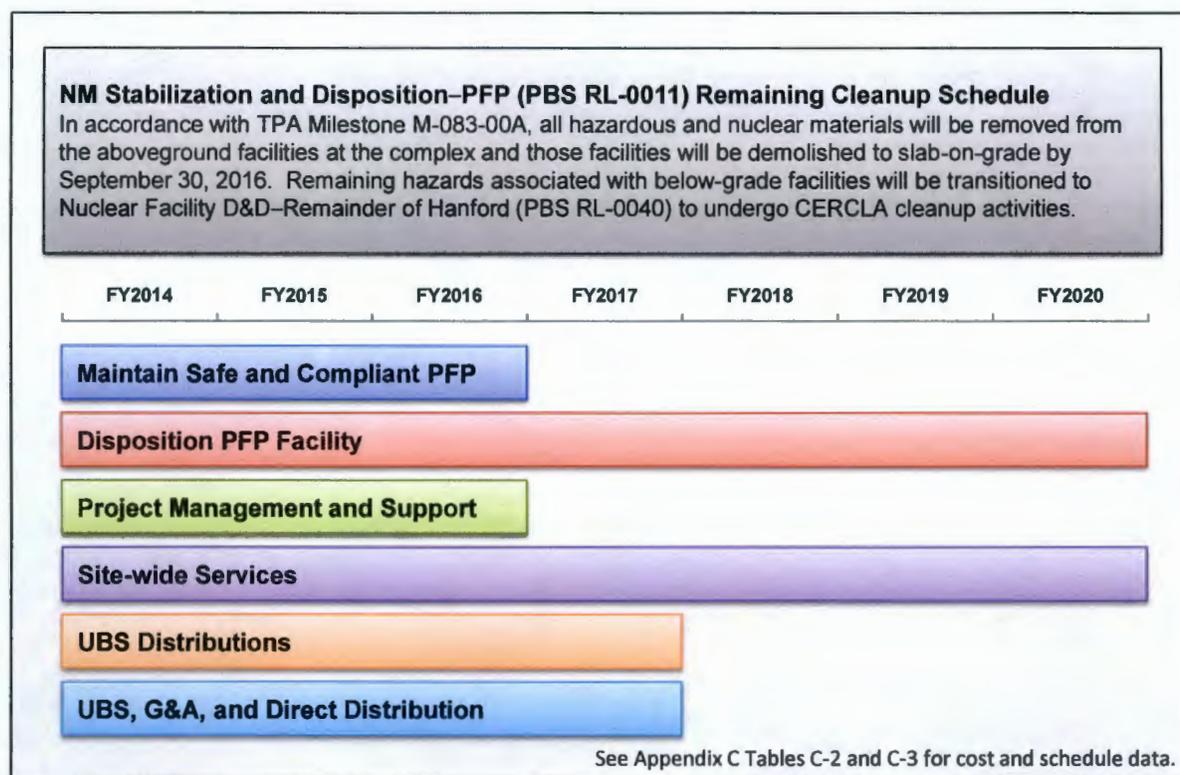


Figure 4-2. NM Stabilization and Disposition–PFP (PBS RL-0011) Remaining Cleanup Schedule.

Figure 4-3 presents the remaining estimated cleanup costs for NM Stabilization and Disposition-PFP (PBS RL-0011) work scope by fiscal year; Figure 4-4 presents the remaining estimated cleanup costs by work element.

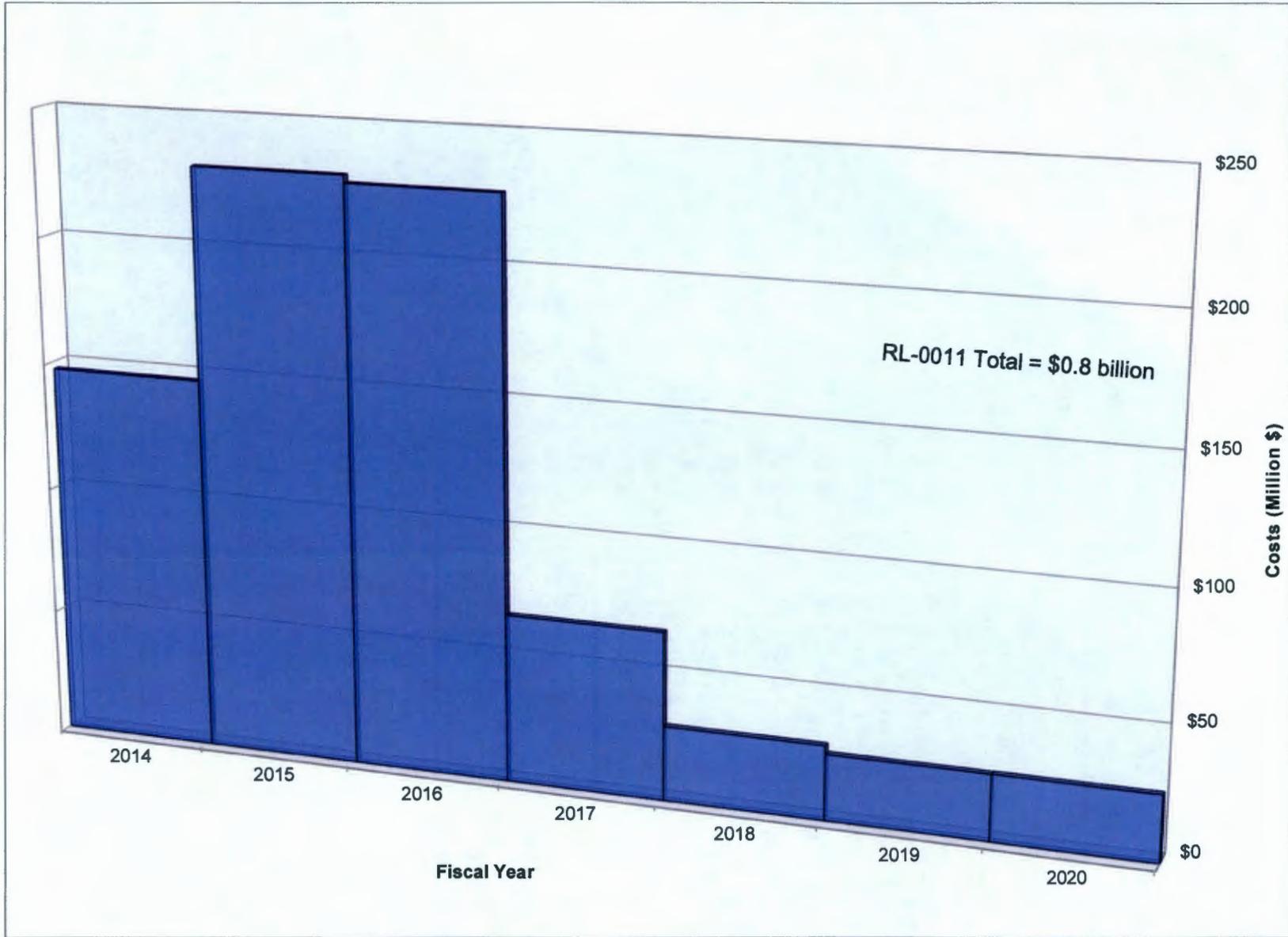


Figure 4-3. NM Stabilization and Disposition–PFP (PBS RL-0011) Remaining Estimated Cleanup Costs by Fiscal Year.

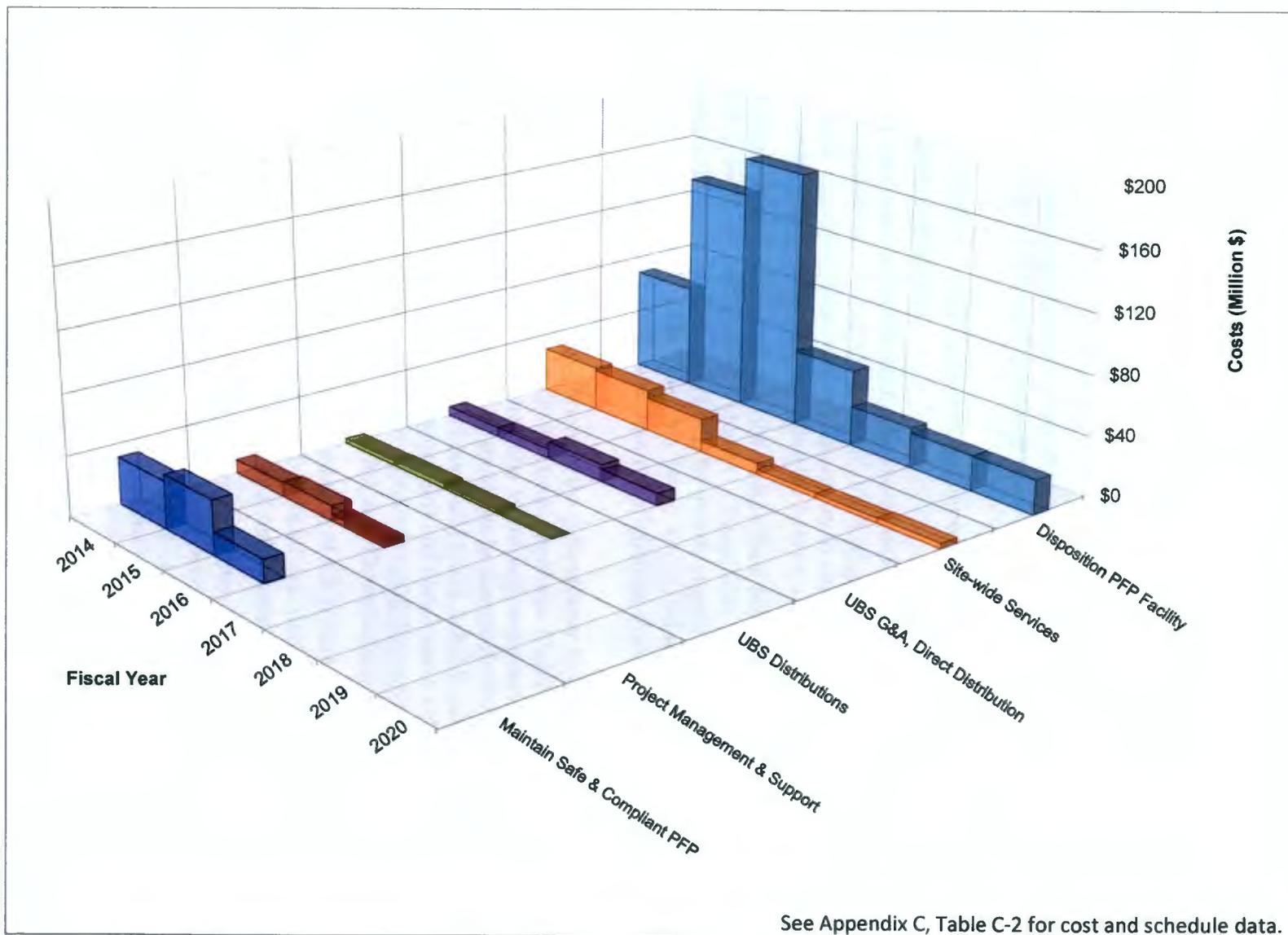


Figure 4-4. NM Stabilization and Disposition-PFP (PBS RL-0011) Remaining Estimated Cleanup Costs by Work Element.

4.2 SOIL AND WATER REMEDIATION–GROUNDWATER/VADOSE ZONE (PBS RL-0030)

Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030), also known as the Groundwater Project, includes the following:

- Regulatory decision-making process for all groundwater OUs on the Hanford Site.
- Remediation of all groundwater on the Hanford Site in accordance with the groundwater OU decisions.
- Regulatory decision-making process for Central Plateau waste sites (remediation of waste sites is part of the Nuclear Facility D&D–Remainder of Hanford [PBS RL-0040] project scope).
- Regulatory decision-making process and remediation for soil contamination in the Central Plateau deep vadose zone.

The project includes soil and groundwater characterization, groundwater monitoring, groundwater treatment, well drilling, treatability testing, evaluation of remediation options, and preparing the regulatory documentation necessary to obtain final RODs on remedial actions for soil waste sites and groundwater, including the River Corridor and Central Plateau.

Much of the contamination remains in the vadose zone soil column above the water table; however, at waste sites where large volumes of liquid were released, the more mobile contaminants have reached groundwater. The tritium groundwater contaminant plume from the Central Plateau has reached the Columbia River. Additional groundwater contaminant plumes such as chromium, strontium-90, and uranium originating in the 100 or 300 Areas also have reached the Columbia River.

The major chemical contaminants present in the groundwater include carbon tetrachloride, hexavalent chromium, cyanide, nitrate, and trichloroethene. Major radioactive contaminants include iodine-129, strontium-90, technetium-99, tritium, and uranium. Other groundwater contaminants that exceed drinking water standards in several Hanford Site areas but are of limited extent include a volatile organic compound (cis-1,2-dichloroethene) and radioactive contaminants (carbon-14, cesium-137, gross beta and plutonium-239/240) (DOE/RL-2013-22). The Groundwater Project has three major objectives (DOE/RL-2002-59, *Hanford Site Groundwater Strategy Protection, Monitoring, and Remediation*):

- Take actions necessary to prevent degradation of the groundwater
- Remediate groundwater to restore it to beneficial use where practicable and protect the river
- Monitor groundwater to identify emerging problems and guide the remediation process.

To be successful, the Groundwater Project needs to obtain sufficient characterization data, evaluate performance of early actions, and develop remedial action objectives. Hanford is divided into 10 groundwater OUs; six in the River Corridor and four in the Central Plateau. Groundwater monitoring activities are also required by the *Atomic Energy Act*, CERCLA, and the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste* (WA7890008967).

The work scope for the Groundwater Project is organized into Level 2 work elements as shown in Figure 4-5, which also presents the remaining cleanup schedule for PBS RL-0030. Table 4-2 provides additional details on the scope of work for each of these work elements.

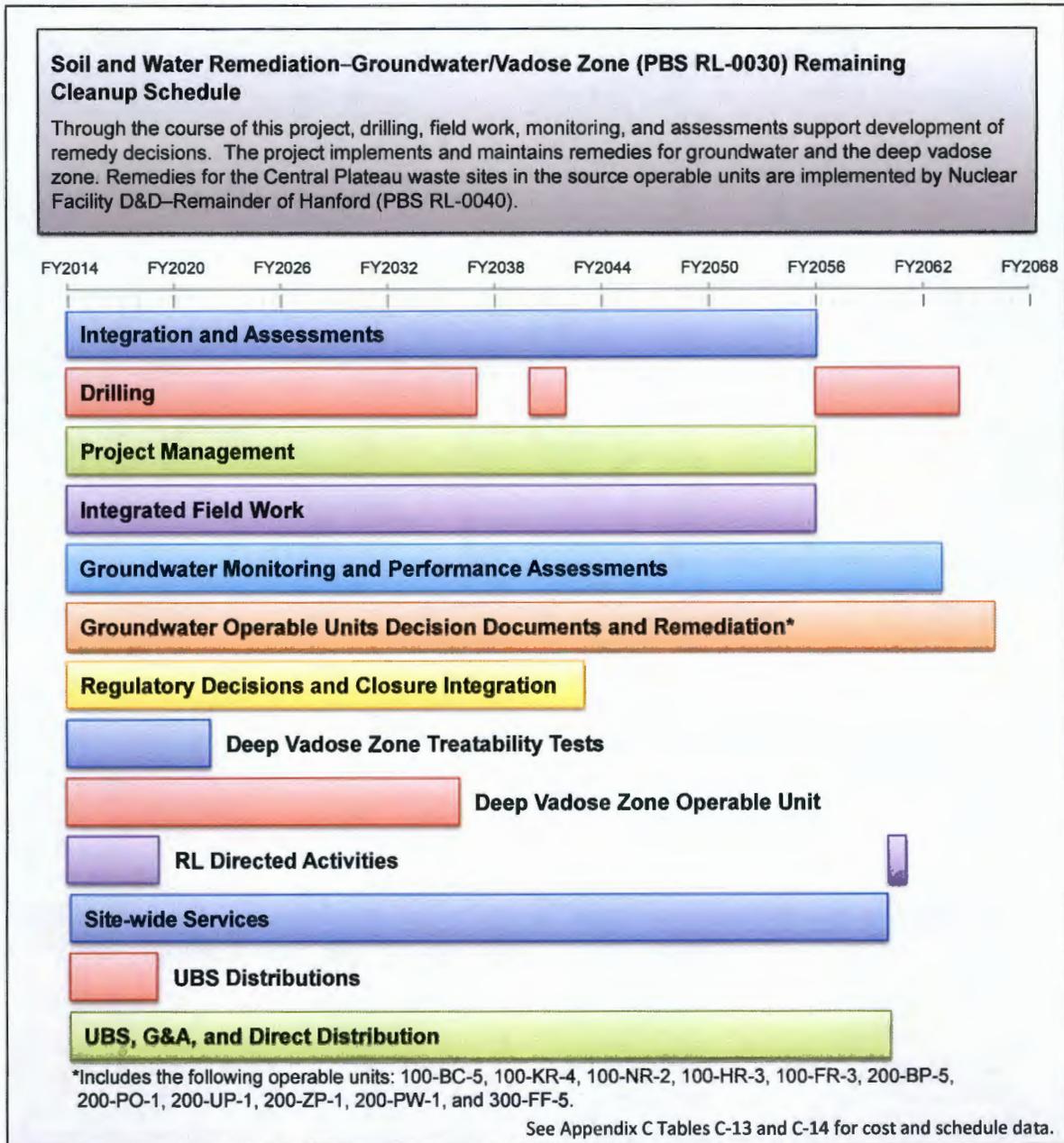


Figure 4-5. Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030) Remaining Cleanup Schedule.

Table 4-2. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description
Integration and Assessments	Includes eight elements: Strategic Integration; Technical Integration; Remediation Decision Support; Remediation Science and Technology; Sample Management and Reporting; Environmental Databases; Value Engineering Studies; and Systematic Planning Integration. This integration function coordinates and focuses Hanford Site characterization and assessment efforts to ensure consistency, eliminate information gaps and overlaps, apply science and technology new to Hanford, foster technical peer review, and integrate remediation decisions.
Drilling	Includes planning, coordinating, and implementing well drilling and well decommissioning for Hanford wells according to project-specific requirements. This includes drilling wells to Washington State standards and preparing all required submittals and notifications required by State law and providing well-related information for Hanford databases. Aspects of drilling include technical coordination, procurement, labor, subcontracts, materials, and equipment for project planning; documentation; field support during drilling; and project closeout to support drilling wells for groundwater monitoring and optimization of groundwater treatment systems.
Project Management	Includes program management oversight; business management and integration; project control and integration; engineering and maintenance; environmental, safety, health and quality; and technical support.
Integrated Field Work	Includes services, infrastructure, material, equipment, labor, and contracts used to plan, support, and perform field work. It includes non-OU related well maintenance, monitoring, and reporting. Major elements include operations and maintenance, training, field equipment purchases, unanticipated field work, and maintenance, monitoring, and reporting for wells that are not aligned with a specific OU.
Groundwater Monitoring & Performance Assessments	<p>Includes:</p> <ul style="list-style-type: none"> • Operation, maintenance, sampling, and dismantlement of the Modutanks that are used for disposal of groundwater from onsite well sampling and maintenance, characterization, and remediation activities. • Groundwater sampling, analysis, monitoring, evaluation, assessment, and reporting for RCRA TSDs, CERCLA OUs, and other permitted facilities and sites. • Coordination and management of groundwater sampling and water level determinations. • Operation, maintenance, and relocation of the Hanford Geotechnical Sample Library, the repository for historical sediment, core, and other soil and sediment samples used for scientific studies including laboratory studies, bench tests, conceptual model development, and fate and transport evaluations for contaminant migration. • Project management for these activities. • Well maintenance, monitoring, and reporting.
Groundwater OUs Decision Documents & Remediation	<p>Includes management and implementation of groundwater remediation for Hanford, including:</p> <ul style="list-style-type: none"> • Implementing the RI/FS process for groundwater OUs by performing RI/FSs leading to final RODs. • Preparing DQO reports, sampling and analysis plans, waste management plans, and other regulatory documentation, as needed, for all groundwater OUs. • Conducting as needed field studies to support decision making and design. • Designing treatment systems in accordance with RODs and remedial action work plans. • Implementing treatment systems in accordance with the design and the ROD requirements or modifying and expanding the remedy to optimize remediation. • Conducting ongoing monitoring and reporting. • Maintaining system and monitoring wells. • Final D&D of remedy components. <p>The work scope is managed by OU and is consistent between the OUs.</p>

Table 4-2. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description														
Regulatory Decisions & Closure Integration	Includes planning, management, characterization, documentation, and other associated activities necessary to complete the remedial decision process for each closure zone, including closure plans for RCRA TSD sites. Specific activities include RI/FSs, proposed plans, closure plans, engineering evaluation/cost analyses, DQOs, sampling and analysis plans, RODs, and other documents and activities leading to remedial decisions and remediation planning. Following completion of assessment activities through decision documentation (e.g., ROD or closure plan), completion of the remedial design/remedial action work plan and waste site/facility remediation and/or closure will be addressed under Nuclear Facility D&D—Remainder of Hanford (PBS RL-0040).														
Deep Vadose Zone Treatability Tests	This involves deep vadose zone treatability testing in accordance with DOE/RL-2007-56, conducting engineering and technical studies necessary to support decision-making for Central Plateau remediation of the deep vadose zone OU, and evaluating tradeoffs associated with remedial action decisions. The initial work phase focuses on conducting laboratory work and numerical modeling to address uncertainties associated with the technology and employing the technology in the deep vadose zone. The second phase involves the design and implementation of treatability testing in the field at carefully selected locations using one or more technologies depending on the success of the initial testing.														
Deep Vadose Zone OU	Addresses mitigation of the contamination present in the deep vadose zone at Hanford. Initial actions planned for this OU are field studies and deployment activities and developing decision documents. Other tasks for this OU, such as remedial action planning and implementation; well support activities; monitoring and reporting support; OU modifications and expansions; and final D&D of the OU remediation activities at the conclusion of the project will be included following the decision process. Changes to the TPA have been undertaken to add milestones for testing remedial technologies and to establish a new deep vadose zone OU (200-DV-1). Also, DOE is establishing a project team to focus on the development and evaluation of deep vadose zone remedies. DOE is also establishing the Deep Vadose Zone Applied Field Research Center at Hanford, which would be the focal point for investigation and resolution of critical deep vadose zone issues at Hanford and within the DOE complex.														
Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Section 6.3.2 for details.														
RL Directed Activities	Includes administrative and technical support provided to the project through the General Support Services Contract. Details are provided in Table C-12.														
UBS Distributions	Includes services that are charged based on predetermined rates, and services that are directly charged to Other Hanford Contractors. Details are provided in Table C-12.														
UBS, G&A and Direct Distribution	Includes contractor's fee and management reserve, allocated pensions and G&A allocations.														
<p><i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601.</i> DOE/RL-2007-56, 2008, <i>Deep Vadose Zone Treatability Test Plan for the Hanford Central Plateau</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. <i>Resource Conservation and Recovery Act of 1976, 42 USC 6901.</i></p> <table border="0"> <tr> <td>CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i></td> <td>RCRA = <i>Resource Conservation and Recovery Act.</i></td> </tr> <tr> <td>D&D = deactivation and decommission.</td> <td>RI/FS = remedial investigation/feasibility study.</td> </tr> <tr> <td>DOE = U.S. Department of Energy.</td> <td>RL = Richland Operations Office.</td> </tr> <tr> <td>DQO = data quality objectives.</td> <td>ROD = record of decision.</td> </tr> <tr> <td>G&A = General and Administrative.</td> <td>TPA = Tri-Party Agreement.</td> </tr> <tr> <td>OU = operable unit.</td> <td>TSD = treatment, storage, and disposal.</td> </tr> <tr> <td>PBS = project baseline summary.</td> <td>UBS = usage-based service.</td> </tr> </table>		CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i>	RCRA = <i>Resource Conservation and Recovery Act.</i>	D&D = deactivation and decommission.	RI/FS = remedial investigation/feasibility study.	DOE = U.S. Department of Energy.	RL = Richland Operations Office.	DQO = data quality objectives.	ROD = record of decision.	G&A = General and Administrative.	TPA = Tri-Party Agreement.	OU = operable unit.	TSD = treatment, storage, and disposal.	PBS = project baseline summary.	UBS = usage-based service.
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Figure 4-6 presents the remaining estimated cleanup costs for Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) by fiscal year; Figure 4-7 presents the remaining estimated cleanup costs by work element.

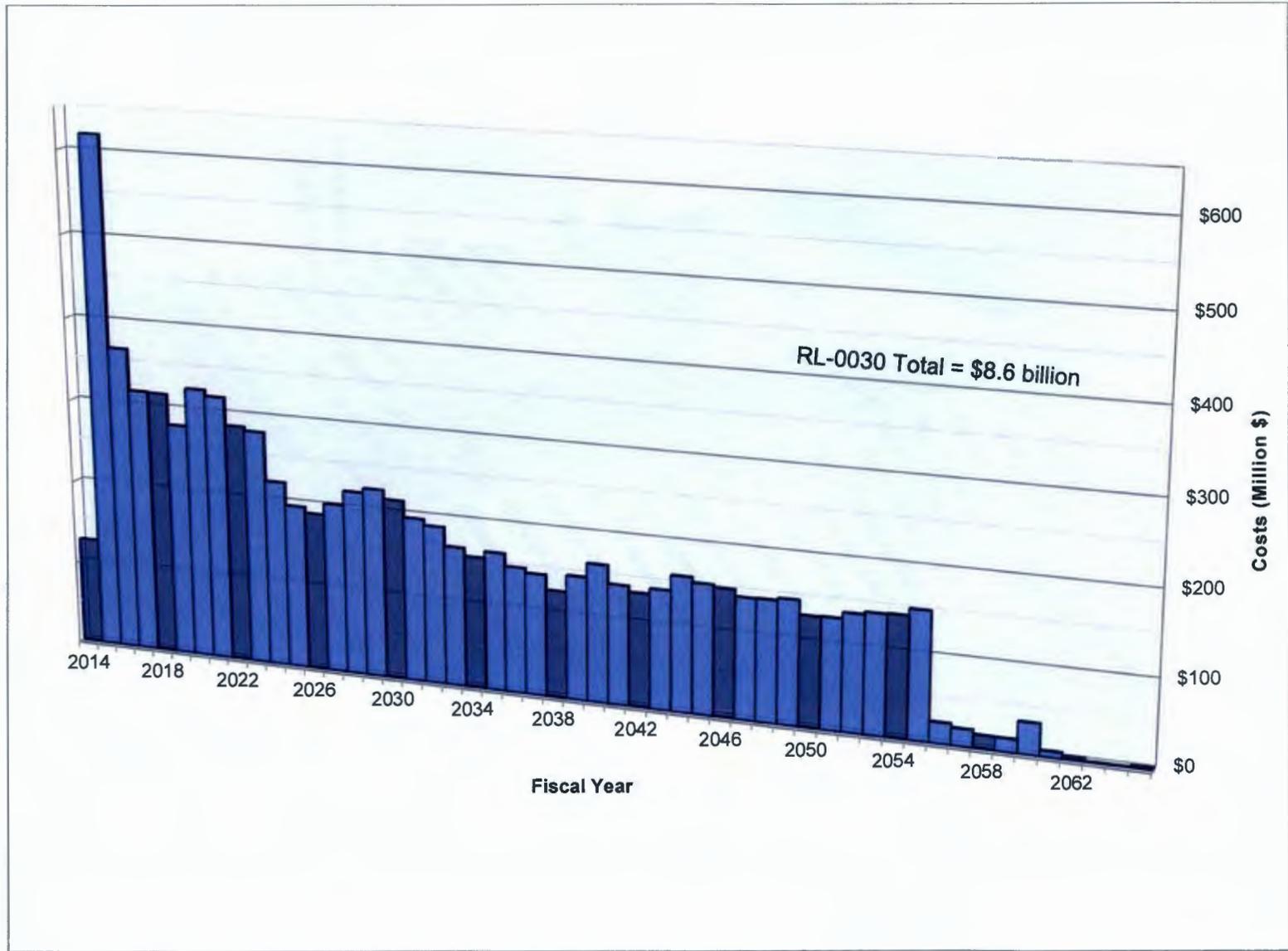


Figure 4-6. Soil and Water Remediation-Groundwater/Vadose Zone (PBS RL-0030) Remaining Estimated Cleanup Costs by Fiscal Year.

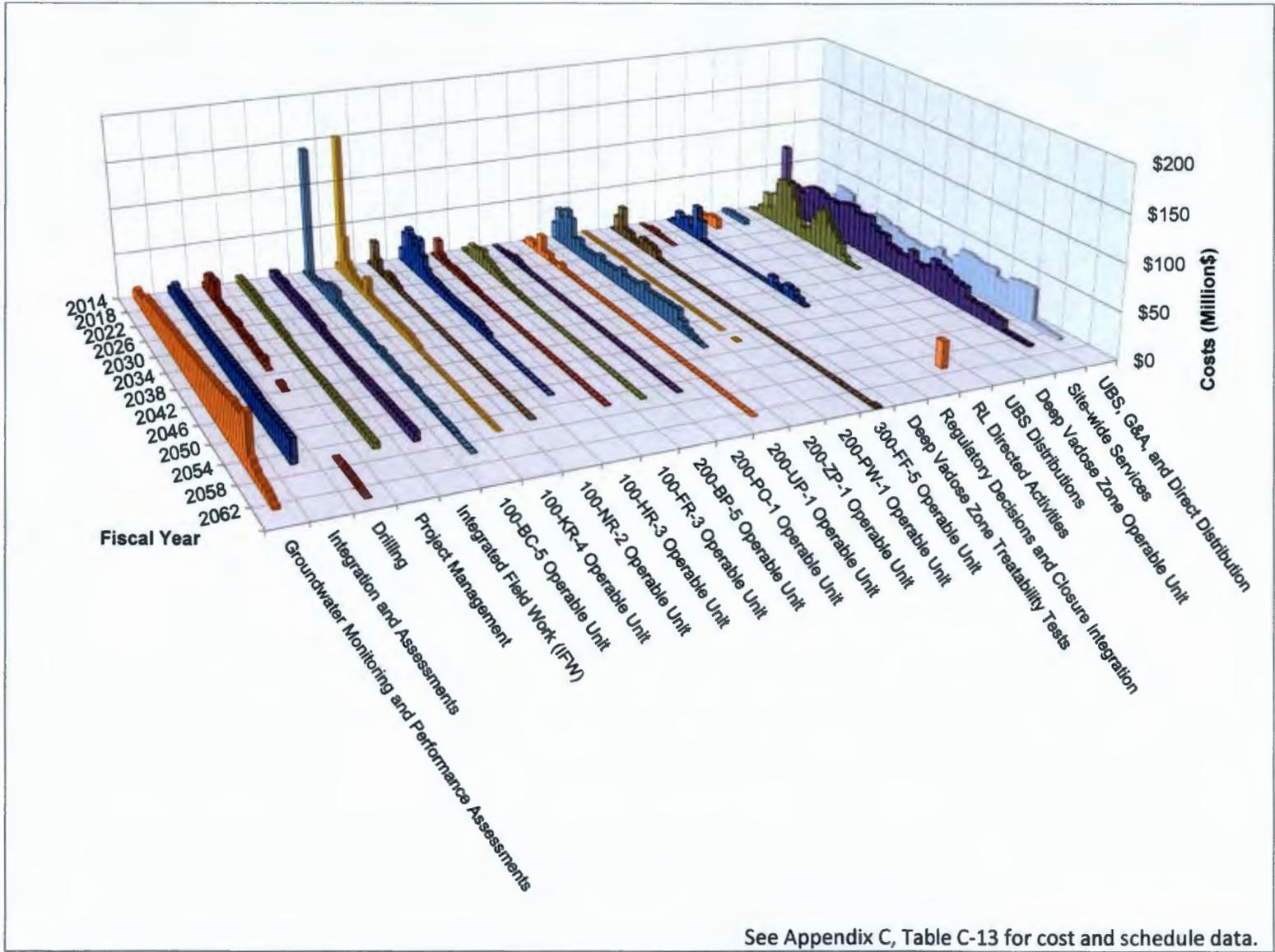


Figure 4-7. Soil and Water Remediation-Groundwater/Vadose Zone (PBS RL-0030) Remaining Estimated Cleanup Costs by Work Element.

4.3 NUCLEAR FACILITY D&D–REMAINDER OF HANFORD (PBS RL-0040)

Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040) is the geographically based cleanup and closure of the Central Plateau and remaining scope in the other Hanford Site areas. In addition to the Central Plateau Cleanup scope, PBS RL-0040 includes the infrastructure and services scope under Mission Support, which is discussed in Chapter 6.0. This section focuses on the cleanup-related elements of the PBS, also known (and referred to in the rest of this section) as the Central Plateau Remediation Project (PBS RL-0040). The Central Plateau Remediation Project scope includes the demolition and remediation scope that is organized into 27 geographical areas referred to as closure zones.

Following completion of assessment activities through decision documentation (e.g., ROD or closure plan) under Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030), completion of the remedial design/remedial action work plan and waste site/facility remediation and/or closure will be addressed under the Central Plateau Remediation Project (PBS RL-0040). The Central Plateau Remediation Project scope includes implementing the decisions through the physical cleanup of canyon facilities, buildings and structures, waste sites, pipelines, and miscellaneous sites (e.g., debris piles), and utilities to ensure appropriate protectiveness has been provided for the cleanup.

To accomplish the Central Plateau Remediation Project (PBS RL-0040), the following major objectives have been established:

- Perform safe S&M of facilities and waste sites pending remediation
- Integrate planning and execution activities with other Central Plateau projects
- Remediate waste sites
- Decontaminate and decommission (D&D) canyons
- D&D excess facilities.

The project will be complete when the following endpoint criteria have been reached:

- Canyons and surplus facilities removed or dispositioned and ready for transition to LTS
- Central Plateau waste sites remediated in accordance with approved decisions
- Legacy wastes and facilities at PNNL dispositioned
- Institutional controls implemented
- Post-remediation operations and maintenance requirements implemented.

The work scope for the Central Plateau Remediation Project (PBS RL-0040) is organized into three primary Level 2 work elements as shown in Figure 4-8, which also presents the remaining cleanup schedule for this PBS. Table 4-3 provides additional details on the scope of work for each of these work elements.

The duration of the work elements in Figure 4-8 includes planning estimates for completing remedial actions for the 27 Central Plateau and remainder of Hanford closure zones.

The duration, in part, is dependent on transition of the tank farms to the project for final disposition after closure activities are completed by ORP (see Chapter 5.0). It is also dependent on transition of waste management facilities that are no longer needed to support Hanford cleanup from Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) to the project for final disposition (see Section 4.5).

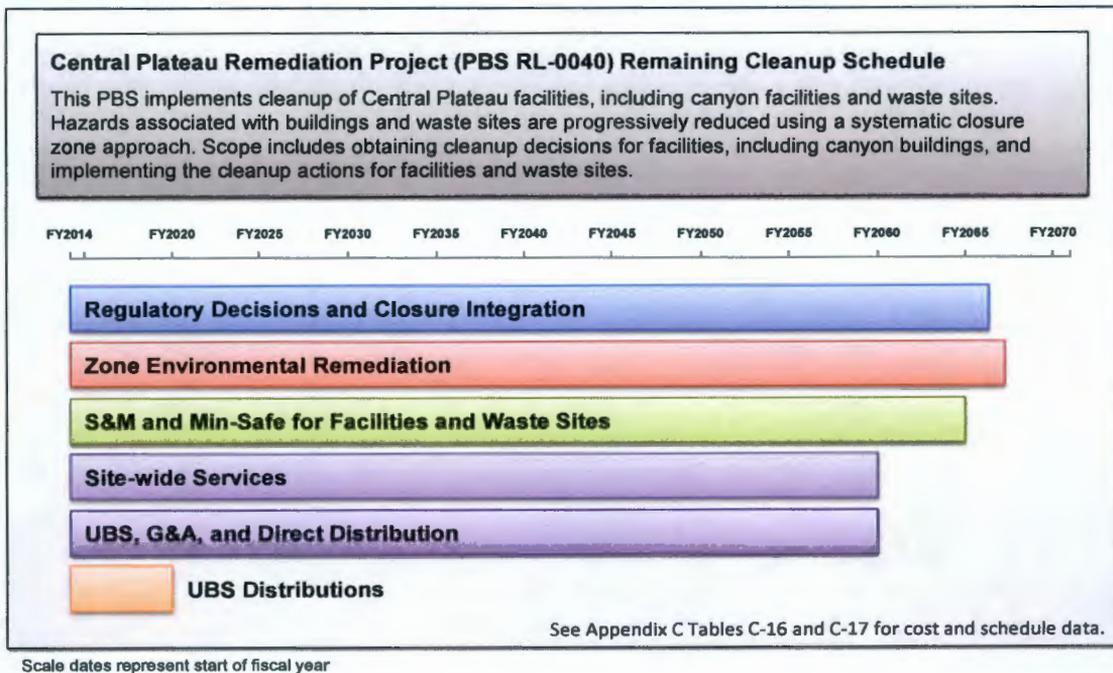


Figure 4-8. Central Plateau Remediation Project (PBS RL-0040) Remaining Cleanup Schedule.

Table 4-3. Central Plateau Remediation Project (PBS RL-0040) Level 2 Scope Summary.

Work Element	Scope Description
Regulatory Decisions and Closure Integration	Includes general management direction and technical/Environment, Safety, Health, and Quality support, engineering and technical studies necessary to support decision making for Central Plateau remediation and to evaluate tradeoffs associated with remedial action and facility disposition decisions, regulatory decisions for canyons and related nuclear process facilities, regulatory decisions for below-slab remediation for non-canyon facilities, hazard reduction and emergency response tasks necessary to address aging facility or waste site conditions that are above and beyond anticipated operational and maintenance plans.
Zone Environmental Remediation	Includes geographic remediation of closure zones in the Central Plateau. Each zone has a variety of cleanup features that can include waste sites, facilities, canyons, pipelines, and remedial barriers. Actions to be taken for cleaning up each waste site, including pipelines, will be determined through the regulatory decision processes (under Soil and Water Remediation–Groundwater/Vadose Zone, PBS RL-0030) and as part of remedial definition activities. Potential remedial actions for waste sites range from monitored natural attenuation to capping or removal, depending on waste site conditions. Contamination levels, risks, proximity to facilities, and other considerations are factored into the selection. Existing structures (other than the canyon facilities) are expected to be demolished and the debris disposed at the Environmental Restoration Disposal Facility.
S&M and Min-Safe for Facilities and Waste Sites	Includes CERCLA 5-year reviews, surveillance and system, structural, equipment, and other maintenance on Central Plateau facilities/buildings and waste sites.
Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Section 6.3.2 for details
UBS Distributions	Includes services that are charged based on predetermined rates, and services that are directly charged to Other Hanford Contractors. Details are provided in Table C-15.
UBS, G&A, and Direct Distribution	Includes contractor’s fee, management reserve, allocated pensions and G&A allocations.
CERCLA =	<i>Comprehensive Environmental Response, Compensation, Liability Act.</i>
G&A =	General and Administrative.
PBS =	project baseline summary.
S&M =	surveillance and maintenance.
UBS =	usage-based service.

Figure 4-9 presents the remaining estimated cleanup costs for the Central Plateau Remediation Project (PBS RL-0040) by fiscal year; Figure 4-10 presents the remaining estimated cleanup costs by work element.

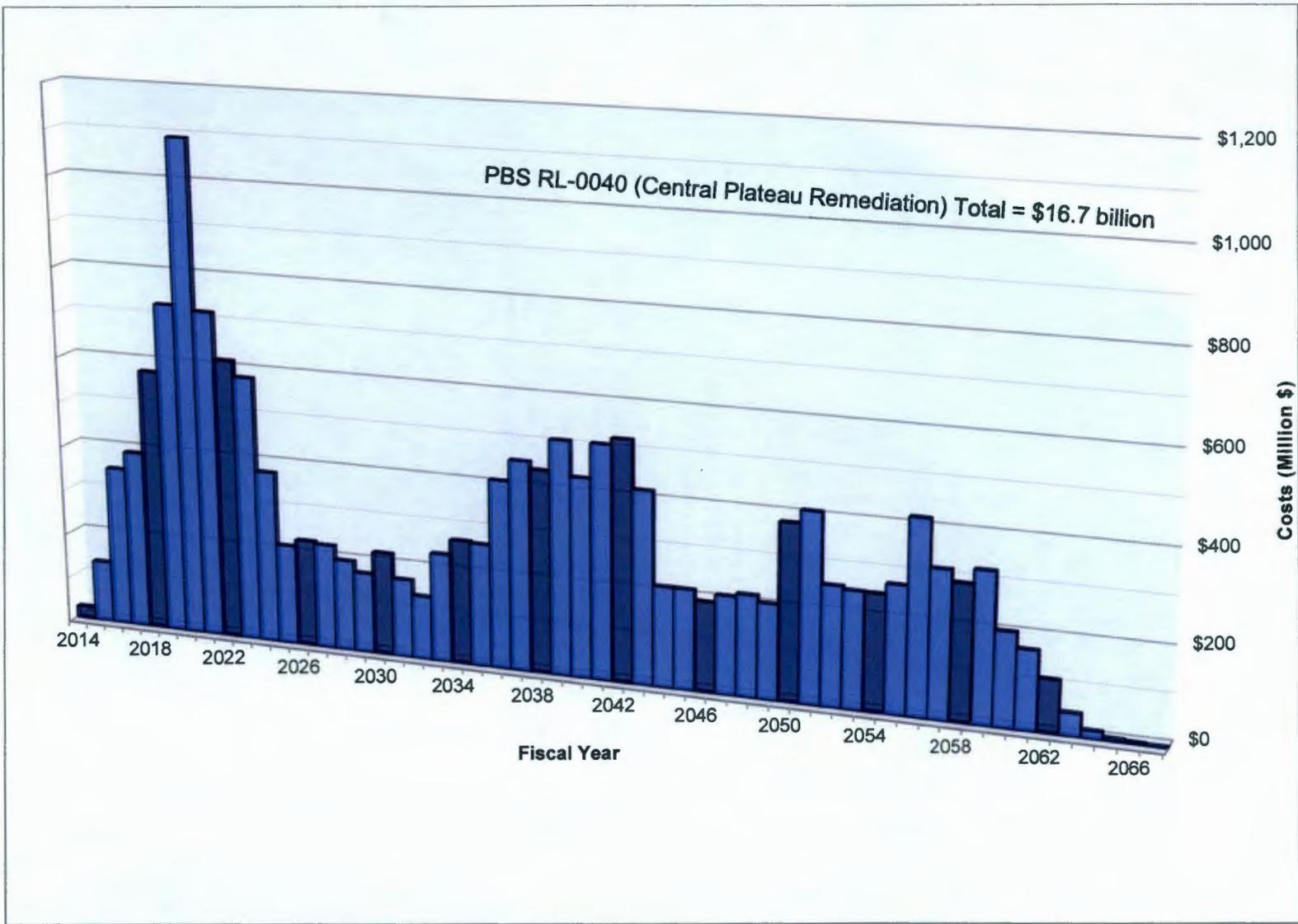


Figure 4-9. Central Plateau Remediation Project (PBS RL-0040) Remaining Estimated Cleanup Costs by Fiscal Year.

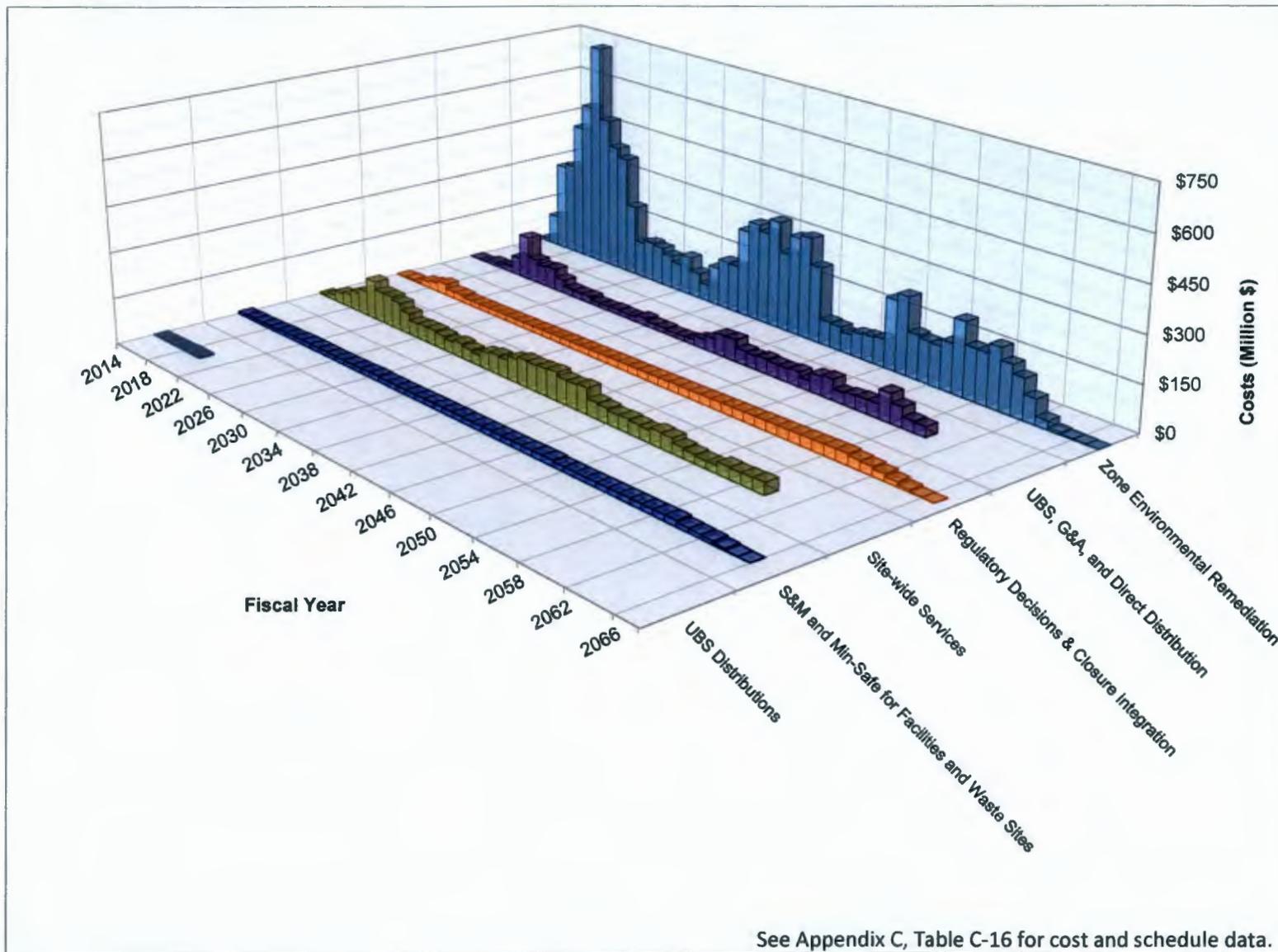


Figure 4-10. Central Plateau Remediation Project (PBS RL-0040) Remaining Estimated Cleanup Costs by Work Element.

4.4 NUCLEAR FACILITY D&D–FAST FLUX TEST FACILITY PROJECT (PBS RL-0042)

FFTF is a deactivated, 400-megawatt (thermal) liquid-metal (sodium)-cooled, research and test reactor located in the 400 Area. The facility was used to develop and test advanced fuels and materials for the Liquid Metal Fast Breeder Reactor Program and to serve as a prototype facility for future Liquid Metal Fast Breeder Reactor Program facilities. In December 1993, DOE issued a shutdown order for FFTF because the Liquid Breeder Reactor Program had been cancelled.

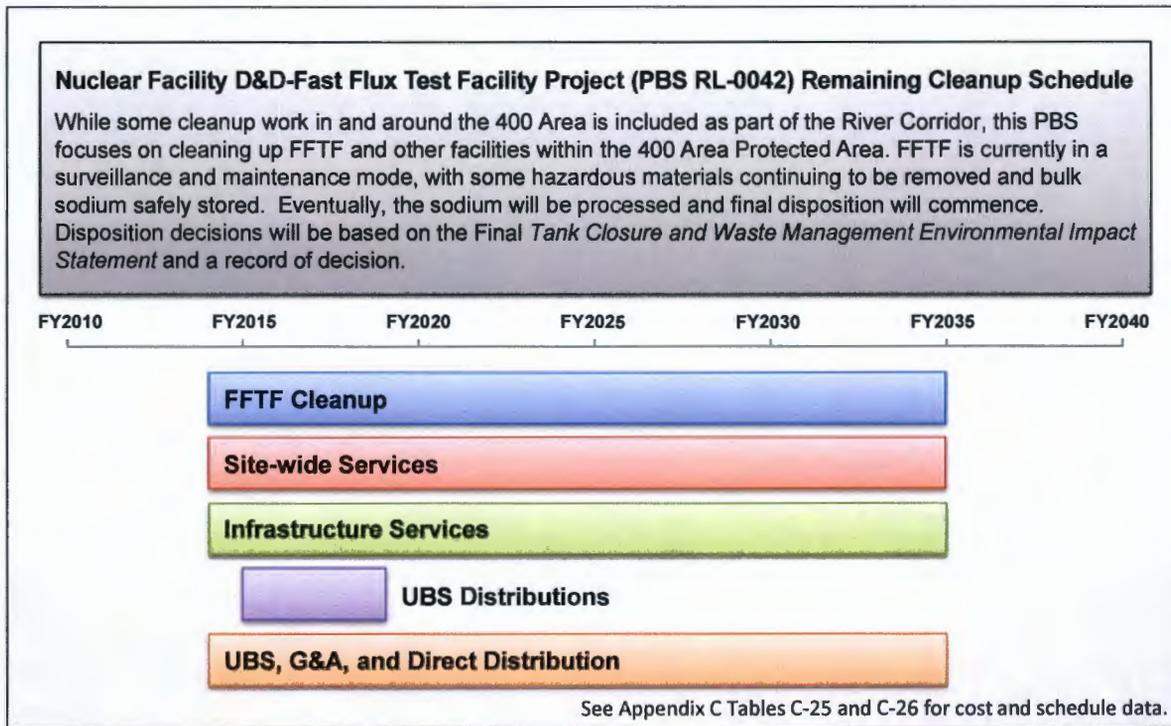
The scope of Nuclear Facility D&D–Fast Flux Test Facility Project (PBS RL-0042) is to provide for safe D&D, secure storage and stabilization of hazardous/radioactive materials, interim maintenance of facilities, demolition, and disposal of the waste. The mission requires removing and dispositioning sodium coolant, the reactor containment building, reactor support buildings, and auxiliary facilities and support systems. The project technical objective will achieve the following:

- Remove and disposition sodium coolant and clean residual sodium
- Fill spaces with grout below the 550-foot elevation level (grade level) of the reactor containment building
- Decommission and demolish all facilities.

The regulatory decision for the FFTF containment building final closure, including the de-fueled reactor vessel, will be determined following the appropriate environmental analysis process. For planning purposes, the reactor containment dome is assumed to be removed, the below-grade reactor containment building grouted and entombed, and support facilities and structures demolished to 3 feet below grade and backfilled. The FFTF alternatives have been evaluated in DOE/EIS-0391, Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington and a December 13, 2013, ROD (78 FR 75913).

Waste sites in the 400 Area are included as part of the 300-FF-2 OU, which is being remediated under the Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041).

Figure 4-11 shows Level 2 scope elements and remaining cleanup schedule for the Nuclear Facility D&D–Fast Flux Test Facility Project (PBS RL-0042). Table 4-4 summarizes the work scope.



Scale dates represent start of fiscal year

Figure 4-11. Nuclear Facility D&D–Fast Flux Test Facility (PBS RL-0042) Remaining Cleanup Schedule.

Table 4-4. Nuclear Facility D&D–Fast Flux Test Facility Project (PBS RL-0042) Level 2 Scope Summary.

Work Element	Scope Description
FFTF Cleanup	Includes monitoring, surveillance, and maintenance of FFTF and surrounding area in a safe and compliant manner until D&D; deactivation of FFTF; disposition of FFTF sodium; construction of a sodium reaction facility; decommissioning of FFTF in accordance with a future record of decision; and project management for these activities.
Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Section 6.3.2 for details.
Infrastructure Services	Includes legal support and other services. Details are provided in Table C-24.
UBS Distributions	Includes services that are charged based on predetermined rates, and services that are directly charged to Other Hanford Contractors. Details are provided in Table C-24.
UBS, G&A and Direct Distribution	Includes contractor’s fee, management reserve, allocated pensions and G&A allocations.
D&D = decontaminate and decommission. PBS = project baseline summary. FFTF = Fast Flux Test Facility. RL = U.S. Department of Energy, Richland Operations Office. G&A = General and Administrative. UBS = usage-based services.	

Figure 4-12 presents the remaining estimated cleanup costs for the Nuclear Facility D&D–Fast Flux Test Facility Project (PBS RL-0042) by fiscal year; Figure 4-13 shows the remaining estimated cleanup costs by work element.

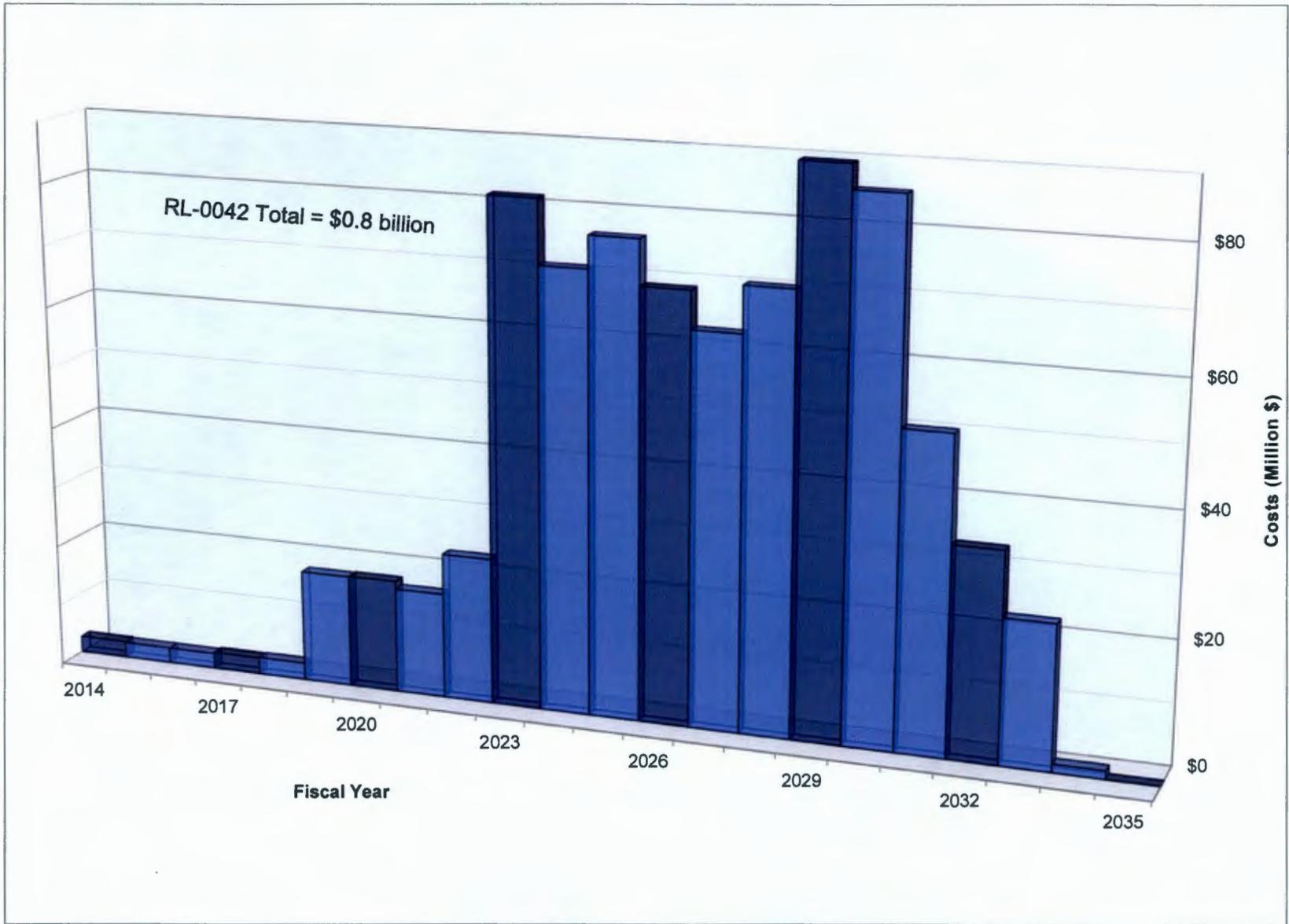


Figure 4-12. Nuclear Facility D&D-Fast Flux Test Facility Project (PBS RL-0042) Remaining Estimated Costs by Fiscal Year.

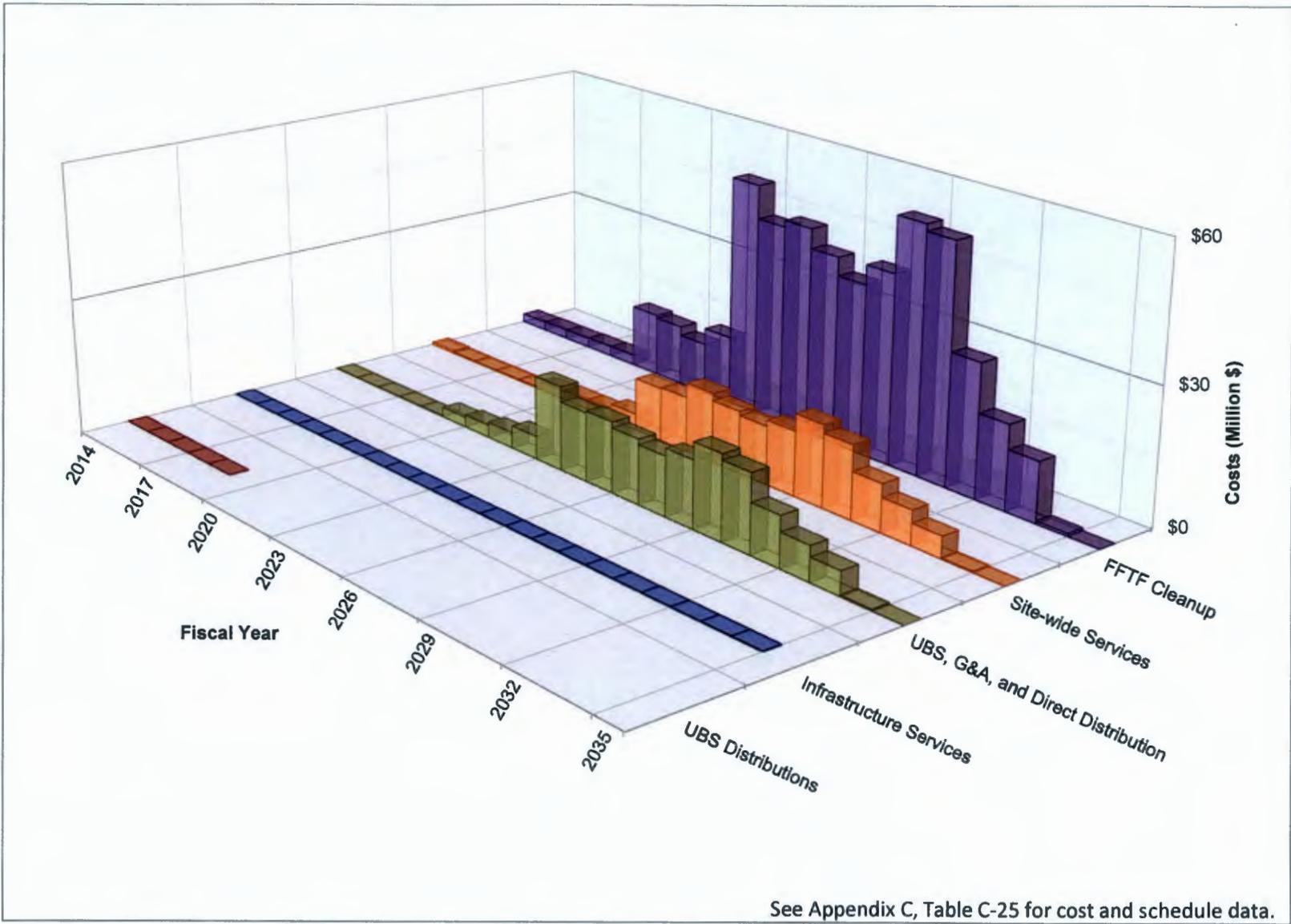


Figure 4-13. Nuclear Facility D&D-Fast Flux Test Facility Project (PBS RL-0042) Remaining Estimated Costs by Work Element.

4.5 SOLID WASTE STABILIZATION AND DISPOSITION–200 AREA (PBS RL-0013C)

The scope of the Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) project is to provide waste treatment and disposal services for Hanford facilities and operations. The major mission objectives are to:

- Operate waste treatment facilities, including T Plant, WRAP Facility, and 200 Area Liquid Effluent Treatment Facilities (ETF).
- Provide Base Waste Management Operations at the CSB and 200 Area Interim Storage Area, Integrated Disposal Facility (IDF), Waste Encapsulation and Storage Facility (WESF) for cesium/strontium capsule storage, and Low-Level Burial Grounds and mixed waste disposal trenches.

Additional objectives are:

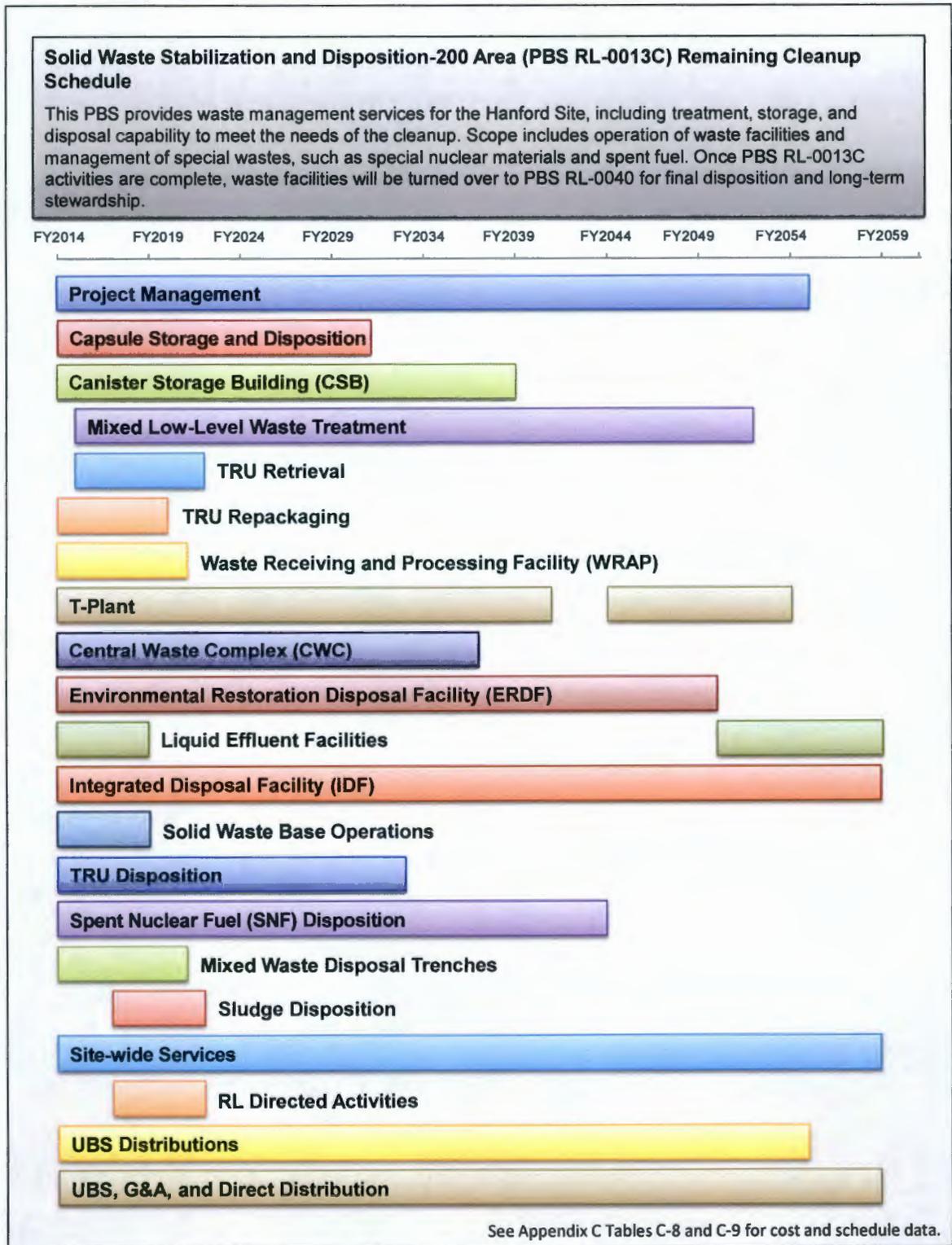
- Retrieve and ship transuranic (TRU) waste for disposal to the WIPP.
- Develop alternative methods for treatment and disposal of orphan waste. This could include seeking land disposal restrictions variance approvals, expanding commercial treatment facilities permit limits and construction and operation of additional onsite treatment capabilities.
- Obtain processing capabilities to include repackaging of large and remote-handled (RH) contaminated waste containers.

The Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) includes completing the following activities:

- Cesium and strontium capsules will be transferred to dry storage and/or permanent disposal.
- Irradiated nuclear fuels will be removed offsite to a national repository for final disposition.
- Stored underground TRU waste will be retrieved and disposed.
- Mixed low-level and low-level waste will be treated as necessary and disposed.
- Waste management facilities will be deactivated at the end of their useful lives and will be turned over to Nuclear Facility D&D-Remainder of Hanford (PBS RL-0040) for final disposition.
- Low-Level Burial Grounds (including the mixed waste trenches) will be closed and transferred to Nuclear Facility D&D-Remainder of Hanford (PBS RL-0040) for final disposition and remedial action.
- ERDF will be operated to provide solid waste treatment and disposal services in support of Hanford cleanup after completion of the Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041).
- IDF will be closed according to the closure plan requirements in the Dangerous Waste Permit (WA7890008967). Closure will follow completion of tank waste vitrification.
- Operate liquid waste retention/transfer facilities to support the Office of Science mission in the 300 Area.

Figure 4-14 presents the scope elements and remaining cleanup schedule for Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C). Table 4-5 summarizes each scope element. As waste management facilities are no longer needed to support Hanford cleanup, they

will be transitioned to Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040) for final disposition.



Scale dates represent start of fiscal year

Figure 4-14. Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) Remaining Cleanup Schedule.

Table 4-5. Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) Level 2 Scope Summary.
(2 pages)

Work Element	Scope Description
Project Management	Provides for the overall project management, coordination, direction, and customer interface to ensure the proper conduct of operation for this project.
Capsule Storage and Disposition	Addresses operation of the WESF pool cells, and includes life extension upgrades to ensure safe and compliant operations, retrieval and disposition of cesium/strontium capsules, and transition of WESF for final D&D.
CSB	Includes safe storage of SNF and immobilized high-level waste from the WTP while awaiting final disposition at the geologic repository, repackaging of SNF for shipment, and coordination with the offsite repository for evaluations and information.
MLLW Treatment	Addresses treatment of MLLW to meet regulatory requirements including alternative methods for treatment and disposal of orphan waste. Treatment technologies include macro-encapsulation, stabilization, or thermal techniques, such as vacuum desorption. Once categorized, the waste will be prepared for shipment to the appropriate processing or treatment facility.
TRU Retrieval	Consists of the retrieval, designation, and transfer to a TSD facility of both CH and RH solid stored underground TRU waste.
TRU Repackaging	Provides funding for WIPP production, TRU repackaging operations at T Plant and WRAP (or a commercial facility), TRU program support for repackaging, and RH/large packaging capabilities.
WRAP Facility	Provides base and minimum safe operations at the WRAP to support processing of TRU wastes to WIPP and includes transition to final D&D.
T Plant	Addresses the operation and maintenance of the T Plant Complex for waste processing operations, including necessary upgrades and transition to final D&D of the canyon.
CWC	Includes operation and maintenance of the CWC, including upgrades to maintain needed capability and transition to final D&D. The scope includes provision of an alternate capability (other than WRAP) to load CH TRU waste into shipping containers for shipment to WIPP.
ERDF	Addresses the operation of the ERDF after turnover from the River Corridor Closure Project through the end of Hanford cleanup, including cell expansion and ERDF interim cover construction.
Liquid Effluent Facilities	Includes operation and maintenance of LERF, ETF, and 200 Area TEDF to receive, store, treat, and dispose of liquid effluents from Hanford cleanup activities.
IDF	Provides for the preparation, startup, and operation of the IDF to receive and store low-level waste and MLLW in accordance with applicable waste acceptance criteria. The scope includes provisions for IDF expansion.
Solid Waste Base Operations	Provides for the minimum staffing to maintain a viable waste management program and to capture those waste support activities that are essentially fixed cost in nature.
TRU Disposition	Provides funding and resources for the TRU Program's coordination with the CCP to certify TRU waste according to the WIPP Waste Acceptance Criteria. This work element also provides funding to perform Hanford WIPP closeout activities, TRU waste characterization activities at the direction or guidance of the CCP and to establish shipping capabilities for RH TRU waste and additional CH TRU waste shipping capabilities.
SNF Disposition	Includes design and construction of a Fuel Preparation Facility, turnover of the facility to operations, and level of effort support to the DOE Office of Civilian Radioactive Waste Management and National Spent Nuclear Fuel Program activities.
Mixed Waste Disposal Trenches	Includes operation of the mixed waste disposal trenches and the design, construction, and other activities necessary to add operational layers in the trenches to maintain their ready-to-serve status and to place temporary caps on the trenches.
Sludge Disposition	Includes activities to stabilize and package the sludge from the 105-KW Basin for final disposition to WIPP or other disposal facilities, including Phase 2 treatment and packaging shutdown and deactivation of needed equipment, and management and support.
Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Section 6.3.2 for details.

Table 4-5. Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) Level 2 Scope Summary.
(2 pages)

Work Element	Scope Description
RL Directed Activities	Includes administrative and technical support provided to the project through the General Support Services Contract and other activities. Details are provided in Table C-7.
UBS Distributions	Includes services that are charged based on predetermined rates, and services that are directly charged to Other Hanford Contractors. Details are provided in Table C-7.
UBS, G&A and Direct Distribution	Includes contractor's fee, management reserve, allocated pensions and G&A allocations.
CCP = Central Characterization Project.	RH = remote-handled.
CH = contact-handled.	RL = U.S. Department of Energy, Richland Operations Office.
CSB = Canister Storage Building.	SNF = spent nuclear fuel.
CWC = Central Waste Complex.	TEDF = Treated Effluent Disposal Facility.
D&D = decontamination and decommission.	TRU = transuranic.
DOE = U.S. Department of Energy.	TSD = treatment, storage, and disposal.
ERDF = Environmental Restoration Disposal Facility.	WESF = Waste Encapsulation and Storage Facility.
ETF = Effluent Treatment Facility.	WIPP = Waste Isolation Pilot Plant.
G&A = General and Administrative.	WRAP = Waste Receiving and Processing (Facility).
IDF = Integrated Disposal Facility.	WTP = Waste Treatment Plant.
LERF = Liquid Effluent Retention Facility.	UBS = usage-based services.
MLLW = mixed low-level waste.	
PBS = project baseline summary.	

Figure 4-15 shows the remaining estimated cleanup costs for the Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) by fiscal year; Figure 4-16 shows the remaining estimated cleanup costs by work element.

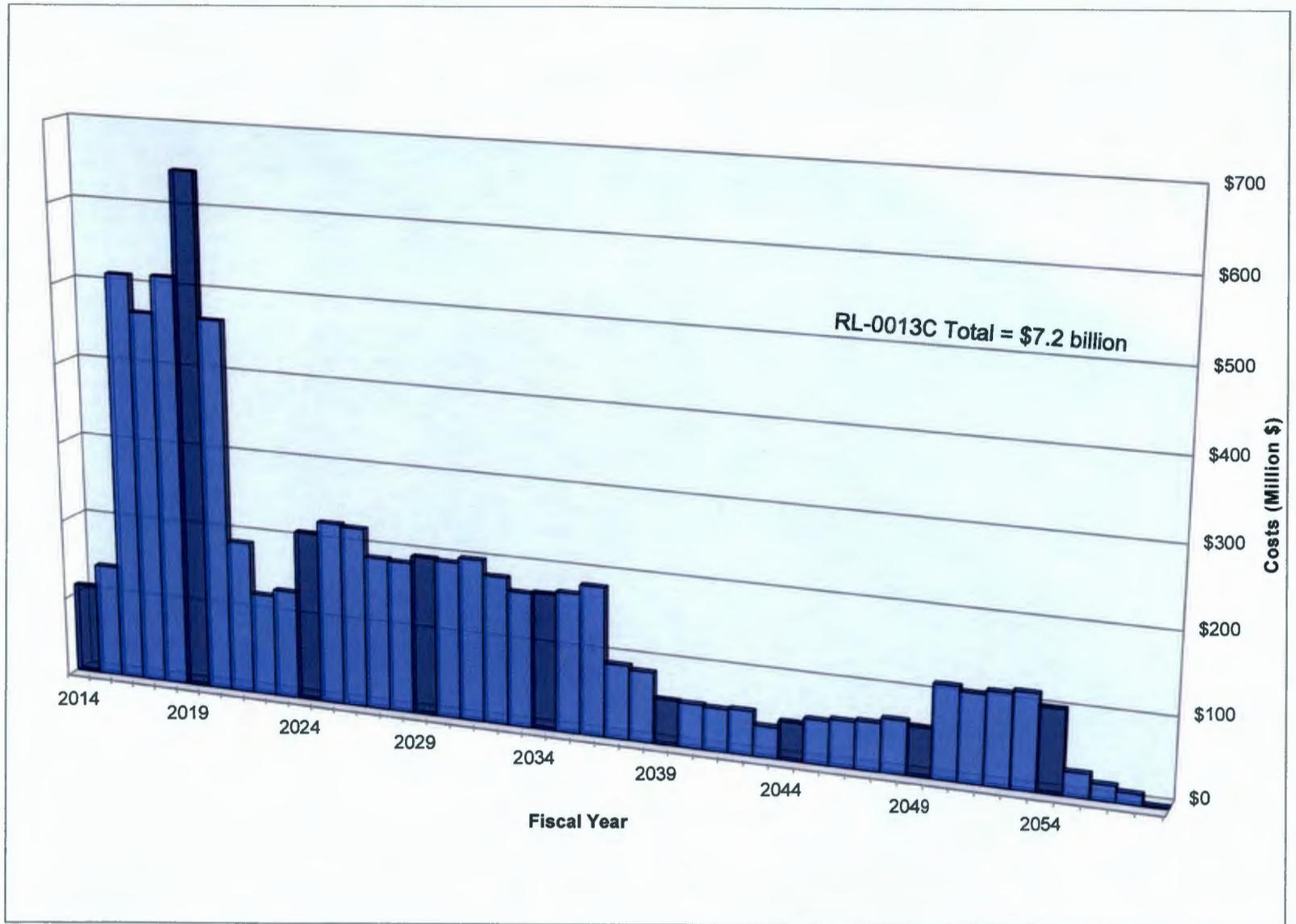
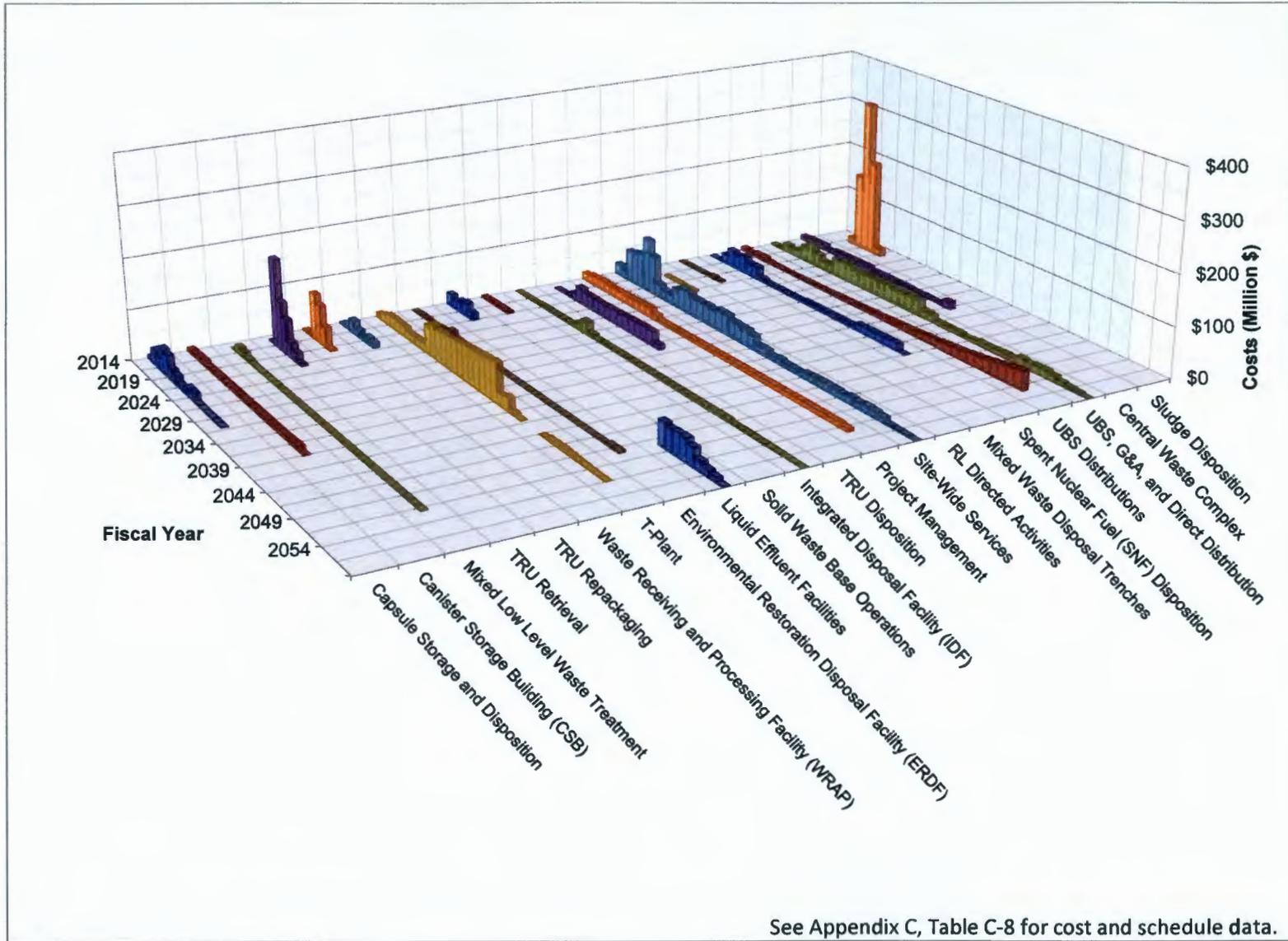


Figure 4-15. Solid Waste Stabilization and Disposition-200 Area (PBS RL-0013C) Remaining Estimated Cleanup Costs by Fiscal Year.



See Appendix C, Table C-8 for cost and schedule data.

Figure 4-16. Solid Waste Stabilization and Disposition—200 Area (PBS RL-0013C) Remaining Estimated Cleanup Costs by Work Element.

4.6 CENTRAL PLATEAU CLEANUP ASSUMPTIONS AND UNCERTAINTIES

In planning for the Hanford Site lifecycle, there are uncertainties considered regarding estimated scope, schedule and cost. While a number of assumptions are made to support lifecycle development, the assumptions presented here are major assumptions that drive costs.

For Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030), the following assumptions are identified:

- Planned characterization of the vadose zone below the high-level waste (HLW) tanks will be sufficient to evaluate remedies for protection of groundwater
- No substantial new requirements will be added to meet the state's implementation of RCRA.

For Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040), the following assumptions are identified:

- An industrial worker scenario will be used to define the exposure scenarios and the threshold cleanup levels for waste sites located in the 200 Areas
- The Central Plateau area will remain under Federal control for the foreseeable future
- All low-level legacy waste will be managed and treated on Hanford via remove, treat, and dispose (RTD) to approved onsite disposal facilities
- Planning assumes that geographic aggregate barriers (ABAR) will be utilized. The ABARs are assumed to cover canyons or other large facilities and adjacent waste sites or to cover multiple adjacent waste sites
- Removal excavations are assumed to be 15 feet below grade for planning and estimating purposes. Decision documents will identify the actual removal excavation criteria (soil cleanup level or excavation depth) for waste sites.

For Nuclear Facility D&D–Fast Flux Test Facility Project (PBS RL-0042), the following assumptions are identified:

- FFTF funding to accomplish the scope can be carried over from year to year. Beginning in FY2019, budget levels are to reflect an optimal ramp up to complete sodium residuals cleaning, bulk sodium processing, and D4 work scope.

For Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C), the following assumptions are identified:

- New treatment facilities are not required to support longer WTP operations
- T Plant will be available for modification to be the facility necessary for retrieval, storage, and treatment/processing of all Hanford RCRA transuranic mixed (TRUM) waste as required by TPA Milestone M-091-01
- WIPP will remain operational through the end of Hanford cleanup operations that have the potential to generate TRU waste. Current planning has shipping of TRU waste until FY2030.

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5.0 TANK WASTE CLEANUP

Tank waste cleanup is part of the River Protection Project (RPP) and is being performed under the authority of the Office of River Protection (ORP). ORP manages the RPP as required by the *Strom Thurmond National Defense Authorization Act for Fiscal Year 1999*, and augmented by the *Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001*.

The RPP mission is to retrieve and treat Hanford tank waste and close the tank farms to protect the Columbia River. As a result, ORP is responsible for the retrieval, treatment, and disposal of approximately 56 million gallons of mixed waste contained in Hanford waste tanks, and closure of all the tanks and associated facilities. The RPP work scope consists of two major elements:

- Safely manage the radioactive mixed waste stored in Hanford's underground storage tanks. This work element is conducted under Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014).
- Design, construct, and commission the WTP, which will treat and immobilize tank wastes into a vitrified glass form. This work element is conducted under Major Construction – Waste Treatment Plant (PBS ORP-0060).

Figure 5-1 illustrates the relationships between the various activities and integration of the elements for retrieval of the waste from the tanks, treatment to reduce hazards, and disposal.

The RPP comprises the tank farms and WTP systems - nearly 200 interrelated waste storage, transfer, treatment, transportation, and disposal facilities. The RPP and these facilities are an important element of the DOE mission to protect the Columbia River. This chapter describes the RPP mission and scope as presented in the *River Protection Project System Plan (ORP-11242, Rev. 4)*. Cost and schedule information are based on Revision 4 of ORP-11242 in order to remain consistent with ORP's last certified baseline and approved baseline change requests. ORP will evaluate the need for potential changes to the RPP baseline, and future baseline changes will be reflected in the LCR.

The underground waste storage tanks were built in groups of 2 to 18 tanks; each group is known as a tank farm (A, AN, AP, AW, AX, AY, AZ, B, BX, BY, C, S, SX, SY, T, TX, TY, and U). Seven tank farms (comprised of 86 tanks) are located in the 200 West Area and 11 tank farms (comprised of 91 tanks) are located in the 200 East Area. The tanks were constructed in below-grade excavations to take advantage of the natural radiation shielding provided by the earth. The 177 underground storage tanks represent two basic design types: SSTs and DSTs. The smallest SSTs have ~55,000 gallons of capacity, while the largest DSTs hold up to ~1,250,000 gallons.

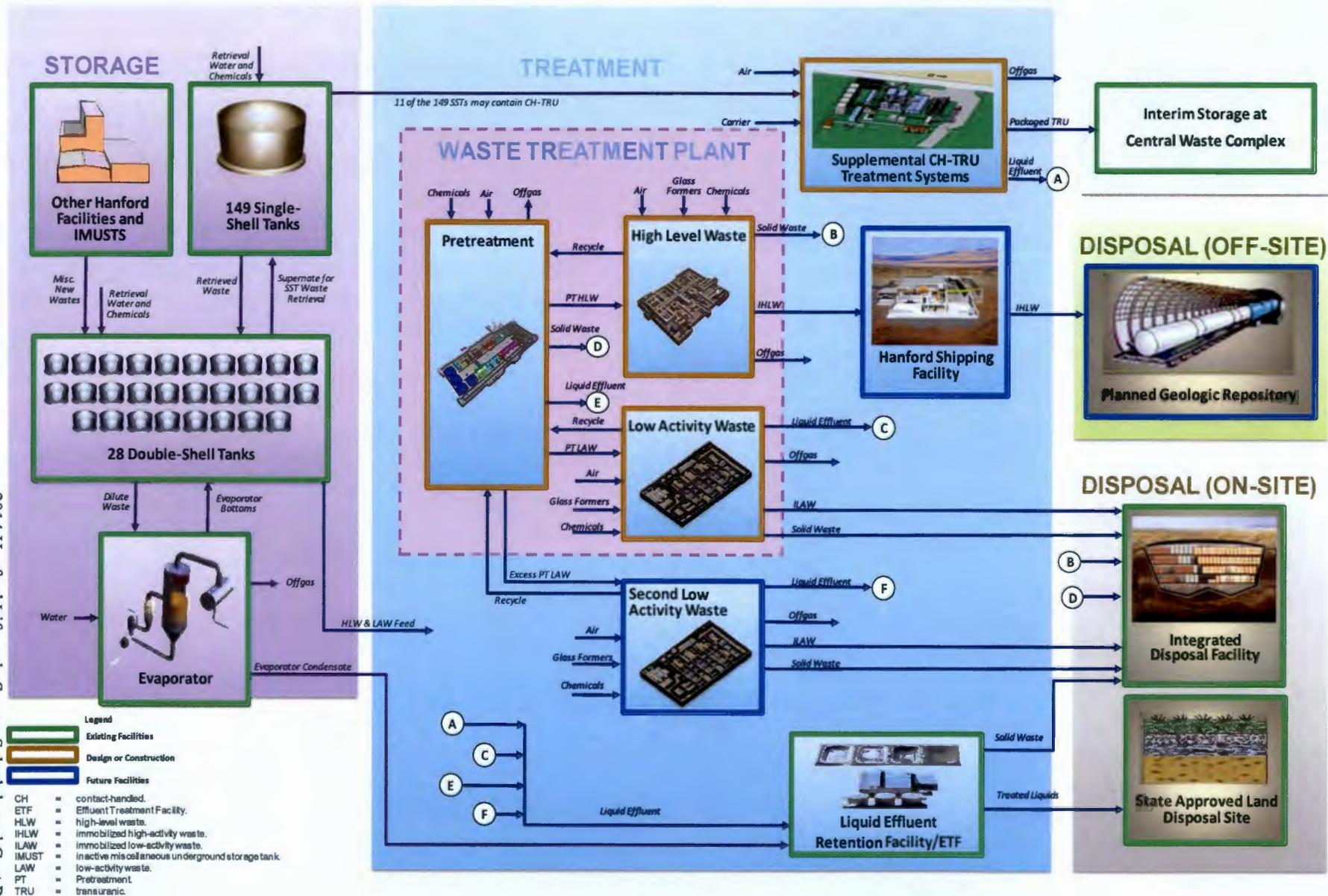


Figure 5-1. Simplified Process Diagram for Tank Waste Retrieval and Treatment.

When Hanford was in production mode, irradiated fuel from the reactors was transported to six separations facilities for isolating the desirable radionuclides from other reactor products. From 1944 to 1989, the separations processes yielded millions of gallons of highly radioactive and chemically hazardous waste, which was pumped through underground transfer lines and subsequently stored in the underground storage tanks. Although the reactors and separations facilities have long since ceased their operations, the underground waste tanks and their contents remain. The radioactive liquid waste was transferred from the separations facilities as slurry, a liquid with suspended solids. Over time, the radioactive solids settled to the bottom of the tanks, creating a layer known as sludge. The clarified radioactive liquid above the sludge is known as supernatant or supernate.

To reduce the total quantity of waste to be stored, the supernate is periodically decanted and transferred out of waste tanks to a waste evaporation process. The evaporation process results in a separation of the heated waste slurry to a steam condensate fraction, which is relatively clean, for further treatment and safe disposal, and a waste slurry fraction, which becomes more concentrated and is returned to the underground waste storage tanks. Historically, the concentrated waste slurry fraction cooled and began to form saltcake, a crystalline solid waste form. At one time, most tanks contained supernate, slurry, and saltcake waste forms simultaneously. The current typical content of the tanks is depicted in Figure 5-2.

Long-term storage at high temperatures, as a result of heat from fission product decay, contributed to the formation of a solid mass or group of large solids not easily removed called hard heels in the bottoms of some tanks. Cesium and strontium capsules, currently stored in the WESF, resulted from efforts to reduce fission products in the tanks. More information regarding the tanks and the RPP can be found in [ORP-11242](#).

The current strategy for tank waste cleanup involves a number of interrelated activities essential to the mission to retrieve and treat Hanford's tank waste and close the tank farms to protect the Columbia River. ORP will reduce risk to the environment posed from tank waste by:

- Retrieving the waste from 149 SSTs, transferring it to 28 DSTs, and delivering the waste to the WTP.
- Constructing and operating the WTP, which will safely treat the entire HLW fraction contained in the tank farms. Approximately one-third of the low-activity waste (LAW) fraction will be immobilized in the WTP LAW Vitrification Facility.
- Developing and deploying supplemental treatment capability to treat the remaining two-thirds of the LAW.
- Developing and deploying waste feed preparation capability to mitigate sodium management issues. The goal is to minimize the quantity of glass by reducing contaminants that would require the addition of glass-forming additives.
- Developing and deploying treatment and packaging capability for potential contact-handled (CH) TRU tank waste with onsite storage prior to final disposition.
- Deploying interim storage capacity for the immobilized high-level waste (IHLW) pending determination of the final disposal pathway (national repository).
- Closing the SST and DST farms, ancillary facilities, and associated waste management and treatment facilities.

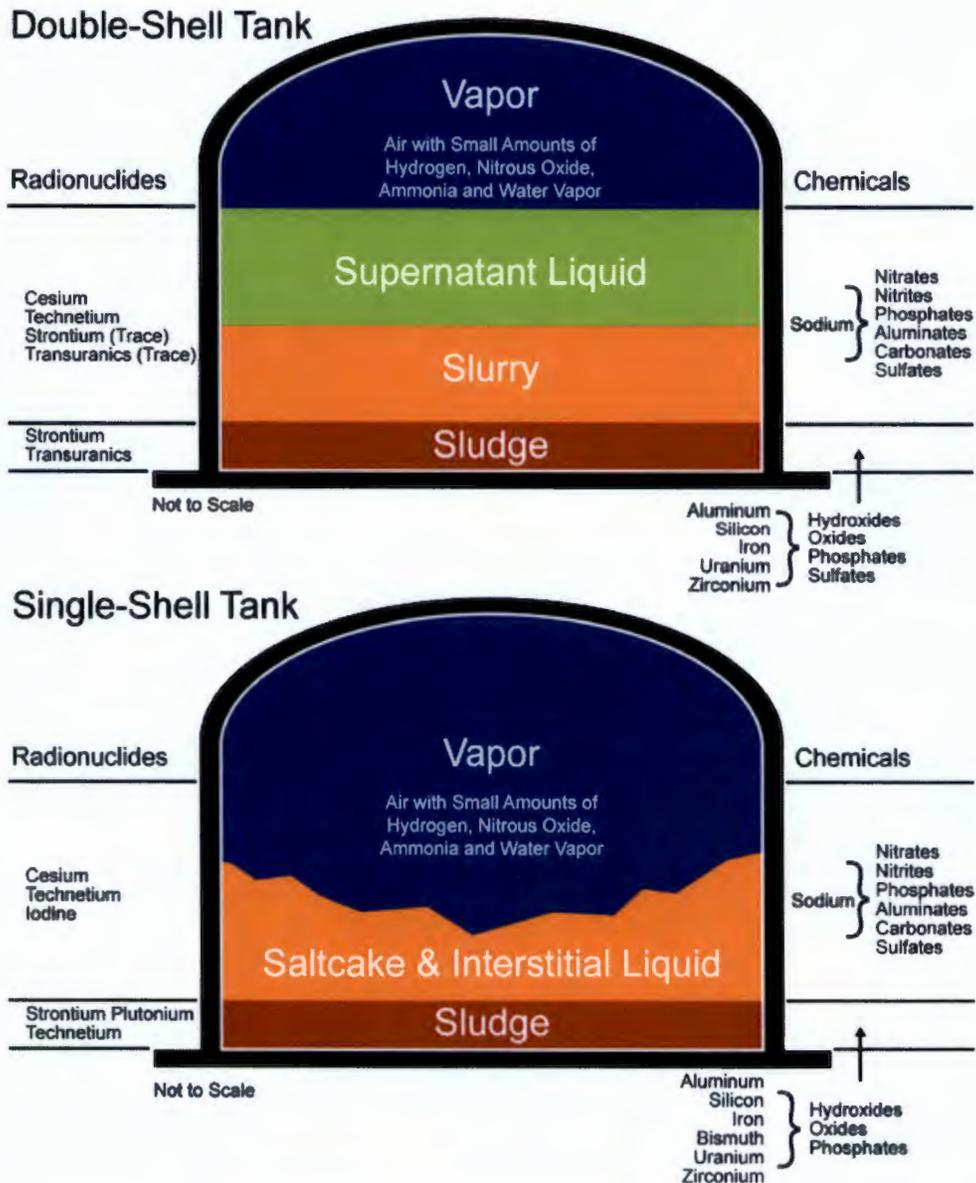


Figure 5-2. Depictions of Typical Tank Contents.

The work scope for tank waste cleanup is organized into two PBSs, as shown in Figure 5-3, which also presents the remaining cleanup schedule. The overall schedule objective is to complete retrieval, treatment, and closure activities by the end of FY2050. Once closure activities are completed, the tank farms will be transitioned to Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040) for final disposition or LTS.

ORP is developing and implementing operating strategies to meet applicable regulatory milestones, including those in the Consent Decree in *State of Washington v. Department of Energy*, Case No. 08-5085 (E.D. Wa. October 25, 2010) (DOE and Ecology, 2010) (the “Consent Decree”).

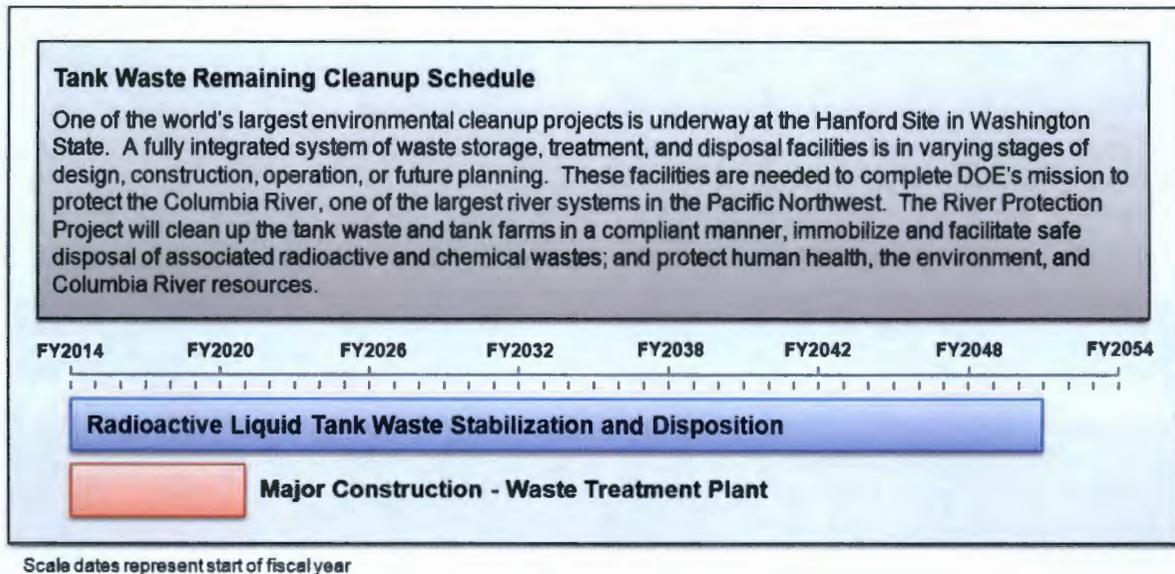


Figure 5-3. Tank Waste Remaining Cleanup Schedule.

5.1 RADIOACTIVE LIQUID TANK WASTE STABILIZATION AND DISPOSITION (PBS ORP-0014)

The 177 underground waste storage tanks and ancillary equipment, along with various support facilities and buildings, are primarily located in the Central Plateau 200 East and 200 West Areas. The waste composition varies widely, necessitating a variety of unique waste retrieval and treatment methods.

ORP's cleanup strategy focuses on achieving significant environmental risk reduction by the retrieval and treatment of Hanford's tank waste and the closure of the tank farms to protect the Columbia River. The primary accomplishments anticipated for FY2014 involve continuing preparation of the tank farms to provide waste streams to the WTP upon hot commissioning. Work also continues on construction of the WTP. Completion and commissioning is driven by the Consent Decree and TPA milestones.

After closure, the remainder of the facilities will be transferred to Nuclear Facility D&D-Remainder of Hanford (PBS RL-0040) for final disposition or LTS.

The tank farms scope in this report includes planning for the lifecycle of the tank farms as detailed in ORP-11242, Revision 4. The scope of PBS ORP-0014 is organized into seven work elements as shown in Figure 5-4, which also presents the remaining cleanup schedule. Additional scope information on these work elements is provided in Table 5-1.

Figure 5-5 presents the remaining estimated cleanup costs for Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014) by fiscal year; Figure 5-6 presents the remaining estimated cleanup costs by work element.

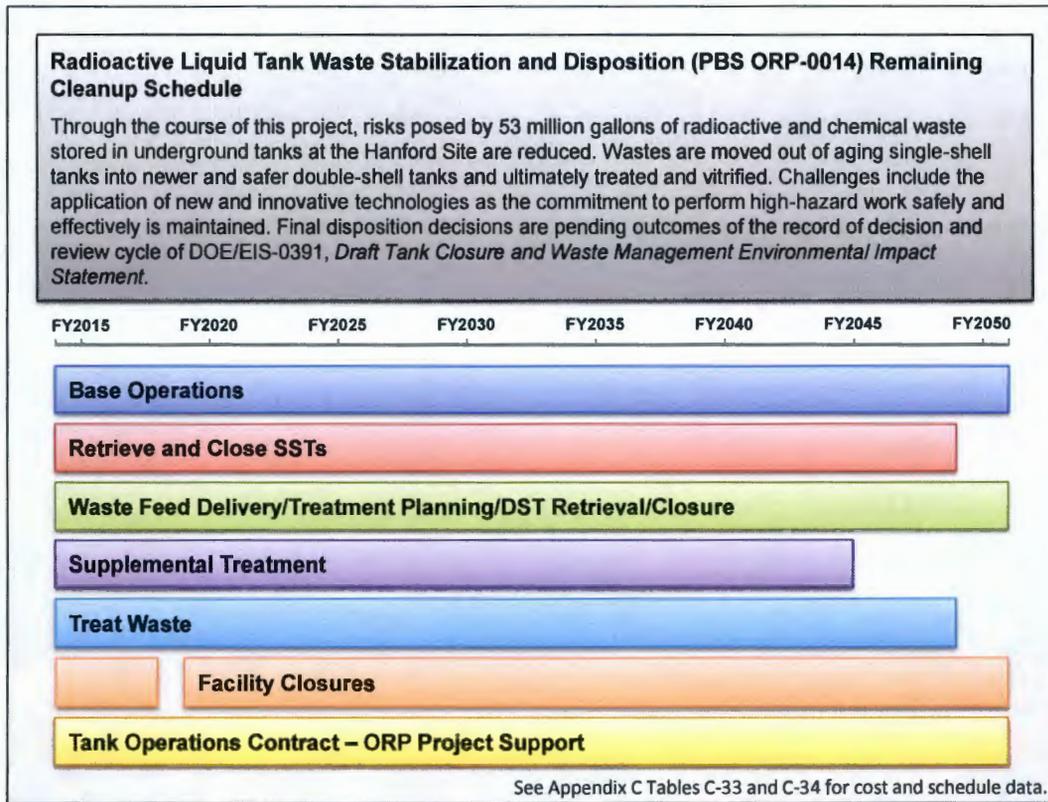


Figure 5-4. Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014) Remaining Cleanup Schedule.

Table 5-1. Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014) Level 2 Scope Summary.

Work Element	Scope Description
Base Operations	Provides for safe storage of waste, reduces the volume of waste through evaporation, provides laboratory support, and includes necessary support activities.
Retrieve and Close SSTs	Includes retrieval of waste from the SSTs and transfer to interim storage in DSTs. SSTs will then undergo closure in accordance with regulatory requirements, as will other associated sites in the tank farms.
Waste Feed Delivery/Treatment Planning/DST Retrieval/Closure	Covers modeling of waste characteristics and volumes; transfer, treatment and preparation of the wastes to meet the requirements for safe retrieval of the DST wastes; successful operation of the WTP; and closure of the DSTs to protect the environment and the community. This work element also includes treatment of secondary wastes generated during handling and processing of tank wastes.
Supplemental Treatment	Includes planning and analysis for supplemental low-activity waste treatment and contact-handled TRU handling, up to and including design and construction.
Treat Waste	Includes preparation for hot commissioning, closure planning, and final closure activities.
Facility Closures	Includes closure and monitoring of buildings and structures in the tank farms areas, but not covered elsewhere. Closure within this scope occurs mostly in the out-years and includes mobile facilities, office buildings, and support facilities (e.g., 200 East and West Evaporators).
Tank Operations Contract-ORP Project Support	Includes proportional share of costs for site services and infrastructure. See Section 6.3.2 for details.
DST = double-shell tank.	SST = single-shell tank.
ORP = Office of River Protection.	TRU = transuranic.
PBS = project baseline summary.	WTP = Waste Treatment and Immobilization Plant.

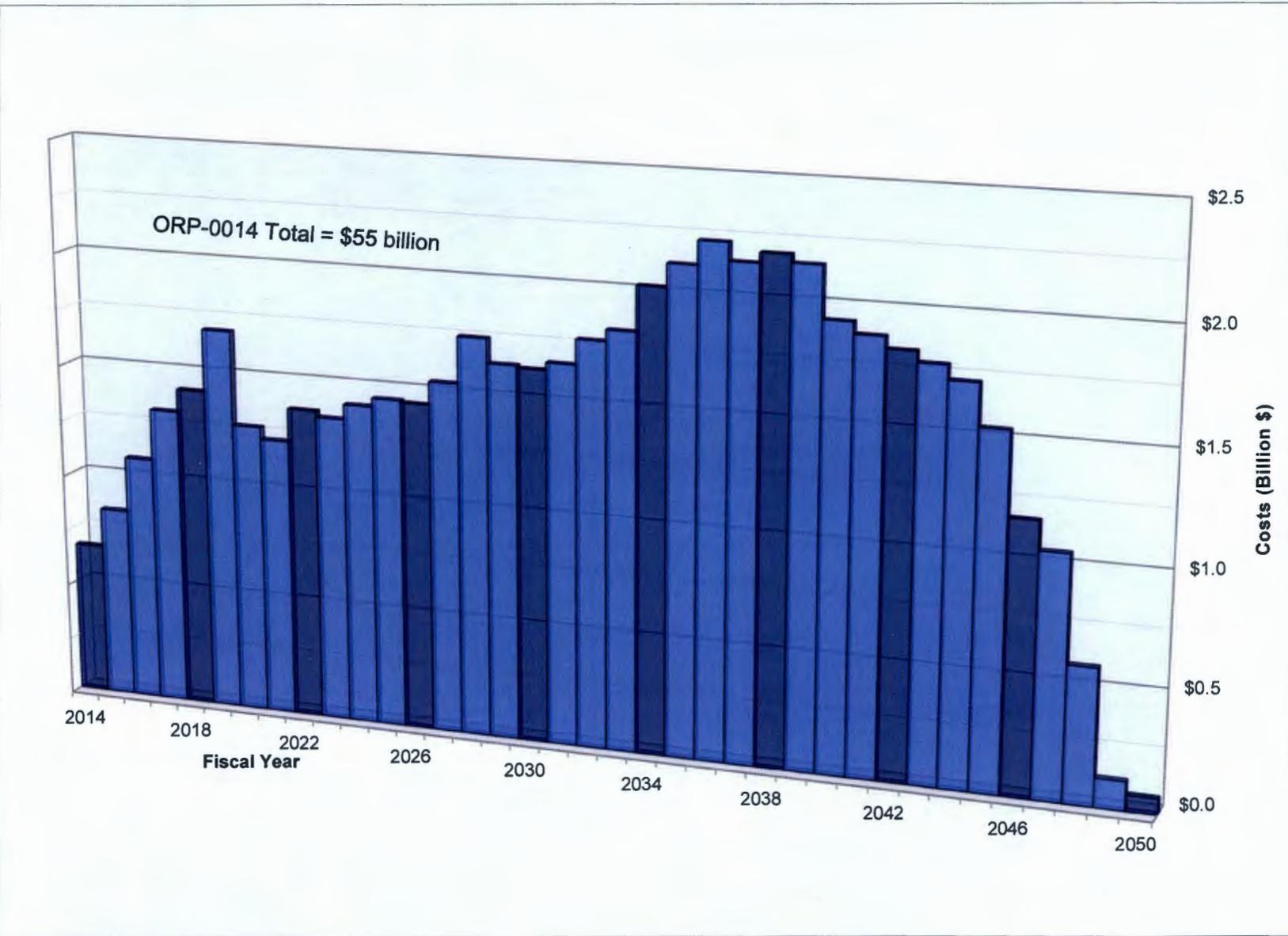
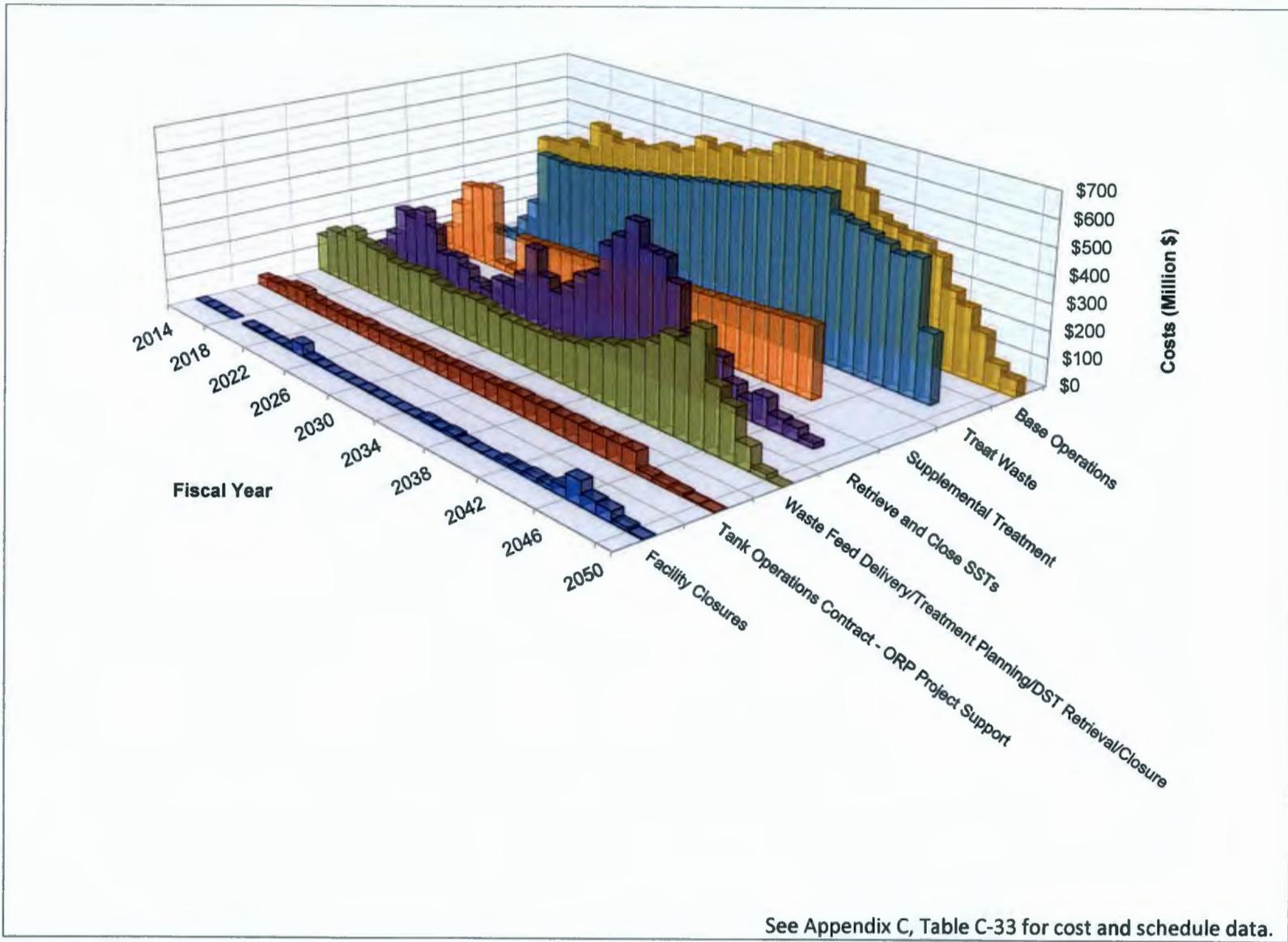


Figure 5-5. Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014) Remaining Estimated Cleanup Costs by Fiscal Year.



See Appendix C, Table C-33 for cost and schedule data.

Figure 5-6. Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014) Remaining Estimated Cleanup Costs by Work Element.

5.2 MAJOR CONSTRUCTION – WASTE TREATMENT PLANT (PBS ORP-0060)

The mission of Major Construction – Waste Treatment Plant (PBS ORP-0060) is to design, construct, and commission the WTP for pretreating and immobilizing the mixed wastes currently stored in Hanford’s underground storage tanks. Work is complete when WTP construction is complete and the facilities are turned over to ORP’s operations contractor. The following five main facilities are being constructed in the WTP:

- Pretreatment
- Low-Activity Waste Vitrification
- High-Level Waste Vitrification
- Balance of Facilities
- Dedicated Analytical Laboratory.

The scope for PBS ORP-0060 is organized into six main work elements, as shown in Figure 5-7, which also presents the remaining cleanup schedule. Additional scope information on these work elements is provided in Table 5-2.

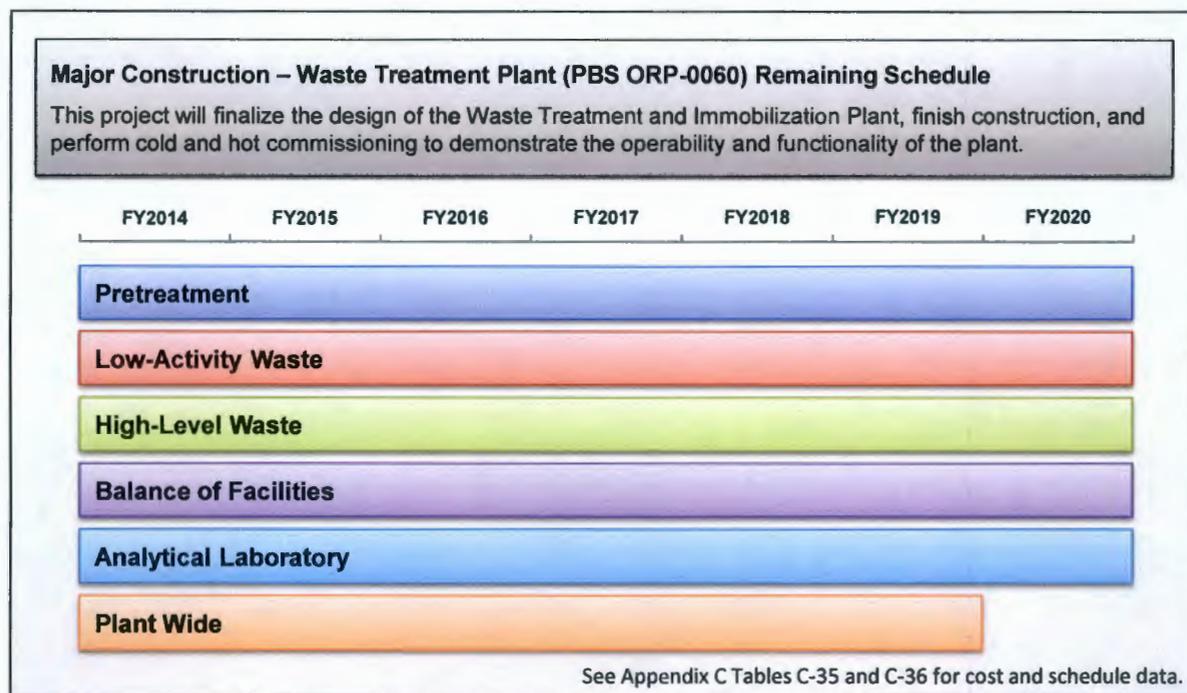


Figure 5-7. Major Construction – Waste Treatment Plant (PBS ORP-0060) Remaining Schedule.

Table 5-2. Major Construction–Waste Treatment Plant (PBS ORP-0060) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description
Pretreatment	Includes design, construction, and commissioning of the Pretreatment Facility. When finished, pretreatment will physically and chemically condition the waste feed stream, separating the low-activity radioactive waste from the high-level radioactive waste.
Low-Activity Waste (LAW)	Includes design, construction, and commissioning of the LAW Vitrification Facility. When finished, the LAW will go into a melter preparation vessel where silica and other glass-forming material are added and the mixture will be fed into one of two melters. The mixture will be heated to 2,100 °F using Joule heating. The molten mixture will be poured into large stainless steel canisters that are then welded shut.

Table 5-2. Major Construction–Waste Treatment Plant (PBS ORP-0060) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description
High-Level Waste (HLW)	Includes design, construction, and commissioning of the HLW Vitrification Facility. Similar to the LAW, when finished the HLW will be mixed with glass-forming materials, heated to molten, and poured into stainless steel canisters.
Balance of Facilities	Includes design, construction and commissioning of the Balance of Facilities. When finished, the dedicated facilities and utilities will support the WTP.
Analytical Laboratory	Includes design, construction, and commissioning of the Analytical Laboratory. When finished, samples will be analyzed to ensure the glass product meets requirements.
Plant Wide	Includes crosscutting services and equipment provided to the construction site (e.g., project controls, engineering design and management, environmental, nuclear safety, construction services) as well as a proportional share of costs for site services and infrastructure (see Section 6.3.2).
HLW = high-level waste.	PBS = project baseline summary.
LAW = low-activity waste.	WTP = Waste Treatment and Immobilization Plant.

Figure 5-8 presents the remaining estimated costs for Major Construction – Waste Treatment Plant (PBS ORP-0060) by fiscal year; Figure 5-9 presents the remaining estimated costs by work element.

5.3 TANK WASTE CLEANUP ASSUMPTIONS AND UNCERTAINTIES

The activities described for the RPP are assumed to be consistent with, and encompassed by, the outcome of the NEPA process. The operating scenarios continue to be reviewed against the assumptions in DOE/EIS-0391 as the planning process continues, and updated as appropriate. Unanticipated changes resulting from the NEPA process could impact assumptions. Detailed designs and processing of permits are subject to completion of the NEPA process and ROD issuance. ORP-11242, Revision 4, details assumptions and uncertainties for the RPP. The following is a summary of key assumptions.

- Cesium and strontium capsules will not be processed in the WTP. (The December 13, 2013, ROD [78 FR 75913] states that DOE is not deciding on treatment of the cesium and strontium capsules.)
- A planned offsite geologic repository will be ready to accept IHLW canisters from the Hanford Site starting in April 2023 at a rate that does not require construction of additional interim storage beyond that planned for the Hanford Shipping Facility. Onsite IHLW interim storage will be operational on or before May 17, 2019, and provide interim storage for at least 2,000 canisters.⁶
- The current strategy to comply with the IHLW acceptance criteria is described in 24590-HLW-PL-RT-07-0001, *IHLW Waste Form Compliance Plan for the Hanford Tank Waste Treatment and Immobilization Plant*. It is assumed that the strategy will be acceptable to the Office of Civilian Radioactive Waste Management. It is further assumed that the WTP prepared hazardous waste delisting petition for the IHLW is accepted by Ecology and the receiving state before shipping the waste to the planned offsite geologic repository.

⁶ ORP recognizes delays in the availability of a national geologic repository by April 2023 as a key uncertainty, and continues to assess potential actions to mitigate this uncertainty. For example, one option being considered is developing a capability to receive and temporarily store IHLW canisters in Interim Hanford Storage, with the IHLW canisters subsequently retrieved and transported to the Hanford Shipping Facility in preparation for shipment to a national repository when it becomes available. Interim Hanford Storage could be expandable in modules up to a maximum capacity of 16,000 canisters, which would accommodate the number of IHLW canisters projected for the WTP. This and other potential mitigating actions are being evaluated, but are not yet reflected in the RPP baseline schedule and cost.

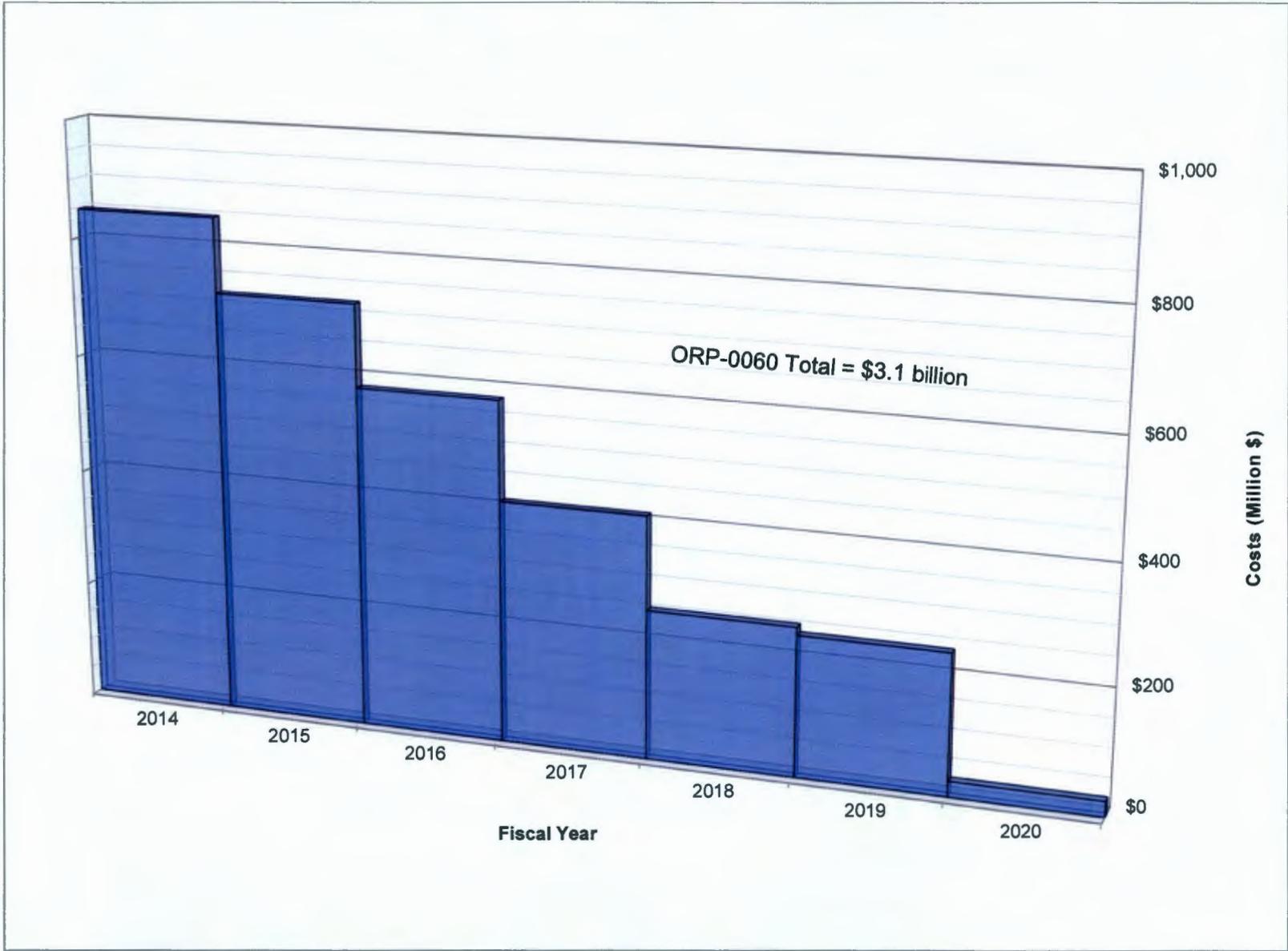


Figure 5-8. Major Construction – Waste Treatment Plant (PBS ORP-0060) Remaining Estimated Costs by Fiscal Year.

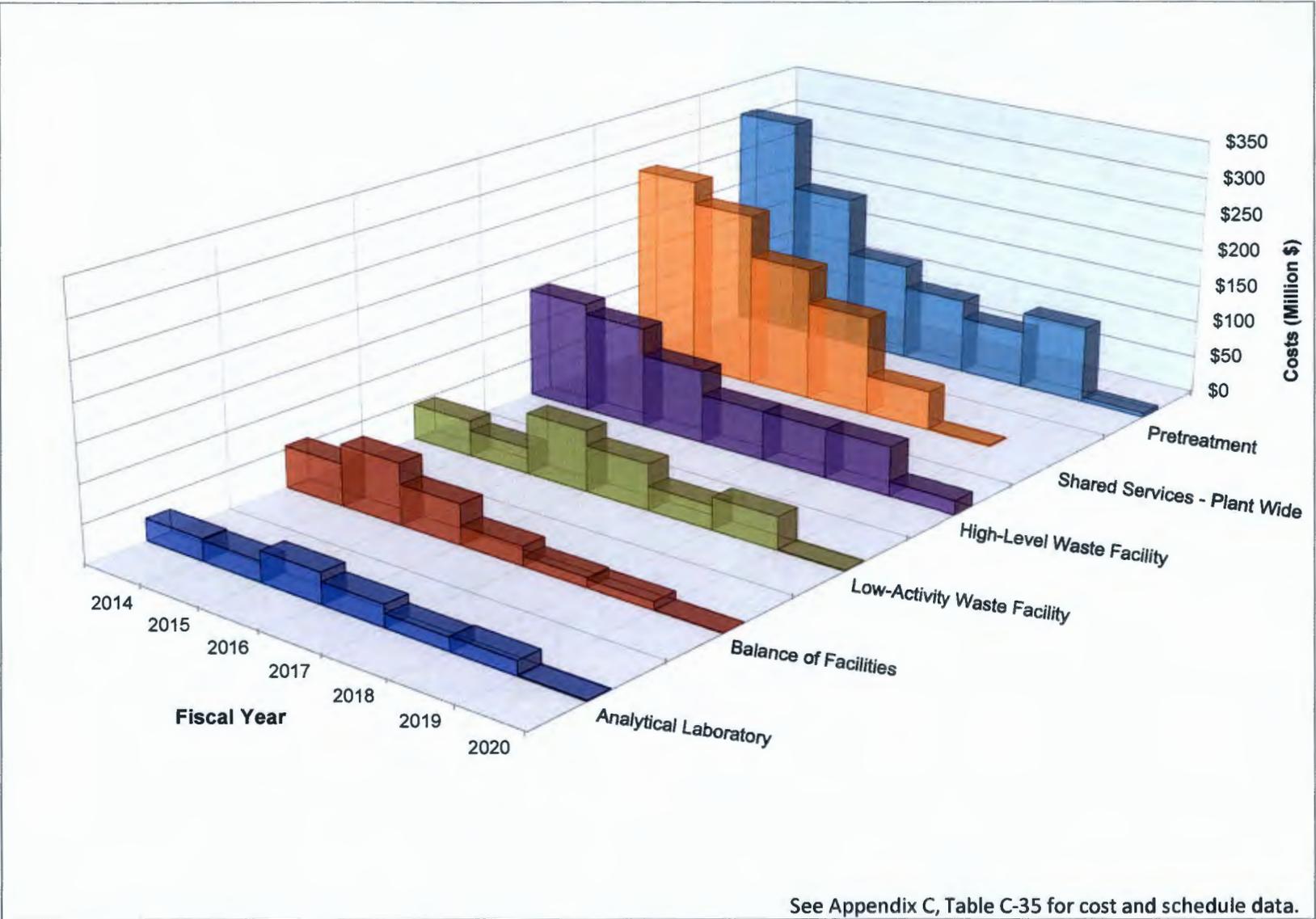


Figure 5-9. Major Construction – Waste Treatment Plant (PBS ORP-0060) Remaining Estimated Costs by Work Element.

- Supplemental LAW treatment capacity will be provided by a second LAW vitrification facility located adjacent to the WTP. The second LAW facility will have the same technical assumptions as the WTP LAW Vitrification Facility, will complete hot commissioning on September 30, 2021, and will begin full operations on October 1, 2021.
- Packaged CH-TRU waste will be interim stored onsite at the Central Waste Complex, and will be acceptable for disposal at the WIPP (a number of conditions, including approval of a RCRA Part B Permit Class III permit modification, would need to be satisfied prior to disposal at WIPP).
- CH-TRU waste treatment and packaging process capability will be available in FY2015 to support TRU tank waste retrieval.
- Waste previously assumed to be RH-TRU waste will be retrieved and treated at the WTP together with the HLW.
- The DSTs will remain fully operational for the nominal 40-year waste treatment mission duration.
- The 242-A Evaporator will continue to operate, as needed, through the life of the mission to support SST retrieval and to maintain the sodium concentration in the delivered feed within WTP feed specifications. The 242-A Evaporator will not be available during scheduled maintenance outages.
- Selected technologies will be able to meet retrieval (tank residual) requirements.
- Laboratory services required to support waste characterization for tank farm projects and operations are available and provided in a timely manner.
- WTP secondary solid waste will be disposed at the IDF and WTP secondary liquid waste will be treated at the ETF and disposed at IDF.
- The IDF is currently in standby mode and will be ready to serve upon completion of a performance assessment, permit modification, operational readiness review, etc. The activation will be completed when the IDF is needed by the WTP. The IDF will provide permanent disposal for the immobilized LAW, other low-level waste, and mixed low-level waste, including:
 - LAW glass packages from the WTP
 - Solid waste from the WTP, including spent LAW and HLW melters
 - Solid waste from the ETF from treating liquid wastes.

The IDF can be expanded as needed to support the mission.

- The baseline case implicitly assumes that the outcome of official Waste Incidental to Reprocessing Waste Determinations will be consistent with the assumed disposition of the primary and secondary waste forms prior to disposal.
- The cross-site transfer system will be modified as needed to allow transfer of slurry in multiple DSTs to provide operational flexibility in managing waste and staging feed to the WTP.
- Fiscal year funding will be available to support the baseline case, including funding required for risk mitigating actions.

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6.0 MISSION SUPPORT

The Mission Support function is service-oriented and provides key infrastructure, utility, resource, and other Hanford Site-wide cleanup support. DOE has responsibilities to protect personnel, nuclear material, and physical property on the Hanford Site. These activities are performed under Safeguards and Security (PBS RL-0020). DOE works closely with the regulatory agencies and community to provide support to Hanford cleanup through Richland Community and Regulatory Support (PBS RL-0100).

There are a number of infrastructure-related Mission Support activities in place to support the cleanup. These Mission Support activities are managed under Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040). Following cleanup efforts at the Hanford Site, DOE will have ongoing activities to maintain the protectiveness of the cleanup actions and support transition to future land uses. This period is referred to as LTS and is covered by PBS RL-LTS; Figure 6-1 presents the remaining cleanup schedule for Mission Support.

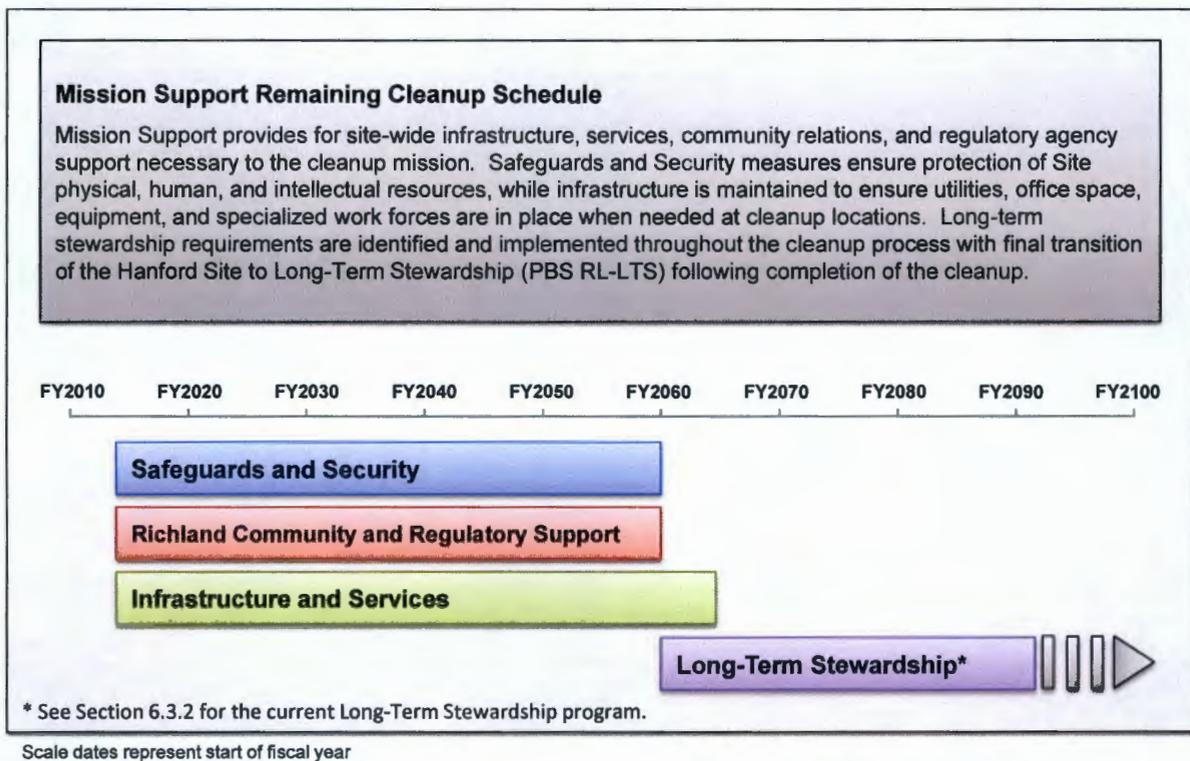


Figure 6-1. Mission Support Remaining Cleanup Schedule.

6.1 SAFEGUARDS AND SECURITY (PBS RL-0020)

The scope of this PBS includes one primary work element: Safeguards and Security. Figure 6-2 presents the remaining cleanup schedule and Table 6-1 describes the work scope. Safeguards and Security will be required until cleanup is complete, then protection of human health and the environment transfers to PBS RL-LTS. The level of effort required to ensure protectiveness may diminish as nuclear material is shipped offsite and as the cleanup progresses.

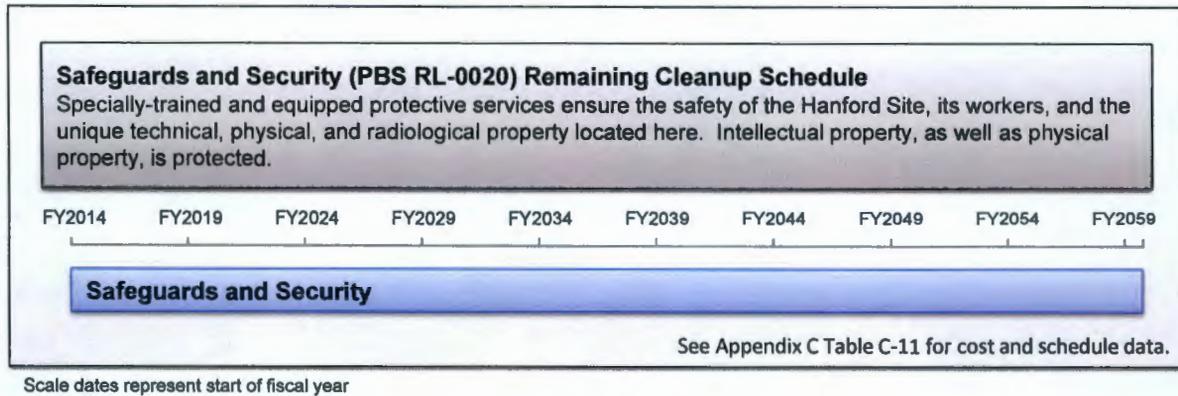


Figure 6-2. Safeguards and Security (PBS RL-0020) Remaining Cleanup Schedule.

Table 6-1. Safeguards and Security (PBS RL-0020) Level 2 Scope Summary.

Work Element	Scope Description
Safeguards and Security	This work element includes management, training, and equipment for staff; physical protective systems, such as intrusion protection, Hanford Site access, and badging; information and cyber security; personnel security; material control and accountability; and security program management.
PBS = project baseline summary.	RL = U.S. Department of Energy, Richland Operations Office.

Figure 6-3 provides the remaining estimated costs for Safeguards and Security (PBS RL-0020) by fiscal year.

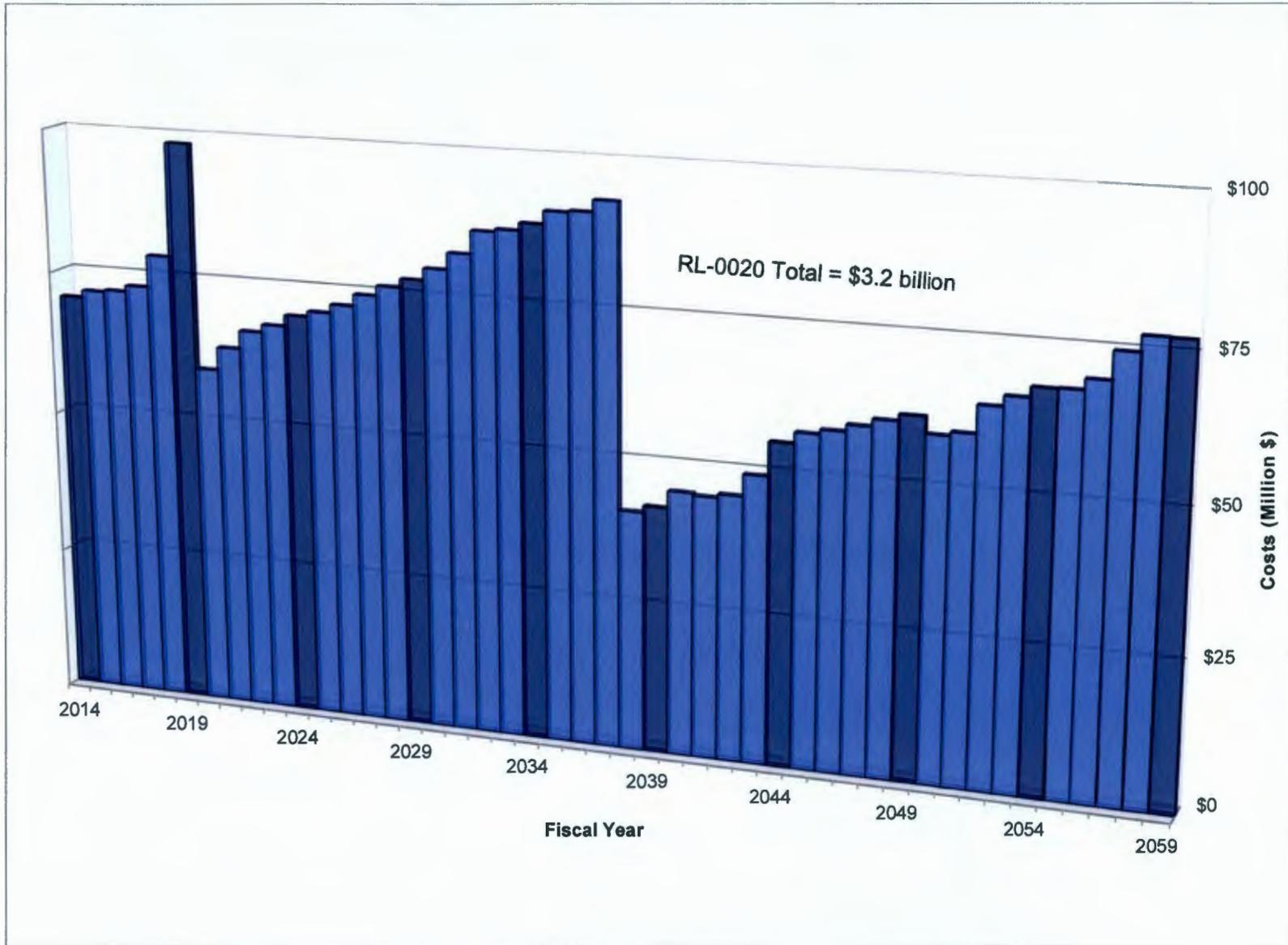
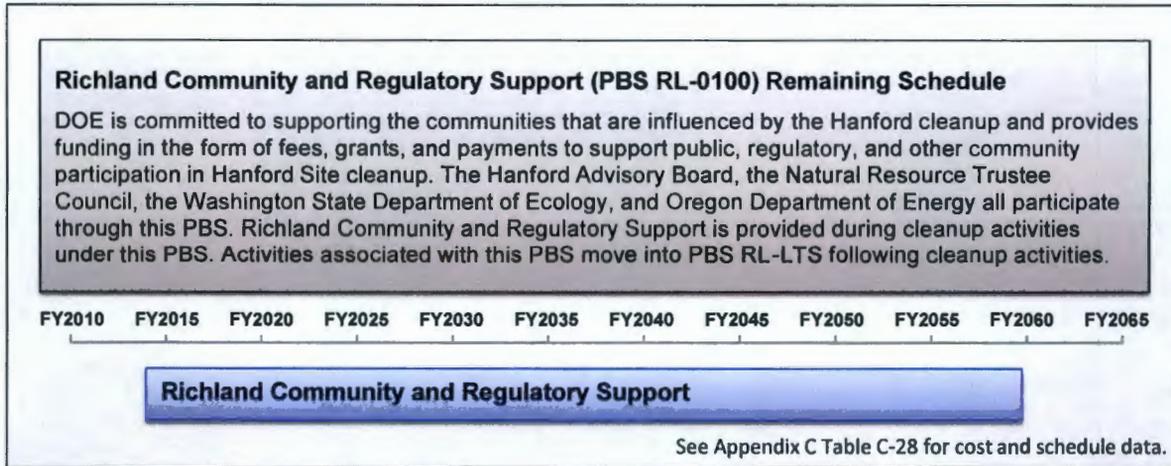


Figure 6-3. Safeguards and Security (PBS RL-0020) Remaining Estimated Costs by Fiscal Year.

6.2 RICHLAND COMMUNITY AND REGULATORY SUPPORT (PBS RL-0100)

This PBS includes support to the communities that are influenced by the Hanford cleanup. Figure 6-4 provides the remaining cleanup schedule for Richland Community and Regulatory Support (PBS RL-0100) and Table 6-2 summarizes its scope of work.



Scale dates represent start of fiscal year

Figure 6-4. Richland Community and Regulatory Support (PBS RL-0100) Remaining Schedule.

Table 6-2. Richland Community and Regulatory Support (PBS RL-0100) Level 2 Scope Summary.

Work Element	Scope Description
Richland Community and Regulatory Support	This work element includes RL support to community activities and regulatory agencies, such as the Hanford Advisory Board, the Oregon Department of Energy, the Natural Resource Trustee Council, the Washington State Department of Ecology, Washington State Department of Health and other entities through grants, permits and payment of fees.
PBS =	project baseline summary.
RL =	U.S. Department of Energy, Richland Operations Office.

Figure 6-5 provides the remaining estimated costs for Richland Community and Regulatory Support (PBS RL-0100) by fiscal year.

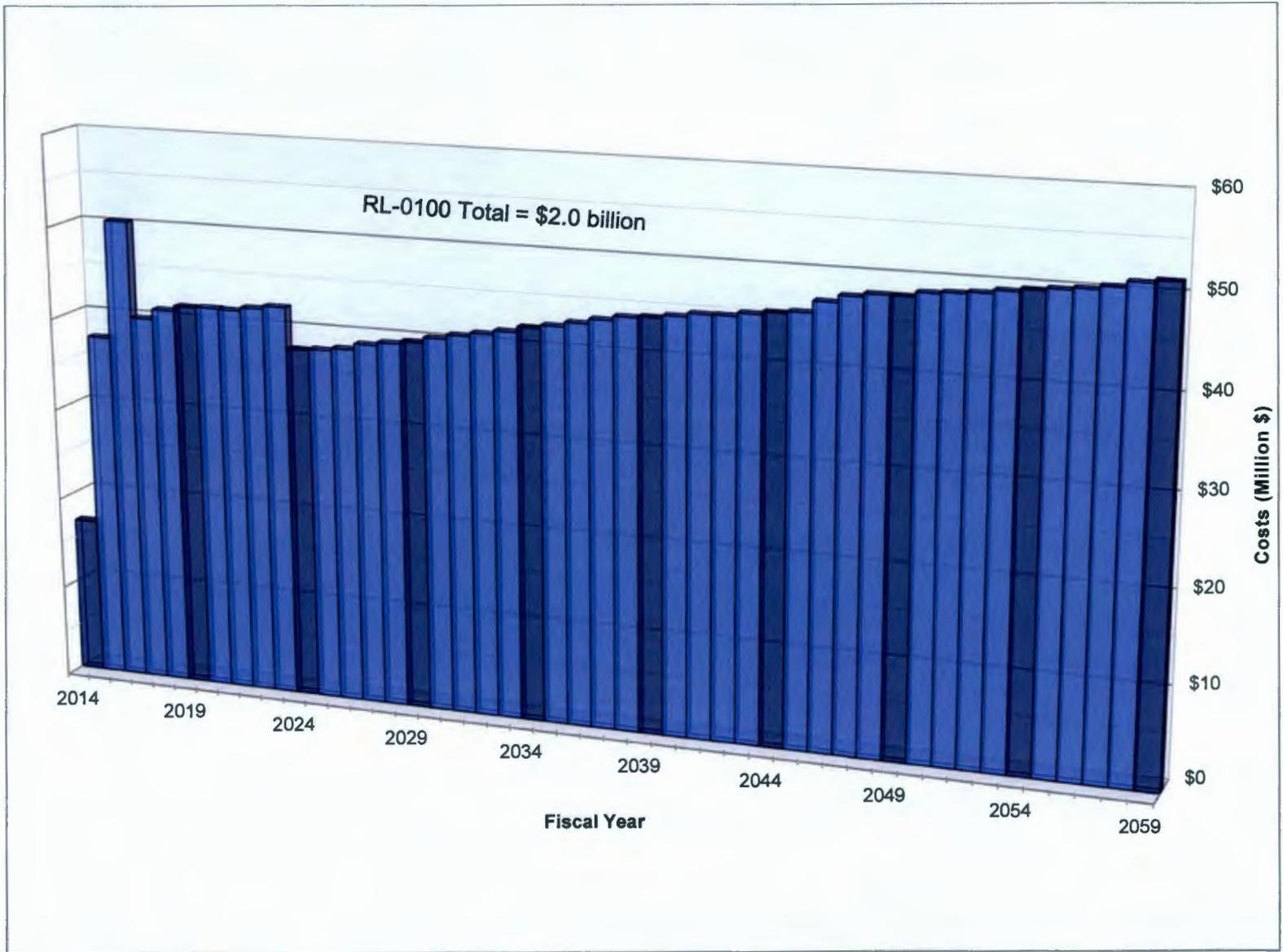


Figure 6-5. Richland Community and Regulatory Support (PBS RL-0100) Remaining Estimated Costs by Fiscal Year.

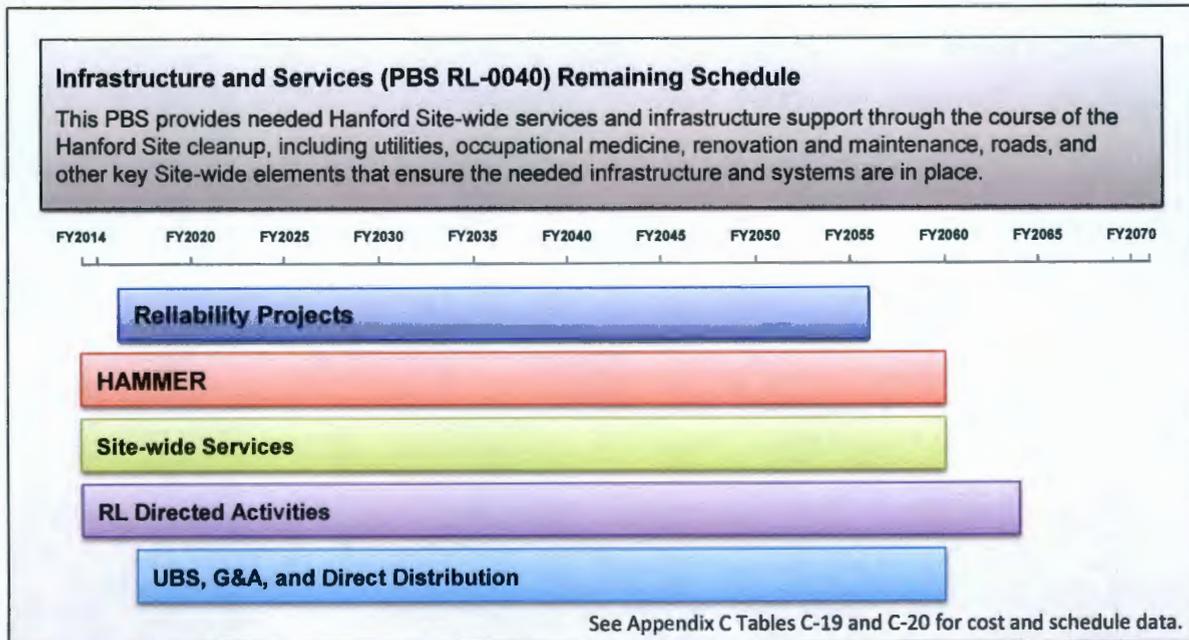
6.3 INFRASTRUCTURE AND SERVICES (PBS RL-0040)

Infrastructure and Services play a key role in completing the cleanup mission, and as noted in Chapters 2.0 and 4.0, the work scope is included within PBS RL-0040.

6.3.1 Reliability Projects, HAMMER, and RL Directed Activities

Infrastructure and Services (PBS RL-0040) provides cost-effective infrastructure and site services that are essential to accomplishing the Hanford Site environmental cleanup mission. These essential services cover a broad spectrum and range from the basic to highly-specialized services that reflect the complexity and scale of the environmental cleanup mission.

The work scope for Infrastructure and Services (PBS RL-0040) is organized into the work elements shown in Figure 6-6, which also presents the remaining cleanup schedule. The scope description for these work elements is provided in Table 6-3.



Scale dates represent start of fiscal year

Figure 6-6. Infrastructure and Services (PBS RL-0040) Remaining Schedule.

Table 6-3. Infrastructure and Services (PBS RL-0040) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description
Reliability Projects	Includes repair and replacement of infrastructure systems and provides capital upgrades to the infrastructure, including larger scale expense projects. Also included are construction and capital equipment expenditures associated with replacements for biological control, crane and rigging, electrical system, facilities, Hanford Fire Department, network and telecommunications, studies and estimates, transportation, water and sewer utilities and other infrastructure reliability projects.
HAMMER	Includes operations and maintenance activities at the HAMMER facility in support of the Hanford Site and other training programs.

Table 6-3. Infrastructure and Services (PBS RL-0040) Level 2 Scope Summary. (2 pages)

Work Element	Scope Description
Site-wide Services	Includes proportional share of costs for site services and infrastructure. This work element includes emergency services (safeguards and security, fire and emergency response, emergency management), environmental integration services (site-wide safety standards, environmental integration, public safety and resource protection, radiological site services, and Waste Sampling and Characterization Facility analytical services), information management (information management planning and controls, information systems, content and records management, infrastructure/cyber security, information resources/content management, and information support services), site infrastructure and utilities/logistics and transportation (roads and grounds, biological services, electrical services, water/sewer services, facility services, transportation, mail, property systems/acquisitions, railroad services, technical services, energy management, work management, land and facilities management), support functions (business operations, human resources, safety, health and quality), and portfolio management (portfolio planning, analysis and performance, project acquisition and support, and independent assessment and analysis).
RL Directed Activities	Includes contracted technical services in key areas such as audit, regulatory analysis, cost and risk analysis and estimating. Also includes mission critical support services to DOE and its contractors in key areas such as occupational medicine, information and telecommunications, janitorial, radiological laundry, electrical power and facilities rentals; critical independent legal counsel and litigation services in support of DOE and its contractors; and other mission critical support services to DOE and its contractors in key areas such as land transfers, acquisition and contract closeout, acquisition of natural gas utility services, energy conservation and management (including steam), natural resource trusteeship, Tribal Nation support, and other small contracts.
UBS, G&A and Direct Distribution	Includes contractor's fee, management reserve, allocated pensions and G&A allocations.
DOE = U.S. Department of Energy. G&A = General and Administrative. HAMMER = Hazardous Materials Management and Emergency Response Training and Education Center.	PBS = project baseline summary. RL = U.S. Department of Energy, Richland Operations Office. UBS = usage-based services.

Figure 6-7 presents the remaining estimated costs for Infrastructure and Services (PBS RL-0040) by fiscal year and Figure 6-8 presents the remaining estimated costs by work element.

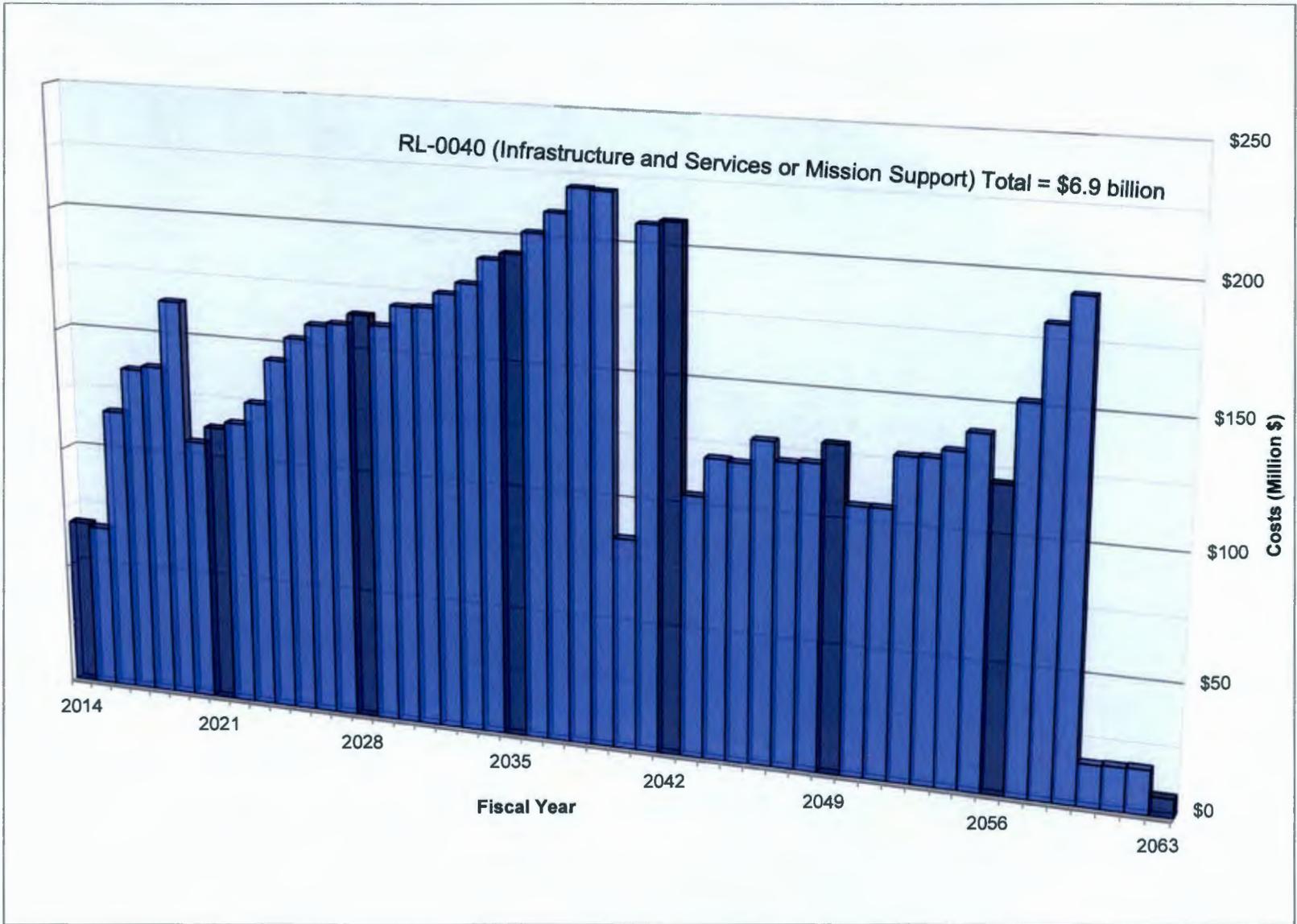


Figure 6-7. Infrastructure and Services (PBS RL-0040) Remaining Estimated Costs by Fiscal Year.

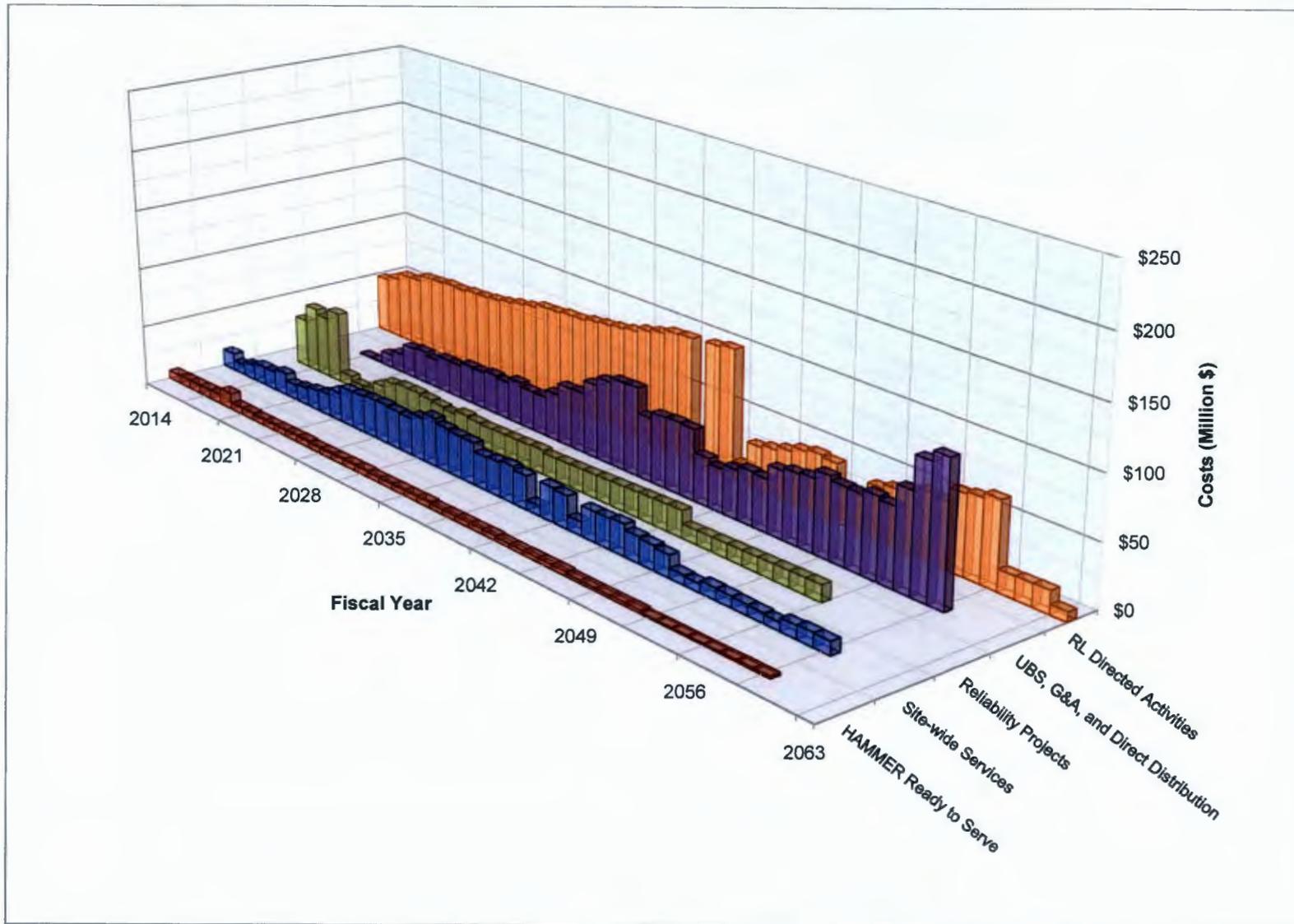


Figure 6-8. Infrastructure and Services (PBS RL-0040) Remaining Estimated Costs by Work Element.

6.3.2 Site-wide Services

The Site-wide Services program provides direct operations support to RL, ORP and their contractors with cost-effective infrastructure and site services integral and necessary to accomplish the environmental cleanup mission. The scope includes five primary functions: Safety, security and environment; site infrastructure and utilities; site business management; information resources and content management; and portfolio management.

Under the safety, security and environment function, both Safeguards and Security (PBS RL-0020) and HAMMER (PBS RL-0040, Section 6.3.1) are funded through their respective projects and not through Site-wide Services. Other work elements under the safety, security and environment function include: Fire and emergency response services; emergency operations; site safety standards; radiological assistance program; environmental regulatory management; public safety and resource protection; and radiological site services.

The work elements under the site infrastructure and utilities function include: Analytical services (e.g., the Waste Sampling and Characterization Facility [WSCF]); biological control; facility services; transportation; railroad services; roads and grounds; utilities (water, electricity), sewer systems; and sanitary waste management and disposal.

The work elements under the site business management function include: Real property asset management; property systems/acquisition and materials management; sponsorship, management and administration of employee pension and other benefits plans; Energy Employees Occupational Illness Compensation Program Act/workers compensation; external affairs and other interactions; mail services; and reproduction, correspondence control and multi-media.

As part of real property asset management, RL has established the LTS program to provide planning and interim execution of LTS for portions of the Hanford Site as they are cleaned up and before they are transferred to the DOE Office of Legacy Management (LM). The current LTS program is part of PBS RL-0040 Infrastructure and Services until it is transferred to LM – this future LTS program under LM is referred to as PBS RL-LTS in this report. The scope of the current and future LTS program is described in Section 6.4.

The work elements under the information resources and content management function include: Strategic planning and program management; telecommunications; information systems; and content (records) management.

The work elements under the portfolio management function include: Hanford portfolio planning, analysis and performance assessment; project acquisition and support; and independent analysis and assessments.

6.4 LONG-TERM STEWARDSHIP (PBS RL-LTS)

Following the completion of Hanford cleanup actions, the disposal facilities and other areas will require long-term management. Administration of the institutional controls activities will be required for portions of the Hanford Site to ensure protection of human health and the environment. As portions of the site are cleaned up, they are managed in accordance with the Hanford Site Long-Term Stewardship Program, as described in [DOE/RL-2010-35](#), *Hanford Long-Term Stewardship Program Plan*, under PBS RL-0040 Infrastructure and Services. When all of the cleanup actions defined by decision documents are completed, the Hanford Site will be turned over to DOE-LM. This PBS element pertains to the LM activities at Hanford.

LTS refers to all activities necessary to ensure protection of human health and the environment following completion of cleanup, disposal, or stabilization at a site or a portion of a site. LTS includes engineered and institutional controls designed to contain or to prevent exposures to residual contamination and waste, such as surveillance activities, recordkeeping activities, inspections, groundwater monitoring, ongoing pump-and-treat activities, cap repair, maintenance of entombed buildings or facilities, maintenance of other barriers and containment structures, access control, and posting signs. LTS begins when cleanup is completed and the selected remedy cleanup objectives and goals are met, as defined by the applicable CERCLA or RCRA decision documents, or when long-term remediation systems are constructed and operating as intended (e.g., groundwater pump-and-treat systems).

The current Hanford Site LTS Program manages the geographic areas for which cleanup has been completed in accordance with the post-cleanup requirements specified in the associated decision documents. These decisions include, but are not limited to, the CERCLA RODs and RCRA post-closure plans. In addition to managing the post-cleanup completion obligations, the LTS Program manages Hanford's natural and cultural resources through the framework of DOE/EIS-0222-F and 64 FR 61615, "Record of Decision: Hanford Comprehensive Land Use Plan Environmental Impact Statement (HCP EIS)," and in accordance with Federal laws, executive orders, Tribal Nation treaties, DOE directives, and Hanford Site procedures. The planning basis for the Hanford Site LTS Program scope integrates stewardship and institutional controls elements into the program from present day to 2060.

The scope, schedule and costs of LTS and institutional controls, to the extent predictable, have been included in this LCR for the period from 2060 to 2090. DOE will have a presence at Hanford well beyond 2090 – especially in the Inner Area of the Central Plateau – to ensure that the cleanup remedies remain protective of people and the environment. As cleanup decisions are made and LTS requirements and institutional controls are refined, more specific information will be included in this LCR. Figure 6-9 presents the remaining schedule and Table 6-4 provides a summary of the scope.

Figure 6-10 shows remaining estimated costs for PBS RL-LTS by fiscal year and Figure 6-11 shows the remaining estimated costs by work element. This PBS is assumed to extend from FY2060 through FY2090.

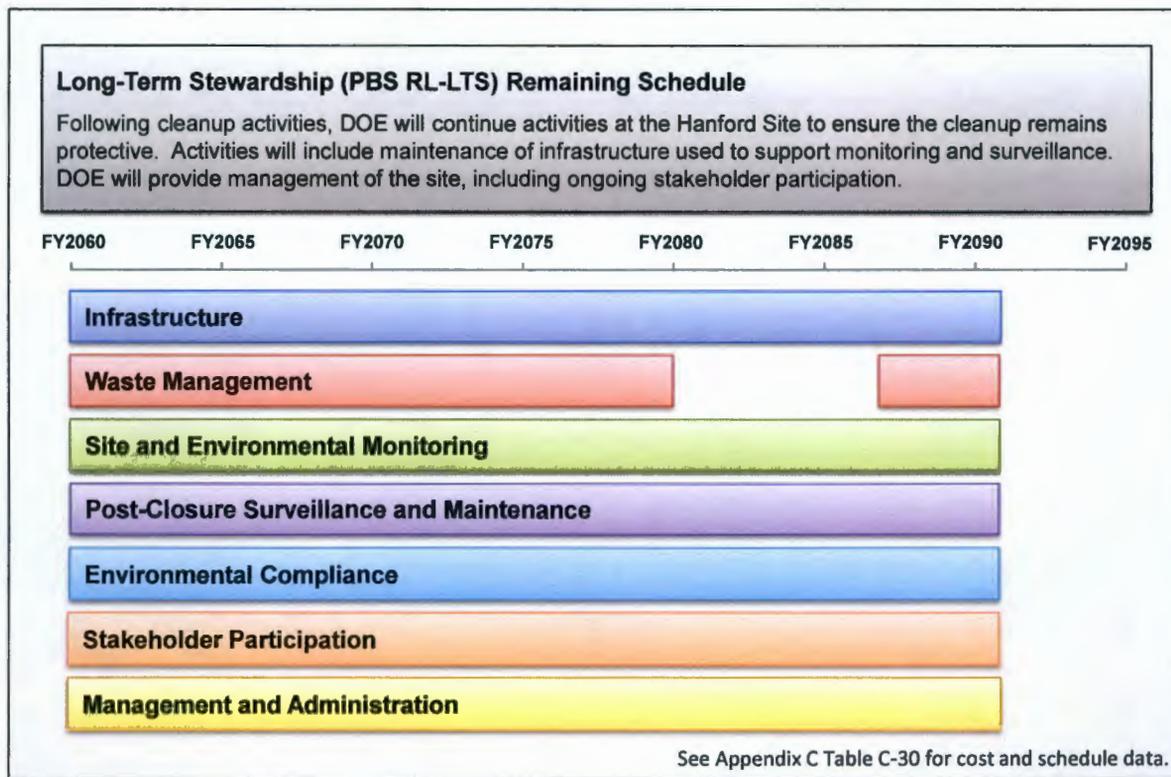


Figure 6-9. Long-Term Stewardship (PBS RL-LTS) Remaining Schedule.

Table 6-4. Long-Term Stewardship (PBS RL-LTS) Level 2 Scope Summary.

Work Element	Scope Description
Infrastructure	Includes operation and maintenance of Hanford Site infrastructure following cleanup activities. Specific scope will include supplying electrical and water utilities, operating and maintaining emergency services (Hanford Fire Department), and maintaining roads as needed to support Hanford Site LTS activities.
Waste Management	Includes operation and maintenance of 200 Area liquid effluent facilities in support of groundwater treatment and monitoring activities.
Site and Environmental Monitoring	Includes ongoing Hanford Site and environmental monitoring of groundwater, soil, vadose zone, and monitoring for public safety and resource protection.
Post-Closure Surveillance and Maintenance	Includes real estate and Hanford Site planning, land management, and surveillance and maintenance activities for the 100 and 200 Areas.
Environmental Compliance	Includes activities to ensure environmental compliance and protection.
Stakeholder Participation	Includes continued support of stakeholder participation through fees and payment in lieu of taxes.
Management and Administration	Provides for management and administration of these LTS activities.
LTS = long-term stewardship. PBS = project baseline summary.	

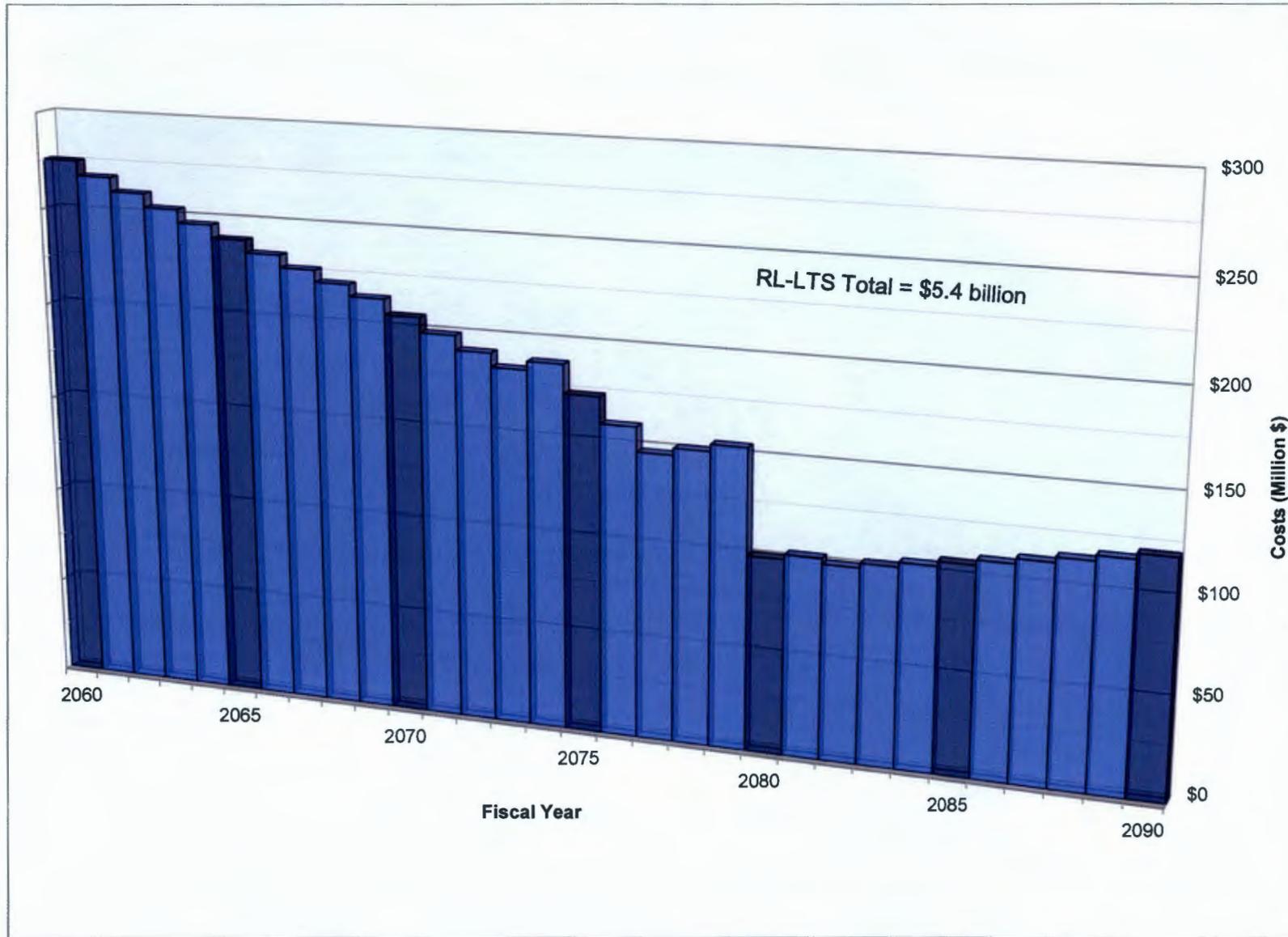


Figure 6-10. Long-Term Stewardship (PBS RL-LTS) Remaining Estimated Costs by Fiscal Year.

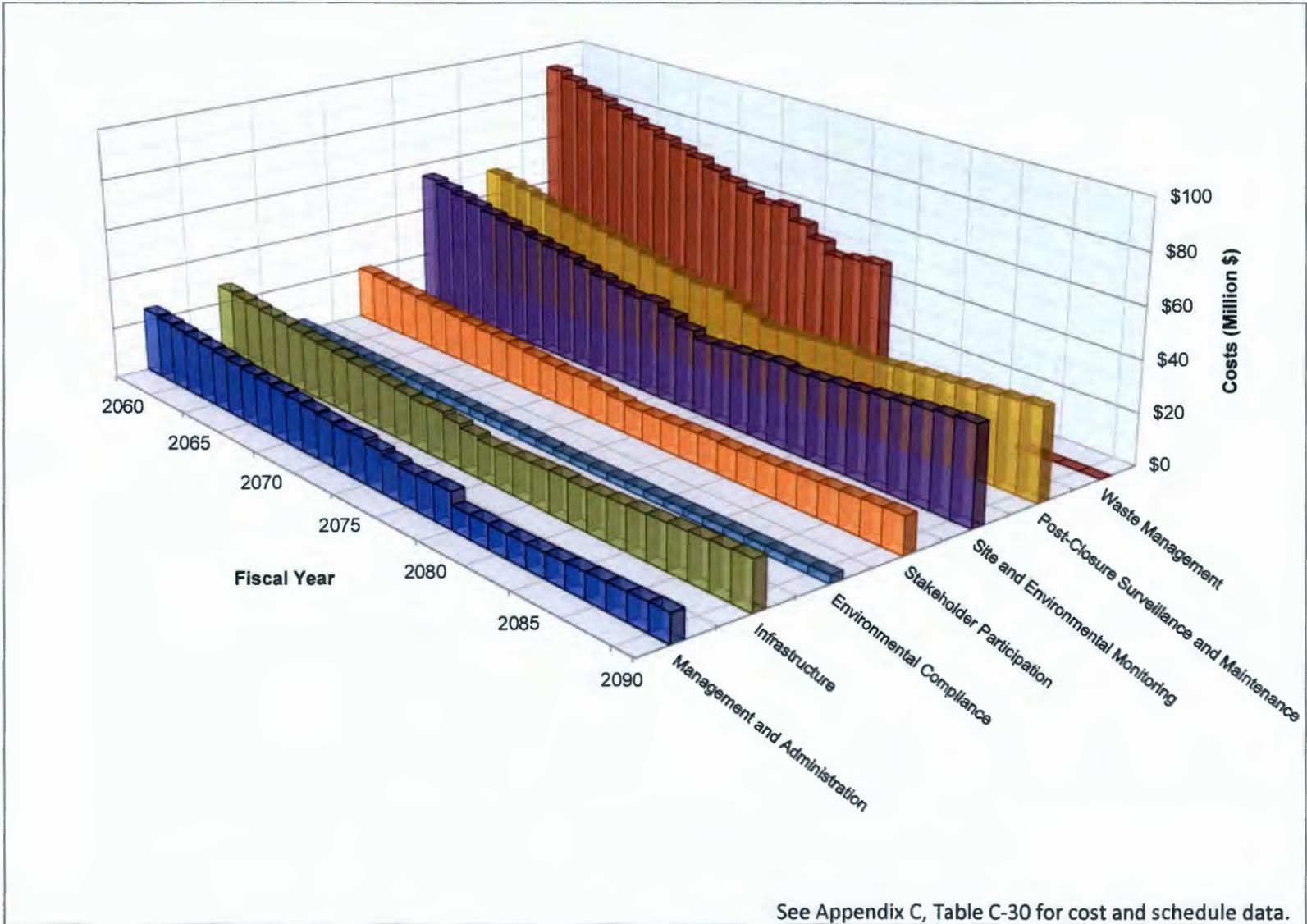


Figure 6-11. Long-Term Stewardship (PBS RL-LTS) Remaining Estimated Costs by Work Element.

7.0 REPORT LIMITATIONS

7.1 SCHEDULE AND COST LIMITATIONS

The LCR is based on an annual compilation of estimated scope, schedule and cost information. In order to finish preparing the LCR, it is necessary to select a deadline each year when the scope, schedule and cost information used to prepare the report will be “locked down.”

For the 2014 LCR, December 1, 2013, serves as the cutoff date. Unless noted otherwise, changes in the TPA and other applicable requirements, budget requests, appropriations, program funding allocations, and other scope, schedule and cost changes after the cutoff date are not reflected in the 2014 LCR.

7.2 OTHER LIMITATIONS

Some of the activities described in the LCR are subject to the analysis and decision-making requirements of CERCLA, RCRA, or other applicable statutes and regulations. The information included in the LCR is for planning purposes only, not for regulatory decision making, which will be conducted following the applicable statutory and regulatory programs.

The LCR does not include resources that may be required to accomplish significant restoration of natural resources related to any liability of the United States for NRDAR.

Several non-DOE entities operate and manage property on the Hanford Site, typically under lease agreements with DOE. Examples include:

- Energy Northwest, a consortium of public utility companies that oversee the Columbia Generating Station nuclear power reactor.
- Laser Interferometer Gravitational Wave Observatory, operated by a consortium of the California Institute of Technology and the Massachusetts Institute of Technology.
- State of Washington, which in turn leases land to US Ecology, Inc., a private firm that operates burial grounds for commercial low-level radioactive waste.

Operation, maintenance, and any subsequent future cleanup associated with activities at these facilities are subject to the terms and conditions of the leases (and/or other agreements) in place between the operating entities and DOE. Potential environmental liabilities for these and similar non-DOE operations are not currently considered to be part of the Hanford Site cleanup, and so are not included in the DOE-EM program. Consequently, lifecycle scope, schedule and cost for these non-DOE operations are not included in the LCR.

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APPENDIX A

HANFORD SITE EXISTING CLEANUP DECISIONS

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TERMS

AM	Action Memorandum
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CCN	correspondence control number
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
D&D	decontamination and decommissioning
D4	deactivation, decontamination, decommissioning, and demolition
DOE	U.S. Department of Energy
DOE/RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
EE/CA	engineering evaluation/cost analysis
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ERA	expedited response action
ERDF	Environmental Restoration Disposal Facility
ESD	explanation of significant differences
HLW	high-level waste
IC	institutional controls
INL	Idaho National Laboratory
ISRM	in situ redox manipulation
ISS	interim safe storage
LCR	Lifecycle Report
MCL	maximum contaminant level
NPL	National Priorities List
NTCRA	non-time-critical removal action.
OU	operable unit
P&T	pump-and-treat
PCB	polychlorinated biphenyl
PFP	Plutonium Finishing Plant
PRG	preliminary remediation goal
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RD/RAWP	remedial design/remedial action work plan
ROD	record of decision
RTD	remove, treat, and dispose
SNF	Spent Nuclear Fuel
SST	single-shell tank
TCRA	time critical removal action
TPA	Tri-Party Agreement
TRU	transuranic
TSD	treatment, storage, and disposal
WIDS	Waste Information Data System
WIPP	Waste Isolation Pilot Plant
WTP	Waste Treatment and Immobilization Plant

APPENDIX A

HANFORD SITE EXISTING CLEANUP DECISIONS

Pursuant to the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989), commonly referred to as the Tri-Party Agreement (TPA), Milestone M-036-01 requires the U.S. Department of Energy (DOE) to prepare an annual *Hanford Lifecycle Scope, Schedule and Cost Report* (Lifecycle Report [LCR]). The LCR is expected to reflect all actions necessary for DOE to meet all applicable environmental obligations as it completes the Hanford Site cleanup mission. These environmental obligations are established in accordance with various decision-making processes that DOE, the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology) (Tri-Party Agencies), and other agencies conduct under Federal and State regulatory programs.

A number of decisions affecting the Hanford cleanup mission have been made, and actions to implement these decisions have been completed, or are/will soon be under way. Many other cleanup decisions, however, cannot be made yet, are in preliminary planning stages, and/or are the subject of final agreements that are being developed. The absence of final decisions is addressed in the TPA Milestone M-036-01:

“In circumstances where final cleanup decisions have not yet been made, the report shall be based upon the reasonable upper bound of the range of plausible alternatives or may set forth a range of alternative costs including such a reasonable upper bound.”

This appendix provides current information about decisions that affect cleanup, and when these decisions might be considered to be final cleanup decisions for LCR purposes. Specifically:

- **Section A.1** provides a general overview of the principal processes that are employed at Hanford to reach decisions about future cleanup actions.
- **Section A.2** describes in more detail the Federal and State decisions that can affect Hanford cleanup, the legal and/or regulatory authorities on which the decision making is based, and the types of documents used to embody and formalize these decisions.
- **Section A.3** summarizes current decisions that, for purposes of this LCR, are considered to be cleanup decisions and which cleanup decision can be identified as final cleanup decisions.

This appendix will be updated to reflect new and changed final cleanup decisions and to provide a basis each year for determining cleanup actions to evaluate in the latest LCR.

A.1 PRINCIPAL HANFORD CLEANUP DECISION-MAKING PROCESSES

To implement the cleanup mission, DOE, with EPA and Ecology, reach decisions about what actions need to be performed to protect public and worker health and the environment. Cleanup decisions are based on a variety of legal and regulatory authorities such as the *Comprehensive Environmental Response, Compensation and Liability Act of 1980* (CERCLA) (42 USC 9601) and the *Resource Conservation and Recovery Act of 1976* (RCRA) (42 USC 6901) that require the consideration of various alternatives before selecting cleanup actions. In some cases, the agencies develop interim or partial decisions that enable cleanup work to proceed pending the ability to make final decisions (e.g., to alleviate urgent concerns, acquire better information, develop technological advances, obtain needed funding).

The TPA is the primary legal framework that the Tri-Party Agencies are using to achieve Hanford cleanup. Cleanup decisions made through the TPA integrate and implement primarily the following regulatory processes:

- CERCLA processes will support remedial decision making for most past-practice waste sites, canyon facilities, and structures that contain radioactive contamination or other hazardous substances. The TPA also identifies a subset of waste sites as RCRA past-practice sites. Consistent with EPA directives and guidance, the TPA establishes the expectation that either a RCRA corrective action or a CERCLA remedial action will lead to an equivalent cleanup result. In practice, this expectation becomes complicated when radioactive materials are present because RCRA authority does not extend to radionuclides. Regardless of this issue with RCRA, cleanup of radionuclides in RCRA waste sites will be protective and consistent with CERCLA cleanup practices.
- RCRA closure processes generally will be used to achieve final closure decisions for active RCRA treatment, storage, and disposal (TSD) facilities. RCRA corrective action processes also are applicable when RCRA wastes from past hazardous waste practices must be cleaned up. EPA has delegated implementation of the RCRA program to the State of Washington. Ecology implements the program via RCRA-equivalent State regulations and through facility-specific permits. RCRA closure and post-closure requirements are contained in the Hanford Site RCRA Permit (WA7890008967, *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste*).

The clear intent of the TPA is to minimize duplication and overlap of regulatory authorities while ensuring compliance with applicable requirements. As noted above, RCRA authority does not extend to the cleanup of radionuclides, while CERCLA does. The TPA states that the cleanup process selected for an operable unit (OU) will be sufficiently comprehensive to satisfy the technical requirements of both authorities and the respective regulations.

In addition to RCRA and CERCLA, DOE is responsible for regulating the radioactive materials that it manages, including setting standards that affect cleanup decisions for radionuclides. DOE O 435.1, *Radioactive Waste Management*, defines additional requirements and processes that are applicable to cleaning up radioactive facilities and media. DOE develops and implements cleanup decisions under this regulatory program.

Land use is also an important factor in making cleanup decisions because remedial action objectives are to reflect the reasonably anticipated future land use(s). These future land-use assumptions allow risk assessments and feasibility studies to focus on developing practical and cost-effective remedial alternatives. These alternatives should then support future site activities that are consistent with the reasonably anticipated future land use. DOE is responsible for designating land uses on the Hanford Site and for identifying future land uses that will guide risk assessments and cleanup decisions. Pursuant to a record of decision (ROD) published on November 2, 1999 (64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)") and amended ROD published on September 26, 2008 (73 FR 55824, "Amended Record of Decision for the Hanford Comprehensive Land-Use Plan Environmental Impact Statement"), DOE has adopted and implemented a comprehensive land-use plan for the Hanford Site. As DOE's decision stated:

“The purpose of this land-use plan and its implementing policies and procedures is to facilitate decision making about the site’s uses and facilities over at least the next 50 years. The Department’s decision seeks to balance the Department’s continuing land-use needs at Hanford with its desire to preserve important ecological and cultural values of the site and allow for economic development in the area.” (64 FR 61615 – 61616)

An area as large and complex as the Hanford Site has an extraordinary number of decisions that need to be made to carry out the cleanup mission. While many cleanup decisions have been made, only some of these decisions are considered to be final; many are either interim decisions, or decisions that lay the groundwork for future final decisions. The rest of this appendix provides a more extensive discussion of the decisions that have been made and that affect cleanup of Hanford, and includes several tables that list and summarize the effects of these decisions.

A.2 DECISIONS THAT CAN AFFECT HANFORD CLEANUP

A.2.1 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 DECISIONS

CERCLA, as modified by the *Superfund Amendments and Reauthorization Act 1986* (42 USC 103), established the Federal program to cleanup uncontrolled or abandoned waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Under 40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan,” DOE is the lead agency with lead agency responsibilities by the National Contingency Plan and Executive Order 12580, *Superfund Implementation*. EPA is the lead regulatory agency under the TPA and oversees the cleanup activities conducted under 40 CFR 300. EPA also has certain oversight authorities granted through CERCLA and the TPA. The most common documentation used to implement cleanup decisions under CERCLA includes the following:

- **CERCLA ROD.** The CERCLA ROD is a public document, developed from information generated during the remedial investigation/feasibility study that explains which remediation alternatives will be used to clean up a site. A ROD contains information about the site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, scope and role of response action, and the remedy selected for cleanup. RODs can be final or interim; interim RODs are used to allow cleanup actions to proceed until a final decision can be reached.
- **Explanation of Significant Differences and ROD Amendment.** Documents used to modify or clarify an existing ROD. The explanation of significant difference is used when changes to a component of a remedy do not fundamentally alter the overall cleanup approach. The amendment is used when there are fundamental changes, or a number of significant changes, that together have the effect of a fundamental change to the remedy selected in the ROD.
- **Action Memorandum.** A public document used to exercise the CERCLA removal authority and enable cleanup action to proceed where a site presents a relatively time-sensitive, non-complex problem that can and should be readily addressed.

A number of CERCLA documents have been completed that include or have resulted in decisions that affect cleanup. These CERCLA documents and summaries of the relevant cleanup decisions are listed in Section A.3.

A.2.2 PERMITS, LICENSES, AND OTHER STATUTORY/REGULATORY PROGRAM APPROVALS

RCRA, as modified by the *Hazardous and Solid Waste Amendments of 1984*, gave EPA authority to control the generation, transportation, and TSD of hazardous waste. The amendments expanded the scope of RCRA to require corrective action for certain releases of hazardous waste constituents to the environment from RCRA facilities regardless of time of release (similar to CERCLA remedial action). Unlike CERCLA, EPA may delegate authority for implementing RCRA to the States, and in Washington, Ecology has lead authority for most elements of RCRA. Principal documents used to implement Hanford cleanup decisions under RCRA include:

- **Final Status Permit.** A final status permit includes explicit descriptions of the conditions and requirements that must be met by a facility at which TSD of regulated hazardous waste (or dangerous waste, in Washington State) occur. A TSD facility may receive a final status permit even though it is closed and not operating, if there are ongoing caretaking activities that must be maintained after closure (i.e., during the post-closure care period). At Hanford, a single final status permit covers the entire site, but is being issued in phases because of the number of TSD facilities that exist. The final status permit includes decisions about how Federal and State statutes, regulations, and guidance have been interpreted and applied to specific activities conducted at each TSD facility.
- **Closure/Post-Closure Plan.** Some TSD facilities have closed or may close before they are covered under the final status permit. In such cases, a closure plan must be prepared to describe the activities necessary to close the TSD facility and address any remaining dangerous wastes. If dangerous waste will remain after closure, a post-closure plan is required to address residual contamination. Ecology must approve closure/post-closure plans before they are implemented, and in the process, decisions will be made and included in the closure/post-closure plans about how to close the TSD facility and, where required, conduct post-closure care.
- **Corrective Action.** Corrective actions to cleanup releases from RCRA TSD facilities may be required before a final status permit is issued. Decisions about degree/methods for cleanup will be made and implemented through a corrective action plan approved by Ecology.

In addition to RCRA, several other programs, authorized under existing Federal and State statutes and regulations require permits, licenses and other approvals that can affect cleanup at Hanford. These other decision documents establish, among other conditions, limits on emissions of radionuclides and other hazardous constituents to the air, water, and ground. Section A.3 lists the various permits, licenses, and other types of approvals authorized under applicable regulatory and statutory programs that include or have resulted in decisions affecting Hanford cleanup.

A.2.3 TRI-PARTY AGREEMENT DECISIONS

Among other functions, the TPA helps define how CERCLA and RCRA programs will be implemented when they have overlapping authorities. The TPA is used to determine which

decision-making process and documentation (e.g., CERCLA ROD, RCRA permit) will be used to establish cleanup actions for the different waste sites and facilities across the Hanford Site, but it is that subsequent documentation (not the TPA itself) where cleanup decisions are formally established. The TPA includes some decisions that affect Hanford cleanup. These may include provisions that set specific waste retrieval objectives and technology performance standards for certain types of cleanup actions. These TPA-based decisions are listed in Section A.3.

A.2.4 OTHER FEDERAL AND STATE DECISIONS

There are a variety of other decisions embodied in executive, legislative, and judicial documents that can affect cleanup of Hanford. Section A.3 lists the various Executive Orders, Presidential Proclamations, Congressional Acts, judicial orders and decrees, and other types of Federal and State decisions that may affect cleanup.

A.3 SUMMARY OF HANFORD CLEANUP DECISIONS – FINAL AND NOT YET FINAL

The statutory/regulatory authorities discussed in Section A.2 have resulted in a multitude of national, regional, and/or State decisions across numerous projects and programs. Some of these decisions establish environmental obligations that affect the cleanup mission. These cleanup decisions are summarized in this section.

While some decisions more clearly affect Hanford than others, care has been taken to include decisions that have indirect effects on cleanup. Examples of such indirect decisions might include those that define national standards for risk-based exposure limits, enable offsite activities that contribute contaminants to Hanford environmental media, or constrain the ability to disposition materials or wastes at or from Hanford. As stated earlier, the LCR is required to consider cleanup alternatives “where final cleanup decisions have not yet been made” (TPA Milestone M-36-01, third paragraph) at Hanford. Some cleanup decisions may appear to be final but are not:

- They may be “interim” remedies until a final cleanup decision can be made, or
- They may be “partial” actions within a much larger cleanup effort.

Even where final decisions have been made, there are legal mandates to perform periodic reviews to ensure that selected remedies continue to be effective; new decisions may be needed depending on how well cleanup actions are working. To stay as simple as possible, the term “final” has been interpreted literally. For purposes of this LCR, a cleanup decision will be treated as a final cleanup decision if:

- The decision is embodied in a statutory/regulatory document that is titled final (e.g., final permit, final ROD); or
- The decision is explicitly represented as final in a document, and such representation is compliant with the statutory/regulatory authority that produced the document.

Hanford cleanup decisions summarized in Tables A-1, A-3, and A-5 indicate whether the decision is considered to be final by inclusion of the word **FINAL** after the decision title in the first column. In addition to decisions that have been made, whether final or not, many cleanup decisions are yet to be made at Hanford. By definition, the absence of a decision means there is not a final cleanup decision. It would not be possible to develop an exhaustive list of all the

decisions that still need to be made to complete the Hanford cleanup mission. However, as these decisions are reached, they will be incorporated into this section of the LCR.

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

Record of Decision			
Title: <i>Record of Decision, USDOE Hanford 1100 Area (EPA/ROD/R10-93/063) FINAL</i>			
ROD Type: CERCLA Final ROD			
Area: 1100			
Date Approved: Sep-93			
Initial Decision: Cap Horn Rapids Landfill; offsite disposal of PCB-contaminated soils; offsite incineration of bis (2-ethylhexyl) phthalate contaminated soils; monitored natural attenuation of groundwater contamination.			
Revision Title	Type	Date	Revised Decision
<i>Explanation of Significant Differences for the Record of Decision for the USDOE Hanford 1100 Area Benton County, Washington (EPA 2010a)</i>	ESD	Sep-10	Documents significant differences to the selected remedies in the ROD. In summary, this ESD clarifies the IC requirements for the Horn Rapids Landfill.
Record of Decision			
Title: <i>Declaration of the Record of Decision for the Environmental Restoration Disposal Facility (EPA/ROD/R10-95/100) FINAL</i>			
ROD Type: CERCLA Final ROD			
Area: 200 West			
Date Approved: Jan-95			
Initial Decision: Initial construction of two cells; maximum size of 1.6 mi ² ; landfill construction in accordance with RCRA; capped at completion.			
Revision Title	Type	Date	Revised Decision
<i>USDOE Environmental Restoration Disposal Facility, Hanford Site, Benton County, Washington, Explanation of Significant Difference (ESD) (EPA/ESD/R10-96/145)</i>	ESD	Jul-96	Allow disposal of investigation-derived waste and RCRA past-practice waste to ERDF; allow disposal of non-process inactive TSD waste to ERDF; allow use of ERDF leachate for dust suppression/compaction activities at ERDF.
<i>U.S. Department of Energy, Environmental Restoration Disposal Facility, Hanford Site – 200 Area, Benton County, Washington, Amended Record of Decision, Decision Summary and Responsiveness Summary, (see also proposed plan for amendment) (EPA/AMD/R10-97/101)</i>	Amended ROD	Sep-97	Authorizes two additional disposal cells and the option of treating waste as needed by containerization and encapsulation at ERDF instead of at the OU.
<i>U.S. Department of Energy, Environmental Restoration Disposal Facility, Hanford Site – 200 Area, Benton County, Washington, Amended Record of Decision, Decision Summary and Responsiveness Summary, (see also proposed plan for amendment) (EPA/AMD/R10-99/038)</i>	Amended ROD	Mar-99	Establishes conditional approval for delisting of the ERDF leachate.
<i>U.S. Department of Energy, Environmental Restoration Disposal Facility, Hanford Site – 200 Area, Benton County, Washington, Amended Record of Decision, Decision Summary and Responsiveness Summary, (see also proposed plan for amendment) (EPA/AMD/R10-02/030)</i>	Amended ROD	Jan-02	Authorizes four additional disposal cells and the option of staging waste at ERDF pending treatment and/or disposal.

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

<i>U.S. Department of Energy, Environmental Restoration Disposal Facility, Hanford Site-200 Area, Benton County, Washington, Amended Record of Decision, Decision Summary and Responsiveness Summary (EPA 2007a)</i>	Amended ROD	May-07	Allows specific waste, such as waste associated with surveillance and maintenance of Hanford facilities, environmental research/development activities, sample analyses, liquid effluent waste treatment, infrastructure support, and environmental monitoring programs, to be disposed at ERDF; identifies a plug-in approach for ERDF disposal of additional similar Hanford cleanup waste generated in support of RCRA/CERCLA cleanup actions.
<i>Declaration: U.S. Department of Energy, Environmental Restoration Disposal Facility, Hanford Site - 200 Area, Benton County, Washington (EPA 2009a)</i>	Amended ROD and ESD	Aug-09	Allows for ERDF expansion of an area equal to 4 cells or 2 super cells; updates cell design to allow super cell concept and allows for ERDF expansion via EPA approval and fact sheets rather than ROD amendments.
Record of Decision			
Title: <i>Declaration of the Interim Record of Decision for the 200-ZP-1 Operable Unit (EPA/ROD/R10-95/114)</i>			
ROD Type: CERCLA Interim Action ROD			
Area: 200 West; 200-ZP-1 OU			
Date Approved: May-95			
Initial Decision: P&T to address carbon tetrachloride, chloroform, and trichloroethylene; treatment with air stripping and vapor phase activated carbon; interim action to continue until final action instituted; reinjection of treated water.			
Record of Decision			
Title: <i>Record of Decision, Hanford 200 Area, 200-ZP-1 Operable Unit Superfund Site, Benton County, Washington (EPA 2008) FINAL</i>			
ROD Type: CERCLA Final ROD			
Area: 200 West; 200-ZP-1 OU			
Date Approved: Sep-08			
Initial Decision: P&T to address carbon tetrachloride, nitrate, chromium, trichloroethylene, I-129, Tc-99, and tritium; monitored natural attenuation; flow-path control through injection of treated water; and ICs.			
Record of Decision			
Title: <i>Declaration of the Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, Hanford Site, Benton County, Washington (EPA/ROD/R10-95/126)</i>			
ROD Type: CERCLA Interim Action ROD			
Area: 100; 100-BC-1, 100-DR-1, and 100-HR-1 OUs			
Date Approved: Sep-95			
Initial Decision: Remove contaminated soil, structures and debris using the Observational Approach; treatment, by thermal desorption to remove organics and/or soil washing for volume reduction, or as needed to meet waste disposal criteria; disposal of contaminated materials at ERDF; backfill of excavated areas followed by revegetation.			
Revision Title	Type	Date	Revised Decision
<i>Amendment to the Interim Action Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, Hanford Site, Benton County, Washington (see Draft B ESD and Proposed Amendment documents preceding this ROD amendment) (EPA/AMD/R10-97/044)</i>	Amended ROD	Apr-97	Incorporates 34 additional waste sites into the ROD; refines remedial cost estimate for original 37 sites and additional 34 sites based on actual data, streamlining, and lessons learned; documents that soil washing is not an effective treatment.
Record of Decision			
Title: <i>Declaration of the Record of Decision for the 100-IU-1, 100-IU-3, 100-IU-4, and 100-IU-5 Operable Units, Hanford Site, Benton County, Washington (EPA/ROD/R10-96/151) FINAL</i>			
ROD Type: CERCLA Final ROD			
Area: 100; 100-IU-1, 100-IU-3, 100-IU-4, and 100-IU-5 OUs			
Date Approved: Feb-96			
Initial Decision: No action.			

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

Record of Decision			
<p>Title: Declaration of the Record of Decision for the 100-HR-3 and 100-KR-4 Operable Units, Hanford Site, Benton County, Washington (EPA/ROD/R10-96/134) ROD Type: CERCLA Interim Action ROD Area: 100; 100-H, 100-K Date Approved: Mar-96 Initial Decision: Interim action to remove hexavalent chromium from groundwater; 30 extraction wells; ion exchange treatment; reinject treated effluent; monitor; institute ICs.</p>			
Revision Title	Type	Date	Revised Decision
U.S. Department of Energy Hanford Site – 100 Area, Benton County, Washington, Amended Record of Decision, Decision Summary and Responsiveness Summary (EPA/AMD/R10-00/122)	Amended ROD	Oct-99	Implements In Situ Redox Manipulation barrier for second chromium plume in 100-HR-3 OU; existing P&Ts remain in operation.
Explanation of Significant Difference for the 100-HR-3 Operable Unit Record of Decision (EPA 2002)	ESD	Oct-02	Provides justification for increased schedule/cost from the 1999 Amendment associated with a greater number of wells and aquifer thickness that affected implementation of the ISRM barrier.
Explanation of Significant Difference for the 100-HR-3 Operable Unit Record of Decision (EPA/ESD/R10-03/606)	ESD	Mar-03	Provides justification for increased schedule/cost from the 1999 Amendment associated with a greater number of wells and aquifer thickness that affected implementation of the ISRM barrier.
Explanation of Significant Differences for the 100-HR-3 and 100-KR-4 Operable Units Interim Action Record of Decision, Hanford Site, Benton County, Washington (EPA 2009b)	ESD	Aug-09	Provides justification for increased cost and location of reinjection wells from the 1999 Amendment associated with operation beyond initial 5-year estimate and need to control plume migration.
Record of Decision			
<p>Title: Declaration of the Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington, (EPA/ROD/R10-96/143) Note: The ROD is only FINAL for the 300-FF-1 OU; it is an interim action for 300-FF-5 OU. ROD Type: CERCLA Final ROD Area: 300; 300-FF-1 and 300-FF-5 OUs Date Approved: Jul-96 Initial Decision: 300-FF-1: removal of contaminated soil and debris; disposal to ERDF; backfill and recontouring; ICs. 300-FF-5: monitoring and ICs for groundwater.</p>			
Revision Title	Type	Date	Revised Decision
USDOE Hanford 300 Area, 300-FF-1 Operable Unit, Hanford Site, Benton County, Washington Explanation of Significant Difference (ESD) (EPA/ESD/R10-00/505)	ESD	Jan-00	Provides a site-specific land disposal restriction treatability variance for lead contamination found in the 628-4 or Landfill 1D waste site.
Explanation of Significant Difference for the 300-FF-5 Record of Decision (EPA/ESD/R10-00/524)	ESD	Jun-00	Expanded scope of 300-FF-5 ROD to include groundwater in 300 Area, including 300-FF-2 sites and any sites plugged into 300-FF-1 ROD.
Record of Decision			
<p>Title: Declaration of the Interim Record of Decision for the 300-FF-2 Operable Unit (EPA/ROD/R10-01/119) ROD Type: CERCLA Interim Action ROD Area: 300; 300-FF-2 OU Date Approved: Apr-01 Initial Decision: Remove contaminated soil, structures, and debris; treat as needed; dispose at ERDF, WIPP, or other; backfill and revegetate; establish ICs; continued groundwater monitoring; and define plug-in approach.</p>			

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

Revision Title	Type	Date	Revised Decision
<i>Explanation of Significant Differences for the 300-FF-2 Operable Unit Record of Decision (EPA 2004b)</i>	ESD	May-04	Modified uranium soil cleanup level from 350 to 267 pCi/g based on engineering study to ensure protectiveness of the groundwater and river; modified land-use assumption for 8 outlying waste sites from industrial to unrestricted, changed cleanup levels for these sites to those consistent with 100 Area cleanup.
<i>Explanation of Significant Differences for the 300-FF-2 Operable Unit Interim Action Record of Decision, Hanford Site, Benton County, Washington (EPA 2009e)</i>	ESD	Aug-09	Incorporates 14 plug-in sites into the ROD and subsequent ESDs; incorporates 2 newly discovered sites into the ROD and subsequent ESDs; allows future newly discovered sites to be incorporated into the ROD and ESDs as long as cost impacts are within specified limits.
<i>Explanation of Significant Differences, Hanford 300 Area, 300-FF-2 Operable Unit, 618-10 Burial Ground (EPA 2011b)</i>	ESD	Aug-11	Modified remedy to allow necessary treatment of liquid waste in bottles, up to 1 gal/bottle, to occur in trays within the excavation area in accordance with an approved work plan.
Record of Decision			
<p>Title: Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1 Hanford Site, Benton County, Washington (EPA and DOE, 2013) FINAL</p> <p>ROD Type: CERCLA Final ROD</p> <p>Area: 300; 300-FF-1, 300-FF-2 and 300-FF-5</p> <p>Date Approved: Nov-13</p> <p>Initial Decision: This ROD selects a remedy for the waste sites in 300-FF-2, selects a remedy for the groundwater in 300-FF-5 and amends the remedy for three 300-FF-1 waste sites. The interim action remedy for 300-FF-5, selected in 1996 and the interim action remedy for 300-FF-2 that was selected in 2001 are replaced with this final action remedy. The remedy for 300-FF-1 selected in 1996 is amended for additional remedial action of uranium from three sites. Contaminated buildings are being removed in accord with CERCLA Action Memoranda and are not part of the OUs addressed by this ROD.</p> <p>The major components of the selected remedy for the 300-FF-2 OU are:</p> <ul style="list-style-type: none"> • Remove, Treat and Dispose (RTD) at waste sites • Temporary surface barriers and pipeline void filling • Enhanced attenuation of uranium using sequestration in the Vadose Zone, Periodically Rewetted Zone (PRZ) and top of the aquifer • Institutional Controls (ICs), including the requirement that DOE prevent the development and use of property that does not meet residential cleanup levels at the 300 Area Industrial Complex and 618-11 for other than industrial uses, including use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds. <p>The major components of the selected remedy for the 300-FF-5 OU are:</p> <ul style="list-style-type: none"> • Monitored Natural Attenuation • Groundwater monitoring • Enhanced attenuation of uranium at the top of aquifer • ICs. <p>The major component of the amended remedy for 300-FF-1 is:</p> <ul style="list-style-type: none"> • Enhanced attenuation of uranium using sequestration in the Vadose Zone, PRZ and top of the aquifer. 			

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

Record of Decision			
<p>Title: Record of Decision, Hanford 200 Area, Superfund Site 200-CW-5 and 200-PW-1, 200-PW-3 and 200-PW-6 Operable Units Hanford Site, Benton County, Washington (EPA 2011c) FINAL</p> <p>ROD Type: CERCLA Final ROD</p> <p>Area: 200 East and 200 West</p> <p>Date Approved: Sep-11</p> <p>Initial Decision: RTD of soil and debris to specified depths or specified cleanup levels for plutonium-contaminated soils and subsurface structures and debris. Soil vapor extraction at three 200-PW-1 waste sites will continue until vadose zone cleanup levels are met. Soil covers will be used to provide coverage to a depth of at least 15 ft over cesium-contaminated soils. Removal of sludge followed by tank stabilization for two tanks. No action for two waste sites. ICs and long-term monitoring for waste sites where contamination is left in place and an unrestricted land use is precluded.</p>			
Record of Decision			
<p>Title: Declaration of the Record of Decision, USDOE Hanford 200 Area, Hanford Site, Benton County, Washington (EPA/ROD/R10-97/048)</p> <p>ROD Type: CERCLA Interim Action ROD</p> <p>Area: 200 West; 200-UP-1 OU</p> <p>Date Approved: Feb-97</p> <p>Initial Decision: Extract groundwater from high concentration zone of uranium and Tc-99 plumes and treat at Effluent Treatment Facility.</p>			
Revision Title	Type	Date	Revised Decision
Explanation of Significant Differences for the Interim Action Record of Decision for the 200-UP-1 Groundwater Operable Unit, Hanford Site, Benton County, Washington (EPA 2009c)	ESD	Feb-09	Adds National MCL of 30 µg/L for uranium as ARAR for treating extracted water; replaces 190 gal/min pumping with a pumping requirement from existing and new wells consistent with approved RD/RAWP until uranium and Tc-99 concentrations are less than 10 times the MCL for 4 consecutive quarters; adds sampling requirements and updates cost estimates and IC requirements.
Record of Decision for Interim Remedial Action Hanford 200 Area Superfund Site 200-UP-1 Operable Unit (EPA 2012)	Interim Action ROD	Sep-12	Supersedes previous interim action ROD (Feb-97) and ESD (Feb-09). Includes groundwater extraction/treatment (with flow path control through injection of treated water) in combination with monitored natural attenuation for Tc-99, uranium, chromium (total and hexavalent), nitrate, carbon tetrachloride and tritium; hydraulic containment and further treatment technology evaluation for I-129; remedy performance monitoring and ICs.
Record of Decision			
<p>Title: Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (EPA/ROD/R10-99/039)</p> <p>ROD Type: CERCLA Interim Action ROD</p> <p>Area: 100, 200 North</p> <p>Date Approved: Jul-99</p> <p>Initial Decision: RTD for 46 sites; plug-in approach for remaining 100 Area and 200 North sites; plug-in approach for newly identified 100 Area sites; disposal of debris from B, D, H, and K reactors to ERDF; provides decision framework for leaving waste in place, generally below 15-ft depth.</p>			

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

Revision Title	Type	Date	Revised Decision
<i>Explanation of Significant Difference for the 100 Area Remaining Sites ROD, USDOE Hanford 100 Area, 100-IU-6 Operable Unit, Hanford Site, Benton County, Washington (EPA/ESD/R10-00/045)</i>	ESD	Jun-00	Plugs in 600-23 and JA Jones #1 waste sites to the Remaining Sites ROD.
<i>Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision (EPA 2004a)</i>	ESD	Feb-04	Adds 28 sites to ROD; adds <u>10 CFR 1022</u> and <u>40 CFR 6</u> , Appendix A as ARARs to ROD; revises annual ICs report date to be coincident with the due date for the Sitewide ICs Plan for Hanford CERCLA Response Actions.
<i>Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington (EPA 2009d)</i>	ESD	Aug-09	Authorizes adding 200-CW-3 OU wastes sites, 99 newly discovered waste sites, and 87 candidate sites using the plug-in approach in the ROD and any newly discovered waste sites that will be documented in the Administrative Record and in an annual fact sheet.
Record of Decision			
<p>Title: Declaration of the Record of Decision for the 100-KR-2 Operable Unit, Hanford Site, Benton County, Washington (EPA/ROD/R10-99/059)</p> <p>ROD Type: CERCLA Interim Action ROD</p> <p>Area: 100-K</p> <p>Date Approved: Sep-99</p> <p>Initial Decision: Remove spent nuclear fuel from basins; remove sludge from basins; treat and remove water from the basins; remove debris from the basins; deactivate the basins; and institute ICs.</p>			
Revision Title	Type	Date	Revised Decision
<i>Interim Remedial Action Record of Decision Amendment, U.S. Department of Energy; 100 K Area K Basins, Hanford Site - 100 Area, Benton County, Washington (EPA 2005a)</i>	Amended ROD	Jun-05	Modifies remedy for sludge by including sludge treatment prior to interim storage and shipment to a national repository; modifies remedy for debris by including grouting in place some of the basin debris followed by removal along with the removal of the basins.
Record of Decision			
<p>Title: Interim Remedial Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington (EPA/ROD/R10-99/112)</p> <p>ROD Type: CERCLA Interim Action ROD</p> <p>Area: 100-N</p> <p>Date Approved: Sep-99</p> <p>Initial Decision: ICs for shoreline site; in situ and RTD with ex situ bioremediation for petroleum sites; RTD for remainder of sites in 100-NR-1; maintain ERA P&T for 100-NR-2.</p>			
Revision Title	Type	Date	Revised Decision
<i>Explanation of Significant Difference for the 100-NR-1 Operable Unit Treatment, Storage, and Disposal Interim Action Record of Decision and 100-NR-1/100-NR-2 Operable Unit Interim Action Record of Decision (EPA/ESD/R10-03/605)</i>	ESD	May-03	Removes July 31 annual ICs reporting requirements, consolidates reporting with the site-wide IC annual report; eliminates requirement to evaluate applying 30 in. of irrigation water to determine if remaining contaminants will impact groundwater; identifies need for additional ICs to preclude access to contaminated groundwater which will be incorporated into site-wide IC document.
<i>U.S. Department of Energy, 100-NR-1 and NR-2 Operable Units, Hanford Site - 100 Area, Benton County, Washington,</i>	Amended ROD	Sep-10	Deploys the apatite sequestration technology for remediating Sr-90 in the 100-NR-2 OU by extending existing apatite permeable reactive

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

<i>Amended Record of Decision, Decision Summary and Responsiveness Summary (EPA 2010b)</i>			barrier to ~2,500 ft, allows for deployment of the apatite sequestration technology elsewhere in the 100-NR-2 OU in accordance with an Ecology approved work plan, and includes decommissioning the treatment components of the existing P&T system.
<i>Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington (EPA 2011a)</i>	ESD	Mar-11	Adds 45 additional waste sites in the 100-NR-1 OU for remediation by RTD (characterized per the 100-N Area sampling and analysis plan) and increases the total cost 38% to \$67,510,386.
Record of Decision			
Title: <i>Interim Remedial Action Record of Decision Declaration, U.S. Department of Energy 100 Area, 100-NR-1 Operable Unit, Hanford Site, Benton County, Washington (EPA/ROD/R10-00/120)</i>			
ROD Type: CERCLA Interim Action ROD for 2 RCRA TSDs and an associated site			
Area: 100-N			
Date Approved: Jan-00			
Initial Decision: RTD of 116-N-1 and 116-N-3 Cribs with ERDF disposal; backfill and revegetate; any pipelines will be removed or sampled and left in place based on sample results.			
Revision Title	Type	Date	Revised Decision
<i>Explanation of Significant Difference for the 100-NR-1 Operable Unit Treatment, Storage, and Disposal Interim Action Record of Decision and 100-NR-1/100-NR-2 Operable Unit Interim Action Record of Decision (EPA/ESD/R10-03/605)</i>	ESD	May-03	Removes July 31 annual ICs requirement and consolidates reporting with the site-wide IC annual report; eliminates requirement to evaluate applying 30 in. of irrigation water to determine if remaining contaminants will impact groundwater; identifies need for additional ICs to preclude access to contaminated groundwater which will be incorporated into site-wide IC document.
Record of Decision			
Title: <i>Declaration of the Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-2, 100-HR-2 and the 100-KR-2 Operable Units (EPA/ROD/R10-00/121)</i>			
ROD Type: CERCLA Interim Action ROD			
Area: 100			
Date Approved: Sep-00			
Initial Decision: Remove contaminated soil, structures, and debris; treat as needed; dispose at ERDF; backfill and revegetate. Applies to 45 100-Area burial grounds.			
Revision Title	Type	Date	Revised Decision
<i>Explanation of Significant Difference for the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-2, 100-HR-2, and 100-KR-2 Operable Units (100 Area Burial Grounds) (EPA 2007b)</i>	ESD	Nov-07	Established limit of RTD excavation at the 118-B-1 Burial Ground considering the balancing factors in the ROD and required additional ICs for protection of groundwater and the Columbia River.
Record of Decision			
Title: <i>Record of Decision 221-U Facility (Canyon Disposition Initiative), Hanford Site, Washington (EPA 2005b)</i>			
FINAL			
ROD Type: CERCLA Final ROD			
Area: 200 West			
Date Approved: Oct-05			
Initial Decision: Remove waste from vessels and equipment in the facility with levels of transuranic isotopes greater than 100 nCi/g and eventual disposal at WIPP; removal of liquids from the facility or treatment to remove liquids; partial removal of contaminated equipment and piping from the gallery side of the facility and dispose at ERDF; demolition and subsequent stabilization of the railroad tunnel, 271-U, 276-U, 291-U, and 292-U structures and 291-			

Table A-1. CERCLA Records of Decision and Associated Changes. (8 pages)

U-1 and 296-U-10 stacks and dispose at ERDF; constructing an engineered barrier; planting semiarid-adapted vegetation on the barrier; ICs; post-closure care; and ongoing barrier performance and groundwater monitoring.			
ARAR	= applicable or relevant and appropriate requirement.	OU	= operable unit.
CERCLA	= <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i>	P&T	= pump-and-treat.
EPA	= U.S. Environmental Protection Agency.	PCB	= polychlorinated biphenyl.
ERA	= expedited response action.	RCRA	= <i>Resource Conservation and Recovery Act of 1976.</i>
ERDF	= Environmental Restoration Disposal Facility.	RD/RAWP	= remedial design/remedial action work plan.
ESD	= explanation of significant difference.	ROD	= record of decision.
IC	= institutional controls.	RTD	= remove, treat, dispose.
ISRM	= in situ redox manipulation.	TSD	= treatment, storage, and disposal.
MCL	= maximum contaminant limit.	WIPP	= Waste Isolation Pilot Plant.

Unless otherwise noted in Table A-2, decisions made through Action Memoranda are considered final and are available in the TPA Administrative Record (<http://www2.hanford.gov/arpir/>). These decisions focus mainly on the deactivation, decontamination, decommissioning, and demolition (D4) of buildings, which are generally considered final actions because buildings are demolished and the waste disposed to approved facilities, or on the removal, treatment, and disposal (RTD) of contaminated soil from waste sites, which are generally considered final actions for individual waste sites. Slabs and contaminated soils underlying the buildings will likely go through additional decision making as part of appropriate source OUs. Similarly, waste sites that undergo RTD as a removal action will likely have a final ROD covering the decision, even though no additional cleanup activities are anticipated.

Table A-2. CERCLA Action Memoranda. (7 pages)

Title	Date	Action	Removal Action/Decision
"618-9 Burial Ground Expedited Response Action, Phase I Project Plan" (CCN 9100749)	Feb-91	TCRA	Provides for trench excavation and removal of drummed liquid wastes from 618-9 Burial Ground. Treatment and/or disposal of liquids and contaminated soils (if present) is considered part of the Phase 2 activities and is not considered time critical.
"Action Memorandum Approval: 316-5 Process Trenches, USDOE Hanford Site, Richland, WA" (CCN 9103432)	Jul-91	ERA	Provides for excavation of soil from the 316-5 Process Trenches and interim stabilization pending further remedial action as part of the 300-FF-1 OU. This AM initially was not a final action; however, the ROD for 300-FF-1 OU, which covers these trenches, is a final CERCLA action.
"Action Memorandum: Expedited Response Action Proposal for 200 West Area Carbon Tetrachloride Plume" (CCN 9200423)	Jan-92	ERA	Identifies installing a soil vapor extraction system with granular activated carbon recovery and offsite granular activated carbon regeneration at 216-Z-1A initially followed by systems at 216-Z-18 and 216-Z-9. While this ERA is not a final decision; a final decision has been made through the CERCLA remedial process for 200-ZP-1 OU.
"Action Memorandum Approval: Sodium Dichromate Barrel Landfill, USDOE Hanford Site, Richland, WA" (CCN 9307470)	Mar-93	ERA	Identifies excavation and disposal of drums and homestead debris from the landfill with sampling of any other wastes encountered during excavation; the expedited reaction would result in cleanup of the landfill to unrestricted levels.

Table A-2. CERCLA Action Memoranda. (7 pages)

Title	Date	Action	Removal Action/Decision
“Action Memorandum: Expedited Response Action Proposal; Riverland Site, USDOE Hanford Site, Richland, WA” (CCN 9305567)	Jun-93	ERA	Provides for cleanup of the Riverland Site, part of the 100-IU-1 OU, through excavation to address pesticide and hydrocarbon contamination, ordnance survey and removal, and sandblasting to decontaminate concrete.
“Action Memorandum: North Slope (Wahluke Slope) Expedited Response Action Cleanup Plan, USDOE Hanford Site, Richland, WA” (<u>Ecology and EPA 1994a</u>)	Mar-94	ERA	Provides for mitigation of physical hazards, excavation of the worst-case landfill, characterization of other landfills, and if needed, excavation of other landfills based on characterization results; includes investigation and as needed, mitigation of ordnance burial pits. As stated in the AM, the intent is to provide for the final removal action taken at the 100-IU-3 OU (the Wahluke Slope).
“Action Memorandum, USDOE Hanford 100 Area NPL, 100-IU-3 Operable Unit (Wahluke Slope), Hanford Site, Adams, Grant, and Franklin Counties, WA” (<u>Ecology and DOE 1997</u>)	Jul-97	TCRA	Addresses contaminated soils/drums at the 2,4-D Burial Ground in 200-IU-3 OU. Removal action includes excavating dioxin-contaminated soil for offsite disposal; bioremediation of 2,4-D contaminated soil; and excavating, cleaning, and disposing drums to ERDF. In the 1994 AM for Wahluke Slope, only 2,4-D Burial Ground was identified for sampling. Subsequently, additional contamination was found, prompting another AM. Completing this AM action allows continuation of the deletion process for the OU from the NPL.
“Action Memorandum; N Springs Expedited Response Action Cleanup USDOE Hanford Site, Richland, WA” (<u>Ecology and EPA 1994b</u>)	Sep-94	ERA	Identifies a P&T system combined with a vertical barrier for implementation at N Springs. These systems comprise a component of overall cleanup of N Springs but were also intended to provide additional information to the ongoing CERCLA and RCRA processes. This ERA is not a final decision.
“Action Memorandum: Expedited Response Action Proposal; 100-BC-1 Demonstration Project; USDOE Hanford Site; Richland, Washington” (<u>EPA and Ecology 1995</u>)	Jun-95	ERA	Allows contaminated soil from 116-B-4, B-5, and 116-C-1 to be excavated and temporarily stored pending start of ERDF operations; actions under this AM would provide additional information to support remedial design, including cost information, for 100-BC-1 OU. The ERA was not intended as a final decision; 100-BC-1 OU has been incorporated into an interim ROD and is undergoing a final ROD process.
“Action Memorandum, 183-H Solar Evaporation Basin Waste Expedited Response Action Cleanup Plan” (CCN 040739)	Nov-96	ERA	Identifies ERDF as the disposal location for 183-H Solar Evaporation Basin waste generated through cleanup activities.
“Action Memorandum; 200 West Area, Central Waste Complex, 183-H Solar Evaporation Basin Waste, Hanford Site, Benton County, WA” (<u>DOE et al. 2003</u>)	Jun-03	NTCRA	Allows for the treatment and disposal to ERDF of wastes generated during the RCRA closure of 183-H basins
“Action Memorandum, N Area Waste Expedited Response Action Cleanup Plan” (CCN 038546)	Nov-96	ERA	Identifies ERDF as the disposal location for contaminated sediment and debris from the Emergency Dump Basin, facility deactivation waste, and environmental investigation waste from the 100-N Area.

Table A-2. CERCLA Action Memoranda. (7 pages)

Title	Date	Action	Removal Action/Decision
"Action Memorandum; 100-B/C Area Ancillary Facilities and the 108-F Building Removal Action, USDOE Hanford Site, Richland, WA" (EPA 1997)	Jan-97	NTCRA	Identifies D4 with ERDF disposal for facilities in 100-B and 100-F Areas: 111-B, 115-B, 118-C-4, 119-B, 105-C reactor waste, and 108-F. B Reactor and ISS of 105-C Reactor are not included in the AM. This action is considered final for ancillary facilities and demolished portions of the reactor. Additional decisions are expected on the reactor core that is in ISS.
"Action Memorandum: Removal Action at the 233-S Plutonium Concentration Facility, USDOE Hanford Site, Benton County, WA" (DOE and EPA 1997)	Mar-97	NTCRA	Identifies D&D as the preferred alternative for 233-S and 233-SA Buildings, including subsurface systems and structures to a depth of 3 ft (further actions beyond the 3-ft depth would be deferred to the associated source OU). Waste meeting the criteria would be disposed at ERDF; other waste would be disposed as appropriate.
"Action Memorandum: USDOE Hanford 100 Area National Priorities List, 105-F and 105-DR Reactor Buildings and Ancillary Facilities, Hanford Site, Benton County, WA" (CCN 059689)	Jul-98	NTCRA	Identifies ISS for 105-F and 105-DR reactor cores and D&D for reactor components up to the cores and for 116-D, 116-DR, 117-DR, and 119-DR ancillary facilities. Demolition will extend generally to 3 ft bgs; however, substructures and/or soil beneath the facilities that exceed cleanup levels will be excavated. This action is considered final for the ancillary facilities and demolished portions of reactors. Additional decisions are expected on the reactor cores in ISS.
"Action Memorandum: USDOE Hanford 100 Area National Priorities List, 100-N Area Ancillary Facilities; Hanford Site, Benton County, WA" (DOE et al. 1998)	Dec-98	NTCRA	Provides for D&D of the inactive contaminated ancillary facilities in 100-N Area, facilities in the buffer zone, Hanford Generating Plant, and solid waste management units inside Hanford Generating Plant support facilities (D&D of 105-N and 109-N are excluded from the AM). Contaminated soils under the facilities would be addressed through 100-N Area decision documents for waste sites.
"Action Memorandum: USDOE, Hanford 300 Area National Priorities List (NPL), 331-A Virology Laboratory Building, Hanford Site, Benton County, WA" (DOE and EPA 2000)	Feb-00	NTCRA	Per the AM, the walls and floors of the 331-A Building would be demolished and the concrete slab would be scraped to remove physical hazards; wastes would be disposed at ERDF. The concrete slab and underlying soils would remain in place.
"Action Memorandum: USDOE Hanford 100 Area National Priorities List (NPL); 105-D and 105-H Reactor Facilities and Ancillary Facilities; Hanford Site; Benton County, WA" (DOE and Ecology 2000)	Dec-00	NTCRA	Identifies ISS for the 105-F and 105-DR Reactor cores and D&D for the reactor components up to the cores and for the 116-D, 116-DR, 117-DR, and 119-DR ancillary facilities. Demolition will extend generally to 3 ft bgs; however, substructures and soil beneath the facilities that exceed cleanup levels will be excavated. This action is considered final for the ancillary facilities and demolished portions of the reactors. Additional decisions are expected on the reactor cores that are in ISS.
"Action Memorandum; USDOE, Hanford 100 Area National Priorities List, 105-B Reactor Facility, Hanford Site, Benton County, WA" (DOE and EPA 2001)	Dec-01	NTCRA	Identifies appropriate actions at B Reactor to mitigate the threat to site workers, public health or welfare or the environment by removing hazardous substances from the facility; these actions are consistent with increased public access to the reactor building; surveillance and maintenance activities would continue. Any wastes generated during the mitigation activities would be disposed at ERDF.

Table A-2. CERCLA Action Memoranda. (7 pages)

Title	Date	Action	Removal Action/Decision
“Action Memorandum; USDOE, 200 Area, Burial Ground 218-W-4C Waste Retrieval, Hanford Site, Benton County, WA” (DOE et al. 2004)	Apr-04	TCRA	Provides for the treatment and disposal of low-level and mixed low-level waste at ERDF from the M-091 TRU retrieval activities at the 218-W-4C Burial Ground. TRU is excluded from the AM.
“Action Memorandum: Request for Time Critical Response for Treatment and Disposal of Sludge from the 105-K East North Loadout Pit, USDOE Hanford Site” (DOE and EPA 2004)	Jun-04	TCRA	Requires treatment of 105-K East North Loadout Pit waste prior to temporary storage at Hanford and ultimate disposal at WIPP.
“Action Memorandum for the Non-Time-Critical Removal Action for the 224-B Plutonium Concentration Facility” (DOE/RL-2004-36)	Jun-04	NTCRA	Provides for removing nonradiological and radiological hazardous substances from 224-B Facility, removing equipment and associated piping, decontaminating structure and stabilizing contamination, demolishing structure to slab, disposing waste generated, and stabilizing area. Samples will be used to determine the need for additional cleanup of the remaining slab and any subsurface soils. These cleanup actions are not included in the AM, but deferred to future activities.
“Comprehensive Environmental Response, Compensation and Liability Act Non-Time-Critical Removal Action Memorandum for Removal of the 232-Z Contaminated Waste Recovery Process Facility from the Plutonium Finishing Plant” (CCN 0093881)	Nov-04	NTCRA	Provides for the remaining contaminated equipment to be removed and the building decontaminated, stabilized, and dismantled leaving the building slab, which will be addressed under a future CERCLA action.
“Action Memorandum for the Non-Time-Critical Removal Action for the U Plant Ancillary Facilities” (DOE/RL-2004-67)	Dec-04	NTCRA	Provides for removing nonradiological and radiological hazardous substances from U Plant Ancillary Facilities, removing equipment/associated piping, decontaminating structures and stabilizing contamination, demolishing structures to slab, disposing the waste generated, and stabilizing the area around U Plant. The AM includes the specific facilities. Slabs and underlying soils will be addressed as needed through future CERCLA actions.
“Action Memorandum #1 for the 300 Area Facilities” (DOE and EPA 2005a)	Jan-05	NTCRA	Provides for D4 of 72 buildings/structures in the northern part of 300 Area, disposing D4 waste at ERDF. An additional 10 buildings/structures were included in the EE/CA that supports the AM; however, those buildings/structures were demolished and had no hazardous materials prior to the AM.
“Action Memorandum #2 for the 300 Area Facilities” (DOE and EPA 2006a)	May-06	NTCRA	Provides for D4 of the 324 and 327 Buildings and ancillary facilities in the 300 Area with D4 waste going to ERDF. The AM provides a list of the ancillary facilities. In general, slabs and subsurface structures would be removed along with about 1 m of surrounding soil; however, on a case-by-case basis, the slabs and/or below-grade structures and soils can be deferred to CERCLA actions associated with the 300-FF-2 OU.

Table A-2. CERCLA Action Memoranda. (7 pages)

Title	Date	Action	Removal Action/Decision
"Action Memorandum #3 for the 300 Area Facilities," (DOE and EPA 2006b)	Nov-06	NTCRA	Provides for D4 of 110 buildings/structures in southern part of the 300 Area with D4 waste going to ERDF. An additional 30 buildings/structures were included in the EE/CA that supports the AM; however, those buildings/structures are not included in the AM because DOE identified alternative uses for them.
"Action Memorandum; USDOE, 100 Area, 105-N Reactor Facility and 109-N Heat Exchanger Building, Hanford Site, Benton County, WA" (DOE and Ecology 2005)	Mar-05	NTCRA	Provides for D&D of portions of 105-N and 109-N facilities and constructing a protective cover over the 105-N Reactor block, 109-N steam generator cells and pipe gallery, placing them into ISS; and waste generally disposed at ERDF. Final D&D of these facilities would be conducted in the future to allow decay of radionuclides in the reactor block. Identifies ISS as 64 years. This action is considered final for demolished portions of the reactor and heat exchange building. Additional decisions are expected on the reactor core and buildings in ISS.
"Action Memorandum for the Plutonium Finishing Plant, Above-Grade Structures Non-Time-Critical Removal Action" (DOE/RL-2005-13)	May-05	NTCRA	Provides for removing nonradiological and radiological hazardous substances from PFP above-grade structures, removing equipment/associated piping, decontaminating structures and stabilizing contamination, demolishing structures to slab, disposing the waste generated, and stabilizing and covering the area around PFP. Provides a listing of the specific structures. Slabs and underlying soils would be addressed as needed through future CERCLA actions.
"Action Memorandum for the Non-Time-Critical Removal Action for the 100-K Area Ancillary Facilities" (DOE and EPA 2005b)	Jun-05	NTCRA	Provides for D4 of 27 buildings/structures in northern part of 100-K Area with D4 waste going to ERDF. In general, slabs and subsurface structures would be removed with about 1 m of surrounding soil; however, on a case-by-case basis, the slabs, below-grade structures and soils can be deferred to CERCLA actions associated with 100-KR-1 and 100-KR-2 source OUs.
"Action Memorandum for the Non-Time-Critical Removal Action for the 224-T Plutonium Concentration Facility" (DOE/RL-2004-68)	Jun-05	NTCRA	Provides for removing nonradiological and radiological hazardous substances from 224-T Facility, removing equipment/associated piping, decontaminating structure and stabilizing contamination, demolishing structure to slab, disposing the waste generated, and stabilizing the area. Samples will determine the need for additional cleanup of the remaining slab and any subsurface soils. These cleanup actions are not included in the AM, but deferred to future activities.
"Action Memorandum for the Time-Critical Removal Action for Support Activities to 200-UW-1 Operable Unit" (DOE/RL-2005-71)	Sep-05	TCRA	Provides activities to support U Canyon barrier construction, including removing part of the 200-W-42 pipeline, rerouting Treated Effluent Disposal Facility line and stabilizing/removing wastewater line; complete or partial removal of concrete slab; remove and seal 3 vent risers; and relocate various markers/utilities. The TCRA accelerated work consistent with weather conditions and to take advantage of available specialized resources. The action is not considered final; the decision process is ongoing for U Plant waste sites. The U Plant barrier ROD is considered final.

Table A-2. CERCLA Action Memoranda. (7 pages)

Title	Date	Action	Removal Action/Decision
"Action Memorandum for the Non-Time-Critical Removal Action for the 105-KE and 105-KW Reactor Facilities and Ancillary Facilities" (DOE and EPA 2007)	Jan-07	NTCRA	Identifies ISS for 105-KE and 105-KW Reactor cores, D&D of reactor components up to the cores and for remaining buildings and structures in 100-K Area. Subsurface structures will be removed 3 ft bgs; substructures and soil beneath facilities that exceed cleanup levels will be evaluated through source OU cleanup activities that are considered final for the ancillary facilities and demolished portions of the reactors. Further decisions are expected on reactor cores in ISS.
"Action Memorandum for the Non-Time-Critical Removal Action for the Northern Part of the BC Controlled Area (UPR-200-E-83) (DOE/RL-2008-21)	May-08	NTCRA	Provides removal, treatment as needed, and disposal, generally to ERDF, of UPR-200-E-83 Zone A soils to a depth of 6 in, or until PRGs are met, and Zone B soils in areas of elevated radioactivity above PRGs. Excavation activities must consider old growth vegetation, avoiding destruction of existing plant life.
"Action Memorandum for the Non-Time-Critical Removal Action for the 212-N, -P and -R Facilities" (DOE/RL-2008-80)	May-09	NTCRA	Provides for removing nonradiological and radiological hazardous substances from 212-N, -P, and -R facilities equipment and associated piping; decontaminating structures, stabilizing contamination, demolishing basins and underlying soils to 1 m depth, disposing waste generated, and stabilizing surrounding area. Samples will be collected from underlying soils to evaluate the need for additional cleanup activities.
"Action Memorandum for the Non-Time-Critical Removal Action for the 212-N, 212-P, and 212-R Facilities, Addendum 1: Disposition of Railcars" (DOE/RL-2008-80-ADD1)	Dec-10	NTCRA	Provides for D4 of 16 railcars located in 200 North Area with disposal to ERDF and includes an option to evaluate some of the cars for movement to the B Reactor for preservation. The AM identifies a pathway for addressing contaminated soils either by removal at the time of D4 or transfer to another OU for continued CERCLA action.
"Action Memorandum for Non-Time-Critical Removal Action for 11 Waste Sites in 200-MG-1 Operable Unit" (DOE/RL-2009-48)	Jul-09	NTCRA	Provides for cleanup of 11 waste sites in the 100-MG-1 OU using either a confirmatory sampling/no further action alternative (8 sites) or RTD alternative (3 sites). Cleanup levels will be consistent with existing 100 Area cleanup levels. If confirmatory sites do not meet cleanup levels, they will be addressed by the RTD alternative.
"Action Memorandum for Non-Time-Critical Removal Action for 37 Waste Sites in the 200-MG-1 Operable Unit" (DOE/RL-2009-86)	Apr-10	NTCRA	Provides for cleanup of 37 waste sites in 100-MG-1 OU using a confirmatory sampling/no further action alternative (21 sites) or RTD alternative (16 sites). Cleanup levels will be consistent with existing 100 Area cleanup levels. If confirmatory sites do not meet cleanup levels, they will be addressed by the RTD alternative. Remaining 200-MG-1 OU sites are not included because contamination may exceed 15 ft bgs; they will be addressed through the CERCLA remedial process.
"Investigation-Derived Waste Purge Water Management Action Memorandum" (DOE/RL-2009-39)	Aug-09	NTCRA	Provides for additional purge water management capacity by relining an existing unit and installing up to 3 new units, each with leak-detection systems. The purge water management units will be operated according to requirements, monitored during operations, and disassembled and dispositioned to appropriate requirements following the operational period.

Table A-2. CERCLA Action Memoranda. (7 pages)

Title	Date	Action	Removal Action/Decision
“Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit” (DOE/RL-2009-37)	Oct-09	NTCRA	Provides for cleanup of 34 waste sites in the 100-MG-2 OU using a confirmatory sampling/no further action alternative (16 sites) or an RTD alternative (18 sites). If the confirmatory sites do not meet cleanup levels, they will be addressed by the RTD alternative. The remaining 200-MG-2 OU sites are not included because contamination may exceed 15 ft bgs; they will be addressed through the CERCLA remedial process.
“Action Memorandum for General Hanford Site Decommissioning Activities” (DOE/RL-2010-22)	Apr-10	NTCRA	Establishes D4 for excess industrial buildings/structures and cleanup of various debris; provides for removing contaminated soil or evaluating contaminated soils for inclusion as a waste site through WIDS; identifies ERDF as the preferred location for wastes meeting ERDF disposal criteria; allows the possibility of using certain wastes in other remedial actions, such as fill material under barriers; and for incorporating additional, similar buildings and structures in the AM.
“Action Memorandum for Decontamination, Deactivation, Decommissioning, and Demolition (D4) Activities for 200 East Tier 2 Buildings/Structures” (DOE/RL-2010-102)	Feb-11	NTCRA	Established D4 to slab-on-grade for 57 Tier 2 buildings/structures in 200 East Area; plug or grout below-grade piping and drains; remove equipment; remove and fill below-grade voids; send waste to ERDF or other approved facility for treatment and disposal; characterize nature and extent of remaining hazardous substances for future decisions; initiate waste site evaluation through WIDS for sites that may require further work; stabilize area as needed.
AM = Action Memorandum.			OU = operable unit.
bgs = below ground surface.			P&T = pump-and-treat.
CCN = correspondence control number.			PFP = Plutonium Finishing Plant.
CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980.</i>			PRG = preliminary remediation goal.
D4 = deactivate, decontaminate, decommission, and demolish.			RCRA = <i>Resource Conservation and Recovery Act of 1976.</i>
D&D = decontamination and decommissioning.			ROD = record of decision.
EE/CA = engineering evaluation/cost analysis.			RTD = remove, treat, and dispose.
ERA = expedited response action.			TCRA = time critical removal action.
ERDF = Environmental Restoration Disposal Facility.			TRU = transuranic.
ISS = interim safe storage.			WIDS = Waste Information Data System.
NTCRA = non-time-critical removal action.			WIPP = Waste Isolation Pilot Plant.

Table A-3. Permits, Licenses, and Other Statutory/Regulatory Program Decisions Affecting Hanford Cleanup. (3 pages)

Document	Summary
<p><i>Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste (WA7890008967).</i></p> <p>FINAL</p> <p>Ecology issued a Draft Hanford Facility Dangerous Waste Permit, Rev. 9, for public review and comment from May 1, 2012, through October 22, 2012. Until Ecology reaches a final decision, Rev. 8C Permit remains in effect.</p>	<p>This dangerous waste permit, for the TSD of dangerous waste at Hanford, is the RCRA Permit for the Hanford Facility. The permit allows a step-wise permitting process to ensure the proper implementation of the TPA. In order to accomplish this, the permit consists of six parts.</p> <ul style="list-style-type: none"> • Part I, Standard Conditions • Part II, General Facility Conditions • Part III, Unit-Specific Conditions for Final Status Operations • Part IV, Unit-Specific Conditions for Corrective Action • Part V, Unit-Specific Conditions for Units Undergoing Closure • Part VI, Unit-Specific Conditions for Units in Post-Closure.

Table A-3. Permits, Licenses, and Other Statutory/Regulatory Program Decisions Affecting Hanford Cleanup.
(3 pages)

Document	Summary
Prevention of Significant Deterioration Permit No. PSD-X80-14, issued to RL by the EPA, Region 10. FINAL	Covers emission of NO _x to the atmosphere from the Plutonium Uranium Extraction Plant and the Uranium-Trioxide Plant. No expiration date.
Record of Decision: Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington (58 FR 48509) FINAL	In December 1992, DOE issued the Final Environmental Impact Statement on Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, WA (DOE/EIS-0119F). The final EIS analyzed alternatives for decommissioning eight water-cooled, graphite-moderated plutonium-production reactors, located along the Columbia River. The eight reactors (B, C, D, DR, F, H, KE and KW) operated between 1944 and 1971 and have been retired from service. The alternatives analyzed in the EIS included no action, immediate one-piece removal, safe storage followed by deferred one-piece removal, safe storage followed by deferred dismantlement, and in situ decommissioning alternatives. The ROD was signed September 10, 1993, (58 FR 48509). The ROD documented the DOE decision for safe storage followed by deferred one-piece removal of the eight surplus reactors. DOE prepared a supplemental analysis to the EIS in July 2010 (<i>Supplement Analysis, Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington</i> [DOE/EIS-0119F-SA-01]) to broaden the possible decommissioning approach, retaining the one-piece removal option and including the option for immediate dismantlement. DOE determined that the proposed action is not a substantial change to the alternatives previously analyzed in the EIS so a supplement to DOE/EIS-0119F or new EIS is not needed.
Hanford Site Air Operating Permit 00-05-006, Renewal 2 FINAL	Covers operations on the Hanford Site having a potential to emit airborne emissions. The permit provides a compilation of applicable <i>Clean Air Act of 1977</i> (42 USC 7401) requirements for radioactive and nonradioactive emissions at Hanford. It will be implemented through Federal and State programs. Effective April 1, 2013 through March 31, 2018. Attachment 1 contains Ecology's permit terms and conditions. Attachment 2 contains the State of Washington Department of Health (Health) Radioactive Air Emissions License (FF-01) as permit terms and conditions. Attachment 3 contains the Benton Clean Air Agency permit terms and conditions applicable to the regulations of open burning and asbestos.
Permit WA-002591-7, Clean Water Act of 1977 – National Pollutant Discharge Elimination System Permit FINAL	Authorizes discharge of water from 100 Area facilities to the Columbia River from Outfall 004 in accordance with discharge point, effluent limitations, monitoring requirements and other conditions. Effective December 1, 2009 through July 31, 2014.
Permit WAR10B90F, Clean Water Act of 1977 – National Pollutant Discharge Elimination System General Permit FINAL	Authorizes storm water discharges associated with construction activities from the Hanford Site to the Columbia River in accordance with a Storm Water Pollution Prevention Plan. No expiration date is specified; the estimated project completion date identified in the most recent Notice of Intent is May 27, 2014.
Permit CR-IU005, Clean Water Act of 1977 – National Pollutant Discharge Elimination System Permit FINAL	Allows wastewater from the Environmental Molecular Sciences Laboratory to be discharged to the city of Richland's wastewater treatment facility.
Permit ST-4500, Washington State Department of Ecology – State Wastewater Permit FINAL	Allows treated wastewater from the Effluent Treatment Facility to be discharged to the State-Approved Land Disposal Site. This permit expired August 1, 2005, and has not been reissued. The old permit will remain in effect until the new permit is issued.

**Table A-3. Permits, Licenses, and Other Statutory/Regulatory Program Decisions Affecting Hanford Cleanup.
(3 pages)**

Document	Summary
Permit ST-4501, Washington State Department of Ecology – State Wastewater Permit FINAL	Allows for the discharge of cooling water and other primarily uncontaminated wastewater from 400 Area facilities to two ponds located north-northeast of the 400 Area perimeter fence. This permit was effective October 1, 2003, and expired on October 1, 2008. It remains in effect pending proposed consolidation into Permit ST-4511.
Permit ST-4502, Washington State Department of Ecology – State Wastewater Permit FINAL	Allows treated effluent from the 200 East and 200 West Areas to be discharged to the 200 Area Treated Effluent Disposal Facility. This permit expired in May 2005 and remains in effect pending reissuance. A draft revised Permit ST-0004502 underwent public review and comment in November 2011. This permit will remain in effect from July 1, 2012 to June 30, 2017.
Permit ST-4511, Washington State Department of Ecology – State Wastewater Permit FINAL	Consolidation of permits: ST-4501, ST-4508, ST-4509, and ST-4510. This Categorical State Waste Discharge Permit authorizes the discharge of wastewater from maintenance, construction, and hydrotesting activities and allows for cooling water, condensate, and industrial storm water discharges at the Hanford Site. This permit was issued February 16, 2005 and was set to expire February 16, 2010. A renewal application was submitted to Ecology in August 2009, and a supplemental request was submitted in April 2010 to incorporate Permit ST-4501 as well. The renewal application is awaiting Ecology action.
Permit ST-0045514, Washington State Department of Ecology – State Wastewater Permit FINAL	Allows domestic wastewater to be treated in a non-discharging, lined evaporative lagoon located northeast of the 200 West Area. Effective July 1, 2012 through June 30, 2017.
Permit WAG-50-5180, Washington State Department of Ecology – State Sand and Gravel General Permit FINAL	Permit for wastewater discharges associated with handling sand and gravel for the Concrete Batch Plant in the 200 East Area. Effective October 1, 2010 through October 1, 2015.
Permit WAG-50-5181, Washington State Department of Ecology – State Sand and Gravel General Permit FINAL	Permit for wastewater discharges associated with Pit 30 Quarry operations in the 200 East Area. Effective October 1, 2010 through October 1, 2015.
Large Onsite Sewage Systems (LOSS) “Permit to Operate” HAN099 FINAL	Lists systems in the various areas.
Underground Injection Control (UIC) Wells	Hanford has a number of UIC wells – storm water, non-storm water and septic systems. The Mission Support Contractor maintains the inventory and locations of active and inactive wells.

Table A-4. Tri-Party Agreement Decisions Affecting Hanford Cleanup.

TPA Documentation	Summary of Decision
<ul style="list-style-type: none"> • M-045-00 and • Appendix C Part 1: Required Retrieval Technologies • Appendix H 	Closure will follow retrieval of as much tank waste as technically possible, with tank waste residues not to exceed 360 ft ³ in each of the 100-series tanks, 30 ft ³ in each of the 200-series tanks, or the limit of waste retrieval technology capability.

Table A-5. Other Federal and State Decisions Affecting Hanford Site Cleanup Mission. (4 pages)

Other Federal/State Decision	Summary of Decision
<u>Executive Order 11514, Protection and Enhancement of Environmental Quality, as amended by Executive Order 11991</u>	This order requires Federal agencies to continually monitor and control their activities to protect and enhance the quality of the environment and develop procedures to ensure the fullest practicable provision of timely public information and understanding of Federal plans and programs that may have potential environmental impacts so that interested parties can submit their views. DOE issued regulations <u>10 CFR 1021</u> , "National Environmental Policy Act Implementing Procedures" and <u>DOE O 451.1B</u> , <i>National Environmental Policy Act Compliance Program</i> for compliance with this order.
<u>Executive Order 12088, Federal Compliance with Pollution Control Standards</u>	This order directs Federal agencies to comply with applicable administrative and procedural pollution control standards established by, but not limited to: <i>Clean Air Act of 1977 (42 USC 7401)</i> ; <i>Noise Control Act of 1972 (42 USC 10101)</i> ; <i>Clean Water Act of 1977 (33 USC 1251)</i> ; <i>Safe Drinking Water Act of 1974 (42 USC 300)</i> ; <i>Toxic Substances Control Act of 1976 (15 USC 2601)</i> ; and <i>RCRA (42 USC 6901)</i> .
<u>Executive Order 12580, Superfund Implementation</u>	This order delegates a number of Federal departments and agencies the authority and responsibility to implement certain provisions of CERCLA. Policies and procedures for implementing these provisions (e.g., response actions and fulfilling natural resource trusteeship responsibilities) are provided in the National Contingency Plan.
<u>Federal Facilities Compliance Act of 1992.</u> FINAL	This act amended RCRA, Section 6961 and other sections and requires DOE to prepare plans that develop treatment capacity for mixed waste stored or generated at each facility, except for those facilities subject to a permit that establishes a schedule for treatment of such waste or an existing agreement or order governing the treatment of such waste to which the State is a party. The host state and/or EPA must approve each plan. Washington State, EPA, and DOE had the TPA, which addressed compliance with the storage prohibition for mixed waste at the time this law was enacted and was not required to develop a new plan. A violation of the TPA may concurrently be a violation of the <i>Federal Facilities Compliance Act of 1992</i> (i.e., Washington State may seek judicial enforcement under <i>RCRA (42 USC 6901)</i>).

Table A-5. Other Federal and State Decisions Affecting Hanford Site Cleanup Mission. (4 pages)

Other Federal/State Decision	Summary of Decision
<p><i>Nuclear Waste Policy Act of 1982 (42 USC 10101).</i> <u>FINAL</u></p>	<p>This act directed DOE to characterize and evaluate the Yucca Mountain site for suitability as a potential repository for disposal of commercial SNF and HLW. The act directed the President to evaluate the need for a separate repository for HLW resulting from atomic energy defense activities. On April 30, 1985, President Reagan completed this evaluation. The result was that HLW from atomic energy defense activities may be disposed in the proposed repository along with SNF. After passage by the U.S. House of Representatives and U.S. Senate, on July 23, 2002, President Bush signed House Joint Resolution 87 approving the site at Yucca Mountain for developing a repository for disposal of HLW and SNF, pursuant to the <i>Nuclear Waste Policy Act of 1982</i>.</p> <p>As indicated in the Obama Administration's FY2010 budget request, the Administration intends to terminate the Yucca Mountain program while developing nuclear waste disposal alternatives. Notwithstanding the decision to terminate the Yucca Mountain program, DOE remains committed to meeting its obligations to manage and dispose of HLW and SNF. The Administration directed establishing the Blue Ribbon Commission on America's Nuclear Future (Commission) to evaluate alternative approaches for meeting these obligations. The Commission submitted its final report to the Secretary of Energy in January 2012. The Commission did not evaluate Yucca Mountain or any other location and recommended a waste management approach to resolve the current impasse, which has eight key elements:</p> <ol style="list-style-type: none"> 1. A new consent-based approach to siting future nuclear waste management facilities. 2. A new organization dedicated solely to implementing the waste management program and empowered with the authority and resources to succeed. 3. Access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management. 4. Prompt efforts to develop one or more geologic disposal facilities. 5. Prompt efforts to develop one or more consolidated storage facilities. 6. Prompt efforts to prepare for eventual large-scale transport of SNF and HLW to consolidated storage/disposal facilities when such facilities become available. 7. Support continued U.S. innovation in nuclear energy technology and workforce development. 8. Active U.S. leadership in international efforts to address safety, waste management, non-proliferation, and security concerns. <p>In January 2013, DOE responded to the Blue Ribbon Commission's final report in the <i>Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste</i>. This policy document proposes a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of SNF and HLW from civilian nuclear power generation, defense, national security and other activities.</p>
<p><i>Waste Isolation Pilot Plant Land Withdrawal Act (Public Law 102-579).</i> <u>FINAL</u></p>	<p>The act withdrew land from the public domain for purposes of creating and operating WIPP, the geologic repository in New Mexico designated as the national disposal site for defense TRU waste. In addition to establishing the location for the facility, the WIPP Land Withdrawal Act defines the characteristics and amount of waste that will be disposed at the facility. Amendments to the WIPP Land Withdrawal Act exempt waste designated by the Secretary of Energy for disposal at WIPP from the RCRA land disposal restrictions. However, these amendments do not exempt mixed TRU waste from other RCRA requirements. WIPP does have a RCRA permit and can accept mixed TRU waste. On May 15, 2003, EPA Region 6 approved DOE's request to dispose TRU and mixed TRU waste containing PCBs at WIPP subject to certain "conditions of approval."</p>

Table A-5. Other Federal and State Decisions Affecting Hanford Site Cleanup Mission. (4 pages)

Other Federal/State Decision	Summary of Decision
<p>Spent Fuel Settlement Agreement (No. CV-91-0035-S-EJL and No. CV-91-0054-S-EJL), October 17, 1995 Consent Decree for Stabilization of SSTs at Hanford Site between U.S. Department of Energy and Washington State Department of Ecology (No. <u>CT-99-5076-EFS</u>) September 29, 1999. FINAL</p>	<p>This agreement allows INL to receive SNF and mixed waste from offsite and establishes schedules for the treatment of existing HLW, TRU waste, mixed waste, and removal of SNF from the State.</p> <p>This consent decree established a court-enforceable, technically sound schedule for pumping liquid nuclear waste from the remaining 29 unstabilized SSTs. The key elements of the consent decree included:</p> <ul style="list-style-type: none"> • Pumping the tanks that pose the greatest environmental risk first, thus providing additional protection for the Columbia River and public health. • Accelerating the schedule for pumping so that 98% of approximately 6.2 million gallons of remaining pumpable liquid is removed by September 30, 2003, with the final 2% scheduled to be removed by September 30, 2004 (this was completed). • Increasing DOE funding to a level that supports successful execution of the new schedule for tank stabilization. • Work under the consent decree has been completed and the court has terminated the consent decree.
<p>Presidential Proclamation 7319, Establishment of the Hanford Reach National Monument (June 9, 2000). FINAL</p>	<p>This proclamation set apart and reserved the Hanford Reach National Monument to protect all lands and interests in lands owned or controlled by the U.S. within the boundaries of the monument area. The lands reserved consist of approximately 195,000 acres, and are appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws. The monument is to be managed by the U.S. Fish and Wildlife Service under existing agreements with DOE. DOE retains its responsibilities under applicable environmental laws, including the remediation of hazardous substances or the restoration of natural resources at the Hanford Site.</p>
<p>Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000). FINAL</p>	<p>This order supplements “Government-to-Government Relations with Native American Tribal Governments” (59 FR 22951), and states that each executive department and agency shall consult, to the greatest extent practicable and to the extent permitted by law, with Tribal Nations prior to taking actions that affect Federally recognized tribal governments. This order also states that each executive department and agency shall assess the impact of Federal government plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities.</p>
<p>U.S. Department of Interior Announcement, National Historic Landmark, August 19, 2008.</p>	<p>Hanford’s B Reactor, has been designated a National Historic Landmark by the U.S. Department of Interior. Since then, efforts have continued to include B Reactor in a new National Historical Park. On June 14, 2013 the Manhattan Project National Historical Park Act passed the House of Representatives in an amendment to H.R. 1960, the National Defense Authorization Act for Fiscal Year 2014.</p>
<p>Consent Decree in <i>State of Washington v. Department of Energy</i>, Case No. CV-08-5085-FVS (E.D. Wa. October 25, 2010)</p>	<p>The Consent Decree imposes milestones for the construction, commissioning, and startup of the WTP, as well as continued retrieval of waste from Hanford’s SSTs. Significant milestones in the Consent Decree require DOE to meet deadlines for the WTP’s facilities to keep construction on pace; start treating tank waste through the WTP by 2019; achieve initial plant operations by 2022; retrieve the waste from the remaining 10 tanks in the “C” tank farm by 2014; identify nine other SSTs to retrieve waste from by 2014; and finish retrieving the waste from those nine other tanks by 2022. The Consent Decree also covers reporting requirements for waste retrievals from SSTs, regulatory coordination, and a process to resolve disputes between the agencies.</p>

Table A-5. Other Federal and State Decisions Affecting Hanford Site Cleanup Mission. (4 pages)

Other Federal/State Decision	Summary of Decision
Settlement Agreement between the State of Washington and the U.S. Department of Energy (No. 2:03CV-05018-AAM January 6, 2006). FINAL	Prior to the issuance of the <i>Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement, Richland, Washington</i> (HSW EIS) (DOE/EIS-0286F) and record of decision (69 FR 39449, "Record of Decision for the Solid Waste Program, Hanford Site, Richland, WA: Storage and Treatment of Low-Level Waste and Mixed Low-Level Waste; Disposal of Low-Level Waste and Mixed Low-Level Waste, and Storage, Processing, and Certification of Transuranic Waste for Shipment to the Waste Isolation Pilot Plant"), the State initiated litigation on issues related to the importation, treatment, and disposal of radioactive and hazardous waste generated off the Hanford Site as a result of nuclear defense and research activities. The court enjoined shipment of offsite TRU waste to Hanford for processing and storage pending shipment to the Waste Isolation Pilot Plant near Carlsbad, New Mexico. DOE, the State, and the U.S. Department of Justice signed a Settlement Agreement ending the litigation on January 6, 2006. The agreement is intended to resolve the State's concerns about HSW EIS (DOE/EIS-0286F) groundwater and other analyses. The agreement specifies that when the <i>Draft Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington</i> (DOE/EIS-0391) is complete, it will supersede the HSW EIS. Until that time, DOE will not rely on HSW EIS groundwater analyses for decision-making will not import offsite waste to Hanford, with certain limited exemptions as specified in the agreement.
CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980.</i> DOE = U.S. Department of Energy. EPA = U.S. Environmental Protection Agency. HLW = high-level waste. HSW EIS = <i>Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement, Richland, Washington.</i>	INL = Idaho National Laboratory. PCB = polychlorinated biphenyl. RCRA = <i>Resource Conservation and Recovery Act of 1976.</i> SNF = spent nuclear fuel. SST = single-shell tank. TPA = Tri-Party Agreement. TRU = transuranic. WIPP = Waste Isolation Pilot Plant. WTP = Waste Treatment Plant.

A.4. REFERENCES

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APPENDIX B

FUTURE CLEANUP ACTIONS AND ALTERNATIVE ANALYSES

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TERMS

ABAR	aggregate barrier
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CSNA	confirmatory sampling to support no further cleanup action
D&D	decontamination and decommissioning
D4	deactivation, decontamination, decommissioning, and demolition
DOE	U.S. Department of Energy
DST	double-shell tank
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ESD	explanation of significant differences
ETF	Effluent Treatment Facility
FBSR	fluidized bed steam reforming
FFTF	Fast Flux Test Facility
HLW	high-level waste
IBAR	individual barrier
IC	institutional controls
IDF	Integrated Disposal Facility
ILAW	immobilized low-activity waste
INL	Idaho National Laboratory
ISS	interim safe storage
LAW	low-activity waste
LCR	Lifecycle Report
LERF	Liquid Effluent Retention Facility
LTS	long-term stewardship
MESC	maintain existing soil cover
MNA	monitored natural attenuation
N/A	not applicable
NEPA	<i>National Environmental Policy Act of 1969</i>
NRDWL	Nonradioactive Dangerous Waste Landfill
OU	operable unit
P&T	pump-and-treat
PFP	Plutonium Finishing Plant
PNNL	Pacific Northwest National Laboratory
PUREX	Plutonium Uranium Extraction (Plant)
RAO	remedial action objective
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
REDOX	Reduction-Oxidation Facility (S Plant)
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RTD	remove, treat, and dispose
SALDS	State-Approved Land Disposal Site

S&M	surveillance and maintenance
SSE	safe storage enclosure
SST	single-shell tank
SWL	solid waste landfill
TBD	to be determined
TC&WM EIS	Tank Closure and Waste Management Environmental Impact Statement
TPA	Tri-Party Agreement
TRU	transuranic
TSD	treatment, storage, and disposal
WAC	<i>Washington Administrative Code</i>
WESF	Waste Encapsulation and Storage Facility
WRAP	Waste Receiving and Processing Plant
WTP	Waste Treatment and Immobilization Plant

APPENDIX B

FUTURE CLEANUP ACTIONS AND ALTERNATIVE ANALYSES

In accordance with the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989), commonly referred to as the Tri-Party Agreement (TPA), Milestone M-036-01 requires that where final cleanup decisions have not yet been made, the *Hanford Lifecycle Scope, Schedule and Cost Report* (Lifecycle Report [LCR]) may consider ranges of alternatives and present a reasonable upper bound:

“In circumstances where final cleanup decisions have not yet been made, the report shall be based upon the reasonable upper bound of the range of plausible alternatives or may set forth a range of alternative costs including such a reasonable upper bound.”

The TPA milestone specifies that when making assumptions (e.g., about alternative cleanup actions), the U.S. Department of Energy (DOE) is to take into account the views of the U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology), as well as the values expressed by affected Tribal Governments and Hanford stakeholders.

Cleanup decisions are made so that DOE can implement future cleanup actions at the Hanford Site. As discussed in Section B.1, the LCR has grouped remaining Hanford Site cleanup work into approximately 39 separate cleanup actions.

Because final cleanup decisions (see Appendix A) have not yet been made for many of the remaining Hanford cleanup work, the LCR may consider the range of plausible alternatives (or alternative costs) and present a reasonable upper bound. DOE has decided that information about the range of plausible alternatives, rather than just a range of alternative costs, would be most useful for this LCR. DOE also believes that in most cases, cost estimates include allowances for uncertainties in current planning that encompass a wide range of potential alternatives. Section B.2 includes information about the range of plausible alternatives for each future cleanup action.

Because many final decisions remain to be made, a reasonable upper bound will need to be defined, along with schedule and costs, for a number of remaining cleanup actions. To give each action a sufficient level of analysis and detail, DOE has decided to take a methodical and planned approach to developing in-depth analyses of cleanup action alternatives, including definition of reasonable upper bound schedules and costs.

Section B.3 proposes a rationale and schedule for when different cleanup actions may undergo in-depth alternatives analyses in the LCR.

Information provided in this appendix has been developed for the sole purpose of preparing the LCR and fulfilling the requirements of TPA Milestone M-036-01; the LCR is not a decision-making document. Cleanup actions and decisions discussed in this appendix are still undergoing formal development, review, and eventual approval pursuant to procedures established in the TPA and applicable Federal and State requirements. Information in this appendix does not presume nor is it intended to prejudice the outcome of the requirements that must be followed by

the Tri-Party Agencies (DOE, Ecology, and EPA). Any errors or discrepancies in this appendix will be superseded by the results of the legally applicable decision-making processes.

B.1 IDENTIFYING FUTURE CLEANUP ACTIONS FOR THE HANFORD SITE

The term “cleanup action” is used to conceptually describe work that enables cleanup to proceed for common or related contaminants that occur in a relatively well-defined environmental media (or waste management system) within a generally contiguous geographic area.

This cleanup action concept is consistent with the operable unit (OU) cleanup approach taken in the TPA and enables future cleanup actions and alternatives to be addressed in a manner consistent with the way cleanup decisions are being made for Hanford. This approach also provides a reasonable middle ground for looking at the cleanup work that is performed on the site.

The Tri-Party Agencies developed a set of cleanup actions for the LCR. Table B-1 lists the future cleanup actions for which final cleanup decisions do not yet exist.

Table B-1. Future Cleanup Actions for which Final Decisions Have Not Been Made. (2 pages)

River Corridor Cleanup Actions
<ul style="list-style-type: none"> • Disposition N Reactor • Disposition 100 Area K West Basin • Remediate 100 Area Contaminated Soil Sites • Restore 100-BC-5 Groundwater OU to Beneficial Use • Restore 100-KR-4 Groundwater OU to Beneficial Use • Restore 100-NR-2 Groundwater OU to Beneficial Use • Restore 100-HR-3 Groundwater OU to Beneficial Use • Restore 100-FR-3 Groundwater OU to Beneficial Use • Disposition 300 Area Facilities Retained by Pacific Northwest National Laboratory • Disposition of 100 Area former Orchard Contaminated Soil Sites (100-OL-1 OU)
Central Plateau Cleanup Actions
<ul style="list-style-type: none"> • Disposition Remaining Outer Area Buildings and Facilities (200-OA-1 OU) • Remediate Remaining Outer Area Contaminated Soil Sites (200-OA-1, 200-CW-1, and 200-CW-3 OUs) • Disposition Below-Grade Portions of Plutonium Finishing Plant • Disposition B Plant Canyon Building/Associated Waste Sites (200-CB-1 OU) • Disposition PUREX Canyon Building/Associated Waste Sites (200-CP-1 OU) • Disposition PUREX Storage Tunnels (200-CP-1 OU) • Disposition REDOX Canyon Building/Associated Waste Sites (200-CR-1 OU) • Disposition T Plant Canyon Building/Associated Waste Sites • Disposition Cesium/Strontium Capsules • Remediate 200-SW-1 OU • Disposition Remaining Liquid Waste Disposal Facilities • Disposition Remaining Waste Treatment, Storage, and Disposal Facilities • Remediate Pipelines, Pits, Diversion Boxes and Associated Tanks (200-IS-1 OU) • Remediate Land Disposal Units (200-SW-2 OU) • Remediate Remaining 200 West Inner Area Contaminated Soil Sites (200-WA-I OU) • Remediate Remaining 200 East Inner Area Contaminated Soil Sites (200-EA-1 OU) • Disposition Fast Flux Test Facility Complex • Disposition Remaining Buildings and Facilities Within Fast Flux Test Facility Complex • Disposition Remaining Inner Area Buildings and Facilities • Remediate Contaminated Deep Vadose Zone (200-DV-1 OU) • Restore 200 West Groundwater to Beneficial Use (200-UP-1 OU) • Restore 200 East Groundwater to Beneficial Use (200-PO-1/200-BP-5 OUs)

a maximum cleanup effort (e.g., a likely upper bound) for that cleanup action. In addition, the ranges of plausible alternatives exclude alternatives that could not be part of a reasonable upper bound (e.g., no action). Determining the range of plausible alternatives and likely upper bounding cleanup effort took into account, among other factors, current requirements under the TPA and other environmental obligations, and the status of alternatives being considered under existing and forthcoming cleanup decisions. The range of plausible alternatives for each cleanup action was intended to encompass the most current planning assumptions with respect to that cleanup action. This list is updated by the Tri-Party Agencies annually.

Tables B-2, B-3, and B-4 list and are organized by the identified future cleanup actions for River Corridor, Central Plateau, and Tank Waste, respectively. These tables include the following:

- For each cleanup action, a summary of the current cleanup decisions that have been made pursuant to the TPA and other environmental obligations, and a list of relevant cleanup decision documents
- For each cleanup action, a list that encompasses the likely range of plausible alternatives.

Table B-2. Summary of Future Cleanup Actions and Plausible Alternatives – River Corridor. (6 pages)

CLEANUP ACTION:	RC-1a¹ River Corridor – Disposition N Reactor
Cleanup Decision Summary and Relevant Decision Documents	
<p>In September 1993, DOE issued 58 FR 48509, “Record of Decision: Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, WA,” which implements the recommendation for safe storage followed by deferred one-piece removal of the surplus reactors. N Reactor was not included in the EIS as it was not available for decommissioning at the time of the NEPA EIS and ISS was approved through the CERCLA process. Final disposition of N Reactor will be determined by a subsequent NEPA or CERCLA decision process.</p> <ul style="list-style-type: none"> • <u>DOE and Ecology, 2000</u>, “Action Memorandum: United States Department of Energy Hanford 100 Area National Priorities List (NPL); 105-D and 105-H Reactor Facilities and Ancillary Facilities; Hanford Site; Benton County, Washington,” U.S. Department of Energy, Richland Operations Office and Washington State Department of Ecology, Richland, Washington, October. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • Demolition of the reactor block in ISS, and transport the reactor block, intact on a tractor transporter, from the present 100 Area location to the 200 West Area for disposal. • Safe storage for a period of up to 75 years of surveillance, monitoring, and maintenance; at the end of the safe storage period, demolition of the reactor block and transport of the reactor block, intact on a tractor transporter, from the present 100 Area location to the 200 West Area for disposal. • Safe storage for a period of up to 75 years of surveillance, monitoring, and maintenance; at the end of the safe storage period, demolition of the reactor buildings and piece by piece dismantlement of the reactor core and transport of radioactive waste to the 200 West Area for burial. Demolition of the reactor buildings and SSE and filling voids beneath and around the reactor block, the reactor block, adjacent shield walls, and the spent fuel storage basin together with the contained radioactivity, gravel, and grout covered to a depth of at least 5 meters with a mound containing earth and gravel. 	
CLEANUP ACTION:	RC-2 River Corridor – Disposition 100 Area K West Basin
Cleanup Decision Summary and Relevant Decision Documents	
<p>An interim ROD, ROD amendment, and Action Memorandum are in place for the removal, treatment, and interim onsite storage of spent nuclear fuel and sludge from the K Basins.</p> <ul style="list-style-type: none"> • <u>EPA/ROD/R10-99/059, 1999</u>, <i>Declaration of the Record of Decision for the 100-KR-2 Operable Unit, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>DOE and EPA, 2004</u>, <i>Action Memorandum: Request for Time Critical Response for Treatment and Disposal of Sludge from the 105-K East North Loadout Pit, USDOE Hanford Site</i>, U.S. Department of Energy, Richland Operations Office and U.S. Environmental Protection Agency, Richland, Washington, June 4. 	

Table B-2. Summary of Future Cleanup Actions and Plausible Alternatives – River Corridor. (6 pages)

<ul style="list-style-type: none"> • <u>EPA, 2005, Interim Remedial Action Record of Decision Amendment, Declaration, U.S. Department of Energy, 100 K Area K Basins, Hanford Site - 100 Area, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • Remove, treat, and transfer sludge for interim storage at T Plant; transfer fuel scrap for interim storage at Canister Storage Building; D4 K West Basin and ancillary structures; remediate below-grade portions consistent with 100 Area contaminated soil sites.* <p>* May require removing K Reactors to access below-grade contaminated soils. K East Basin was demolished in 2009.</p>	
CLEANUP ACTION:	RC-3 River Corridor – Remediate 100 Area Contaminated Soil Sites
Cleanup Decision Summary and Relevant Decision Documents	
Interim RODs, ROD amendments, ESDs, and Annual Fact Sheets (100 Area “Plug-In” and Candidate Waste Sites for FY2010) are in place to remove contaminated soil, structures, debris, and burial grounds using the observational and plug-in approaches with onsite disposal at ERDF.	
<ul style="list-style-type: none"> • <u>EPA, 2004, Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2007, Explanation of Significant Difference for the Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-2, 100-HR-2, and 100-KR-2 Operable Units (100 Area Burial Grounds)</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2009a, Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2011, Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-95/126, 1995, Declaration of the Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, Hanford Site, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/AMD/R10-97/044, 1997, Amendment to the Interim Action Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, Hanford Site, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-99/039, 1999, Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ESD/R10-00/045, 2000, Explanation of Significant Difference for the 100 Area Remaining Sites ROD, USDOE Hanford 100 Area, 100-IU-6 Operable Unit, Hanford Site, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-00/120, 2000, Interim Remedial Action Record of Decision for the 100-NR-1 Operable Unit, Hanford Site, Benton County, Washington</u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. 	

Table B-2. Summary of Future Cleanup Actions and Plausible Alternatives – River Corridor. (6 pages)

<ul style="list-style-type: none"> • <u>EPA/ESD/R10-03/605</u>, 2003, <i>Explanation of Significant Difference for the 100-NR-1 Operable Unit Treatment, Storage, and Disposal Interim Action Record of Decision and 100-NR-1/100-NR-2 Operable Unit Interim Action Record of Decision</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-00/121</u>, 2000, <i>Declaration of the Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-2, 100-HR-2, 100-KR-2 Operable Units</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <i>Resource Conservation and Recovery Act of 1976, (42 USC 6901), et seq.</i> 		
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • RTD contaminated soil sites to achieve RAOs* and applicable closure performance standards**; backfill, contour, and revegetate excavations. <p>Note: The 100 Area interim RODs for waste sites will be covered by the six final RODs for the River Corridor currently being worked through a final RI/FS process.</p> <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p> <p>* In accordance with applicable interim action RODs.</p> <p>** Closure of several 100-N facilities will be according to approved RCRA closure plans.</p>		
<table border="1"> <tr> <td style="width: 15%;">CLEANUP ACTION:</td> <td>RC-4.1 River Corridor – Restore 100-BC-5 Groundwater OU to Beneficial Use</td> </tr> </table>	CLEANUP ACTION:	RC-4.1 River Corridor – Restore 100-BC-5 Groundwater OU to Beneficial Use
CLEANUP ACTION:	RC-4.1 River Corridor – Restore 100-BC-5 Groundwater OU to Beneficial Use	
<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>No cleanup decisions have been made for this OU. Groundwater monitoring and annual reporting continue to track groundwater contamination in this OU.</p> <ul style="list-style-type: none"> • <u>WAC 173-340</u>, “Model Toxics Control Act -- Cleanup,” <i>Washington Administrative Code</i>, Olympia, Washington. – <u>WAC 173-340-720</u>, “Groundwater Cleanup Standards.” 		
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Install P&T system in 100-BC-5; transition to S&M for post-treatment groundwater monitoring. • Incorporate bioremediation for chromium. • Allow monitored natural attenuation to proceed under LTS with institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>		
<table border="1"> <tr> <td style="width: 15%;">CLEANUP ACTION:</td> <td>RC-4.2 River Corridor – Restore 100-KR-4 Groundwater OU to Beneficial Use</td> </tr> </table>	CLEANUP ACTION:	RC-4.2 River Corridor – Restore 100-KR-4 Groundwater OU to Beneficial Use
CLEANUP ACTION:	RC-4.2 River Corridor – Restore 100-KR-4 Groundwater OU to Beneficial Use	
<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>An interim ROD is in place to clean up hexavalent chromium in the groundwater using P&T.</p> <ul style="list-style-type: none"> • <u>EPA, 2009d</u>, <i>Explanation of Significant Differences for the 100-HR-3 and 100-KR-4 Operable Units Interim Action Record of Decision, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-96/134</u>, 1996, <i>Declaration of the Record of Decision for the 100-HR-3 and 100-KR-4 Operable Units, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>WAC 173-340</u>, “Model Toxics Control Act -- Cleanup,” <i>Washington Administrative Code</i>, Olympia, Washington. – <u>WAC 173-340-720</u>, “Groundwater Cleanup Standards.” 		
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Expand the P&T system in 100-KR-4; transition to S&M for post-treatment groundwater monitoring. • Continue operation of P&T system with incorporation of bioremediation for chromium. • Allow monitored natural attenuation to proceed under LTS with institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>		

Table B-2. Summary of Future Cleanup Actions and Plausible Alternatives – River Corridor. (6 pages)

CLEANUP ACTION:	RC-4.3 River Corridor – Restore 100-NR-2 Groundwater OU to Beneficial Use
	<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>An Action Memorandum, interim ROD, and ESD are in place to clean up strontium-90 in the groundwater using P&T and physical barriers. An in situ apatite barrier and phytoremediation treatability tests are being evaluated for use in the cleanup of strontium-90 in groundwater.</p> <ul style="list-style-type: none"> • <u>EPA, 2011, <i>Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington</i></u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2010, <i>Amended Record of Decision, Decision Summary and Responsiveness Summary U.S. Department of Energy 100-NR-1 and NR-2 Operable Units, Hanford Site – 100 Area, Benton County, Washington</i></u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>Ecology and EPA, 1994, “Action Memorandum; N Springs Expedited Response Action Cleanup U.S. Department of Energy Hanford Site, Richland, WA”</u> (letter to R. Izatt, U.S. Department of Energy, Richland Operations Office from R.F. Smith, U.S. Environmental Protection Agency and D. Butler, Washington State Department of Ecology), U.S. Environmental Protection Agency, Richland, Washington, September 23. • <u>EPA/ESD/R10-03/605, 2003, <i>Explanation of Significant Difference for the 100-NR-1 Operable Unit Treatment, Storage, and Disposal Interim Action Record of Decision and 100-NR-1/100-NR-2 Operable Unit Interim Action Record of Decision</i></u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-99/112, 1999, <i>Interim Remedial Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington</i></u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>WAC 173-340, “Model Toxics Control Act -- Cleanup,” <i>Washington Administrative Code</i></u>, Olympia, Washington. – <u>WAC 173-340-720, “Groundwater Cleanup Standards.”</u>
	<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Resume operation of existing P&T system; operate and expand system as necessary until cleanup objectives are achieved; transition to S&M for post-treatment groundwater monitoring. • Construct an impermeable barrier along the shoreline to re-direct groundwater flow and increase travel times for radioactive decay to achieve cleanup objectives. • Expand the apatite permeable reactive barrier to promote sequestration of strontium-90. • Incorporate phytotechnology. • Use sequestration and immobilization technologies for inner portion of strontium-90 plume. • Allow monitored natural attenuation to proceed under LTS with institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>
CLEANUP ACTION:	RC-4.4 River Corridor – Restore 100-HR-3 Groundwater OU to Beneficial Use
	<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>An interim ROD, ROD amendment, and ESDs are in place to clean up hexavalent chromium in the groundwater using P&T and an in situ reduction/oxidation (“redox”) manipulation barrier.</p> <ul style="list-style-type: none"> • <u>EPA/ROD/R10-96/134, 1996, <i>Declaration of the Record of Decision for the 100-HR-3 and 100-KR-4 Operable Units, Hanford Site, Benton County, Washington</i></u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/AMD/R10-00/122, 1999, <i>Interim Remedial Action Record of Decision Amendment: 100-HR-3 Operable Unit</i></u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2002, <i>Explanation of Significant Difference for the 100-HR-3 Operable Unit Record of Decision</i></u>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington.

Table B-2. Summary of Future Cleanup Actions and Plausible Alternatives – River Corridor. (6 pages)

<ul style="list-style-type: none"> • <u>EPA/ESD/R10-03/606</u>, 2003, <i>Explanation of Significant Difference for the 100-HR-3 Operable Unit Record of Decision, USDOE Hanford 100 Area, 100-HR-3 Operable Unit, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2009b</u>, <i>Explanation of Significant Differences for the 100-HR-3 and 100-KR-4 Operable Units Interim Action Record of Decision, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>WAC 173-340</u>, "Model Toxics Control Act -- Cleanup," <i>Washington Administrative Code</i>, Olympia, Washington. <ul style="list-style-type: none"> – <u>WAC 173-340-720</u>, "Groundwater Cleanup Standards." 	
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Expand P&T system in 100-HR-3; transition to S&M for post-treatment groundwater monitoring. • Maintain and repair in situ redox manipulation barrier. • Incorporate bioremediation. • Allow monitored natural attenuation to proceed under LTS with institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>	
CLEANUP ACTION:	RC-4.5 River Corridor – Restore 100-FR-3 Groundwater OU to Beneficial Use
<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>No cleanup decisions have been made for this OU. Groundwater monitoring and annual reporting continue to track groundwater contamination.</p> <ul style="list-style-type: none"> • <u>WAC 173-340</u>, "Model Toxics Control Act - Cleanup," <i>Washington Administrative Code</i>, Olympia, Washington. <ul style="list-style-type: none"> – <u>WAC 173-340-720</u>, "Groundwater Cleanup Standards." 	
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Install P&T system in 100-FR-3; transition to S&M for post-treatment groundwater monitoring. • Incorporate bioremediation for chromium. • Allow monitored natural attenuation to proceed under LTS with institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>	
CLEANUP ACTION:	RC-5 River Corridor – Disposition 300 Area Facilities Retained By PNNL
<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>Action memoranda are in place for the remaining 300 Area buildings and facilities, and DOE anticipates extending those cleanup decisions to include the PNNL-retained facilities once their operations end. DOE considers D&D of buildings and other structures to be final cleanup decisions if the facility is removed in accordance with an applicable Action Memorandum. The Removal Action Work Plan will need to be modified to address PNNL retained facilities once PNNL declares the facilities as surplus. Alternatives do not need to be considered where such D&D has been completed. Decision documents for D&D of 300 Area buildings and facilities that may have future application for the PNNL-retained facilities are listed here.</p> <ul style="list-style-type: none"> • <u>DOE and EPA, 2005</u>, <i>Action Memorandum #1 for the 300 Area Facilities</i>, U.S. Department of Energy, Richland Operations Office and U.S. Environmental Protection Agency, Richland, Washington, January 20. • <u>DOE and EPA, 2006a</u>, <i>Action Memorandum #2 for the 300 Area Facilities</i>, U.S. Department of Energy, Richland Operations Office and U.S. Environmental Protection Agency, Richland, Washington, May 16. • <u>DOE and EPA, 2006b</u>, <i>Action Memorandum #3 for the 300 Area Facilities</i>, U.S. Department of Energy, Richland Operations Office and U.S. Environmental Protection Agency, Richland, Washington, November 30. 	
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Following end of operational period for PNNL facilities (assumed no earlier than 2023), D4 all buildings and facilities; remediate consistent with 300 Area contaminated soil sites if needed. 	

Table B-2. Summary of Future Cleanup Actions and Plausible Alternatives – River Corridor. (6 pages)

D4 = deactivate, decontaminate, decommission, and demolish.	OU = operable unit.
D&D = decontamination and decommissioning.	P&T = pump-and-treat.
DOE = U.S. Department of Energy.	PNNL = Pacific Northwest National Laboratory.
EIS = environmental impact statement.	RAO = remedial action objective.
ERDF = Environmental Restoration Disposal Facility.	RCRA = <i>Resource Conservation and Recovery Act</i> .
ESD = explanation of significant differences.	RI/FS = remedial investigation/feasibility study.
FFTF = Fast Flux Test Facility.	ROD = record of decision.
ISS = interim safe storage.	RTD = remove, treat, and dispose.
LTS = long-term stewardship.	S&M = surveillance and maintenance.
NEPA = <i>National Environmental Policy Act of 1969</i> .	SSE = safe storage enclosure.
	WAC = <i>Washington Administrative Code</i> .

¹ RC-1 River Corridor – Disposition 100 Area Reactors (Except B Reactor) was removed from the LCR in response to comments that the 1993 National Environmental Policy Act ROD is considered a final action (see Appendix A, Table A-3)

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

CLEANUP ACTION:	CP-1 Central Plateau – Disposition Remaining Outer Area Buildings and Facilities
	<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>Action memoranda are in place to D4 buildings and facilities to slab-on-grade and evaluate below-grade portions for contamination. Future cleanup decisions for remaining buildings and facilities will be included in decision documents (e.g., action memoranda, RODs). DOE considers D&D of buildings and other structures to be final cleanup decisions if all regulated contaminants have been removed in accordance with an applicable Action Memorandum. Alternatives do not need to be considered where such D&D has been completed.</p> <ul style="list-style-type: none"> • <u>DOE/RL-2008-80-ADD1</u>, 2010, <i>Action Memorandum for the Non-Time Critical Removal Action for the 212-N, 212-P, and 212-R Facilities, Addendum 1: Disposition of Railcars</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2010-22</u>, 2010, <i>Action Memorandum for General Hanford Site Decommissioning Activities</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
	<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • D4 all buildings and facilities to slab-on-grade; evaluate below-grade portions for residual contamination; if needed, remediate below-grade portions consistent with Central Plateau Outer Area contaminated soil sites.
CLEANUP ACTION:	CP-2 Central Plateau – Remediate Remaining Outer Area Contaminated Soil Sites (200-OA-1, 200-CW-1, and 200-CW-3 OUs)
	<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>An interim ROD, ESD, and action memoranda are in place to remove contaminated soil, structures, and debris with disposal at ERDF. Future cleanup decisions for remaining soil sites will be included in decision documents (e.g., action memoranda, RODs).</p> <ul style="list-style-type: none"> • <u>EPA/ROD/R10-99/039</u>, 1999, <i>Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2009a</u>, <i>Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>DOE/RL-2009-48</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 11 Waste Sites in 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-37</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-86</u>, 2010, <i>Action Memorandum for Non-Time-Critical Removal Action for 37 Waste Sites in the 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

Range of Plausible Alternatives	
<ul style="list-style-type: none"> • RTD contaminated soil sites to achieve RAOs comparable to 100 Areas; backfill, contour, and revegetate excavations. • RTD all sites except ponds; allow monitored natural attenuation for large pond sites with presence of existing vegetated soil covers. • Allow monitored natural attenuation to proceed for all sites with appropriate institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>	
CLEANUP ACTION:	CP-3 Central Plateau – Disposition Below-Grade Portions of Plutonium Finishing Plant
Cleanup Decision Summary and Relevant Decision Documents	
<p>A non-time critical Action Memorandum is in place, associated TPA milestone decision documents are approved, and D4 activities are being completed for above-grade structures of PFP. Final decisions and cleanup actions have not been made for below-grade structures/contaminated areas and are not identified in the Action Memorandum.</p> <ul style="list-style-type: none"> • <u>DOE/RL-2005-13</u>, 2005, <i>Action Memorandum for the Plutonium Finishing Plant, Above-Grade Structures Non-Time Critical Removal Action</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • Evaluate below-grade portions for residual contamination; leave remaining below-grade structures and contaminated areas in-place and transition to LTS with appropriate institutional controls. • RTD all PFP below-grade structures and contaminated areas; backfill and revegetate. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>	
CLEANUP ACTION:	CP-4 Central Plateau – Disposition B Plant Canyon Building/Associated Waste Sites (200-CB-1 OU)
Cleanup Decision Summary and Relevant Decision Documents	
<p>Several action memoranda are in place to remove contaminated soil, structures, and debris from waste sites with disposal at ERDF. Future cleanup decisions for remaining buildings and waste sites will be included in decision documents (e.g., action memoranda, RODs).</p> <ul style="list-style-type: none"> • <u>DOE/RL-2009-48</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 11 Waste Sites in 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-37</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-86</u>, 2010, <i>Action Memorandum for Non-Time-Critical Removal Action for 37 Waste Sites in the 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • Remove all contents and D4 B Plant Canyon Building, including below-grade foundation; remove all contaminated materials, associated waste sites, and contaminated soils to achieve RAOs; dispose all wastes and debris at approved facility. • Condition contents for placement in spaces below canyon deck level; stabilize and fill voids; remove contaminated wastes and soils from associated waste sites and dispose at approved facility; partially demolish building to canyon deck level; place engineered barrier over demolished structure; maintain institutional controls and perform post-closure monitoring and caretaking. • Condition contents, retrieve associated waste site contaminated soils and debris, and place in B Plant Canyon for entombment; stabilize and fill voids; surround with clean fill and place an engineered barrier over the canyon building; maintain institutional controls and perform post-closure monitoring and caretaking. • Same as preceding (entombment) alternative, with addition of disposal capability to allow receipt of wastes from cleanup activities. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>	

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

CLEANUP ACTION:	CP-5 Central Plateau – Disposition PUREX Canyon Building/Associated Waste Sites (200-CP-1 OU)
<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>Several action memoranda are in place to remove contaminated soil, structures, and debris from waste sites with disposal at ERDF. Future cleanup decisions for remaining buildings and waste sites will be included in decision documents (e.g., action memoranda, RODs).</p> <ul style="list-style-type: none"> • <u>DOE/RL-2009-48</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 11 Waste Sites in 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-37</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-86</u>, 2010, <i>Action Memorandum for Non-Time-Critical Removal Action for 37 Waste Sites in the 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. 	
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Remove all contents and D4 PUREX Canyon Building including below-grade foundation; remove all contaminated materials, associated waste sites and contaminated soils to achieve RAOs; dispose all wastes and debris at approved facility. • Condition contents to place in spaces below canyon deck level; stabilize and fill voids; remove contaminated wastes and soils from associated waste sites and dispose at approved facility; partially demolish building to canyon deck level; place engineered barrier over demolished structure; maintain institutional controls and perform post-closure monitoring and caretaking. • Condition contents, retrieve associated waste site contaminated soils and debris, and place in PUREX Canyon for entombment; stabilize and fill voids; surround with clean fill and place an engineered barrier over the canyon building; maintain institutional controls and perform post-closure monitoring and caretaking. • Same as preceding (entombment) alternative, with addition of disposal capability to allow receipt of wastes from cleanup activities. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p> <p>Note: Cleanup decisions affecting disposition of the PUREX Canyon Building/associated waste sites and disposition of PUREX Storage Tunnels should be aligned and cleanup actions should be coordinated and integrated as much as practical.</p>	
CLEANUP ACTION:	CP-6 Central Plateau – Disposition PUREX Storage Tunnels (200-CP-1 OU)
<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>No cleanup decisions have been made for the PUREX Storage Tunnels.</p> <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Maintain safe storage, perform hazardous waste facility closure consistent with RCRA Permit, remediate radionuclides consistent with CERCLA, and conduct post-closure monitoring. • Stabilize waste and prepare tunnels for in-place disposal, install barrier, perform post-closure care and transition to LTS. • Remove and dispose waste and contaminated equipment from tunnels, evaluate tunnels for residual contamination; if needed, remediate tunnels consistent with 200 East Inner Area contaminated soil sites. 	
<p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p> <p>Note: Cleanup decisions affecting disposition of PUREX Storage Tunnels and disposition of PUREX Canyon Building/associated waste sites should be aligned and cleanup actions should be coordinated and integrated as much as practical.</p>	

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

CLEANUP ACTION:	CP-7 Central Plateau – Disposition REDOX Canyon Building/Associated Waste Sites (200-CR-1 OU)
	<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>Several action memoranda are in place to remove contaminated soil, structures, and debris from waste sites with disposal at ERDF. Future cleanup decisions for remaining buildings and waste sites will be included in decision documents (e.g., action memoranda, RODs).</p> <ul style="list-style-type: none"> • <u>DOE/RL-2009-48</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 11 Waste Sites in 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-37</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-86</u>, 2010, <i>Action Memorandum for Non-Time-Critical Removal Action for 37 Waste Sites in the 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
	<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Remove all contents and D4 REDOX Canyon Building including below-grade foundation; remove all contaminated materials, associated waste sites and contaminated soil to achieve RAOs; dispose all waste and debris at approved facility. • Condition contents for placement in spaces below canyon deck level; stabilize and fill voids; remove contaminated waste and soil from associated waste sites and dispose at approved facility; partially demolish building to canyon deck level; place engineered barrier over demolished structure; maintain institutional controls and perform post-closure monitoring and caretaking. • Condition contents, retrieve associated waste site contaminated soil and debris, and place in REDOX Canyon for entombment; stabilize and fill voids; surround with clean fill and place an engineered barrier over the canyon building; maintain institutional controls and perform post-closure monitoring and caretaking. • Same as preceding (entombment) alternative, with addition of disposal capability to allow receipt of wastes from cleanup activities. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>
CLEANUP ACTION:	CP-8 Central Plateau – Disposition T Plant Canyon Building/Associated Waste Sites
	<p>Cleanup Decision Summary and Relevant Decision Documents</p> <p>No cleanup decisions have been made for the T Plant Canyon Building and Associated Waste Sites. Current expectations are that T Plant will continue to be used to support other remediation and waste management work.</p> <ul style="list-style-type: none"> • TBD – No decision documents currently available.
	<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Continue ongoing operations until 2036; transition to D4 in 2038; fulfill hazardous waste facility closure obligations consistent with RCRA permit. • Remove all contents and D4 T Plant Canyon Building including below-grade foundation; remove all contaminated materials, associated waste sites and contaminated soil to achieve RAOs; dispose all waste and debris at approved facility. • Condition contents for placement in spaces below canyon deck level; stabilize and fill voids; remove contaminated wastes and soils from associated waste sites and dispose at approved facility; partially demolish building to canyon deck level; place engineered barrier over demolished structure; maintain institutional controls and perform post-closure monitoring and caretaking. • Condition contents, retrieve associated waste site contaminated soil and debris, and place in T Plant Canyon for entombment; stabilize and fill voids; surround with clean fill and place an engineered barrier over the canyon building; maintain institutional controls and perform post-closure monitoring and caretaking. • Same as preceding (entombment) alternative, with addition of disposal capability to allow receipt of waste from cleanup activities. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

CLEANUP ACTION:	CP-9 Central Plateau – Disposition Cesium/Strontium Capsules
<p>Cleanup Decision Summary and Relevant Decision Documents No cleanup decisions have been made for final disposition of the cesium/strontium capsules. Decisions have been deferred to future decision-making processes.</p> <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Package and transport capsules from WESF to dry storage; store capsules pending final disposition; direct dispose of capsules at a geologic repository. • Incorporate capsules into immobilized high-level waste glass at WTP. • Store capsules at Hanford for 300 years (approximately 10 half-lives); after natural decay, direct dispose of capsules as mixed low-level radioactive waste. 	
CLEANUP ACTION:	CP-10 Central Plateau – Remediate 200-SW-1 OU*
<p>Cleanup Decision Summary and Relevant Decision Documents No cleanup decisions have been made for the 200-SW-1 OU.</p> <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
<p>Range of Plausible Alternatives The following alternatives are being considered as part of <u>DOE/EA-1707D, Environmental Assessment Closure of Nonradioactive Dangerous Waste Landfill (NRDWL) and Solid Waste Landfill (SWL)</u>; these alternatives are not intended to presume the outcome of the ongoing environmental assessment process:</p> <ul style="list-style-type: none"> • Install an evapotranspiration barrier over both landfills; upgrade monitoring and infrastructure systems; perform post-closure monitoring and caretaking. • Partial RTD with removal of waste material from both landfills and impacted soil as deep as 10 feet below the waste material; backfill and revegetate; if necessary (e.g., contaminated residues remain), perform post-closure monitoring and caretaking. • Remove all waste material from both landfills; excavate and RTD all contaminated soil to groundwater, if necessary; backfill and revegetate. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p> <p>* Includes NRDWL and SWL.</p>	
CLEANUP ACTION:	CP-11 Central Plateau – Disposition Remaining Liquid Waste Disposal Facilities*
<p>Cleanup Decision Summary and Relevant Decision Documents No cleanup decisions have been made for the Remaining Liquid Waste Disposal Facilities. TBD – No decision documents currently available.</p>	
<p>Range of Plausible Alternatives</p> <ul style="list-style-type: none"> • Closure of facilities will be according to approved operating plans and closure plans. • If needed, may remediate contaminated soil under zone closure; may include partial RTD with various capping alternatives; monitoring and institutional controls after closure may be required. • RTD all contaminated soil; backfill and revegetate. • Allow monitored natural attenuation to proceed under LTS with appropriate institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p> <p>* Includes State-Approved Land Disposal Site; State Waste Discharge Permit Sites; 100-N Sewage Lagoon; onsite Sewage Systems; National Pollutant Discharge Elimination System Outfalls; and Underground Injection Control Well Sites.</p>	

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

CLEANUP ACTION:	CP-12 Central Plateau – Disposition Remaining Waste Treatment, Storage and Disposal Facilities*
Cleanup Decision Summary and Relevant Decision Documents No cleanup decisions have been made for the Remaining Waste Treatment, Storage and Disposal Facilities. <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
Range of Plausible Alternatives <ul style="list-style-type: none"> • Closure of facilities will be according to approved operating plans and closure plans (e.g., RCRA Closure Plans); consequently, cleanup actions will be determined and accomplished in accordance with applicable regulatory and permit/license requirements. No other alternatives are being considered. * Includes LERF/ETF, WESF, WRAP, 222-S Laboratory, IDF, and Inert Waste Landfill/Pit 9.	
CLEANUP ACTION:	CP-13 Central Plateau – Remediate Pipelines, Pits, Diversion Boxes and Associated Tanks 200-IS-1 OU
Cleanup Decision Summary and Relevant Decision Documents The 200-IS-1 OU waste sites include tanks (except to be included in the Tank Farms), pipelines, pits, diversion boxes, and associated ancillary equipment. Several pipelines are being addressed (in part) per 200-MG-1 removal actions; final remediation decisions will be addressed in RODs; TSD ancillary equipment will be addressed in future RCRA Closure Plan(s); other media may be addressed via CERCLA process. <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
Range of Plausible Alternatives <ul style="list-style-type: none"> • RTD all contaminated equipment, materials, debris and soil to a depth that is determined by the Tri-Party Agencies to be protective of human health and ecological resources (depth TBD); backfill and revegetate. • RTD all contaminated equipment, materials, debris and soil; backfill and revegetate. • Stabilize select equipment in place using technologies yet to be determined. • Leave everything in place; maintain under LTS with appropriate institutional controls. If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.	
CLEANUP ACTION:	CP-14 Central Plateau – Remediate Land Disposal Units (200-SW-2 OU)
Cleanup Decision Summary and Relevant Decision Documents No cleanup decisions have been made to remediate the 200-SW-2 OU. (Note that this OU is not a single contaminated site, but is comprised of a large number of land disposal units.) <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
Range of Plausible Alternatives <ul style="list-style-type: none"> • Excavation, treatment (as necessary), and disposal of all waste from within individual landfills. • Excavation, treatment (as necessary), and disposal of waste from selected sections of individual landfills followed by capping of remaining waste; includes continued cap maintenance and monitoring. • Capping of individual landfills; includes continued cap maintenance and monitoring. • In situ treatment/stabilization (e.g., vitrification or grouting) of portions of individual landfills followed by capping; includes continued cap maintenance and monitoring. If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.	
CLEANUP ACTION:	CP-15 Central Plateau – Remediate Remaining 200 West Inner Area Contaminated Soil Sites (200-WA-1 OU)
Cleanup Decision Summary and Relevant Decision Documents Several action memoranda are in place to remove contaminated soil, structures, and debris from 200 West Inner Area soil sites with disposal at ERDF. Future cleanup decisions for remaining waste sites will be included in decision documents (e.g., action memoranda, RODs). <ul style="list-style-type: none"> • <u>DOE/RL-2009-37</u>, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • <u>DOE/RL-2009-86</u>, 2010, <i>Action Memorandum for Non-Time-Critical Removal Action for 37 Waste Sites in the 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. 	

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

Range of Plausible Alternatives	
<ul style="list-style-type: none"> • RTD approximately half of waste sites and cap remainder. • RTD all waste sites; backfill and revegetate. • Cap and maintain under LTS with monitoring and appropriate institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>	
CLEANUP ACTION:	CP-16 Central Plateau – Remediate Remaining 200 East Inner Area Contaminated Soil Sites (200-EA-1 OU)
Cleanup Decision Summary and Relevant Decision Documents	
<p>Several action memoranda are in place to remove contaminated soil, structures, and debris from 200 East Inner Area soil sites with disposal at ERDF. Future cleanup decisions for remaining waste sites will be included in decision documents (e.g., action memoranda, RODs).</p> <ul style="list-style-type: none"> • DOE/RL-2009-37, 2009, <i>Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. • DOE/RL-2009-86, 2010, <i>Action Memorandum for Non-Time-Critical Removal Action for 37 Waste Sites in the 200-MG-1 Operable Unit</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • RTD approximately half of waste sites and cap remainder. • RTD all waste sites; backfill and revegetate. • Cap and maintain under LTS with monitoring and appropriate institutional controls. <p>If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.</p>	
CLEANUP ACTION:	CP-17 Central Plateau – Disposition Fast Flux Test Facility (FFTF) Complex
Cleanup Decision Summary and Relevant Decision Documents	
<p>In 1995, DOE determined FFTF would be deactivated. Other decisions have been deferred to future decision-making processes.</p> <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
Range of Plausible Alternatives	
<p>The following reflect alternatives considered as part of DOE/EIS-0391, <i>Final Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS)</i>; these alternatives are not intended to presume the outcome of the environmental impact decision process:</p> <ul style="list-style-type: none"> • Entombment – Consolidate buildings and waste, compact, and fill void spaces in the reactor containment building and contaminated ancillary buildings; install a landfill barrier over remaining structures and extend as needed to cover contaminated below-grade portions. • Removal – Remove contaminated equipment and structures; reduce above-grade portions of reactor containment building and ancillary buildings to slab-on-grade; backfill with soil, compact and stabilize remaining below-grade portions; contour and revegetate. • Remove and treat remote-handled special components onsite or at INL; dispose treated components at IDF or Nevada Test Site. • Store sodium; convert to caustic sodium hydroxide solution onsite or at INL; reuse caustic sodium hydroxide solution for tank corrosion control or processing tank waste at WTP. • Leave structures in place with inert gas blanket for sodium residuals; transition to LTS with appropriate institutional controls. 	
CLEANUP ACTION:	CP-18 Central Plateau – Disposition Remaining Buildings and Facilities in FFTF Complex
Cleanup Decision Summary and Relevant Decision Documents	
<p>In 1995, DOE determined FFTF would be deactivated. Other decisions have been deferred to future decision-making processes.</p> <ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • D4 all buildings per appropriate Removal Action Work Plan; if needed, remediate below-grade portions. • Leave structures in place and transition to LTS with appropriate institutional controls. 	

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

CLEANUP ACTION:	CP-19 Central Plateau –Disposition Remaining Inner Area Buildings And Facilities
Cleanup Decision Summary and Relevant Decision Documents	
Cleanup decisions have been made for D&D of some of the Remaining Inner Area Buildings and Facilities, and the applicable Action Memorandum is expected to cover future D&D activities. DOE considers D&D of buildings and other structures to be final cleanup decisions if all regulated contaminants have been removed in accordance with an applicable Action Memorandum. Alternatives do not need to be considered where such D&D has been completed. (Note that cleanup decisions have been or will be made for the Canyon Buildings and Associated Waste Sites; see separate cleanup actions for these facilities.)	
<ul style="list-style-type: none"> • <u>DOE/RL-2010-22</u>, 2010, <i>Action Memorandum for General Hanford Site Decommissioning Activities</i>, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • D4 all buildings and facilities to slab-on-grade; evaluate below-grade portions for residual contamination; if needed, remediate below-grade portions consistent with contiguous contaminated soil sites. • Leave structures in place and transition to LTS with appropriate institutional controls. 	
CLEANUP ACTION:	CP-20 Central Plateau – Remediate Contaminated Deep Vadose Zone (200-DV-1 OU)
Cleanup Decision Summary and Relevant Decision Documents	
No cleanup decisions have been made for the Deep Vadose Zone.	
<ul style="list-style-type: none"> • TBD – No decision documents currently available. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> • Implement results of treatability testing in accordance with CERCLA and/or RCRA final decisions. • RTD all contaminated soils, to groundwater if necessary and technically practical; backfill and revegetate. • In place treatment to destroy, immobilize, or capture, treat and dispose contaminants. • Soil flushing with P&T or pore water removal. • Install surface barriers. • Allow monitored natural attenuation to proceed under LTS with appropriate institutional controls. 	
CLEANUP ACTION:	CP-21 Central Plateau – Restore 200 West Groundwater To Beneficial Use (200-UP-1 OU)
Cleanup Decision Summary and Relevant Decision Documents	
An interim ROD for 200-UP-1 OU was issued in September 2012 that superseded the previous remedy decisions for this OU and a final ROD is in place for the 200-ZP-1 OU to address all contaminants.	
<ul style="list-style-type: none"> • <u>EPA, 2012</u>, <i>Record of Decision for Interim Remedial Action Hanford 200 Area Superfund Site, 200-UP-1 Operable Unit</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-95/114</u>, 1995, <i>Declaration of the Interim Record of Decision for the 200-ZP-1 Operable Unit</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA/ROD/R10-97/048</u>, 1997, <i>Declaration of the Record of Decision, USDOE Hanford 200-UP-1 Operable Unit, 200 Area, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2009c</u>, <i>Explanation of Significant Differences for the Interim Action Record of Decision for the 200-UP-1 Groundwater Operable Unit, Hanford Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>EPA, 2008</u>, <i>Record of Decision Hanford 200 Area 200-ZP-1 Superfund Site, Benton County, Washington</i>, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. • <u>WAC 173-340</u>, “Model Toxics Control Act -- Cleanup,” <i>Washington Administrative Code</i>, Olympia, Washington. <ul style="list-style-type: none"> – <u>WAC 173-340-720</u>, “Groundwater Cleanup Standards.” 	

Table B-3. Summary of Future Cleanup Actions and Plausible Alternatives – Central Plateau. (9 pages)

Range of Plausible Alternatives	
<ul style="list-style-type: none"> Expand 200-ZP-1 extraction, treatment and injection capacity; install extraction and transfer system for 200-UP-1; operate P&T system to achieve RAOs; continue monitoring. Allow monitored natural attenuation to proceed under LTS with appropriate institutional controls. Hydraulic containment of the iodine-129 groundwater plume. Groundwater monitoring and institutional controls. 	
CLEANUP ACTION:	CP-22 Central Plateau – Restore 200 East Groundwater to Beneficial Use (200-PO-1/200-BP-5 OUs)
Cleanup Decision Summary and Relevant Decision Documents	
No cleanup decisions have been made for 200 East Groundwater.	
<ul style="list-style-type: none"> <u>WAC 173-340</u>, “Model Toxics Control Act -- Cleanup,” <i>Washington Administrative Code</i>, Olympia, Washington. <ul style="list-style-type: none"> – <u>WAC 173-340-720</u>, “Groundwater Cleanup Standards.” 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> Install P&T system for 200-BP-5 OU; implement monitored natural attenuation for 200-PO-1 OU; perform well support and maintenance activities. Allow monitored natural attenuation to proceed under LTS with appropriate institutional controls. Install P&T system for 200-BP-5 and selective P&T for 200-PO-1 hot spots. 	
Note: 400 Area groundwater cleanup actions are included as part of 200-PO-1 OU.	
CERCLA=	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980.</i>
D&D	= decontamination and decommissioning.
D4	= deactivation, decontamination, decommissioning, and demolition.
DOE	= U.S. Department of Energy.
ERDF	= Environmental Restoration Disposal Facility.
ESD	= explanation of significant difference.
ETF	= Effluent Treatment Facility.
FFTF	= Fast Flux Test Facility.
IDF	= Integrated Disposal Facility.
INL	= Idaho National Laboratory.
LERF	= Liquid Effluent Retention Facility.
LTS	= long-term stewardship.
NRDWL	= Nonradioactive Dangerous Waste Landfill.
OU	= operable unit.
P&T	= pump-and-treat.
PFP	= Plutonium Finishing Plant.
PUREX	= Plutonium-Uranium Extraction (Plant).
RAO	= remedial action objective.
RCRA	= <i>Resource Conservation and Recovery Act of 1976.</i>
REDOX	= reduction-oxidation.
ROD	= record of decision.
RTD	= remove, treat, and dispose.
SWL	= solid waste landfill.
TBD	= to be determined.
TPA	= Tri-Party Agreement.
TSD	= treatment, storage, and disposal.
WAC	= Washington Administrative Code.
WESF	= Waste Encapsulation and Storage Facility.
WRAP	= Waste Receiving and Processing Plant.
WTP	= Waste Treatment and Immobilization Plant.

Table B-4. Summary of Future Cleanup Actions and Plausible Alternatives – Tank Waste. (2 pages)

CLEANUP ACTION:	TW-1 Tank Waste – Tank Retrieval and Single-Shell Tank Farm Closure
Cleanup Decision Summary and Relevant Decision Documents	
In the February 26, 1997 <i>Federal Register</i> , DOE decided to retrieve and treat tank waste (62 FR 8693). Further decisions have been deferred to future decision-making processes.	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> Retrieve SST wastes (assumes two retrieval technologies) to meet milestones in the Consent Decree (DOE and Ecology, 2010); achieve designated retrieval objectives or limits of technology; remediate structures and soil and install cover/cap to meet closure performance standards; maintain post-closure care and monitoring consistent with RCRA Permit. 	
The following reflect alternatives considered as part of the TC&WM EIS (DOE/EIS-0391); these alternatives are not intended to presume the outcome of the environmental impact decision process:	
<ul style="list-style-type: none"> Grout, cap and close SSTs with residual waste in place; monitor and implement institutional controls after closure; eventual transition to LTS. Construct new DST capacity sufficient to complete SST retrieval; close SSTs and implement post-closure care, monitoring, and institutional controls; eventual transition to LTS. RTD some SSTs and ancillary facilities, residual waste, and contaminated soils; backfill and revegetate. 	
If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.	
CLEANUP ACTION:	TW-2 Tank Waste – Tank Waste Treatment
Cleanup Decision Summary and Relevant Decision Documents	
In the February 26, 1997 <i>Federal Register</i> , DOE decided to retrieve, separate, vitrify, and dispose the tank waste (62 FR 8693). The ILAW would be prepared for onsite disposal and the vitrified HLW would be placed in interim storage pending future disposal at a national geologic repository. Further decisions have been deferred to future decision-making processes.	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> Pretreat, condition and immobilize tank wastes in the WTP to meet TPA milestones and comply with RCRA Permit; operate supplemental treatment systems (assumed to be second LAW) to augment WTP capacity; place immobilized waste in canisters; transfer ILAW for disposal at the IDF; provide capacity to store all immobilized HLW in Hanford Shipping Facility or Interim Hanford Storage Facility (new) until a final repository is available. Perform blending and waste characterization at a new Enhanced Waste Receiving Facility. 	
CLEANUP ACTION:	TW-3 Tank Waste – Secondary Waste Treatment
Cleanup Decision Summary and Relevant Decision Documents	
No cleanup decisions have been made. Decisions have been deferred to future decision-making processes.	
<ul style="list-style-type: none"> TBD – No decision documents currently available. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> Recycle liquid waste streams in WTP; manage residual liquid waste at LERF/ETF/SALDS; treat solid waste from WTP and ETF and dispose at IDF; manage and disposition other secondary waste (e.g., failed melters). 	
Other plausible alternatives will be determined at a later date.	
Note: Any radioactive HLW will be stored and eventually shipped to a geologic repository.	
CLEANUP ACTION:	TW-4 Tank Waste – Double-Shell Tank Closure
Cleanup Decision Summary and Relevant Decision Documents	
No cleanup decisions have been made. Decisions have been deferred to future decision-making processes.	

Table B-4. Summary of Future Cleanup Actions and Plausible Alternatives – Tank Waste. (2 pages)

Range of Plausible Alternatives	
<ul style="list-style-type: none"> Retrieve DST wastes consistent with TPA; achieve designated retrieval objectives or limits of technology; remediate structures and soil and install cover/cap to meet closure performance standards; maintain post-closure care and monitoring consistent with RCRA Permit. RTD DSTs and ancillary facilities, residual waste, and contaminated soil; backfill and revegetate. Stabilize, cap and close DSTs with residual waste in place; monitor and implement institutional controls after closure; eventual transition to LTS. 	
If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.	
CLEANUP ACTION:	TW-5 Tank Waste – WTP Closure
Cleanup Decision Summary and Relevant Decision Documents	
<p>The RCRA Hanford Dangerous Waste Permit, Operable Unit-10, Chapter 11 states “Clean closure is the goal for the WTP. The closure plan will be revised if efforts to achieve the clean closure standards for the WTP structures or soil are unsuccessful. The “modified closure” approach may be followed if feasible, as provided in Condition II.K.3 of the Hanford RCRA Permit. It also may be closed as a landfill, as provided in Condition II.K.4 of the Hanford RCRA Permit, if the clean closure standards are not technically or economically feasible. The revised closure plan will be accompanied by a written request for modification of the permit.” Further decisions have been deferred to future decision-making processes.</p> <ul style="list-style-type: none"> WA7890008967, 2013, <i>Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste</i>, Washington State Department of Ecology, Nuclear Waste Program, Richland, Washington, September 30. 	
Range of Plausible Alternatives	
<ul style="list-style-type: none"> Demolish ancillary facilities/structures to the primary containment structure; seal containment structure and construct a soil-based environmental barrier over the containment structure; remediate structures and soils; maintain post-closure care and monitoring consistent with RCRA Permit. D4 all buildings and facilities to slab-on-grade; evaluate below-grade portions for residual contamination; if needed, remediate below-grade portions. Perform clean closure of WTP and all ancillary facilities/structures. Leave structures in place and transition to LTS with appropriate institutional controls. 	
If residual contamination remains after cleanup actions are completed, cleanup work will transition to LTS, including institutional controls and 5-year reviews of remedy effectiveness.	
D4 = deactivation, decontamination, decommissioning, and demolition.	LTS = long-term stewardship.
DOE = U.S. Department of Energy.	RCRA = <i>Resource Conservation and Recovery Act of 1976</i> .
DST = double-shell tank.	RTD = remove, treat, and dispose.
ETF = Effluent Treatment Facility.	SALDS = State-Approved Land Disposal Site.
HLW = high-level waste.	SST = single-shell tank.
IDF = Integrated Disposal Facility.	TBD = to be determined.
ILAW = immobilized low-activity waste.	TC&WM EIS = Tank Closure and Waste Management Environmental Impact Statement.
LAW = low-activity waste.	TPA = Tri-Party Agreement.
LERF = Liquid Effluent Retention Facility.	WTP = Waste Treatment and Immobilization Plant.

B.2.2 DOE’S APPROACH FOR ANALYZING ALTERNATIVES AND DESCRIBING THE REASONABLE UPPER BOUND

TPA Milestone M-036-01 refers to a “reasonable upper bound” with respect to presenting information about cleanup alternatives, but the milestone does not include a ready definition for “reasonable upper bound.” To ensure the LCR provides information that meets the requirement and intent of the milestone, DOE has relied on a conceptual framework as described in the 2013 LCR (Appendix A, Section A.2.2).

B.3 RATIONALE FOR ANNUAL SELECTION OF FUTURE CLEANUP ACTIONS TO BE ANALYZED

DOE will consider recommendations from EPA and Ecology, government-to-government consultations (e.g., Tribal Nations, Oregon), Hanford Advisory Board advice, input from Hanford stakeholders, and public comments received on previous LCRs selecting the future cleanup actions to be analyzed in the LCR. Additional details regarding the rationale used to select the future cleanup actions to be analyzed in the LCR are described in the prior 2013 LCR (Appendix A, Section A.3).

B.4 COMPLETED CLEANUP ACTION ALTERNATIVES

The cleanup actions that have been analyzed in-depth in LCRs are summarized in Table B-5. For details about the cost estimate alternative analysis of any of these cleanup actions, see the specific LCR referenced in Table B-5.

Table B-5. Summary of Completed Cleanup Action Alternatives. (2 pages)

2011 HANFORD LIFECYCLE SCOPE, SCHEDULE AND COST REPORT (DOE/RL-2010-25)		
Cleanup Action	Cost Estimate Alternative Analysis (Million \$)	Final Decision Reference
River Corridor–Disposition 100 Area Reactors	Reactors Remain in Place - \$0 Remove Reactors - \$676	Record of Decision; Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, WA (58 FR 48509)
Central Plateau–Remediate 200-SW-2 OU	Barriers - \$823 Remove, Treat, Dispose of Waste - \$16,614	TBD
2012 HANFORD LIFECYCLE SCOPE, SCHEDULE AND COST REPORT (DOE/RL-2011-93)		
Cleanup Action	Cost Estimate Alternative Analysis (Million \$)	Final Decision Reference
Tank Waste Cleanup Action– Tank Retrieval and Single-Shell Tank Farm Closure	1 – Baseline Case - \$59,900 2 – TRU Waste to WTP - \$61,600 3 – FBSR for supplemental treatment - \$58,100 4 – WTP delay with +10% vitrification capacity - \$66,000	TBD
Tank Waste Cleanup Action– Tank Waste Treatment	5 – 2020 Vision One System - \$58,000 6 – WTP delay with new DST farm - \$68,700 7 – Enhanced tank waste strategy - \$57,300 8 – Accelerated SST retrievals - \$62,800 9 – Early U Farm closure - \$59,600 10 – Slow SST retrievals - \$60,800	TBD
Tank Waste Cleanup Action– Secondary Waste Treatment		TBD
2013 HANFORD LIFECYCLE SCOPE, SCHEDULE AND COST REPORT (DOE/RL-2012-13)		
Cleanup Action	Cost Estimate Alternative Analysis (Million \$)	Final Decision Reference
Central Plateau–Remediate Remaining Outer Area Contaminated Soil Sites (200- OA-1, 200-CW-1, and 200-CW-3 OUs)	The DOE planning case cleanup remedies for the 190 waste sites evaluated includes: RTD - \$98.3 CSNA - \$4.9 MESC/MNA/IC - \$3.2 IBAR - \$19.2 <u>ABAR - \$19.8</u> Total - \$145.4	TBD
Central Plateau–Remediate Remaining 200 West Inner Area Contaminated Soil Sites (200- WA-1 OU)		TBD

Table B-5. Summary of Completed Cleanup Action Alternatives. (2 pages)

2014 HANFORD LIFECYCLE SCOPE, SCHEDULE AND COST REPORT (DOE/RL-2013-02)		
Cleanup Action	Cleanup Action	Cleanup Action
None selected for 2014	N/A	N/A
ABAR = aggregate barrier.	MNA = monitored natural attenuation.	
CSNA = confirmatory sampling to support no further cleanup action.	N/A = not applicable.	
DOE = U.S. Department of Energy.	OU = operable unit.	
DST = double-shell tank.	RTD = remove, treat and dispose.	
FBSR = fluidized bed steam reformer.	SST = single-shell tank.	
IBAR = individual barrier.	TBD = to be determined.	
IC = institutional controls.	TRU = transuranic.	
MESC = maintain existing soil cover.	WTP = Waste Treatment and Immobilization Plant.	

Considering the criteria described above and cleanup actions analyzed in previous LCRs, DOE developed an anticipated schedule for performing in-depth analyses of plausible alternatives for each future cleanup action currently remaining at Hanford. Table B-6 presents this schedule along with an explanation of the rationale for analyzing alternatives in the recommended LCR year.

Table B-6. Anticipated Schedule for Detailed Analyses of Future Cleanup Action Alternatives. (3 pages)

Cleanup Action	Alternative
<ul style="list-style-type: none"> • Central Plateau–Disposition B Plant Canyon Building/Associated Waste Sites (200-CB-1 OU) • Central Plateau–Disposition PUREX Canyon Building/Associated Waste Sites (200-CP-1 OU) • Central Plateau–Remediate Contaminated Deep Vadose Zone (200-DV-1 OU) 	Based on new TPA milestones for these canyon facilities, it is unlikely that extensive evaluation of alternatives will have been performed yet (e.g., in feasibility studies). It may be reasonable to develop alternatives in the 2015 LCR that could benefit future planning and budget requests.
<ul style="list-style-type: none"> • Central Plateau–Restore 200 East Groundwater to Beneficial Use (200-PO-1/200-BP-5 OUs) 	TPA Milestone M-015-21A requires FS/proposed plan submittal by June 30, 2015. May be reasonable to develop alternatives in the 2015 LCR to benefit future planning and budget requests.
<ul style="list-style-type: none"> • Central Plateau– Remediate Pipelines, Pits, Diversion Boxes and Associated Tanks (200-IS-1 OU) • Central Plateau–Remediate Remaining 200 East Inner Area Contaminated Soil Sites (200-EA-1 OU) 	Waste sites to be included in 200-IS-1/200-EA-1 OUs are subject to TPA negotiations that are expected to be resolved in the 2013 timeframe. CERCLA/RCRA decision document submittals are scheduled by December 31, 2016 (TPA Milestone M-015-92B). Analyzing potential alternatives in the 2015 LCR or later could provide information to help inform the decision process.
<ul style="list-style-type: none"> • Central Plateau–Disposition Below-Grade Portions of PFP • Central Plateau–Remediate 200-SW-1 OU 	Cleanup is proceeding with existing decisions (e.g., interim ROD, Action Memorandum, RCRA interim status/final permit) and reflected in current planning documents. Final decisions could be made within 1-2 years of 2015 timeframe and are expected to be compatible with interim decisions. Prior to developing the 2015 LCR, decide whether alternatives should be analyzed based on status of final cleanup decision making.
<ul style="list-style-type: none"> • River Corridor–Disposition 100 Area former orchard contaminated soil sites (100-OL-1 OU) 	TPA Milestone M-015-95 requires RI/FS work plan submittal by April 30, 2013. May be reasonable to develop alternatives in the 2015 LCR that could benefit future planning and budget requests.
<ul style="list-style-type: none"> • Central Plateau–Disposition FFTF Complex 	It is expected that the TC&WM EIS (DOE/EIS-0391) and final ROD will address decisions related to this cleanup action before cleanup must begin. If, instead, cleanup decisions have not been made, it may be timely to reassess whether the FFTF cleanup action could be analyzed.

Table B-6. Anticipated Schedule for Detailed Analyses of Future Cleanup Action Alternatives. (3 pages)

Cleanup Action	Alternative
<ul style="list-style-type: none"> Central Plateau–Disposition REDOX Canyon Building/Associated Waste Sites (200-CR-1 OU) 	TPA Milestone M-085-30A requires RI/FS work plan submittal by December 31, 2017. May be reasonable to develop alternatives after 2015 that may benefit future planning/budget requests.
<ul style="list-style-type: none"> Central Plateau–Disposition Cesium/Strontium Capsules 	TPA Milestone M-092-05 requires DOE to determine a disposition path and establish interim milestones for the cesium/strontium capsules by June 30, 2017. Capsules are in safe storage; no immediate action is required. Other activities will provide data and potential problem resolutions that will enhance considering alternatives for management/disposition of the cesium/strontium capsules. Prior to the 2017 LCR, decide if alternatives would benefit future planning/budget requests.
<ul style="list-style-type: none"> Central Plateau–Restore 200 West Groundwater to Beneficial Use (200-UP-1 OU) 	An interim action ROD was issued in September 2012 that superseded the previous 200-UP-1 OU decisions. Deferral to after 2015 would allow final decisions to be made and coincide with subsequent CERCLA 5-year review.
<ul style="list-style-type: none"> River Corridor–Disposition 300 Area Facilities Retained by PNNL 	Facilities will be maintained operational by PNNL until 2023, which is the assumed date to start closure and disposition of the facilities. Earlier analysis of alternatives would be premature and not needed for out-year budget planning.
<ul style="list-style-type: none"> Central Plateau (Outer Area)–Disposition Remaining Outer Area Buildings and Facilities (200-OA-1 OU) 	The few remaining structures in the Outer Area do not present imminent or significant threats to health or environment. Cleanup actions are likely to be non-controversial and focused on RTD, with scope, schedule and cost accounted for in planning documents. Analysis of alternatives before 2016 is not likely to contribute useful information for out-year budget planning.
<ul style="list-style-type: none"> Central Plateau–Disposition PUREX Storage Tunnels (200-CP-1 OU) 	TPA Milestone M-085-20A requires DOE to submit an RI/FS Work Plan for the 200-CP-1 OU by September 30, 2015. Prior to development of the 2017 LCR, decide whether development of alternatives would benefit future planning and budget requests.
<ul style="list-style-type: none"> Central Plateau–Disposition T Plant Canyon Building/Associated Waste Sites Central Plateau–Disposition Remaining Liquid Waste Disposal Facilities Central Plateau–Disposition Remaining Waste Treatment, Storage and Disposal Facilities 	These facility operations are integral to the long-term cleanup mission and will continue well after 2020. Any likely cleanup actions are not expected for at least 20+ years in the future so earlier analyses would be premature and not needed before 2018 for out-year budget planning.
<ul style="list-style-type: none"> Central Plateau–Disposition Remaining Buildings and Facilities Within FFTF Complex Central Plateau–Disposition Any Remaining Inner Area Buildings and Facilities 	Continuing with the current planning bases and uncertainties is sufficient for health and environmental protection and scope and budget planning before 2018. Information about conditions after other cleanup actions have occurred (e.g., disposition of FFTF) would be insufficient for useful analyses. It would be premature to analyze alternatives for cleanup actions before the 2018 LCR.
<ul style="list-style-type: none"> Tank Waste–Double-Shell Tank Closure Tank Waste–WTP Closure 	DST closure is not expected to begin before 2034 and WTP closure before 2050. No imminent or significant health/environmental concerns were identified that need to be addressed. Earlier planning and budget development would be unnecessary and not account credibly for future decisions and conditions.
CLEANUP ACTIONS FOR WHICH ALTERNATIVES WOULD NOT BE ANALYZED	
River Corridor–B Reactor Preservation - B Reactor is designated a National Historic Landmark so no cleanup actions are anticipated. Minor conditioning/maintenance activities will be performed consistent with National Park Service decision making under the <i>National Environmental Policy Act</i> (42 USC 4321) and/or <i>National Historic Preservation Act</i> (16 USC 470).	

Table B-6. Anticipated Schedule for Detailed Analyses of Future Cleanup Action Alternatives. (3 pages)

Cleanup Action	Alternative
River Corridor-Disposition Remaining 100 Area Buildings/Facilities and Disposition Remaining 300 Area Buildings/Facilities (except facilities retained for use by PNNL) - Although cleanup actions are ongoing for these buildings/facilities, excess buildings/facilities in the 100 and 300 Areas are expected to undergo D&D according to applicable action memoranda. DOE considers D&D of buildings/structures to be final cleanup decisions if all regulated contaminants are removed in accordance with an Action Memorandum so alternatives do not need to be analyzed.	
River Corridor-Remediate Remaining Contaminated Sites Within Hanford Reach National Monument - National Monument remediation is being implemented to fulfill obligations under a Presidential Proclamation that establishes a <i>de facto</i> final decision. RTD and decontamination in the Monument areas are expected to be substantially complete by 2012 (some residual cleanup in the 100 Area portions of the Monument will be addressed after 2012).	
River Corridor - Disposition 100 Area K West Basin River Corridor - Remediate 100 Area Contaminated Soil Sites River Corridor - Restore 100-BC-5 Groundwater OU to Beneficial Use River Corridor - Restore 100-KR-4 Groundwater OU to Beneficial Use River Corridor - Restore 100-NR-2 Groundwater OU to Beneficial Use River Corridor - Restore 100-HR-3 Groundwater OU to Beneficial Use River Corridor - Restore 100-FR-3 Groundwater OU to Beneficial Use	
The Tri-Party Agencies agreed that for cleanup actions close to having final decisions there would be little value in presenting cost estimate alternatives analysis in the LCR. Since the 100 Area K West Basin clean up action was limited to only one alternative (Table B-2) the agencies agreed to remove it from the alternatives analysis in the LCR.	
Central Plateau-Disposition U Plant (Canyon Building/Associated Waste Sites) - U Plant remediation was approved according to a CERCLA Final ROD. If performed, further analysis of alternatives should be done as part of the process under which the current final cleanup decisions were made.	
Central Plateau-Manage ERDF - ERDF was approved according to a CERCLA Final ROD and closure and post-closure care are part of the operating documentation. Alternatives need not be analyzed, unless future decisions are made that modify the current final ERDF decisions.	
CERCLA= <i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980.</i>	PFP = Plutonium Finishing Plant.
D&D = decontamination and decommissioning.	PNNL = Pacific Northwest National Laboratory.
DOE = U.S. Department of Energy.	PUREX = Plutonium-Uranium Extraction (Plant).
DST = double-shell tank.	RCRA = <i>Resource Conservation and Recovery Act of 1976.</i>
ERDF = Environmental Restoration Disposal Facility.	REDOX = Reduction-Oxidation (Facility).
FFTF = Fast Flux Test Facility.	RI/FS = remedial investigation/feasibility study.
FS = feasibility study.	ROD = record of decision.
LCR = Lifecycle Report.	RTD = remove, treat, and dispose.
OU = operable unit.	TPA = Tri-Party Agreement.
	WTP = Waste Treatment and Immobilization Plant.

B.5 REFERENCES

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APPENDIX C

HANFORD ESTIMATED SCHEDULE AND COST STATUS

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TERMS

BOF	Balance of Facilities
CCP	Central Characterization Project
CENRTC	capital equipment not related to construction
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CH	contact-handled
CSB	Canister Storage Building
CVDF	Cold Vacuum Drying Facility
CWC	Central Waste Complex
D&D	decontamination and decommissioning
D4	deactivation, decontamination, decommissioning, and demolition
DOE	U.S. Department of Energy
DST	double-shell tank
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ESH&Q	environmental safety, health and quality
ETF	Effluent Treatment Facility
FFTF	Fast Flux Test Facility
FY	fiscal year
G&A	general and administrative
GM	groundwater monitoring
GRP	Groundwater Remediation Project
GSSC	General Support Services Contract
HAMMER	Hazardous Materials Management and Emergency Response (Facility); also known as the Volpentest HAMMER Training and Education Center
HLW	high-level waste
IDF	Integrated Disposal Facility
IFW	Integrated Field Work
ISA	Interim Storage Area
ISS	interim safe storage
KE	K East Basin
KW	K West Basin
LAW	low-activity waste
LCR	Lifecycle Report
LDR	land disposal restriction
LERF	Liquid Effluent Retention Facility
LLBG	low-level burial ground
LOE	level of effort
LTS	Long-Term Stewardship
MLLW	mixed low-level waste
MSC	Mission Support Contract
MS/GS	Mission Support/General Support
NEPA	<i>National Environmental Policy Act</i>

NM	nuclear material
O&M	operations and maintenance
OHC	Other Hanford Contractor
ORP	U.S. Department of Energy, Office of River Protection
NRDWL	non-radioactive dangerous waste landfill
OSHA	Occupational Safety and Health Administration
OU	operable unit
PA	performance assessment
PBS	project baseline summary
PFP	Plutonium Finishing Plant
PRC	Plateau Remediation Contract
PT	pretreatment
PUREX	Plutonium Uranium Extraction (Plant)
RH	remote-handled
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
REA	request for equitable adjustment
REDOX	Reduction-Oxidation Facility (S Plant)
RL	U.S. Department of Energy, Richland Operations Office
ROD	record of decision
RTD	remove, treat, and dispose
S&M	surveillance and maintenance
SAP	Service Assessment Pool
SIF	slightly irradiated fuel
SNF	spent nuclear fuel
SST	single-shell tank
STSC	Sludge Transfer Storage Container
SWOC	Solid Waste Operations Complex
TEDF	Treated Effluent Disposal Facility
TOC	Tank Operations Contract
TPA	Tri-Party Agreement
TRU	transuranic
TSD	treatment, storage, and disposal
UBS	usage-based services
WAC	<i>Washington Administrative Code</i>
WCH	Washington Closure Hanford
WIPP	Waste Isolation Pilot Plant
WESF	Waste Encapsulation and Storage Facility
WRAP	Waste Receiving and Processing (Facility)
WSCF	Waste Sampling and Characterization Facility
WTP	Waste Treatment and Immobilization Plant

APPENDIX C

HANFORD ESTIMATED SCHEDULE AND COST STATUS

As directed in the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989), also referred to as the Tri-Party Agreement (TPA)¹, Milestone M-036-01, additional schedule and cost details are provided in appendices to the *Hanford Lifecycle Scope, Schedule and Cost Report* (Lifecycle Report [LCR]). The schedules and costs are provided by project baseline summary (PBS) and reflect the scope discussed in Chapters 3.0 through 6.0 of the LCR, additional scope information is provided in this appendix in summary form.

The schedules and costs provided in this appendix are reported to Level 2 for the entire lifecycle and to Level 3 for the execution year (fiscal year [FY] 2014) and a period of approximately 5 more years. Due to the complexity of the Level 3 schedules, the information is reported in table format with costs by year. The start and finish of each Level 3 work element is reflected by the initial and final years that include costs. Information for each PBS is provided in the following subsections as a series of tables:

- A scope table that summarizes the Level 3 work elements. In some instances, the scope descriptions have been developed only to Level 2. In these cases, the information has been presented in the main chapters of the report and is not repeated here. These PBSs are identified in the appropriate subsections.
- A cost and schedule table for the remaining lifecycle is presented at Level 2 by fiscal year. The costs are escalated and include site-wide service allocations and cost and/or schedule uncertainty (also referred to as contingency in the Waste Treatment and Immobilization Plant [WTP] PBS). Costs are presented from FY2014 through the final year of the lifecycle for all PBSs. PBS RL-LTS extends from FY2060 through FY2090.
- A near-term cost and schedule table at Level 3 by fiscal year that extends for about 5 years.

Risk management is an essential function of project management. Cost and schedule uncertainty are included in the development of the Total Project Cost and the approved U.S. Department of Energy (DOE) planning case. Information provided in this LCR includes estimates for both cost and schedule uncertainty based on risk analysis methods that comply with DOE guidelines and orders. These estimates are identified as “cost and/or schedule uncertainty” in the tables in this appendix. Additional information about uncertainty and project risk is included in Section 1.7.2.

C.1 RICHLAND OPERATIONS OFFICE PROJECT BASELINE SUMMARY INFORMATION

The DOE, Richland Operations Office (RL) manages their assigned cleanup mission through the following PBSs (at Level 1):

- Nuclear Materials Stabilization and Disposition–PFP, PBS RL-0011
- SNF Stabilization and Disposition, PBS RL-0012

¹ Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, as amended.

- Solid Waste Stabilization and Disposition–200 Area, PBS RL-0013C
- Safeguards and Security, PBS RL-0020
- Soil and Water Remediation–Groundwater/Vadose Zone, PBS RL-0030
- Nuclear Facility D&D–Remainder of Hanford, PBS RL-0040.01.1
- Infrastructure and Services, PBS RL-0040.01.2
- Nuclear Facility D&D–River Corridor Cleanup Project, PBS RL-0041
- Nuclear Facility D&D–Fast Flux Test Facility Project, PBS RL-0042
- Richland Community and Regulatory Support, PBS RL-0100
- Long-Term Stewardship, PBS RL-LTS
- Final Reactor Disposition.

C.1.1 NM STABILIZATION AND DISPOSITION–PFP (PBS RL-0011) SCHEDULE AND COST DETAILS

Table C-1. NM Stabilization and Disposition–PFP (PBS RL-0011) Level 3 Scope Summary.

Level 2 Work Element	Level 3 Work Element	Scope Summary
Maintain Safe and Compliant PFP	Maintain Safe and Compliant PFP	Provides safety, emergency management, OSHA, fire protection programs, environmental management and administration, permitting, NEPA support, ensures the facility configuration minimizes risks, protects the environment, and remains in a safe and compliant condition, provides resources to manage and implement the PFP maintenance program, and provides special projects to safely sustain required facility capabilities.
Disposition PFP Facility	Disposition PFP Facility	Addresses progressive deactivation and dismantling of systems, components, and structures in compliance with CERCLA process and resulting in established criteria (i.e., clean-slab-on-grade). Activities include necessary maintenance during D&D and activities to maintain temporary safe configurations.
Project Management and Support	Project Management and Support	Provides for management functions, including management and technical/engineering support to the project mission.
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Table C-18 for details.
UBS Distributions	Assessments for Mission Support Contract Services	Includes services that are charged based on predetermined rates, and services directly charged to OHCs. Examples of UBS with predetermined rates include: Training, Reproduction, Waste Sampling and Characterization Facility Laboratory Sample Analysis, Crane and Rigging, Fleet Maintenance, Desktop and User Services, and Telecommunications. Examples of UBS charged to OHCs include: Janitorial, Facility Services, and Motor Carrier Services.
UBS, G&A, and Direct Distribution	Fee and Management Reserve	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor.
<p>NOTE: See Tables C-2 and C-3 for schedule and budget information.</p> <p>CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i> OHS = Other Hanford Contractors. D&D = decontamination and decommissioning. NM = nuclear materials. G&A = General & Administrative. PFP = Plutonium Finishing Plant. NEPA = <i>National Environmental Policy Act.</i> RL = U.S. Department of Energy, Richland Operations Office. UBS = usage-based services.</p>		

Table C-2. NM Stabilization and Disposition–PFP (PBS RL-0011) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	Total
Maintain Safe and Compliant PFP	31,044	35,566	15,120	0	0	0	0	81,730
Disposition PFP Facility	68,526	147,225	172,127	51,087	26,518	23,311	23,043	511,837
Project Management and Support	8,838	10,066	4,197	0	0	0	0	23,101
Site-wide Services	29,289	27,522	22,253	7,363	3,226	3,107	3,517	96,277
UBS Distributions	3,307	3,693	2,284	6	0	0	0	9,290
UBS, G&A, and Direct Distribution	6,037	6,187	11,305	8,018	0	0	0	31,547
Total	147,041	230,259	227,286	66,474	29,744	26,418	26,560	753,782
G&A = general and administrative. PBS = project baseline summary. PFP = Plutonium Finishing Plant. UBS = usage-based services.								

Table C-3. NM Stabilization and Disposition–PFP (PBS RL-0011) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
1	NM Stabilization and Disposition – PFP							
2	Maintain Safe and Compliant PFP	31,044	35,566	15,120	0	0	0	81,730
3	Maintain Safe and Compliant	31,044	30,651	14,648	0	0	0	76,343
3	Cost and/or Schedule Uncertainty	0	4,915	472	0	0	0	5,387
2	Disposition PFP Facility	68,526	147,225	172,127	51,087	26,518	23,311	488,794
3	Disposition PFP Facility	68,526	68,213	68,305	1,429	0	0	206,473
3	Cost and/or Schedule Uncertainty	0	79,012	103,822	49,658	26,518	23,311	282,321
2	Project Management and Support	8,838	10,066	4,197	0	0	0	23,101
3	Project Management & Support	8,838	8,782	4,061	0	0	0	21,681
3	Cost and/or Schedule Uncertainty	0	1,284	136	0	0	0	1,420
2	Site-wide Services	29,289	27,522	22,253	7,363	3,226	3,107	92,790
3	Site-wide Services	29,289	27,522	22,253	7,363	3,226	3,107	92,790
2	UBS Distributions	3,307	3,693	2,284	6	0	0	9,290
3	Assessments for MSC Services to PRC	3,307	3,357	2,247	6	0	0	8,917
3	Cost and/or Schedule Uncertainty - UBS Distributions	0	336	37	0	0	0	374

Table C-3. NM Stabilization and Disposition–PFP (PBS RL-0011) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
2	UBS G&A, Direct Distribution	6,037	6,187	11,305	8,018	0	0	31,547
3	Fee and Management Reserve	6,037	6,187	11,305	8,018	0	0	31,547
Total		147,041	230,259	227,286	66,474	29,744	26,418	727,222
G&A = general and administrative. MSC = Mission Support Contract. PBS = project baseline summary.		PFP = Plutonium Finishing Plant. PRC = Plateau Remediation Contract. UBS = usage-based services.						

C.1.2 SNF STABILIZATION AND DISPOSITION (PBS RL-0012) SCHEDULE AND COST DETAILS

Table C-4. SNF Stabilization and Disposition (PBS RL-0012) Level 3 Scope Summary. (2 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary
Program Management	100-K Area Project Management	Provide overarching project management for 100-K Area work activities.
K Basins Operations and Maintenance	KW Basin	Provide operations support to keep KW Basin in a safe and compliant mode until finish of dewatering and turnover to D&D; includes support to preventative maintenance, operation of equipment, system walk downs, daily routines, management oversight, review and approve work package, and safety inspections.
Facility Operations	100-K Facility Operations and Support	Provide infrastructure maintenance support for non-reactor buildings (e.g., janitorial services, project support, direct supervision, sampling support, corrective maintenance, modifications); includes activities to operate all support facilities required to maintain KW Basin safe and compliant, including operation of water plant and all potable water services; routine surveillance, sampling, maintenance support in compliance with state and federal drinking water requirements; operation of facilities, including auxiliary systems (boilers; compressor; heating, ventilation, and air conditioning units; fire systems, etc.) at KE, KW, and CVDF; and management of the National Pollution Discharge Environmental System at 100-K Area; also provides for field operations for waste handling support for waste flows not specific to sludge treatment and D&D, including waste characterization and designation, planning, preparation of waste management plans, waste area operations, and shipment documentation and coordination.
Sludge Treatment Project	Management and Support	Provides for project management; engineering; training; safety and health support activities; dose data gathering and analysis, sampling, and characterization of radioactive and hazardous waste; baseline management; and updating waste volume projections.
	Process Containerized Sludge	Includes designing/testing a system to retrieve, package, and transport sludge stored in engineered containers in KW Basin to an interim storage facility on the Central Plateau; procuring Containerized Sludge Retrieval and transportation system; modifications to existing 105 KW Facility and construction of a new facility, including installing all equipment necessary in the KW Facility and the new Annex; readiness and startup activities; retrieving sludge from the engineered containers in KW Basin, loading sludge into STSC, transporting the STSCs to T Plant, receiving the STSCs at T Plant and placing into interim storage; nuclear safety support; containerized sludge testing; sludge sampling and analysis; performing sludge treatment and packaging; T Plant modifications including project management, clear deck as required and cleanout cells, modify additional cells, and update safety documentation.
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Table C-18 for details.
RL Directed Activities	GSSC Support, Other	GSSC support includes contracted technical services in key areas such as audit, regulatory analysis and estimating. Other activities include mission critical support services to DOE and its contractors in key areas such as land transfers, acquisition and contract closeout, acquisition of natural gas utility services, energy conservation and management (including steam), natural resource trusteeship, Tribal Nations support, and other small contracts.

Table C-4. SNF Stabilization and Disposition (PBS RL-0012) Level 3 Scope Summary. (2 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary		
UBS Distributions	Assessments for Mission Support Contract Services	Includes services that are charged based on predetermined rates, and services that are directly charged to OHC. Examples of USBs with predetermined rates include: Training, Reproduction, WSCF Laboratory Sample Analysis, Crane and Rigging, Fleet Maintenance, Desktop and User Services, and Telecommunications. Examples of USBs that are directly charged to OHCs include: Janitorial, Facility Services, and Motor Carrier Services.		
UBS G&A, Direct Distribution	Fee and Management Reserve	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor.		
<p>NOTE: See Tables C-5 and C-6 for schedule and budget information.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> CVDF = Cold Vacuum Drying Facility. D&D = decontamination and decommissioning. G&A = General & Administrative. GSSC = General Support Services Contract. KE = K East. KW = K West. </td> <td style="width: 50%; border: none;"> OHC = Other Hanford Contractor. PBS = project baseline summary. STSC = Sludge Transfer Storage Container. UBS = usage-based services. WSCF = Waste Sampling and Characterization Facility. </td> </tr> </table>			CVDF = Cold Vacuum Drying Facility. D&D = decontamination and decommissioning. G&A = General & Administrative. GSSC = General Support Services Contract. KE = K East. KW = K West.	OHC = Other Hanford Contractor. PBS = project baseline summary. STSC = Sludge Transfer Storage Container. UBS = usage-based services. WSCF = Waste Sampling and Characterization Facility.
CVDF = Cold Vacuum Drying Facility. D&D = decontamination and decommissioning. G&A = General & Administrative. GSSC = General Support Services Contract. KE = K East. KW = K West.	OHC = Other Hanford Contractor. PBS = project baseline summary. STSC = Sludge Transfer Storage Container. UBS = usage-based services. WSCF = Waste Sampling and Characterization Facility.			

Table C-5. SNF Stabilization and Disposition (PBS RL-0012) Remaining Lifecycle Schedule and Costs, Level 2 by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2014	2015	2016	2017	2018	Total
Program Management	2,507	2,774	2,829	2,987	2,972	14,069
K Basins Operations and Maintenance	7,766	9,451	17,622	18,850	0	53,689
Facility Operations	8,686	9,687	11,105	12,437	10,382	52,297
Sludge Treatment Project	27,075	67,680	93,970	91,863	0	280,588
Site-wide Services	12,874	13,114	0	0	0	25,988
RL Directed Activities	512	1,249	1,288	0	0	3,049
Usage-Based Services Distributions	2,050	2,241	2,217	2,346	2,337	11,191
Usage-Based Services, General & Administrative, and Direct Distribution	3,521	4,047	8,300	6,440	545	22,583
Total	64,991	110,243	137,331	134,923	16,236	463,724

Table C-6. SNF Stabilization and Disposition (PBS RL-0012) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	Total
1	NF Stabilization and Disposition						
2	Program Management	2,507	2,774	2,829	2,987	2,972	14,069
3	100K Area Project Management	2,507	2,521	2,703	2,923	2,972	13,627
3	Cost and/or Schedule Uncertainty	0	253	126	64	0	443
2	K Basins Operations and Maintenance	7,766	9,451	17,622	18,850	0	53,689
3	KW Basin	7,766	8,102	16,993	18,538	0	51,399
3	Cost and/or Schedule Uncertainty	0	1,349	629	312	0	2,290
2	Facility Operations	8,686	9,687	11,105	12,437	10,382	52,297
3	100K Facility Operations & Support	8,686	8,772	10,774	12,215	10,382	50,829
3	Cost and/or Schedule Uncertainty	0	915	331	222	0	1,467
2	Sludge Treatment Project	27,075	67,680	93,970	91,863	0	280,588
3	Management and Support	3,132	7,472	12,116	13,289	0	36,009
3	Process Containerized Sludge	23,943	60,208	81,854	78,574	0	244,578
2	Site-wide Services	12,874	13,114	0	0	0	25,988
3	Site-wide Services	12,874	13,114	0	0	0	25,988

Table C-6. SNF Stabilization and Disposition (PBS RL-0012) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	Total
2	RL Directed Activities	512	1,249	1,288	0	0	3,049
3	GSSC Support	512	811	850	0	0	2,173
3	Other	0	438	438	0	0	876
2	UBS Distributions	2,050	2,241	2,217	2,346	2,337	11,191
3	Assessments for MSC Services to PRC	2,050	2,061	2,125	2,299	2,337	10,872
3	Cost and/or Schedule Uncertainty	0	180	92	47	0	319
2	UBS, G&A, and Direct Distribution	3,521	4,047	8,300	6,440	545	22,853
3	Fee and Management Reserve	3,521	4,047	8,300	6,440	545	22,852
Total		64,991	110,243	137,331	134,923	16,236	463,724
GSSC = General Support Services Contract.		MSC = Mission Support Contract.					
G&A = general and administrative.		PRC = Plateau Remediation Contract.					
KW = K West.		UBS = usage-based services.					
PBS = project baseline summary.							

C.1.3 SOLID WASTE STABILIZATION AND DISPOSITION–200 AREA (PBS RL-0013C) SCHEDULE AND COST DETAILS

**Table C-7. Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) Level 3 Scope Summary.
(4 pages)**

Level 2 Work Element	Level 3 Work Element	Scope Summary
Project Management	Project Management	Provides for overall management function in support of the waste management mission.
Capsule Storage and Disposition	WESF Base Operations	Includes activities to safely store cesium/strontium capsules in the WESF pool cells, operate and maintain WESF facilities and associated waste sites, structures, operating systems and equipment, and monitoring systems within the authorization envelope, prepare and package waste streams for disposition as required, dispose as appropriate, and maintain systems necessary for environmental compliance, radiological control, personnel safety and capsule integrity.
	Transition WESF	Provides for the WESF operating crews to transition the facility to a condition ready for D&D after transfer of the capsules and facility shutdown.
	Cesium/Strontium Capsule Disposition	Includes retrieval of cesium/strontium capsules from WESF pool cells and packaging, transportation, and placement of capsules into dry storage. Provides for construction, including contracting/construction management oversight, and operations and maintenance of the interim dry storage area.
Canister Storage Building (CSB)	Canister Storage Building	Includes activities to safely store SNF (primarily from K Basins) and immobilized high-level waste from WTP, while awaiting final disposition at a national repository. Includes operation and maintenance of CSB facilities and associated structures, operating systems and equipment, and monitoring systems. Also includes various corrective maintenance tasks, facility modifications, or capital projects necessary to continue safe, cost-effective, and compliant operations throughout the operating life of the facility.
Mixed Low-Level Waste (MLLW) Treatment	Tri-Party Agreement Milestone M-91-42 (MLLW)	Prepare M-91-42 MLLW packages in aboveground storage at SWOC facilities (including Waste Retrieval Project) for treatment, as required to meet regulatory requirements. Includes management of offsite commercial MLLW treatment/disposal contracts and receipt of MLLW packages into the Onsite Mixed Waste Disposal Trenches for disposal once treatment has been completed and the packages have been determined to be LDR compliant. Development of alternative methods for treatment and disposal of orphan waste may include LDR variance approvals, expanding commercial treatment facilities permit limits and construction and operation of additional onsite treatment capabilities.
	M-91-43 (MLLW)	Prepare large MLLW containers and RH packages in aboveground storage at SWOC facilities or retrieved from the LLBGs for treatment, as required to meet regulatory requirements. Includes management of offsite commercial MLLW treatment contracts, as well as the receipt of MLLW packages into the onsite Mixed Waste Disposal Trenches for disposal once the treatment has been completed and the package determined to be LDR compliant.
	Other Treatment Activities	Includes the identification and disposition of LLW packages in aboveground storage at SWOC facilities to meet rad waste storage compliance requirements. Disposition of these containers includes onsite and offsite processing and/or treatment activities. As such, this scope also includes management of offsite commercial contracts. Includes final disposition of the processed containers (e.g., management of receipt into appropriate disposal facility).
	MLLW Project Management	Includes management and maintenance of the MLLW treatment and disposal project as well as the management of offsite commercial MLLW treatment/disposal contracts. It also includes the receipt of MLLW packages into the Onsite Mixed Waste Disposal Trenches for disposal once the treatment has been completed and the packages have been determined to be LDR compliant.

**Table C-7. Solid Waste Stabilization and Disposition—200 Area (PBS RL-0013C) Level 3 Scope Summary.
(4 pages)**

Level 2 Work Element	Level 3 Work Element	Scope Summary
TRU Retrieval	CH Waste Retrieval Operations	Provides for retrieval, designation, and transfer to a TSD facility of CH suspect TRU waste from LLBGs 218-W-4C, 218-W-4B, 218-E-12B, and 218-W-3B.
	RH Waste Retrieval Operations	Provides for retrieval, designation, and transfer to a TSD facility of RH suspect TRU waste from LLBGs 218-W-4C, 218-W-4B, 218-E-12B, and 218-W-3B.
TRU Repackaging	TRU Repackaging	Provides for WIPP production, TRU repacking operations at T Plant and WRAP, TRU program support for repack, and RH/large packaging capabilities. It includes staffing, contracts and consumables directly related to operations.
Waste Receiving and Processing Facility (WRAP)	WRAP Base Operations	Provides for operations and maintenance of the WRAP facility to support shipping and receiving activities associated with WIPP shipments.
	WRAP Transition	Following operations, WRAP will be transitioned to a condition ready for D&D.
	WRAP Min Safe Operations	Provides for surveillance and maintenance of structures, systems, components, and processes to ensure operation within the approved safety and compliance requirements envelope, including preventive maintenance, repair of failed and malfunctioning equipment, walkdown of safety systems, equipment, and facility grounds (operational surveillance); and routine radiological surveys during non-operational period and during TRU package transporter only operational period.
T Plant	T Plant Base Operations	Provides for services necessary to maintain the T Plant Complex in a ready-to-serve status (base operations) for waste processing operations.
	T Plant Upgrades	Provides for upgrades to waste processing equipment, systems components, and computer interface equipment, including physical upgrades to T Plant Facility.
	T Plant Transition	Following operations, T Plant will be transitioned to a condition ready for D&D.
Central Waste Complex (CWC)	CWC	Provides for services necessary to maintain CWC in a ready-to-serve status (base operations) for interim storage of LLW, MLLW, TRU waste and waste receipts from RL approved generators.
	CWC CENRTC	Provides for CENRTC that may be required to maintain CWC in a ready-to-operate condition, includes procurement of forklifts and other equipment necessary to maintain compliant facility operations for CWC, LLBG, and Mixed Waste Trenches.
	CWC Transition	Following operations, CWC will be transitioned to a condition ready for D&D.
	Low-Level Waste Burial Grounds (LLBG)	Provides for the operation of the LLBGs in a safe, compliant, and cost-effective manner, including activities such as emergency preparedness, assessments and surveillances, environmental monitoring and sampling, fire protection, engineering, and training.
Environmental Restoration Disposal Facility (ERDF)	ERDF Cell Expansion	Provides for expansion of ERDF as needed to support site cleanup efforts.
	ERDF Interim Cover	Provides for interim covers to be placed over ERDF cells as they are filled.
	ERDF Operations	Includes ERDF operations-related activities, such as leachate pump preventive maintenance, pump replacement, and air monitoring. Disposal and transportation costs are not included here, but are included for each PBSs generating waste.

Table C-7. Solid Waste Stabilization and Disposition—200 Area (PBS RL-0013C) Level 3 Scope Summary.
(4 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary
Liquid Effluent Facilities	200 Area Liquid Effluent Facilities Base Operations	Provides for safe, cost-effective, and environmentally compliant operation and maintenance of the LERF, ETF, and TEDF, and includes receiving, storing, treating, and disposing of liquid effluents from Hanford Site cleanup activities.
	200 Area Liquid Effluent Facilities Upgrades	Provides for modifications to ETF, TEDF and LERF to improve operations, extend useful life, ensure regulatory compliance, and/or correct identified deficiencies.
	300 Area Liquid Effluent Facilities Base Operations	Provides for maintenance of the 300 Area TEDF (310 TEDF) until it is transferred to decommissioning activities, surveillance and maintenance of the 340 Waste Handling Facility (340 Facility) until it is transferred to decommissioning activities, and operation of the 310 Retention/Transfer System which receives, samples, and disposes of liquid effluents generated in the 300 Area to the city of Richland sewer system.
Integrated Disposal Facility (IDF)	IDF Operations	Provides for operation of IDF in a safe, compliant and cost-effective manner, including emergency preparedness; assessments and surveillances; environmental monitoring and sampling; fire protection; engineering; and training.
	IDF Regulatory and Safety	Includes safety oversight and Industrial Safety, such as assist in review of documents for safety impacts, perform safety surveillances, inspections and support, assist in maintenance of the Health and Safety Plan, and update baseline hazards assessments; includes regulatory support, such as performance assessment, associated permit modifications, and other requirements (e.g., operational readiness reviews) needed for the existing IDF to be in “ready-to-serve” status.
	IDF-East Construction	Provides for additional onsite, expandable, integrated, disposal capacity for compliant immobilized low-activity waste stream packages produced at WTP and for MLLW and LLW; includes project management, permitting and safety, project support, and engineering, procurement, and construction.
Solid Waste Base Operations	Solid Waste Ready to Serve	Provides for the minimum staffing to maintain a viable waste management program and to capture those waste support activities that are essentially fixed cost in nature.
TRU Disposition	Central Characterization Project (CCP) Support	Provides resources to develop and maintain an interface with Hanford Site generators and CCP to perform TRU Certification activities. Includes support for generators of TRU waste to define CH and RH waste volumes and packaging requirements and resources to perform WIPP closeout activities to the current Hanford WIPP Program.
	Establish Shipping Capability	Includes modifications to an existing CWC 2404 series structure to provide an additional or alternative CH shipping capabilities and establishing RH shipping capabilities, including all capital funded activities.
	TRU Shipping	Provides for the WRAP facility to support TRU waste characterization in support of the CCP, including staffing, overtime and consumables directly related to providing waste containers and operating equipment under the guidance or control of CCP.
Spent Nuclear Fuel (SNF) Disposition	Fuel Prep Facility	Includes design, construction and turnover to operations of a Fuel Preparation Facility to repackage fuel stored at the 200 Area ISA into DOE Standard Canisters that satisfy repository acceptance requirements. The facility will include a shielded hot cell and remote welding capabilities.
	Offsite SNF Disposition	Includes activities to facilitate final disposition of Hanford SNF inventories at a National Repository including compliance document review, technical and programmatic interface with the National SNF and Office of Civilian Radioactive Waste Management, SNF data package compliance, and planning for SNF disposition.

Table C-7. Solid Waste Stabilization and Disposition–200 Area (PBS RL-0013C) Level 3 Scope Summary.
(4 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary																														
	Consolidate Slightly Irradiated Fuel at ISA	Includes the care and custody of all slightly irradiated fuel and special nuclear material stored at the 200 Area ISA until such time as final disposition to a National Repository is complete.																														
Mixed Waste Disposal Trenches	Mixed Waste Disposal Trenches Base Operations	Provides for the operation of the Mixed Waste Disposal Trenches in a safe, compliant, and cost-effective manner, including activities such as emergency preparedness; assessments and surveillances; environmental monitoring and sampling; fire protection; engineering; and training.																														
	Mixed Waste Disposal Trenches Upgrades	Provides for the design, construction, and other activities necessary to add operational layers in the Mixed Waste Disposal Trenches to maintain their ready-to-serve status and for placing temporary caps on the trenches prior to turnover to PBS RL-0040.01.1 for final cleanup and closure.																														
Sludge Disposition	Sludge Disposition	Includes activities to stabilize and package sludge from 105 KW Basin for final disposition to WIPP or other disposal facilities, including Phase 2 treatment and packaging, shutdown and deactivation of needed equipment, and management and support.																														
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Table C-18 for details.																														
RL Directed Activities	GSSC Support, Other	GSSC support includes contracted technical services in key areas such as audit, regulatory analysis, cost and risk analysis and estimating. Other activities include mission critical support services to DOE and its contractors in key areas such as land transfers, acquisition and contract closeout, acquisition of natural gas utility services, energy conservation and management (including steam), natural resource trusteeship, Tribal Nation support, and other small contracts.																														
UBS Distributions	Assessments for Mission Support Contract Services, Assessments for other provided services	Includes services that are charged based on predetermined rates, and services that are directly charged to OHCs. Examples of UBSs with predetermined rates are: Training, Reproduction, Waste Sampling and Characterization Facility Laboratory Sample Analysis, Crane and Rigging, Fleet Maintenance, Desktop and User Services, and Telecommunications. Examples of UBSs that are directly charged to OHCs include: Janitorial, Facility Services, and Motor Carrier Services.																														
UBS, G&A, Direct Distribution	Fee and Management Reserve, Allocated Pensions, G&A Allocations	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor. Allocated pensions are for the multi-employer pension plan for the contractor work force. General and administrative costs are allocated to the project.																														
NOTE: See Tables C-8 and C-9 for schedule and budget information.																																
<table> <tbody> <tr> <td>CCP = Central Characterization Project.</td> <td>LLW = low-level waste.</td> </tr> <tr> <td>CENRTC = capital equipment not related to construction.</td> <td>MLLW = mixed low-level waste.</td> </tr> <tr> <td>CH = contact-handled.</td> <td>OHC = Other Hanford Contractors.</td> </tr> <tr> <td>CSB = Canister Storage Building.</td> <td>PBS = project baseline summary.</td> </tr> <tr> <td>CWC = Central Waste Complex.</td> <td>RH = remote-handled.</td> </tr> <tr> <td>D&D = decontamination and decommissioning.</td> <td>SNF = spent nuclear fuel.</td> </tr> <tr> <td>ERDF = Environmental Restoration Disposal Facility.</td> <td>SWOC = Solid Waste Operations Complex.</td> </tr> <tr> <td>ETF = Effluent Treatment Facility.</td> <td>TEDF = Treated Effluent Disposal Facility.</td> </tr> <tr> <td>G&A = General & Administrative.</td> <td>TRU = transuranic.</td> </tr> <tr> <td>GSSC = General Support Services Contract.</td> <td>TSD = treatment, storage, and disposal.</td> </tr> <tr> <td>IDF = Integrated Disposal Facility.</td> <td>UBS = usage-based services.</td> </tr> <tr> <td>ISA = Interim Storage Area.</td> <td>WESF = Waste Encapsulation Storage Facility.</td> </tr> <tr> <td>LDR = land disposal restriction.</td> <td>WRAP = Waste Receiving and Processing (Facility).</td> </tr> <tr> <td>LERF = Liquid Effluent Retention Facility.</td> <td>WTP = Waste Treatment and Immobilization Plant.</td> </tr> <tr> <td>LLBG = Low-Level Burial Grounds.</td> <td></td> </tr> </tbody> </table>			CCP = Central Characterization Project.	LLW = low-level waste.	CENRTC = capital equipment not related to construction.	MLLW = mixed low-level waste.	CH = contact-handled.	OHC = Other Hanford Contractors.	CSB = Canister Storage Building.	PBS = project baseline summary.	CWC = Central Waste Complex.	RH = remote-handled.	D&D = decontamination and decommissioning.	SNF = spent nuclear fuel.	ERDF = Environmental Restoration Disposal Facility.	SWOC = Solid Waste Operations Complex.	ETF = Effluent Treatment Facility.	TEDF = Treated Effluent Disposal Facility.	G&A = General & Administrative.	TRU = transuranic.	GSSC = General Support Services Contract.	TSD = treatment, storage, and disposal.	IDF = Integrated Disposal Facility.	UBS = usage-based services.	ISA = Interim Storage Area.	WESF = Waste Encapsulation Storage Facility.	LDR = land disposal restriction.	WRAP = Waste Receiving and Processing (Facility).	LERF = Liquid Effluent Retention Facility.	WTP = Waste Treatment and Immobilization Plant.	LLBG = Low-Level Burial Grounds.	
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Table C-8. Solid Waste Stabilization and Disposition –200 Area (PBS RL-0013C) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000 Escalated). (4 pages)

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Project Management	14,010	17,628	18,116	19,238	18,247	16,457	16,917	17,269	17,710	18,090
Capsule Storage and Disposition	6,796	28,025	23,174	46,332	40,852	21,484	16,822	6,161	5,821	15,710
Canister Storage Building	6,837	7,446	7,552	7,768	3,147	4,074	4,167	4,279	4,357	4,434
MLLW Treatment	0	5	12,729	10,550	4,283	361	318	332	341	339
TRU Retrieval	0	1,953	172,997	95,029	67,843	29,528	17,413	2,320	0	0
TRU Repackaging	2,667	1,772	90,798	75,028	38,517	1,828	0	0	0	0
WRAP	3,196	10,346	23,796	12,396	4,228	12,066	9,494	0	0	0
T Plant	9,096	14,442	20,509	20,930	20,444	19,177	13,348	13,617	14,040	14,371
Central Waste Complex	8,762	10,190	10,330	10,286	4,344	7,781	8,005	8,410	8,398	8,632
ERDF	69	1,829	1,457	209	173	2,596	2,660	11,629	2,263	1,263
Liquid Effluent Facilities	23,576	17,396	23,222	26,866	13,346	0	0	0	0	0
Integrated Disposal Facility	332	583	631	845	2,147	2,534	2,471	2,531	2,581	2,644
Solid Waste Base Operations	3,119	3,269	3,291	3,547	3,600	0	0	0	0	0
TRU Disposition	0	23	264	2,736	13,180	31,437	25,469	25,558	24,600	24,474
Spent Nuclear Fuel Disposition	323	417	17,922	34,053	29,898	34,004	25,851	26,354	6,806	3,416
Mixed Waste Disposal Trenches	575	606	629	705	368	3,692	1,928	0	0	0
Sludge Disposition	0	0	0	12,318	156,055	317,159	194,466	14,775	0	0
Site-Wide Services	22,354	16,695	63,049	66,738	72,170	107,386	79,269	27,199	19,512	20,260
RL Directed Activities	0	0	0	1,377	1,389	1,040	618	630	0	0
UBS Distributions	6,780	4,622	7,519	8,388	3,799	2,184	2,350	1,933	2,116	2,316
UBS, G&A, Direct Distribution	3,191	2,841	15,192	12,425	16,582	30,852	44,262	27,245	18,103	18,823
Total	111,683	140,087	513,177	467,764	514,612	645,640	465,828	190,242	126,648	134,772
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Project Management	18,602	19,039	11,850	5,161	5,300	5,383	5,527	5,647	5,837	5,965
Capsule Storage and Disposition	14,822	1,044	137	141	144	364	159	0	0	0
Canister Storage Building	4,528	4,673	4,709	4,832	4,936	5,021	5,174	5,330	5,450	5,559
MLLW Treatment	350	358	388	388	411	397	401	410	429	430
TRU Retrieval	0	0	0	0	0	0	0	0	0	0
TRU Repackaging	0	0	0	0	0	0	0	0	0	0
WRAP	0	0	0	0	0	0	0	0	0	0
T Plant	56,727	67,056	61,764	62,666	64,501	65,575	67,341	69,158	71,059	72,192
Central Waste Complex	8,851	4,533	4,888	4,732	4,874	4,909	5,043	3,263	3,036	3,096
ERDF	1,289	1,322	1,349	1,378	1,407	3,020	106	109	114	115

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Table C-8. Solid Waste Stabilization and Disposition –200 Area (PBS RL-0013C) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000 Escalated). (4 pages)

Liquid Effluent Facilities	0	0	0	0	0	0	0	0	0	0
Integrated Disposal Facility	4,777	14,500	25,397	7,488	3,030	3,039	3,058	3,186	3,226	3,282
Solid Waste Base Operations	0	0	0	0	0	0	0	0	0	0
TRU Disposition	25,137	25,715	26,307	26,912	27,530	28,052	28,811	28,180	8,890	0
Spent Nuclear Fuel Disposition	3,478	3,547	3,116	3,188	3,286	5,739	5,858	5,993	6,179	6,295
Mixed Waste Disposal Trenches	0	0	0	0	0	0	0	0	0	0
Sludge Disposition	0	0	0	0	0	0	0	0	0	0
Site-Wide Services	35,868	45,042	43,707	38,147	37,470	38,647	35,951	41,782	41,012	34,156
RL Directed Activities	0	0	0	0	0	0	0	0	0	0
UBS Distributions	2,535	2,775	3,037	3,325	3,639	3,983	4,360	4,773	5,224	5,719
UBS, G&A, Direct Distribution	34,834	37,593	37,868	31,569	31,625	33,184	33,291	33,850	33,209	30,682
Total	211,798	227,197	224,517	189,927	188,153	197,313	195,080	201,681	183,665	167,491
Fiscal Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Project Management	6,058	6,214	6,404	6,556	6,707	6,855	6,927	7,162	7,362	7,480
Capsule Storage and Disposition	0	0	0	0	0	0	0	0	0	0
Canister Storage Building	5,615	5,753	7,112	7,939	29	0	0	0	0	0
MLLW	448	450	469	497	508	512	519	533	540	556
TRU Retrieval	0	0	0	0	0	0	0	0	0	0
TRU Repackaging	0	0	0	0	0	0	0	0	0	0
WRAP	0	0	0	0	0	0	0	0	0	0
T Plant	73,641	75,359	77,234	22,032	25,043	4,789	154	0	0	0
Central Waste Complex	3,147	3,551	14,151	0	0	0	0	0	0	0
ERDF	116	125	122	124	128	129	132	138	138	144
Liquid Effluent Facilities	0	0	0	0	0	0	0	0	0	0
Integrated Disposal Facility	3,383	3,473	3,574	3,665	3,687	3,817	3,866	3,981	4,052	4,215
Solid Waste Base Operations	0	0	0	0	0	0	0	0	0	0
TRU Disposition	0	0	0	0	0	0	0	0	0	0
Spent Nuclear Fuel Disposition	6,440	6,588	6,749	13,437	13,824	14,142	14,521	14,743	15,119	62
Mixed Waste Disposal Trenches	0	0	0	0	0	0	0	0	0	0
Sludge Disposition	0	0	0	0	0	0	0	0	0	0
Site-Wide Services	33,085	32,861	28,657	14,901	14,450	8,880	11,238	8,432	8,345	7,695
RL Directed Activities	0	0	0	0	0	0	0	0	0	0
UBS Distributions	6,260	6,852	7,500	8,210	8,987	9,837	10,767	11,786	12,901	14,122
UBS, G&A, Direct Distribution	31,007	32,113	33,124	14,858	14,181	7,044	6,909	6,622	6,680	4,441
Total	169,200	173,339	185,096	92,219	87,544	56,005	55,033	53,397	55,137	38,715

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Table C-8. Solid Waste Stabilization and Disposition –200 Area (PBS RL-0013C) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000 Escalated). (4 pages)

Fiscal Year	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Project Management	7,696	7,822	7,954	8,171	8,410	8,584	8,245	8,467	8,217	8,406
Capsule Storage and Disposition	0	0	0	0	0	0	0	0	0	0
Canister Storage Building	0	0	0	0	0	0	0	0	0	0
MLLW	578	581	608	596	610	622	643	661	0	0
TRU Retrieval	0	0	0	0	0	0	0	0	0	0
TRU Repackaging	0	0	0	0	0	0	0	0	0	0
WRAP	0	0	0	0	0	0	0	0	0	0
T Plant	1,051	3,796	4,362	4,700	3,928	2,106	1,628	526	28	123
Central Waste Complex	0	0	0	0	0	0	0	0	0	0
ERDF	148	148	152	160	3,490	3,501	0	0	0	0
Liquid Effluent Facilities	0	0	0	0	0	0	46,908	42,880	43,935	44,952
Integrated Disposal Facility	4,321	4,310	4,426	4,550	4,669	1,460	1,802	1,974	1,788	1,801
Solid Waste Base Operations	0	0	0	0	0	0	0	0	0	0
TRU Disposition	0	0	0	0	0	0	0	0	0	0
Spent Nuclear Fuel Disposition	0	0	0	0	0	0	0	0	0	0
Mixed Waste Disposal Trenches	0	0	0	0	0	0	0	0	0	0
Sludge Disposition	0	0	0	0	0	0	0	0	0	0
Site-Wide Services	12,073	13,218	13,768	13,529	13,611	11,846	15,152	12,834	14,597	13,455
RL Directed Activities	0	0	0	0	0	0	0	0	0	0
UBS Distributions	15,458	16,920	18,521	20,273	22,191	24,291	26,589	29,105	31,858	34,873
UBS, G&A, Direct Distribution	6,150	7,797	8,010	8,167	9,942	8,906	15,038	13,853	14,865	15,353
Total	47,475	54,592	57,801	60,146	66,851	61,316	116,005	110,300	115,288	118,963
Fiscal Year	2054	2055	2056	2057	2058	Total				
Project Management	5,665	0	0	0	0	417,355				
Capsule Storage and Disposition	0	0	0	0	0	227,988				
Canister Storage Building	0	0	0	0	0	130,720				
MLLW	0	0	0	0	0	43,151				
TRU Retrieval	0	0	0	0	0	387,083				
TRU Repackaging	0	0	0	0	0	210,610				
WRAP	0	0	0	0	0	75,522				
T Plant	0	0	0	0	0	1,118,513				
Central Waste Complex	0	0	0	0	0	153,212				

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Table C-8. Solid Waste Stabilization and Disposition –200 Area (PBS RL-0013C) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000 Escalated). (4 pages)

ERDF	0	0	0	0	0	43,252
Liquid Effluent Facilities	35,692	19,471	12,762	8,346	972	360,324
Integrated Disposal Facility	1,342	1,062	531	158	115	160,304
Solid Waste Base Operations	0	0	0	0	0	16,826
TRU Disposition	0	0	0	0	0	373,275
Spent Nuclear Fuel Disposition	0	0	0	0	0	331,348
Mixed Waste Disposal Trenches	0	0	0	0	0	8,503
Sludge Disposition	0	0	0	0	0	694,773
Site-Wide Services	10,554	2,376	1,672	1,338	179	1,205,160
RL Directed Activities	0	0	0	0	0	5,054
UBS Distributions	38,172	0	0	0	0	456,850
UBS, G&A, Direct Distribution	12,578	7,456	4,940	3,880	515	821,650
Total	104,003	30,365	19,905	13,722	1,781	7,241,473
<p>ERDF = Environmental Restoration Disposal Facility. TRU = transuranic. G&A = general and administrative. UBS = usage-based services. MLLW = Mixed Low-Level Waste. WRAP = Waste Receiving and Processing Facility. PBS = project baseline summary.</p>						

Table C-9. Solid Waste Stabilization and Disposition—200 Area (PBS RL-0013C) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(3 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
1	Solid Waste Stabilization and Disposition—200 Area							
2	Project Management	14,010	17,628	18,116	19,238	18,247	16,457	103,697
3	Project Management	14,010	14,422	15,721	16,928	17,670	15,668	94,420
3	Cost and/or Schedule Uncertainty	0	3,206	2,395	2,310	577	789	9,277
2	Capsule Storage and Disposition	6,796	28,025	23,174	46,332	40,852	21,484	166,664
3	WESF Base Operations	6,796	6,834	7,127	7,620	7,747	4,425	40,548
3	Cesium/Strontium Capsule Disposition	0	4,172	13,703	31,684	32,348	13,547	95,454
3	Cost and/or Schedule Uncertainty	0	17,019	2,344	7,028	757	3,512	30,661
2	Canister Storage Building (CSB)	6,837	7,445	7,552	7,768	3,147	4,074	36,824
3	Canister Storage Building	6,837	6,684	7,270	7,479	2,879	3,750	34,900
3	Cost and/or Schedule Uncertainty	0	761	282	289	268	324	1,924
2	Mixed Low Level Waste Treatment	0	5	12,729	10,550	4,283	361	27,930
3	M-91-42 (MLLW)	0	0	2,934	9,301	3,227	0	15,463
3	M-91-43 (MLLW)	0	0	1,154	3	0	0	1,157
3	Other Treatment Activities	0	0	149	1	0	0	150
3	MLLW Project Management	0	0	926	92	0	301	1,320
3	Cost and/or Schedule Uncertainty	0	5	7,566	1,153	1,056	60	9,840
2	TRU Retrieval	0	1,953	172,997	95,029	67,843	29,528	367,351
3	CH Waste Retrieval Operations	0	0	149,134	60,171	24,786	15,188	249,280
3	RH Waste Retrieval Operations	0	0	22,913	24,889	4,504	0	52,306
3	Cost and/or Schedule Uncertainty	0	1,953	950	9,969	38,553	14,340	65,766
2	TRU Repackaging	2,667	1,772	90,798	75,028	38,517	1,828	210,610
3	TRU Repackaging	2,667	0	87,097	43,942	29,953	0	163,659
3	Cost and/or Schedule Uncertainty	0	1,772	3,701	31,086	8,564	1,828	46,951
2	Waste Receiving and Processing Facility (WRAP)	3,196	10,346	23,796	12,396	4,228	12,066	66,028
3	WRAP Base Operations	0	6,842	6,836	6,993	0	0	20,672
3	WRAP Transition	0	0	0	0	0	11,498	11,498
3	Min-Safe Operation	3,196	2,812	4,831	5,225	3,643	0	19,706
3	Cost and/or Schedule Uncertainty	0	692	12,129	178	585	568	14,152
2	T-Plant	9,096	14,442	20,509	20,930	20,444	19,177	104,598
3	T-Plant Base Operations	9,096	12,048	14,822	15,647	9,482	17,234	78,329
3	T-Plant Upgrades	0	1,004	3,817	3,555	8,781	0	17,157
3	Cost and/or Schedule Uncertainty	0	1,390	1,870	1,728	2,181	1,943	9,112

Table C-9. Solid Waste Stabilization and Disposition—200 Area (PBS RL-0013C) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(3 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
2	Central Waste Complex	8,762	10,190	10,330	10,286	4,344	7,781	51,692
3	Central Waste Complex	8,269	6,771	8,804	9,241	3,735	7,427	44,246
3	Low-Level Waste Burial Grounds	493	721	1,144	691	215	0	3,264
3	Cost and/or Schedule Uncertainty	0	2,698	382	354	394	354	4,181
2	Environmental Restoration Disposal Facility (ERDF)	69	1,829	1,457	209	173	2,596	6,333
3	ERDF Cell Expansion	0	0	0	0	0	1,955	1,955
3	ERDF Interim Cover	0	1,194	1,222	0	0	0	2,416
3	ERDF Operations	69	32	33	33	41	80	287
3	Cost and/or Schedule Uncertainty	0	603	202	176	132	561	1,675
2	Liquid Effluent Facilities	23,576	17,397	23,222	26,866	13,346	0	104,407
3	200 Area Liquid Effluent Facilities Base Operations	23,396	16,142	21,407	22,526	6,208	0	89,679
3	200 Area Liquid Effluent Facilities Upgrades	0	0	633	3,160	6,797	0	10,590
3	300 Area Liquid Effluent Facilities Base Operations	180	209	212	233	91	0	926
3	Cost and/or Schedule Uncertainty	0	1,045	970	947	250	0	3,212
2	Integrated Disposal Facility (IDF)	332	583	631	845	2,147	2,534	7,072
3	IDF Operations	332	333	356	549	1,968	1,350	4,888
3	IDF Regulatory and Safety	0	134	225	188	172	1,094	1,812
3	Cost and/or Schedule Uncertainty	0	116	50	108	7	90	372
2	Solid Waste Base Operations	3,119	3,269	3,291	3,547	3,600	0	16,826
3	Solid Waste Ready to Serve	3,119	3,129	3,219	3,474	3,525	0	16,467
3	Cost and/or Schedule Uncertainty	0	140	72	73	75	0	359
2	TRU Disposition	0	23	264	2,736	13,180	31,437	47,640
3	CCP Support	0	0	178	548	303	712	1,741
3	Establish Shipping Capability	0	0	0	0	0	953	953
3	TRU Shipping	0	0	0	1,974	10,734	22,602	35,310
3	Cost and/or Schedule Uncertainty	0	23	86	214	2,143	7,170	9,637
2	Spent Nuclear Fuel (SNF) Disposition	323	417	17,922	34,053	29,898	34,004	116,616
3	Fuel Prep Facility	0	0	0	0	0	17,233	17,233
3	Offsite SNF Disposition	323	325	17,834	33,964	29,807	15,896	98,148
3	Consolidate SIF at ISA	0	0	0	0	0	434	434
3	Cost and/or Schedule Uncertainty	0	92	88	89	91	441	801
2	Mixed Waste Disposal Trenches	575	606	629	705	368	3,692	6,576
3	Mixed Waste Disposal Trenches Base Operations	575	577	614	640	249	0	2,656
3	Mixed Waste Disposal Trenches Upgrades	0	0	0	0	0	3,692	3,692

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**Table C-9. Solid Waste Stabilization and Disposition—200 Area (PBS RL-0013C) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(3 pages)**

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	Cost and/or Schedule Uncertainty	0	29	15	65	119	0	228
2	Sludge Disposition	0	0	0	12,318	156,055	317,159	485,532
3	Sludge Disposition	0	0	0	10,490	133,227	269,674	413,391
3	Cost and/or Schedule Uncertainty	0	0	0	1,828	22,828	47,485	72,141
2	Site-Wide Services	22,354	16,695	63,049	66,738	72,170	107,386	348,392
3	Site-Wide Services	22,354	16,695	63,049	66,738	72,170	107,386	348,392
2	RL Directed Activities	0	0	0	1,377	1,389	1,040	3,806
3	GSSC Support	0	0	0	939	951	602	2,492
3	Other	0	0	0	438	438	438	1,314
2	UBS Distributions	6,780	4,622	7,519	8,388	3,799	2,184	33,290
3	Assessments for MSC Services to PRC	2,374	2,352	2,510	3,116	1,527	518	12,396
3	Assessments -Other Provided Services to PRC	4,406	1,850	4,729	4,989	1,975	1,666	19,615
3	Cost and/or Schedule Uncertainty	0	420	280	283	297	0	1,279
2	UBS, G&A, and Direct Distribution	3,191	2,841	15,192	12,425	16,582	30,852	81,063
3	Fee and Management Reserve	3,191	2,841	5,078	3,817	7,974	9,740	32,641
3	G&A Allocations	0	0	10,114	8,608	8,608	21,112	48,443
Total		111,683	140,087	513,177	467,764	514,612	645,640	2,392,963
CCP = Central Characterization Project.		MLLW = mixed low-level waste.						
CH = contact-handled.		PRC = Plateau Remediation Contract.						
CSB = Canister Storage Building.		PBS = project baseline summary.						
CWC = Central Waste Complex.		RH = remote-handled.						
ERDF = Environmental Restoration Disposal Facility.		SIF = slightly irradiated fuel.						
G&A = general and administrative.		SNF = spent nuclear fuel.						
GSSC = General Support Services Contract.		TRU = transuranic.						
IDF = Integrated Disposal Facility.		UBS = usage-based services.						
ISA = interim storage area.		WESF = Waste Encapsulation Storage Facility.						
MSC = Mission Support Contract.		WRAP = Waste Receiving and Processing (Facility).						

C.1.4 SAFEGUARDS AND SECURITY (PBS RL-0020) SCHEDULE AND COST DETAILS

Scope information for Safeguards and Security, PBS RL-0020, is presented in Table C-10. This PBS is not broken down to Level 3 details, so no additional scope is presented; however, both near-term and remaining estimated cost information is provided.

Table C-10. Safeguards and Securities (PBS RL-0020) Level 2 Scope Summary.

Work Element	Scope Description
Safeguards and Security	Includes management, training, and equipment for staff; physical protective systems, such as intrusion protection, Hanford Site access, and badging; information and cyber security; personnel security; material control and accountability; and security program management.
<p>NOTE: See Table C-11 for schedule and budget information.</p> <p>PBS = project baseline summary.</p> <p>RL = U.S. Department of Energy, Richland Operations Office.</p>	

Table C-11. Safeguards and Security (PBS RL-0020) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000 Escalated).

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Safeguards and Security	70,240	71,519	71,864	72,958	78,541	98,365	59,333	63,381	66,584	67,979
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Safeguards and Security	69,941	70,906	72,411	74,470	76,230	77,704	79,824	82,712	86,753	87,254
Fiscal Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Safeguards and Security	88,565	90,818	91,101	93,143	41,369	42,497	45,498	45,100	45,751	49,532
Fiscal Year	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Safeguards and Security	55,370	57,321	58,145	59,323	60,602	61,735	58,942	59,615	64,403	66,217
Fiscal Year	2054	2055	2056	2057	2058	2059				
Safeguards and Security	68,002	68,123	69,993	74,797	77,491	77,409				
Total	3,169,827									

C.1.5 SOIL AND WATER REMEDIATION–GROUNDWATER / VADOSE ZONE (PBS RL-0030) SCHEDULE AND COST DETAILS

Table C-12. Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030) Level 3 Scope Summary. (4 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary
Integration and Assessments	Strategic Integration	Coordinates and focuses on site characterization and assessment efforts to ensure consistency and technical defensibility in the application of CERCLA processes, eliminate information gaps and overlaps, apply science and technology new to Hanford, foster technical peer review, integrate remediation decisions, and develop necessary and sufficient strategies.
	Technical Integration	
	Remediation Decision Support	
	Remediation Science and Technology	
	Sample Management and Reporting	
	Environmental Databases	
	Value Engineering Studies	
	Systematic Planning Integration	
Drilling	100-KR-4 Drilling	Planning, coordinating, and implementing well drilling and well decommissioning for Hanford Site wells according to project-specific requirements.
	100-NR-2 Drilling	
	100-HR-3 Drilling	
	200-BP-5 Drilling	
	200-PO-1 Drilling	
	200-UP-1 Drilling	
	200-ZP-1 Drilling	
	TPA M-24-00 Well Drilling	
	Miscellaneous Well Drilling	
	Decommission Non-Tank Farm Wells	
	100-BC-5 Well Drilling	
	100-FR-3 Well Drilling	
	300-FF-5 Well Drilling	
	Deep Vadose Zone	
Project Management	Project Management and Support	Planning, management direction, evaluation, and management system outputs for this PBS.
Integrated Field Work (IFW)	IFW – Operations and Maintenance	Includes general and common activities, services, infrastructure, material, equipment, labor, and contracts used to plan, support, and perform non-OU specific field work, including non-OU-related well maintenance, monitoring, and reporting.
	IFW – GRP Field Work Projects	
	IFW – Field Equipment Purchases (CENRTC)	
	Well Maintenance, Monitoring & Reporting	
	Spare Parts	
Groundwater Monitoring and Performance Assessments	Modutanks	Includes operation, maintenance, sampling, and dismantling the Modutanks used for disposing groundwater from onsite well sampling and maintenance; geophysical borehole logging and reporting, groundwater sampling, water level monitoring, evaluating, and reporting for RCRA treatment, storage and disposal facilities, CERCLA OUs, and other permitted facilities and sites; operation and maintenance of the Hanford Geotechnical Sample Library which is the repository for historical sediment, core, and other soil and sediments samples used for scientific studies including laboratory studies, bench tests, conceptual model development, and fate and transport evaluations for contaminant migration; well maintenance; and development of an updated soil survey map of the Hanford Site.
	Geophysical Sciences and Logging	
	RCRA Monitoring and Reporting	
	RCRA Field Support	
	Hanford Geotechnical	
	GM/PA Project Management	
	Well Maintenance, Monitoring and Reporting	
100-BC-5	100-BC-5 OU Project Management	Includes project management, CERCLA process implementation for final remedy, remedial actions,
	100-BC-5 CERCLA Process Implementation	

Table C-12. Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030) Level 3 Scope Summary. (4 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary
Operable Unit	100-BC-5 Remedial Actions-Interim and Final	and monitoring and reporting.
	100-BC-5 Monitoring and Reporting	
100-KR-4 Operable Unit	100-KR-4 OU Project Management	Includes project management, CERCLA process implementation for final remedy, remedial actions, monitoring and reporting, modifications and expansions, and final D&D of remedy components.
	100-KR-4 CERCLA Process Implementation	
	100-KR-4 Remedial Actions-Interim and Final	
	100-KR-4 Monitoring and Reporting	
	100-KR-4 Modifications and Expansions	
	100-KR-4 D&D	
100-NR-2 Operable Unit	100-NR-2 OU Project Management	Includes project management, CERCLA process implementation for final remedy, remedial actions, monitoring and reporting, modifications and expansions, and final D&D of remedy components.
	100-NR-2 CERCLA Process Implementation	
	100-NR-2 Remedial Actions-Interim and Final	
	100-NR-2 Monitoring and Reporting	
	100-NR-2 Modifications and Expansions	
	100-NR-2 D&D	
100-HR-3 Operable Unit	100-HR-3 Project Management	Includes project management, decision documents for final remedy, remedial actions, well support, monitoring and reporting, modifications and expansions, and final D&D of remedy components.
	100-HR-3 Decision Documentation	
	100-HR-3 Remedial Actions-Interim and Final	
	100-HR-3 Well Support	
	100-HR-3 Monitoring and Reporting	
	100-HR-3 Modifications and Expansions	
	100-HR-3 D&D	
100-FR-3 Operable Unit	100-FR-3 OU Project Management	Includes project management, CERCLA process implementation for final remedy, remedial actions, and monitoring and reporting.
	100-FR-3 CERCLA Process Implementation	
	100-FR-3 Remedial Actions	
	100-FR-3 Monitoring and Reporting	
200-BP-5 Operable Unit	200-BP-5 Project Management	Includes project management, decision documents for final remedy, remedial actions, monitoring and reporting, and field studies and deployment.
	200-BP-5 Decision Documentation	
	200-BP-5 Remedial Actions – Interim and Final	
	200-BP-5 Monitoring and Reporting	
	200-BP-5 Field Studies and Deployment	
200-PO-1 Operable Unit	200-PO-1 OU Project Management	Includes project management, decision documents for final remedy, remedial actions, and monitoring and reporting.
	200-PO-1 Decision Documentation	
	200-PO-1 Remedial Actions-Interim and Final	
	200-PO-1 Monitoring and Reporting	
200-UP-1 Operable Unit	200-UP-1 OU Project Management	Includes project management, remedial actions, monitoring and reporting, modifications and expansions, and final D&D of remedy components.
	200-UP-1 Remedial Actions-Interim and Final	
	200-UP-1 Monitoring and Reporting	
	200-UP-1 Modifications and Expansions	
	200-UP-1 D&D	
200-ZP-1 Operable Unit	200-ZP-1 OU Project Management	Includes project management, decision documentation, remedial actions, monitoring and reporting, and final D&D of remedy components.
	200-ZP-1 Decision Documentation	
	200-ZP-1 Remedial Actions-Interim and Final	
	200-ZP-1 Monitoring and Reporting	
	200-ZP-1 D&D	

Table C-12. Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030) Level 3 Scope Summary. (4 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary
200-PW-1 Operable Unit	200-PW-1 OU Project Management	Includes project management, remedial actions, monitoring and reporting, and final D&D of remedy components.
	200-PW-1 Remedial Actions-Interim and Final	
	200-PW-1 Monitoring and Reporting	
	200-PW-1 D&D	
300-FF-5 Operable Unit	300-FF-5 OU Project Management	Includes project management, decision documents for final remedy, remedial actions, and monitoring and reporting.
	300-FF-5 Decision Documentation	
	300-FF-5 Remedial Actions – Interim and Final	
	300-FF-5 Monitoring and Reporting	
Regulatory Decisions and Closure Integration	200-B/C Cribs & Trenches Area Remediation	Includes CERCLA and RCRA assessment activities for the Central Plateau source OUs, including project management, planning, documentation, and field and other activities necessary to complete the final remedy decision process.
	200-TW-1/2 Scavenged Waste	
	200-PW-2/4 Uranium-Rich Process Waste Group	
	200-PW-1 Plutonium-Rich Waste Group	
	200-LW-1/2 Chemical Lab Waste Group	
	200-UR-1 Unplanned Releases Waste Group	
	200-SW-1/2 Solid Waste Disposal Areas	
	200-IS-1 Tanks, Lines, Pits & Boxes	
200-FF-5 Monitoring and Reporting		
Deep Vadose Zone Treatability Tests	Deep Vadose Zone Treatability Tests	Includes planning for and conducting both laboratory and field treatability tests to investigate options for remediating the deep vadose zone in the Central Plateau.
Deep Vadose Zone Operable Unit	Deep Vadose Zone OU	The Deep Vadose Zone OU will address mitigation of the contamination present at the Hanford Site in the deep vadose zone. The initial actions planned for this OU are the development of the decision documents, field studies, and deployment activities. Other tasks for this OU, such as remedial action planning and implementation; well support activities; monitoring and reporting support; OU modifications and expansions; and final D&D of the OU remediation activities at the conclusion of the project, will be further developed following the decision process.
	Deep Vadose Zone Decision Documentation	
	Deep Vadose Zone Field Studies and Deployment	
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Table C-18 for details.
RL Directed Activities	General Support Services Contract Support	Includes contracted technical services in key areas such as audit, regulatory analysis, cost and risk analysis and estimating.
UBS Distributions	Assessments for Mission Support Contract Services to Plateau Remediation Contract, Assessments for Other Provided Services to Plateau Remediation Contract	Includes services that are charged based on predetermined rates, and services that are directly charged to OHC. Examples of UBSSs with predetermined rates include: training, reproduction, Waste Sampling and Characterization Facility Laboratory Sample Analysis, crane and rigging, fleet maintenance, desktop and user services, and telecommunications. Examples of UBSSs that are directly charged to OHCs include: Janitorial, facility services, and motor carrier services. Other Provided Services includes General Services Administration vehicle lease and mileage charges and Hanford Site job control system.

Table C-12. Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030) Level 3 Scope Summary. (4 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary																
UBS, G&A, and Direct Distribution	Fee and Management Reserve, Allocated Pensions, G&A Allocations	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor. Allocated pensions are for the multi-employer pension plan for the contractor work force. G&A costs are allocated to the project.																
<p>NOTE: See Tables C-13 and C-14 for schedule and budget information.</p> <table border="0"> <tr> <td>CENRTC = capital equipment not related to construction.</td> <td>GRP = Groundwater Remediation Project.</td> </tr> <tr> <td>CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i></td> <td>IFW = Integrated Field Work.</td> </tr> <tr> <td>D&D = deactivation and decommissioning.</td> <td>OHC = Other Hanford Contractor.</td> </tr> <tr> <td>G&A = General & Administrative.</td> <td>OU = operable unit.</td> </tr> <tr> <td>GM/PA = groundwater monitoring/performance assessment.</td> <td>PBS = project baseline summary.</td> </tr> <tr> <td></td> <td>RCRA = <i>Resource Conservation and Recovery Act.</i></td> </tr> <tr> <td></td> <td>TPA = Tri-Party Agreement.</td> </tr> <tr> <td></td> <td>UBS = usage-based service.</td> </tr> </table>			CENRTC = capital equipment not related to construction.	GRP = Groundwater Remediation Project.	CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i>	IFW = Integrated Field Work.	D&D = deactivation and decommissioning.	OHC = Other Hanford Contractor.	G&A = General & Administrative.	OU = operable unit.	GM/PA = groundwater monitoring/performance assessment.	PBS = project baseline summary.		RCRA = <i>Resource Conservation and Recovery Act.</i>		TPA = Tri-Party Agreement.		UBS = usage-based service.
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Table C-13. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated). (4 pages)

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Integration and Assessments	6,686	8,364	18,532	13,993	14,198	14,826	14,729	15,098	14,030	14,005
Drilling	5,550	18,245	23,215	18,835	24,446	5,310	4,314	3,008	7,092	6,757
Project Management	7,574	8,990	8,345	8,978	9,705	8,883	8,755	8,983	6,255	6,246
Integrated Field Work	8,271	11,491	10,279	10,407	12,208	9,986	10,012	10,385	10,647	10,846
GW Monitoring/Performance Assessment	8,545	14,508	12,652	13,660	14,917	21,355	21,362	22,755	23,376	23,760
100-BC-5 Operable Unit	1,758	144,186	5,362	4,696	6,566	8,596	8,684	14,398	17,573	18,276
100-KR-4 Operable Unit	6,398	153,803	44,328	20,109	15,314	10,160	9,004	8,477	6,701	22,189
100-NR-2 Operable Unit	2,558	30,251	13,582	1,653	1,030	8,485	8,905	6,682	4,292	339
100-HR-3 Operable Unit	13,525	35,186	43,456	38,732	30,767	41,924	26,280	14,226	10,457	10,484
100-FR-3 Operable Unit	1,130	21,740	8,559	4,995	3,761	4,725	5,414	4,894	5,058	3,232
200-BP-5 Operable Unit	2,538	2,618	13,859	14,408	16,506	18,741	11,965	11,430	8,744	6,712
200-PO-1 Operable Unit	0	949	674	3,107	3,578	5,721	4,970	2,804	1,336	929
200-UP-1 Operable Unit	516	7,344	8,181	5,078	21,483	6,244	7,193	1,915	1,919	5,508
200-ZP-1 Operable Unit	18,469	37,686	31,258	43,799	36,644	16,440	19,363	12,441	12,563	12,863
200-PW-1 Operable Unit	978	1,177	1,067	1,147	1,540	1,759	1,693	2,057	1,926	2,408
300-FF-5 Operable Unit	813	19,087	32,817	9,898	9,292	3,862	3,879	12,784	11,786	11,788
Regulatory Decisions/Closure Integration	26	5,523	17,192	13,537	17,595	9,152	37,039	23,742	2,596	1,102
Deep Vadose Zone Treatability Tests	4	618	3,537	4,084	1,605	682	234	18	0	0
Deep Vadose Zone Operable Unit	438	3,090	10,394	28,983	15,107	34,482	54,310	57,788	54,190	41,891
Site-wide Services	26,103	75,047	36,378	35,062	34,231	31,600	40,300	44,128	45,219	43,275
RL Directed Activities	6,745	7,716	7,777	11,741	11,646	0	0	0	0	0
UBS Distributions	3,840	5,830	5,338	5,136	5,445	0	0	0	0	0
UBS, G&A, and Direct Distribution	4,806	5,737	9,424	4,549	8,262	16,292	26,679	40,087	39,168	37,885
Total	127,272	619,187	366,205	316,587	315,845	279,226	325,085	318,099	284,928	280,494
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Integration and Assessments	14,293	14,611	14,941	15,541	15,646	15,936	16,366	16,766	17,509	17,533
Drilling	6,569	7,909	9,554	5,192	5,231	5,271	7,489	5,456	4,820	4,955
Project Management	6,435	6,607	6,754	7,114	5,019	4,879	5,347	2,741	2,356	2,419
Integrated Field Work	11,156	11,441	10,071	9,993	8,732	8,753	9,398	5,653	5,166	5,246
GW Monitoring/Performance Assessment	24,556	24,677	25,812	26,450	27,135	28,172	28,039	30,412	29,484	30,142
100-BC-5 Operable Unit	18,560	8,537	7,954	7,056	5,136	5,465	5,036	4,741	4,813	5,148
100-KR-4 Operable Unit	6,436	5,983	6,136	6,123	6,455	6,207	6,706	6,882	7,113	7,173
100-NR-2 Operable Unit	156	160	163	167	172	183	129	75	77	79
100-HR-3 Operable Unit	10,080	8,870	8,482	7,838	7,850	7,932	8,198	8,579	8,911	8,975
100-FR-3 Operable Unit	2,559	3,001	1,846	490	1,295	1,099	627	234	248	253
200-BP-5 Operable Unit	5,230	3,672	3,267	1,835	2,488	1,425	1,286	1,103	330	266
200-PO-1 Operable Unit	741	636	382	363	371	378	663	397	408	416
200-UP-1 Operable Unit	1,635	1,384	1,374	568	522	543	551	559	539	550

Table C-13. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated). (4 pages)

200-ZP-1 Operable Unit	13,147	17,622	13,905	14,048	14,423	14,680	19,567	15,374	15,827	16,137
200-PW-1 Operable Unit	1,758	197	97	100	101	103	105	107	211	170
300-FF-5 Operable Unit	8,831	1,402	380	369	405	345	315	439	345	335
Regulatory Decisions/Closure Integration	1,010	429	438	924	227	226	232	234	245	250
Deep Vadose Zone Treatability Tests	0	0	0	0	0	0	0	0	0	0
Deep Vadose Zone Operable Unit	21,487	13,329	16,825	31,417	43,334	47,284	34,571	27,272	18,771	6,784
Site-wide Services	40,194	41,664	40,066	43,890	46,569	46,932	42,333	43,090	45,037	36,559
RL Directed Activities	0	0	0	0	0	0	0	0	0	0
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	27,707	23,134	19,973	22,834	28,614	29,568	27,741	25,224	26,173	22,627
Total	222,541	195,264	188,423	202,314	219,723	225,381	214,699	195,339	188,384	166,017
Fiscal Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Integration and Assessments	17,870	18,162	18,685	19,006	19,395	19,839	20,190	20,814	21,137	20,882
Drilling	5,049	8,112	398	0	0	0	2,524	46	0	0
Project Management	2,451	2,507	2,580	2,620	2,703	2,743	2,746	4,062	4,157	4,253
Integrated Field Work	5,308	5,571	4,885	4,813	4,868	5,034	4,951	6,449	6,604	6,781
GW Monitoring/Performance Assessment	30,668	31,056	32,452	33,014	33,787	35,189	34,971	35,851	36,716	37,594
100-BC-5 Operable Unit	4,171	2,114	3,118	5,651	2,662	4,316	3,598	3,596	1,515	1,943
100-KR-4 Operable Unit	7,254	6,851	5,109	4,016	183	187	190	195	200	205
100-NR-2 Operable Unit	84	86	88	90	90	91	93	96	98	100
100-HR-3 Operable Unit	9,228	9,035	6,406	5,158	226	227	232	238	243	249
100-FR-3 Operable Unit	258	227	228	233	238	244	248	255	261	267
200-BP-5 Operable Unit	271	277	286	291	298	304	310	318	326	334
200-PO-1 Operable Unit	424	738	445	456	466	465	813	487	501	513
200-UP-1 Operable Unit	568	591	592	266	266	266	187	183	201	192
200-ZP-1 Operable Unit	16,597	21,884	17,450	17,940	18,303	18,928	19,599	19,334	20,569	11,677
200-PW-1 Operable Unit	170	173	182	184	188	193	196	202	242	47
300-FF-5 Operable Unit	485	602	618	491	449	410	399	440	438	338
Regulatory Decisions/Closure Integration	257	257	10,973	4,806	903	11,879	10,704	5,217	1,117	0
Deep Vadose Zone Treatability Tests	0	0	0	0	0	0	0	0	0	0
Deep Vadose Zone Operable Unit	940	382	0	0	0	0	0	0	0	0
Site-wide Services	33,101	33,915	25,116	24,498	21,618	22,931	32,038	22,129	20,228	25,697
RL Directed Activities	0	0	0	0	0	0	0	0	0	0
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	21,472	21,933	20,250	20,980	20,353	23,701	29,771	22,199	20,660	30,815
Total	156,626	164,471	149,860	144,512	126,995	146,948	163,761	142,112	135,214	156,626

Table C-13. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated). (4 pages)

Fiscal Year	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Integration and Assessments	21,257	21,499	20,416	20,403	21,045	21,349	21,811	22,327	22,837	23,425
Drilling	0	0	0	0	0	0	0	0	0	0
Project Management	4,368	4,431	4,581	4,748	4,868	4,980	5,148	5,176	5,380	5,496
Integrated Field Work	6,999	7,177	7,252	7,449	7,751	7,891	8,064	8,250	8,443	8,702
GW Monitoring/Performance Assessment	38,619	38,983	40,121	41,247	42,287	43,997	44,037	47,483	46,132	47,180
100-BC-5 Operable Unit	3,930	1,692	3,425	1,009	1,427	2,193	2,474	1,448	657	1,541
100-KR-4 Operable Unit	208	205	210	242	125	128	131	133	137	140
100-NR-2 Operable Unit	103	104	107	110	113	115	117	120	123	126
100-HR-3 Operable Unit	256	249	366	245	142	144	42	50	0	0
100-FR-3 Operable Unit	274	278	285	292	300	306	313	319	328	338
200-BP-5 Operable Unit	343	347	356	365	375	383	391	384	396	401
200-PO-1 Operable Unit	526	909	558	562	579	594	596	603	621	643
200-UP-1 Operable Unit	190	193	201	213	218	223	228	238	237	238
200-ZP-1 Operable Unit	6,379	3,583	1,427	48	0	0	0	0	0	0
200-PW-1 Operable Unit	1	0	0	0	0	0	0	0	0	0
300-FF-5 Operable Unit	387	324	517	344	287	302	521	332	518	330
Regulatory Decisions/Closure Integration	0	0	0	0	0	0	0	0	0	0
Deep Vadose Zone Treatability Tests	0	0	0	0	0	0	0	0	0	0
Deep Vadose Zone Operable Unit	0	0	0	0	0	0	0	0	0	0
Site-wide Services	35,900	32,723	31,665	28,268	25,987	25,060	15,379	13,837	15,168	13,732
RL Directed Activities	0	0	0	0	0	0	0	0	0	0
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	40,633	41,579	40,016	38,030	38,552	39,476	31,292	30,579	37,697	39,523
Total	160,374	154,278	151,502	143,574	144,056	147,141	130,542	131,279	138,672	141,814
Fiscal Year	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Integration and Assessments	23,863	24,548	0	0	0	0	0	0	0	0
Drilling	0	0	154	897	1,324	1,334	1,417	1,167	487	6
Project Management	5,654	5,744	0	0	0	0	0	0	0	0
Integrated Field Work	8,874	9,063	0	0	0	0	0	0	0	0
GW Monitoring/Performance Assessment	47,683	55,118	15,846	11,613	7,995	8,242	7,425	5,499	2,786	0
100-BC-5 Operable Unit	1,495	1,758	282	34	99	119	0	0	0	0
100-KR-4 Operable Unit	143	157	33	0	0	0	0	0	0	0
100-NR-2 Operable Unit	129	132	0	0	0	0	0	0	0	0
100-HR-3 Operable Unit	0	0	0	0	0	0	0	0	0	0
100-FR-3 Operable Unit	346	354	0	0	0	0	0	0	0	0
200-BP-5 Operable Unit	407	417	0	0	0	0	0	0	0	0
200-PO-1 Operable Unit	670	675	0	0	0	0	0	0	0	0
200-UP-1 Operable Unit	241	264	71	14	85	46	19	37	14	0

Table C-13. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated). (4 pages)

200-ZP-1 Operable Unit	0	0	0	0	0	0	0	0	0	0
200-PW-1 Operable Unit	0	0	0	0	0	0	0	0	0	0
300-FF-5 Operable Unit	409	279	288	322	295	621	298	191	199	161
Regulatory Decisions/Closure Integration	0	0	0	0	0	0	0	0	0	0
Deep Vadose Zone Treatability Tests	0	0	0	0	0	0	0	0	0	0
Deep Vadose Zone Operable Unit	0	0	0	0	0	0	0	0	0	0
Site-wide Services	12,195	11,818	2,097	2,027	1,611	1,558	0	0	0	0
RL Directed Activities	0	0	0	0	0	0	27,718	0	0	0
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	40,633	40,721	5,783	5,359	4,087	3,462	0	0	0	0
Total	142,741	151,047	24,554	20,267	15,496	15,384	36,877	6,894	3,486	167
Fiscal Year	2064	2065	Total							
Integration and Assessments	0	0	754,363							
Drilling	0	0	202,134							
Project Management	0	0	223,780							
Integrated Field Work	0	0	341,319							
GW Monitoring/Performance Assessment	0	0	1,385,359							
100-BC-5 Operable Unit	0	0	358,809							
100-KR-4 Operable Unit	0	0	388,076							
100-NR-2 Operable Unit	0	0	81,450							
100-HR-3 Operable Unit	0	0	383,486							
100-FR-3 Operable Unit	0	0	81,355							
200-BP-5 Operable Unit	0	0	136,003							
200-PO-1 Operable Unit	0	0	41,669							
200-UP-1 Operable Unit	0	0	79,891							
200-ZP-1 Operable Unit	0	0	589,972							
200-PW-1 Operable Unit	0	0	20,475							
300-FF-5 Operable Unit	70	2,359	143,198							
Regulatory Decisions/Closure Integration	0	0	177,830							
Deep Vadose Zone Treatability Tests	0	0	10,782							
Deep Vadose Zone Operable Unit	0	0	563,070							
Site-wide Services	0	0	1,367,973							
RL Directed Activities	0	0	73,342							
UBS Distributions	0	0	25,590							
UBS, G&A, and Direct Distribution	0	0	1,156,042							
Total	70	2,359	8,585,968							
G&A = general and administrative.				UBS = usage-based services.						

Table C-14. Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (5 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
1	Soil and Water Remediation–Groundwater/Vadose Zone, PBS RL-0030							
2	Integration and Assessments	6,686	8,364	18,532	13,993	14,198	14,826	76,599
3	Strategic Integration	743	747	771	834	847	1,625	5,567
3	Technical Integration	1,518	1,858	6,050	4,558	2,720	2,699	19,401
3	Remediation Decision Support	176	315	650	498	507	1,228	3,375
3	Remediation Science and Technology	0	0	5,217	1,905	2,858	4,137	14,117
3	Sample Management and Reporting	1,409	1,368	1,411	1,526	1,551	1,077	8,342
3	Environmental Databases	2,302	2,437	2,921	3,431	3,488	2,970	17,550
3	Value Engineering Studies	0	0	409	0	450	0	859
3	Systematic Planning Integration	537	723	556	683	694	0	3,193
3	Cost and/or Schedule Uncertainty	0	916	548	558	1,083	1,090	4,195
2	Drilling	5,550	18,245	23,215	18,835	24,446	5,310	95,602
3	100-KR-4 Drilling	574	2,674	1,343	1,453	1,477	38	7,559
3	100-NR-2 Drilling	0	0	0	512	3,081	0	3,593
3	100-HR-3 Drilling	155	1,182	661	715	727	1,423	4,863
3	200-BP-5 Drilling	881	365	0	0	0	0	1,246
3	200-PO-1 Drilling	0	0	1,105	972	1,417	0	3,494
3	200-UP-1 Drilling	0	2,084	4,034	0	0	1,008	7,126
3	200-ZP-1 Drilling	1,533	4,549	2,712	2,910	2,072	1,344	15,119
3	M-24-00 Well Drilling	858	2,219	1,487	1,183	1,203	557	7,506
3	Miscellaneous Well Drilling	626	1,006	770	833	847	0	4,081
3	Decommission Non-Tank Farm Wells	0	1,328	1,446	5,356	6,798	0	14,927
3	100-BC-5 Well Drilling	923	802	0	0	2,204	0	3,930
3	100-FR-3 Well Drilling	0	0	519	0	567	0	1,086
3	300-FF-5 Well Drilling	0	0	3,910	3,326	3,816	81	11,133
3	Deep Vadose Zone	0	849	0	0	0	449	1,298
3	Cost and/or Schedule Uncertainty	0	1,188	5,227	1,576	237	412	8,639
2	Project Management	7,574	8,990	8,345	8,978	9,705	8,883	52,475
3	Project Management and Support	7,574	8,068	7,892	8,552	8,677	7,984	48,748
3	Cost and/or Schedule Uncertainty	0	922	453	426	1,028	900	3,727
2	Integrated Field Work (IFW)	8,271	11,491	10,279	10,407	12,208	9,986	62,641
3	IFW – Operations and Maintenance	5,685	6,656	6,531	6,723	6,834	7,992	40,421
3	IFW – GRP Field Work Projects	2,088	2,565	2,234	2,286	3,547	1,101	13,821
3	IFW – Field Equipment Purchases (CENRTC)	0	0	230	0	0	0	230
3	Well Maintenance, Monitoring & Reporting	0	0	0	0	0	118	118

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Table C-14. Soil and Water Remediation–Groundwater/Vadose Zone (PBS RL-0030) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (5 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	Spare Parts	498	388	400	433	440	0	2,159
3	Cost and/or Schedule Uncertainty	0	1,882	883	966	1,387	774	5,892
2	Groundwater Monitoring and Performance Assessments	8,545	14,508	12,652	13,660	14,917	21,355	85,637
3	Modutanks	531	416	433	450	469	835	3,134
3	Geophysical Sciences and Logging	0	0	0	0	0	535	535
3	RCRA Monitoring and Reporting	0	0	0	0	0	6,747	6,747
3	RCRA Field Support	3,817	8,262	6,219	6,726	6,837	2,567	34,429
3	Hanford Geotechnical	78	78	80	87	88	66	477
3	GM/PA Project Management	2,900	1,810	3,559	3,849	3,913	216	16,248
3	Well Maintenance, Monitoring and Reporting	1,219	1,737	1,537	1,662	1,661	0	7,816
3	Cost and/or Schedule Uncertainty	0	2,205	824	885	1,948	10,390	16,250
2	100-BC-5 Operable Unit	1,758	144,186	5,362	4,696	6,566	8,596	171,164
3	100-BC-5 Operable Unit Project Management	247	180	154	158	161	52	1,062
3	100-BC-5 CERCLA Process Implementation	892	661	610	376	526	0	3,065
3	100-BC-5 Remedial Actions (Interim and Final)	0	0	0	0	0	2,188	2,188
3	100-BC-5 Monitoring and Reporting	619	202	197	226	217	49	1,509
3	Cost and/or Schedule Uncertainty	0	143,143	4,401	3,937	5,662	6,307	163,450
2	100-KR-4 Operable Unit	6,398	153,803	44,328	20,109	15,314	10,160	250,112
3	100-KR-4 Project Management	343	345	355	384	391	0	1,818
3	100-KR-4 CERCLA Process Implementation	111	261	591	0	0	0	963
3	100-KR-4 Remedial Actions (Interim and Final)	3,973	2,729	5,742	4,445	4,719	2,659	24,267
3	100-KR-4 Monitoring and Reporting	540	607	508	549	559	214	2,977
3	100-KR-4 Modifications and Expansions	1,432	0	3,542	2,204	1,942	0	9,120
3	100-KR-4 D&D	0	0	0	0	168	0	168
3	Cost and/or Schedule Uncertainty	0	149,861	33,590	12,526	7,536	7,288	210,800
2	100-NR-2 Operable Unit	2,558	30,251	13,582	1,653	1,030	8,485	57,558
3	100-NR-2 Project Management	269	271	279	302	307	372	1,799
3	100-NR-2 CERCLA Process Implementation	839	545	0	0	0	0	1,384
3	100-NR-2 Remedial Actions (Interim and Final)	1,241	239	7,376	551	555	1,518	11,480
3	100-NR-2 Monitoring and Reporting	209	46	46	45	46	149	540
3	100-NR-2 Modifications and Expansions	0	0	0	0	0	5,980	5,980
3	100-NR-2 D&D	0	0	0	344	0	0	344
3	Cost and/or Schedule Uncertainty	0	29,149	5,882	410	123	466	36,030

Table C-14. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (5 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
2	100-HR-3 Operable Unit	13,525	35,186	43,456	38,732	30,767	41,924	203,590
3	100-HR-3 Project Management	0	0	0	0	0	67	67
3	100-HR-3 Decision Documentation	484	343	227	149	0	0	1,204
3	100-HR-3 Remedial Actions (Interim and Final)	4,877	5,889	5,701	6,001	6,464	5,113	34,045
3	100-HR-3 Well Support	7,367	10,563	9,251	10,005	10,171	0	47,357
3	100-HR-3 Monitoring and Reporting	796	801	826	893	908	467	4,692
3	100-HR-3 Modifications and Expansions	0	0	0	0	0	441	441
3	100-HR-3 D&D	0	0	1,034	0	2,007	6,587	9,628
3	Cost and/or Schedule Uncertainty	0	17,589	26,418	21,684	11,217	29,248	106,156
2	100-FR-3 Operable Unit	1,130	21,740	8,559	4,995	3,761	4,725	44,910
3	100-FR-3 Operable Unit Project Management	187	241	154	158	161	53	955
3	100-FR-3 CERCLA Process Implementation	541	278	0	0	0	0	819
3	100-FR-3 Remedial Actions (Interim and Final)	0	0	0	0	0	2,155	2,155
3	100-FR-3 Monitoring and Reporting	402	382	417	426	459	55	2,142
3	Cost and/or Schedule Uncertainty	0	20,838	7,987	4,411	3,140	2,462	38,838
2	200-BP-5 Operable Unit	2,538	2,618	13,859	14,408	16,506	18,741	68,670
3	200-BP-5 Project Management	244	1,555	12,985	11,477	220	182	26,664
3	200-BP-5 Decision Documentation	1,728	754	568	150	0	0	3,201
3	200-BP-5 Remedial Actions (Interim and Final)	0	0	0	2,277	6,021	1,597	9,895
3	200-BP-5 Monitoring and Reporting	218	219	226	245	249	0	1,157
3	200-BP-5 Field Studies and Deployment	347	24	0	0	0	0	371
3	Cost and/or Schedule Uncertainty	0	66	79	260	10,016	16,962	27,383
2	200-PO-1 Operable Unit	0	949	674	3,107	3,578	5,721	14,029
3	200-PO-1 Project Management	0	496	253	274	220	0	1,244
3	200-PO-1 Decision Documentation	0	187	(32)	87	0	0	241
3	200-PO-1 Remedial Actions (Interim and Final)	0	0	293	164	83	289	829
3	200-PO-1 Monitoring and Reporting	0	244	125	135	137	0	641
3	Cost and/or Schedule Uncertainty	0	22	35	2,447	3,138	5,432	11,074
2	200-UP-1 Operable Unit	516	7,344	8,181	5,078	21,483	6,244	48,846
3	200-UP-1 Project Management	82	610	112	115	117	232	1,268
3	200-UP-1 Remedial Actions (Interim and Final)	232	0	5,363	1,788	18,298	3,594	29,275
3	200-UP-1 Monitoring and Reporting	203	168	173	188	191	785	1,708
3	200-UP-1 Modifications and Expansions	0	0	0	0	0	102	102

Table C-14. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (5 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	Cost and/or Schedule Uncertainty	0	6,566	2,532	2,987	2,877	1,531	16,493
2	200-ZP-1 Operable Unit	18,469	37,686	31,258	43,799	36,644	16,440	184,296
3	200-ZP-1 Project Management	591	594	613	663	674	11,091	14,224
3	200-ZP-1 Decision Documentation	464	492	478	517	506	0	2,457
3	200-ZP-1 Remedial Actions (Interim and Final)	17,252	18,868	28,298	41,139	33,839	3,657	143,054
3	200-ZP-1 Monitoring and Reporting	162	163	168	182	185	155	1,016
3	Cost and/or Schedule Uncertainty	0	17,568	1,701	1,299	1,440	1,538	23,545
2	200-PW-1 Operable Unit	978	1,177	1,067	1,147	1,540	1,759	7,668
3	200-PW-1 Project Management	67	68	70	76	77	210	568
3	200-PW-1 Remedial Actions (Interim and Final)	835	900	850	919	1,184	1,355	6,042
3	200-PW-1 Monitoring and Reporting	75	76	78	85	86	0	400
3	Cost and/or Schedule Uncertainty	0	133	69	68	193	194	658
2	300-FF-5 Operable Unit	813	19,087	32,817	9,898	9,292	3,862	75,770
3	300-FF-5 Project Management	173	174	149	153	156	328	1,134
3	300-FF-5 Decision Documentation	507	65	10,824	0	0	0	11,396
3	300-FF-5 Remedial Actions (Interim and Final)	0	0	14,468	3,283	4,387	0	22,138
3	300-FF-5 Monitoring and Reporting	133	40	41	42	43	584	884
3	Cost and/or Schedule Uncertainty	0	18,808	7,335	6,419	4,706	2,951	40,218
2	Regulatory Decisions and Closure Integration	26	5,523	17,192	13,537	17,595	9,152	63,025
3	Closure Zones	26	2,525	14,397	10,519	9,009	3,829	40,305
3	Cost and/or Schedule Uncertainty	0	2,998	2,796	3,018	8,585	5,323	22,720
2	Deep Vadose Zone Treatability Tests	4	618	3,537	4,084	1,605	682	10,530
3	Deep Vadose Zone Treatability Tests	4	119	2,848	2,953	1,089	180	7,193
3	Cost and/or Schedule Uncertainty	0	500	690	1,131	516	501	3,338
2	Deep Vadose Zone Operable Unit	438	3,090	10,394	28,983	15,107	34,482	92,494
3	Deep Vadose Zone OU	218	219	226	244	196	0	1,103
3	Deep Vadose Zone Decision Documentation	220	76	54	3,011	821	24,639	28,822
3	Deep Vadose Zone Field Studies and Deployment	0	2	4,732	5,764	0	0	10,498
3	Cost and/or Schedule Uncertainty	0	2,792	5,382	19,964	14,089	9,843	52,071
2	Site-wide Services	26,103	75,047	36,378	35,062	34,231	31,600	238,421
3	Site-wide Services	26,103	75,047	36,378	35,062	34,231	31,600	238,421
2	RL Directed Activities	6,745	7,716	7,777	11,741	11,646	0	45,625

Table C-14. Soil and Water Remediation—Groundwater/Vadose Zone (PBS RL-0030) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (5 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	GSSC Support	6,745	7,716	7,777	11,741	11,646	0	45,625
2	UBS Distributions	3,840	5,830	5,338	5,136	5,445	0	25,590
3	Assessments for MSC Services to PRC	3,701	5,374	4,946	4,777	5,119	0	23,917
3	Assessments for Other Provided Services to PRC	139	172	170	164	176	0	822
3	Cost and/or Schedule Uncertainty	0	284	221	195	151	0	850
2	UBS, G&A, and Direct Distribution	4,806	5,737	9,423	4,549	8,262	16,292	49,070
3	Fee and Management Reserve	4,806	5,737	9,367	4,437	8,018	5,773	38,138
3	G&A Allocations	0	0	57	112	245	10,519	10,932
Total		127,272	619,187	366,205	316,587	315,845	279,226	2,024,321
CENRTC = capital equipment not related to construction.				IFW = Integrated Field Work.				
CERCLA = <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i>				MSC = Mission Support Contract.				
D&D = decontamination and decommissioning.				OU = operable unit.				
G&A = general and administrative.				PBS = performance baseline summary.				
GM/PM = groundwater monitoring/performance assessment.				PRC = Plateau Remediation Contract.				
GRP = Groundwater Remediation Project.				UBS = usage-based services.				
GSSC = General Support Services Contract.								

C.1.6 NUCLEAR FACILITY D&D–REMAINDER OF HANFORD (PBS RL-0040.01.1) SCHEDULE AND COST DETAILS

**Table C-15. Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040.01.1) Level 3 Scope Summary.
(3 pages)**

Level 2 Work Element	Level 3 Work Element	Scope Summary
Regulatory Decisions and Closure Integration	Central Plateau Project Management	Provides for overall management function in support of the nuclear facility D&D mission on the Central Plateau.
	Central Plateau Engineering Studies	Provides for crosscutting engineering and technical studies and trade-off evaluations necessary to optimize design and execution for Central Plateau facility and waste site remediation/restoration with consideration of groundwater and vadose zone remediation and ongoing operations.
	Emergency Response for Facility/Waste Site ESH&Q or Remediation – FY2014 to FY2048	Includes the tasks necessary to address aging facility or waste site conditions that are above and beyond anticipated operational and maintenance plans. Activities may include hazard removal, RTD, stabilization, or increased S&M of waste sites; or D&D or increased S&M of buildings. Activities are focused on unplanned or unforeseen facility or waste site conditions impacting safety, human health, or environment (e.g., major equipment failure, spread of contamination, structural failure).
	Below Slab Remediation ROD Non-Canyon Facilities	Includes preparation of a feasibility study, proposed plan, and ROD for remediation of the non-canyon facility slabs.
	Hazard Reduction	Provides the necessary resources and equipment to establish and execute hazard reduction in advance of scheduled facility D&D.
Zone Environmental Remediation	For each closure zone, provides for remediation definition, remediation of pipelines, installation of barriers, utility relocations, post-ROD confirmatory sampling, S&M/O&M of installed barriers, and zone closure activities. Potential waste site remediation range includes no action, in situ treatment (e.g., grouting), monitored natural attenuation, capping, RTD, or combinations of these techniques. Buildings and structures are assumed to undergo D4 activities, including demolition to slab-on-grade. Below-grade portions will be addressed through the waste site cleanup process. Actual remedial actions will be determined through the appropriate decision process and applied through a geographical implementation strategy. The information in this table is a summary of the planning assumptions.	
	Zone 1, 200-E Admin Zone	This zone contains waste sites, buildings and structures, and pipelines that will be addressed through zone closure.
	Zone 2, 200-E Ponds Zone	This zone contains waste sites, buildings and structures, and pipelines that will be addressed through zone closure. This is the largest remediation zone on the Central Plateau. This zone also constitutes a considerable portion of the Outer Zone.
	Zone 3, 200-W Ponds Zone in Industrial Exclusive Zone	This zone contains waste sites, buildings and structures, and pipelines that will be addressed through zone closure.
	Zone 4, B Farm Zone	This zone contains waste sites, buildings and structures, and pipelines that will be addressed through zone closure. This zone also contains a tank farm and will require remedial coordination with the tank farm cleanup efforts.
Zone 5, B Plant Zone	This zone contains a canyon (B Plant), waste sites, buildings and structures, and pipelines that will be addressed through zone closure.	

Table C-15. Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040.01.1) Level 3 Scope Summary.
(3 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary
	Zone 6, C Farm Zone	This zone contains waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure. This zone also contains a tank farm (C Farm) and will require remedial coordination with the tank farm cleanup efforts.
	Zone 7, CSB Zone	This zone contains waste sites and buildings and structures that will be addressed through zone closure.
	Zone 8, ERDF Zone	This zone contains waste sites and buildings and structures that will be addressed through zone closure.
	Zone 9, ETF Zone	This zone contains waste sites and buildings and structures that will be addressed through zone closure.
	Zone 10, PFP Zone	This zone contains waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure.
	Zone 11, PUREX Zone	This zone contains a canyon (PUREX), waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure.
	Zone 12, REDOX Zone	This zone contains a canyon (REDOX), waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure.
	Zone 13, S/U Farm Zone	This zone contains waste sites, buildings and structures, and utility relocations that will be addressed through zone closure. This zone also contains tank farms and will require remedial coordination with the tank farm cleanup efforts.
	Zone 14, Semi-Works Zone	This zone contains waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure.
	Zone 15, Solid Waste Zone	This zone contains waste sites and buildings and structures that will be addressed through zone closure.
	Zone 16, T Farm Zone	This zone contains waste sites and buildings and structures that will be addressed through zone closure. This zone also contains tank farms and will require remedial coordination with the tank farm cleanup efforts.
	Zone 17, T Plant Zone	This zone contains a canyon (T Plant), waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure.
	Zone 18, U Plant Zone	This zone contains a canyon (U Plant), waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure.
	Zone 19, Waste Management Zone	This zone contains waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure.
	Zone 20, WTP/A Farm Zone	This zone contains waste sites, buildings and structures, pipelines, and utility relocations that will be addressed through zone closure. This zone also contains tank farms and will require remedial coordination with the tank farm cleanup efforts.
	Zone 21, IDF Zone	This zone contains waste sites that will be addressed through zone closure.
	Zone 22, NRDWL/BC Control Zone	This zone contains waste sites and pipelines that will be addressed through zone closure.
	Zone 23, 100 Area	This zone contains buildings and structures that will be addressed through zone closure.

Table C-15. Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040.01.1) Level 3 Scope Summary.
(3 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary																										
	Zone 24, 600 Area (and Misc.)	This zone contains buildings and structures that will be addressed through zone closure.																										
	Zone 25, 300 Area	This zone does not currently have any identified scope in the lifecycle plan. Cleanup is assumed to be accomplished through RL-0041.																										
	Zone 26, 400 Area	This zone contains buildings and structures that will be addressed through zone closure.																										
	Outer Area	This includes the demolition of structures, remediation of waste sites, construction of barriers, and closure of the zone. Includes deactivation of existing structures as applicable, formal evaluation (Facility Decommissioning Evaluation) of deactivated structures to determine if and which CERCLA decommissioning path is appropriate, generation of regulatory and work documents as applicable, demolition of structures, remediation of waste sites and pipelines, closure of wells not required for future monitoring, construction of barriers, O&M, utility relocations, closure of the zone, and post-ROD confirmatory sampling.																										
Surveillance and Maintenance and Min-Safe for Facilities and Waste Sites	S&M and Min-Safe for Facilities and Waste Sites	Includes CERCLA 5-year reviews, visual surveillance, surface maintenance, maintain facilities and waste sites in minimum safe condition to protect personnel and the environment, documentation, environmental protection, ISMS, nuclear safety, occupational safety and health, QA, emergency preparedness, radiation protection, safeguards and security, baseline controls, and training.																										
	200 Area S&M																											
	600 Area S&M																											
	300 Area S&M																											
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Table C-18 for details.																										
UBS Distributions	Assessments for Other Hanford Contractor Services to the Plateau Remediation Contract	Includes training, fleet services, reproduction services, motor carrier services, industrial hygiene equipment and measuring and test equipment calibration, Government Services Administration vehicle lease and mileage charges, Hanford Site job control system, and site laundry charges.																										
UBS, G&A, and Direct Distribution	Fee and Management Reserve, Allocated Pensions, G&A Allocations	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor. Allocated pensions are for the multi-employer pension plan for the contractor work force. G&A costs are allocated to the project.																										
<p>NOTE: See Tables C-16 and C-17 for schedule and budget information.</p> <table> <tbody> <tr> <td>CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980.</td> <td>NRDWL = non-radioactive dangerous waste landfill.</td> </tr> <tr> <td>CSB = Canister Storage Building.</td> <td>O&M = operation and maintenance.</td> </tr> <tr> <td>D&D = decontamination and decommissioning.</td> <td>PBS = project baseline summary.</td> </tr> <tr> <td>D4 = deactivation, decommissioning, decontamination, and demolition.</td> <td>PFP = Plutonium Finishing Plant.</td> </tr> <tr> <td>ERDF = Environmental Restoration Disposal Facility.</td> <td>PUREX = Plutonium Uranium Extraction (Plant).</td> </tr> <tr> <td>ESH&Q = Environment, Safety, Health, and Quality.</td> <td>QA = quality assurance.</td> </tr> <tr> <td>ETF = Effluent Treatment Facility.</td> <td>REDOX = Reduction-Oxidation (Plant).</td> </tr> <tr> <td>FY = fiscal year.</td> <td>RL = U.S. Department of Energy, Richland Operations Office.</td> </tr> <tr> <td>G&A = General & Administrative.</td> <td>ROD = record of decision.</td> </tr> <tr> <td>IDF = Integrated Disposal Facility.</td> <td>RTD = remove, treat, dispose.</td> </tr> <tr> <td>ISMS = Integrated Safety Management System.</td> <td>S&M = surveillance and maintenance.</td> </tr> <tr> <td></td> <td>UBS = usage-based service.</td> </tr> <tr> <td></td> <td>WTP = Waste Treatment and Immobilization Plant.</td> </tr> </tbody> </table>			CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980.	NRDWL = non-radioactive dangerous waste landfill.	CSB = Canister Storage Building.	O&M = operation and maintenance.	D&D = decontamination and decommissioning.	PBS = project baseline summary.	D4 = deactivation, decommissioning, decontamination, and demolition.	PFP = Plutonium Finishing Plant.	ERDF = Environmental Restoration Disposal Facility.	PUREX = Plutonium Uranium Extraction (Plant).	ESH&Q = Environment, Safety, Health, and Quality.	QA = quality assurance.	ETF = Effluent Treatment Facility.	REDOX = Reduction-Oxidation (Plant).	FY = fiscal year.	RL = U.S. Department of Energy, Richland Operations Office.	G&A = General & Administrative.	ROD = record of decision.	IDF = Integrated Disposal Facility.	RTD = remove, treat, dispose.	ISMS = Integrated Safety Management System.	S&M = surveillance and maintenance.		UBS = usage-based service.		WTP = Waste Treatment and Immobilization Plant.
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Table C-16. Nuclear Facility D&D–Remainder of Hanford (PBS RL-0040.01.1) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated). (2 pages)

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Reg. Decisions & Closure Integration	1,949	4,745	1,644	18,753	26,336	36,265	21,244	21,446	16,039	16,269
Zone Environmental Remediation	9,009	101,604	293,466	307,521	453,517	536,045	788,102	507,424	422,495	392,774
S&M & Min-Safe for Facilities and Waste Sites	7,964	9,511	8,839	9,871	9,863	11,942	12,211	13,805	14,403	14,114
Site-wide Services	5,237	16,250	34,079	42,503	60,660	78,615	125,379	99,542	99,267	89,596
UBS Distributions	1,075	1,562	2,846	3,193	6,639	5,627	0	0	0	0
UBS, G&A, and Direct Distribution	688	677	10,889	9,880	20,075	59,899	145,677	77,071	64,928	69,928
Total	25,923	134,349	351,762	391,721	577,090	728,394	1,092,613	719,289	617,132	582,680
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Reg. Decisions & Closure Integration	16,725	16,637	17,100	17,616	17,990	18,351	18,854	19,300	19,835	20,281
Zone Environmental Remediation	235,220	118,960	131,279	124,708	108,522	90,398	126,376	83,472	54,868	124,606
S&M & Min-Safe for Facilities and Waste Sites	14,553	13,341	13,669	13,990	14,345	15,759	17,378	15,007	15,466	15,053
Site-wide Services	67,749	46,406	49,549	49,604	44,330	38,348	46,455	39,041	33,789	53,215
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	43,750	22,868	21,573	22,705	13,173	12,147	15,339	13,948	13,840	23,438
Total	377,997	218,212	233,170	228,623	198,360	175,002	224,403	170,768	137,799	236,593
Fiscal Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Reg. Decisions & Closure Integration	20,553	21,092	21,700	22,142	22,631	23,202	23,686	24,265	24,864	25,351
Zone Environmental Remediation	157,922	155,715	285,777	320,062	301,732	351,531	256,950	320,925	333,693	248,221
S&M & Min-Safe for Facilities and Waste Sites	15,357	15,777	16,226	16,601	16,997	17,258	16,240	16,656	17,394	16,915
Site-wide Services	61,014	58,401	75,224	85,605	83,730	86,849	90,447	79,571	78,214	84,106
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	15,848	16,594	12,459	13,544	16,888	31,389	46,672	68,892	70,763	45,956
Total	270,694	267,579	411,387	457,954	441,979	510,228	433,994	510,309	524,928	420,549
Fiscal Year	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Reg. Decisions & Closure Integration	26,150	26,495	27,068	27,752	28,517	29,119	29,781	30,326	31,173	31,833
Zone Environmental Remediation	81,042	77,887	64,567	78,915	83,755	89,589	228,613	253,539	144,134	136,208
S&M & Min-Safe for Facilities and Waste Sites	17,380	17,623	18,109	18,668	19,144	15,597	15,761	15,702	15,878	16,297
Site-wide Services	51,415	48,029	41,943	44,100	41,314	39,221	48,407	45,980	32,516	27,510
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	42,367	47,988	43,809	43,769	47,879	33,422	60,833	66,341	36,678	42,194
Total	218,354	218,022	195,496	213,204	220,609	206,949	383,396	411,888	260,379	254,042
Fiscal Year	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Reg. Decisions & Closure Integration	32,589	33,341	34,132	34,755	35,697	36,494	31,135	28,208	22,513	14,415
Zone Environmental Remediation	134,170	156,783	239,880	167,519	167,873	198,768	159,704	131,059	81,467	27,954
S&M & Min-Safe for Facilities and Waste Sites	16,717	17,075	17,573	17,984	18,518	19,040	12,966	11,693	10,377	6,264
Site-wide Services	23,944	23,979	36,667	34,666	36,521	38,238	0	0	0	0

Table C-16. Nuclear Facility D&D-Remainder of Hanford (PBS RL-0040.01.1) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated). (2 pages)

UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS, G&A, and Direct Distribution	45,486	45,044	92,678	64,489	35,768	33,277	0	0	0	0
Total	252,906	276,221	420,929	319,412	294,377	325,817	203,805	170,960	114,357	48,633
Fiscal Year	2064	2065	2066	2067	Total					
Reg. Decisions & Closure Integration	7,302	1,629	140	0	1,177,432					
Zone Environmental Remediation	7,254	3,215	2,371	666	10,459,823					
S&M and Min-Safe for Facilities and Waste Sites	1,578	214	0	0	746,662					
Site-wide Services	0	0	0	0	2,517,226					
UBS Distributions	0	0	0	0	20,942					
UBS, G&A, and Direct Distribution	0	0	0	0	1,783,519					
Reg. Decisions & Closure Integration	16,134	5,058	2,511	666	16,705,604					
G&A = general and administrative. PBS = project baseline summary. Reg. = Regulatory.						S&M = surveillance and maintenance. UBS = usage-based services.				

Table C-17. Nuclear Facility D&D-Remainder of Hanford (PBS RL-0040.01.1) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
1	Nuclear Facility D&D-Remainder of Hanford, PBS RL-0040.01.1							
2	Regulatory Decisions & Closure Integration	1,949	4,745	1,644	18,753	26,336	36,265	89,693
3	Central Plateau Project Management	1,199	1,206	1,057	10,721	16,700	19,756	50,639
3	Central Plateau Engineering Studies	0	0	0	0	0	439	439
3	Emergency Response for Facility/Waste Site ESH&Q or Remediation - FY 2014 - FY 2048	750	0	0	5,558	5,603	8,845	20,756
3	Below Slab Remediation ROD Non-Canyon Facilities	0	0	0	0	0	2,342	2,342
3	Hazard Reduction	0	0	0	2,043	3,306	3,918	9,267
3	Cost and/or Schedule Uncertainty	0	3,539	587	431	727	964	6,248
2	Zone Environmental Remediation	9,009	101,603	293,466	307,520	453,517	536,045	1,701,160
3	200-E Admin Zone	0	43	1,470	612	217	1,797	4,139
3	200-E Ponds Zone	0	0	52,550	4,706	11,272	8,364	76,892
3	200-W Ponds Zone in Industrial Exclusive Zone	0	0	38,401	5,547	41,427	15,993	101,367
3	B Farm Zone	0	0	606	1,262	261	2,465	4,595
3	B Plant Zone	0	0	7,051	1,397	5,605	15,985	30,038
3	CSB Zone	0	0	0	0	0	151	151
3	ERDF Zone	0	0	87	3	0	126	216
3	PFP Zone	0	0	4,005	4,898	63,609	58,620	131,132

Table C-17. Nuclear Facility D&D-Remainder of Hanford (PBS RL-0040.01.1) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	PUREX Zone	0	0	0	4,612	3,097	47,069	54,778
3	REDOX Zone	0	0	0	3,968	1,180	6,889	12,037
3	S/U Farm Zone	0	0	0	0	114	2,071	2,185
3	Semi-Works Zone	0	0	0	0	117	20,900	21,017
3	Solid Waste Zone	0	0	588	2,585	8,938	30,239	42,350
3	T Farm Zone	0	0	0	0	3,341	432	3,773
3	T Plant Zone	0	0	0	9,287	6,513	96	15,896
3	U Plant Zone	0	0	39,311	84,396	57,857	81,609	263,172
3	Waste Management Zone	0	0	50	183	0	846	1,080
3	WTP/A Farm	0	0	0	0	7,330	0	7,330
3	NRDWL/BC Control Zone	0	0	0	40	1,596	3	1,639
3	100 Area	0	0	0	0	0	957	957
3	600 Area (and Misc.)	0	0	0	2,822	13,461	1,386	17,670
3	300 Area	0	0	0	0	0	845	845
3	400 Area	0	0	0	0	0	1,213	1,213
3	Outer Area	9,009	13,917	11,486	29,650	32,122	65,703	161,887
3	Cost and/or Schedule Uncertainty - Zone Environmental Remediation	0	87,643	137,861	151,552	195,460	172,286	744,803
2	S&M and Min-Safe for Facilities and Waste Sites	7,964	9,512	8,839	9,871	9,863	11,942	57,991
3	S&M and Min-Safe for Facilities and Waste Sites	7,964	8,152	8,310	8,956	9,104	383	42,868
3	200 Area S&M	0	0	0	0	0	10,760	10,760
3	600 Area S&M	0	0	0	0	0	81	81
3	300 Area S&M	0	0	0	0	0	256	256
3	Cost and/or Schedule Uncertainty	0	1,360	529	915	759	462	4,025
2	Site-wide Services	5,237	16,250	34,079	42,503	60,660	78,615	237,344
3	Site-wide Services	5,237	16,250	34,079	42,503	60,660	78,615	237,344
2	UBS Distributions	1,075	1,562	2,846	3,192	6,639	5,627	20,942
3	Assessments for OHC Services to PRC	1,075	989	2,701	3,156	6,599	5,627	20,147
3	Cost and/or Schedule Uncertainty	0	573	145	36	40	0	795
2	UBS, G&A, and Direct Distribution	688	678	10,889	9,880	20,074	59,899	102,108
3	Fee and Management Reserve	688	672	2,644	3,343	5,486	21,647	34,480
3	G&A Allocations	0	6	8,245	6,537	14,588	38,252	67,628
	Total	25,922	134,350	351,763	391,719	577,089	728,392	2,209,235

CSB = Canister Storage Building.	NRDWL = non-radioactive dangerous waste landfill.	PUREX = Plutonium Uranium Extraction (Plant).
ERDF = Environmental Restoration Disposal Facility.	OHC = Other Hanford Contractor.	REDOX = Reduction-Oxidation (Plant).
ESH&Q = environment, safety, health, and quality.	PBS = Project Baseline Summary.	ROD = record of decision.
ETF = Effluent Treatment Facility.	PFP = Plutonium Finishing Plant.	S&M = surveillance and maintenance.
FY = fiscal year.	PRC = Plateau Remediation Contract.	UBS = usage-based services.

C.1.7 INFRASTRUCTURE AND SERVICES (PBS RL-0040.01.2) SCHEDULE AND COST DETAILS

Table C-18. Infrastructure and Services (PBS RL-0040.01.2) Level 3 Scope Summary.

Level 2 Work Element	Level 3 Work Element	Scope Summary
Reliability Projects	Water System	Includes repair and replacement of infrastructure systems and provides capital upgrades to the infrastructure, including larger scale expense projects. This includes construction and capital equipment expenditures associated with replacements for biological control, crane and rigging, electrical system, facilities, Hanford Fire Department, network and telecommunications, sewer system, studies and estimates, transportation – CENTRC, transportation system, water system, emerging facility and infrastructure upgrades and other infrastructure reliability projects.
	Sewer System	
	Electrical System	
	Transportation System	
	Facility System	
	Studies & Estimates	
	Network & Telecommunication	
	CENTRC	
WSCF-Projects		
HAMMER Ready to Serve	HAMMER Ready to Serve	Includes operations and maintenance activities at the HAMMER facility in support of Hanford Site and other training.
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. This work element includes emergency services (safeguards and security, fire and emergency response, emergency management), environmental integration services (site-wide safety standards, environmental integration, public safety and resource protection, radiological site services, and Waste Sampling and Characterization Facility analytical services), information management (information management planning and controls, information systems, content and records management, infrastructure/cyber security, information resources/content management, and information support services), site infrastructure and utilities/logistics and transportation (roads and grounds, biological services, electrical services, water/sewer services, facility services, transportation, mail, property systems/acquisitions, railroad services, technical services, energy management, work management, land and facilities management), support functions (business operations, human resources, safety, health and quality), and portfolio management (portfolio planning, analysis and performance, project acquisition and support, and independent assessment and analysis).
RL Directed Activities	GSSC Support, SAP, Legal Support, Other RL Directed Activities	GSSC includes contracted technical services in key areas such as audit, regulatory analysis, cost and risk analysis and estimating. SAP includes mission critical support services to DOE and its contractors in key areas such as occupational medicine, information and telecommunications, janitorial, radiological laundry, electrical power and facilities rentals. Legal support includes critical independent legal counsel and litigation services in support of DOE and its contractors. Other RL Directed includes other mission critical support services to DOE and its contractors in key areas such as land transfers, acquisition and contract closeout, acquisition of natural gas utility services, energy conservation and management (including steam), natural resource trusteeship, Tribal Nation support, and other small contracts.
UBS, G&A and Direct Distribution	Fee and Management Reserve, Allocated Pensions, G&A Allocations	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor. Allocated pensions are for the multi-employer pension plan for the contractor work force. General and administrative costs are allocated to the project.
NOTE: See Tables C-19 and C-20 for schedule and budget information.		
CENTRC = capital equipment not related to construction. HAMMER = Hazardous Materials Management and Emergency Response. DOE = U.S. Department of Energy. SAP = Service Assessment Pool. G&A = general and administrative. WSCF = Waste Sampling and Characterization Facility. GSSC = General Support Services Contract.		

Table C-19. Infrastructure and Services (PBS RL-0040.01.2) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).
(2 pages)

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Reliability Projects	0	0	40,200	54,256	50,201	58,563	8,385	4,460	2,448	12,195
HAMMER Ready to Serve	6,814	6,971	7,132	7,296	7,463	12,900	5,408	5,511	4,574	4,676
Site-wide Services	13,990	8,102	11,610	14,919	14,798	18,126	12,159	13,838	16,216	17,845
RL Directed Activities	47,409	51,771	57,917	58,194	63,969	64,540	65,881	65,470	66,973	67,409
UBS, G&A, and Direct Distribution	0	0	0	622	563	10,467	15,548	24,834	26,614	23,680
Total	68,213	66,844	116,859	135,287	136,994	164,596	107,381	114,113	116,825	125,804
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Reliability Projects	18,793	20,523	20,595	19,415	18,102	16,588	19,796	18,339	17,789	18,202
HAMMER Ready to Serve	4,842	4,976	5,111	4,357	4,485	4,562	4,715	4,817	4,080	4,168
Site-wide Services	23,496	29,899	30,186	31,396	31,808	30,821	29,996	34,456	39,288	35,574
RL Directed Activities	68,789	70,463	73,018	75,164	78,481	78,921	80,486	80,788	82,974	84,548
UBS, G&A, and Direct Distribution	28,152	27,769	30,919	30,752	32,540	30,819	35,114	32,093	32,264	38,572
Total	144,072	153,630	159,829	161,084	165,416	161,711	170,107	170,493	176,395	181,064
Fiscal Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Reliability Projects	18,469	18,867	19,468	17,664	18,070	18,486	18,836	19,346	19,791	20,246
HAMMER Ready to Serve	4,263	4,329	4,485	3,663	3,740	3,839	3,889	4,029	3,081	3,140
Site-wide Services	34,244	33,750	26,950	27,741	29,515	26,982	8,002	27,418	26,319	10,890
RL Directed Activities	86,057	88,099	92,019	94,946	98,521	99,459	3,543	101,308	103,637	14,225
UBS, G&A, and Direct Distribution	48,155	48,888	59,747	66,943	71,138	71,629	51,245	56,801	57,680	56,957
Total	191,188	193,933	202,669	210,957	220,984	220,395	85,515	208,902	210,508	105,458
Fiscal Year	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Reliability Projects	20,794	21,104	21,589	11,082	11,382	11,597	11,864	12,089	12,416	12,702
HAMMER Ready to Serve	3,243	3,306	3,411	2,316	2,391	2,427	2,487	2,546	1,291	1,332
Site-wide Services	23,992	24,106	25,084	20,627	19,345	17,517	7,737	6,684	9,330	8,794
RL Directed Activities	34,094	36,825	40,631	45,225	47,762	45,960	29,466	28,912	41,150	44,890
UBS, G&A, and Direct Distribution	38,681	34,793	38,939	42,883	41,895	53,260	56,137	57,600	64,493	61,303
Total	120,804	120,134	129,654	122,133	122,775	130,761	107,691	107,831	128,680	129,021
Fiscal Year	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Reliability Projects	12,994	13,293	0	0	0	0	0	0	0	0
HAMMER Ready to Serve	1,343	1,393	1,431	1,688	1,771	1,805	0	0	0	0
Site-wide Services	8,266	7,827	6,623	10,109	10,937	10,584	0	0	0	0
RL Directed Activities	49,000	52,948	51,240	62,543	64,740	68,586	17,310	17,638	17,972	7,765
UBS, G&A, and Direct Distribution	60,666	64,426	62,190	78,616	105,076	112,719	0	0	0	0
Total	132,269	139,887	121,484	152,956	182,524	193,694	17,310	17,638	17,972	7,765

**Table C-19. Infrastructure and Services (PBS RL-0040.01.2) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).
(2 pages)**

Fiscal Year	Total
Reliability Projects	780,998
HAMMER Ready to Serve	187,497
Site-wide Services	927,896
RL Directed Activities	2,969,626
UBS, G&A, and Direct Distribution	1,984,182
Total	6,850,199
<p>G&A = general and administrative. HAMMER = Hazardous Materials Management and Emergency Response (Facility). PBS = project baseline summary. RL = U.S. Department of Energy, Richland Operations Office. UBS = usage-based services.</p>	

Table C-20. Infrastructure and Services (PBS RL-0040.01.2) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
1	Infrastructure and Services, PBS RL-0040.01.2							
2	Reliability Projects	0	0	40,200	54,256	50,201	58,563	203,220
3	Water System	0	0	7,764	1,797	10,511	15,714	35,786
3	Sewer System	0	0	0	1,795	0	2,537	4,332
3	Electrical System	0	0	6,698	7,558	5,243	0	19,499
3	Transportation System	0	0	19,447	6,969	7,993	0	34,409
3	Facility System Reliability Projects	0	0	5,638	17,738	16,356	22,092	61,824
3	Reliability Projects Studies & Estimates	0	0	653	856	876	1,965	4,350
3	Network and Telecommunication	0	0	0	6,203	1,095	8,757	16,055
3	Capital Equipment Not Related to Construction	0	0	0	11,340	3,684	6,828	21,852
3	WSCF-Projects	0	0	0	0	4,443	670	5,113
2	HAMMER Ready to Serve	6,814	6,971	7,132	7,296	7,463	12,900	48,576
3	HAMMER Ready to Serve	6,814	6,971	7,132	7,296	7,463	12,531	48,207
3	Cost and/or Schedule Uncertainty	0	0	0	0	0	369	369
2	Site-Wide Services	13,990	8,102	11,610	14,919	14,798	18,126	81,545
3	Site-Wide Services	13,990	8,102	11,610	14,919	14,798	18,126	81,545
2	RL Directed Activities	47,409	51,771	57,917	58,194	63,969	64,540	343,800
3	GSSC Support	8,076	7,753	8,085	7,636	8,076	7,758	47,384
3	SAP	21,508	20,921	20,932	24,862	28,488	30,121	146,832
3	Legal Support	2,933	2,933	1,955	978	978	978	10,755
3	Other	14,892	16,922	25,280	23,133	24,805	24,053	129,085
3	RL Directed	0	3,242	1,665	1,585	1,622	1,630	9,744
2	UBS, G&A and Direct Distribution	0	0	0	622	563	10,467	11,652
3	Fee and Management Reserve	0	0	0	0	0	6,071	6,071
3	G&A Allocations	0	0	0	622	563	4,396	5,581
	Total	68,213	66,844	116,859	135,287	136,994	164,596	688,793
GSSC	= General Support Services Contract.							
G&A	= general and administrative.							
HAMMER	= Hazardous Materials Management and Emergency Response.							
PBS	= project baseline summary.							
RL	= U.S. Department of Energy, Richland Operations Office.							
SAP	= Service Assessment Pool.							
WSCF	= Waste Sampling and Characterization Facility.							

C.1.8 NUCLEAR FACILITY D&D-RIVER CORRIDOR CLOSURE PROJECT (PBS RL-0041) SCHEDULE AND COST DETAILS

**Table C-21. Nuclear Facility D&D-River Corridor Closure Project (PBS RL-0041) Level 3 Scope Summary.
(3 pages)**

Level 2 Work Element	Level 3 Work Element	Scope Summary
D4 Closure	100 Area	Includes D4 of approximately 500 facilities, provision of utility and S&M services during D4, and closure of utilities located in the River Corridor. The D4 closure buildings are located throughout the River Corridor in the 100 and 300 Areas. Typical hazards associated with the buildings include radiological contamination (e.g., uranium, mixed fission products, activation products, plutonium), hazardous materials (e.g., asbestos, chemicals), and industrial hazards (e.g., elevated working locations, degraded roofs, biological hazards, electrical hazards, excavations). The D4 process includes obtaining regulatory approvals; characterizing hazards and waste; deactivating the facility by removing loose hazardous materials and equipment; decontaminating the facility to allow open-air demolition; and decommissioning the facility by disconnecting utilities and services. The structure is then demolished using techniques such as track hoe, processor, loader, cranes; explosives, cutting equipment, or other methods and the demolition debris are disposed, generally to ERDF. Following demolition, samples are collected to verify that cleanup criteria are met, and the sites are backfilled and revegetated.
	324/327 Area (does not include 300-296 remediation)	
	300 Area Sites	
	S&M	
	Operate and Close Utilities	
	Management & Support	
Field Remediation Closure	100-B/C Area	Includes performing CERCLA field remediation and closure of contaminated waste sites (liquid waste disposal facilities, burial grounds, burn pits, disposal pits, unplanned release sites, and contaminated pipelines) in the River Corridor. This includes confirmatory sampling, remediation design, RTD activities, verification sampling, and closure documentation. The RODs for the Field Remediation Closure work scope generally identify RTD as the preferred alternative (RODs are identified in Appendix B). In addition to RTD, confirmatory sites were identified that require sampling to determine the need for RTD. Following sampling, these sites become RTD sites or are closed as no-action sites. Contamination in the waste sites and burial grounds of the River Corridor include chemical and radioactive constituents, such as metals, hexavalent chromium, petroleum related compounds, strontium, uranium, and cesium. The cleanup process involves sampling and analyzing the site to determine the extent and type of contamination, excavating contaminated waste materials, and restoring the landscape through backfill, grading, and revegetation.
	100-D Area	
	100-H Area	
	100-K Area	
	100-N Area	
	100 Area Remaining Sites	
	300 Area Sites (does not include 300-296 remediation)	
	600 Area	
	Misc. Restoration	
Management & Support	Provides support of the field remediation mission.	
Waste Operations	200 Area Waste Operations	Includes the transportation, disposal, and treatment (if required) of waste from the River Corridor cleanup activities and other site cleanup operators. Waste operations will expand and operate the ERDF, and transition the ERDF to a successor operator at the end of the Nuclear Facility D&D-River Corridor Closure Project.

Table C-21. Nuclear Facility D&D-River Corridor Closure Project (PBS RL-0041) Level 3 Scope Summary.
(3 pages)

Level 2 Work Element	Level 3 Work Element	Scope Summary
	Management & Support	Provides for management function in support of the waste operations mission.
End State/Final Closure	End State/Final Closure	Includes preparing an integrated River Corridor work plan for a CERCLA baseline risk assessment; preparing a baseline risk assessment for the 100 and 300 Areas; conducting a risk evaluation for River Corridor areas outside 100 and 300 Areas; conducting orphan site evaluations; conducting surface soil surveys; preparing remedial action reports documenting completion of interim remedial actions for each geographic area; conducting closure reviews; preparing an remedial investigation/feasibility study and Proposed Plan for six River Corridor source and groundwater areas; and preparing transition turnover packages for the six geographic areas for transition to Hanford Long-Term Stewardship Program.
	Management & Support	Provides for management function in support of the final closure mission.
Mission Support/ General Support	Project Integration	Consists of functional support and business operations necessary to achieve River Corridor Closure and field project objectives. This includes providing trained and qualified staff, performance standards, facilities services, and office supplies. General support functions include safety health and quality, regulatory and environmental management, project integration, project services, engineering services, and Office of the Project General Manager.
	Project Services	
	SH&Q	
	Engineering	
	Regulatory and Environmental Management	
	Office of the Project GM	
WCH Indirect Costs	WCH Performance & Incentive Fee	Project performance and incentive fee.
PRC River Zone Environmental	100-K Regulatory Closure Documents	Final remediation of waste sites and D4 of buildings and structures in the 100-K Area will be completed when all spent nuclear fuel is removed from the K Basins. Includes the ISS of the KE and KW reactors consistent with the other 100 Area reactors and project management.
	100-K Group 1 Remediation	
	100-K Group 2 Remediation	
	100-K Group 3 Remediation	
	KW Deactivation	
	105KE & 105KW Reactor Disposition	
	100-K Project Management	
Site Infrastructure & Utility/ Logistics & Transportation	B Reactor	Includes management and oversight for B Reactor facility activities, including planning, directing, and providing technical support to maintain, upgrade, and preserve the B Reactor facility in a safe condition.
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Table C-18 for details.

**Table C-21. Nuclear Facility D&D-River Corridor Closure Project (PBS RL-0041) Level 3 Scope Summary.
(3 pages)**

Level 2 Work Element	Level 3 Work Element	Scope Summary
RL Directed Activities	General Support Services Contract Support, SAP, and Other RL Directed Activities	GSSC includes contracted technical services in key areas such as audit, regulatory analysis, cost and risk analysis and estimating. SAP includes mission critical support services to DOE and its contractors in key areas such as occupational medicine, information and telecommunications, janitorial, radiological laundry, electrical power and facilities rentals. Other RL Directed includes other mission critical support services to DOE and its contractors in key areas such as land transfers, acquisition and contract closeout, acquisition of natural gas utility services, energy conservation and management (including steam), natural resource trusteeship, Tribal Nation support, and other small contracts.
UBS Distributions	Assessments for MSC Services to Plateau Remediation Contract	Includes services that are charged based on predetermined rates, and services that are charged to OHCs. Examples of UBSs with predetermined rates are: training, reproduction, WSCF Laboratory Sample Analysis, crane and rigging, fleet maintenance, desktop and user services, and telecommunications. Examples of UBSs that are directly charged to OHCs are: Janitorial, facility services, and motor carrier services.
Management Reserve	Fee and Management Reserve, G&A Allocations	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor. General and administrative costs are allocated to the project.
<p>NOTE: See Tables C-22 and C-23 for schedule and budget information.</p> <p>CERCLA= <i>Comprehensive Environmental Response, Compensation, and Liability Act.</i></p> <p>D&D = decontamination and decommissioning.</p> <p>D4 = deactivation, decontamination, decommissioning, and demolition.</p> <p>ERDF = Environmental Restoration Disposal Facility.</p> <p>G&A = general and administrative.</p> <p>GSSC = General Support Services Contract.</p> <p>ISS = interim safe storage.</p> <p>KE = K East.</p> <p>KW = K West.</p> <p>MSC = Mission Support Contract.</p> <p>OHC = Other Hanford Contractor.</p> <p>PBS = project baseline summary.</p> <p>REA = request for equitable adjustment.</p> <p>RCRA= <i>Resource Conservation and Recovery Act.</i></p> <p>ROD = record of decision.</p> <p>RTD = remove, treat, and dispose.</p> <p>S&M = surveillance and maintenance.</p> <p>SAP = Service Assessment Pool.</p> <p>SHQ = Safety, Health & Quality.</p> <p>UBS = usage-based service.</p> <p>WSCF= Waste Sampling and Characterization Facility.</p>		

Table C-22. Nuclear Facility D&D–River Corridor Closure Project (PBS RL-0041), Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	
D4 Closure	40,022	7,033	11,209	48,604	40,336	0	0	0	
Field Remediation Closure	98,152	96,728	79,122	74,820	68,127	438	0	0	
Waste Operations	43,723	15,108	32,672	28,185	28,923	2,522	2,598	0	
End State/Final Closure	1,944	4,019	1,715	1,223	1,256	351	362		
Mission Support/General Support	31,462	21,477	30,777	24,704	18,224	0	0	0	
WCH Indirect Costs	55,412	66,652	8,791	3,640	2,089	0	0	0	
PRC River Zone Environment	6,104	7,262	110,596	74,899	64,792	48,199	7,036	10,150	
Site Infrastructure & Utility/Logistics & Transportation	2,013	2,072	2,124	870	898	571	0	0	
Site-wide Services	72,568	30,595	30,146	31,281	26,539	6,942	1,535	1,784	
RL Directed Activities	5,238	4,940	4,143	0	0	0	0	0	
UBS Distributions	1,405	516	2,917	2,277	1,760	0	0	0	
Management Reserve	523	2,490	13,548	18,583	15,133	16,005	9,153	11,894	
Total	358,566	258,892	327,761	309,086	268,077	75,028	20,684	23,828	
Fiscal Year	2022	2023	2024	Total					
D4 Closure	0	0	0	147,204					
Field Remediation Closure	0	0	0	417,387					
Waste Operations	0	0	0	153,731					
End State/Final Closure	0	0	0	10,870					
Mission Support/General Support	0	0	0	126,645					
WCH Indirect Costs	0	0	0	136,584					
PRC River Zone Environment	9,738	26	0	338,802					
Site Infrastructure & Utility/Logistics & Transportation	0	0	0	8,548					
Site-wide Services	2,075	5	0	203,470					
RL Directed Activities	0	0	0	14,321					
UBS Distributions	0	0	0	8,875					
Management Reserve	3,634	177	134	91,274					
Total	15,447	208	134	1,657,711					
D4	= deactivation, decontamination, decommission, and demolition.				PRC	= Plateau Remediation Contract.			
ISS	= interim safe storage.				UBS	= usage-based service.			
PBS	= project baseline summary.				WCH	= Washington Closure Hanford.			

Table C-23. Nuclear Facility D&D-River Corridor Closure Project (PBS RL-0041), Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
1	Nuclear Facility D&D-River Corridor Closure Project, PBS RL-0041							
2	D4 Closure	40,022	7,033	11,209	48,604	40,336	0	147,204
3	D4-100 Area	4,835	0	0	0	0	0	4,835
3	D4-324/327 Area (does not include 300-296 remediation)	0	0	6,066	43,426	40,018	0	89,510
3	D4-300 Area Sites	21,175	174	0	0	318	0	21,667
3	D4-S&M	7,026	6,859	5,143	5,178	0	0	24,206
3	Operate and Close Utilities	745	0	0	0	0	0	745
3	D4-Management and Support	6,241	0	0	0	0	0	6,241
2	Field Remediation Closure	98,152	96,728	79,122	74,820	68,127	438	417,387
3	Field Remediation - 100 B/C Area	3,417	299	0	0	0	0	3,716
3	Field Remediation.- 100 D Area	14,427	4,844	499	418	137	0	20,325
3	Field Remediation - 100 H Area	4,392	1,370	0	0	0	0	5,762
3	Field Remediation - 100 K Area	347	0	20	35	0	0	402
3	Field Remediation - 100 N Area	8,564	1,715	5	0	0	0	10,284
3	Field Remediation - 100 Area Remaining Sites	3,723	3,058	6	0	0	0	6,787
3	Field Remediation - 300 Area Sites (does not include 300-296 remediation)	32,850	31,982	24,095	16,852	0	0	105,779
3	Field Remediation - 600 Area	23,309	51,108	54,497	57,515	67,990	438	254,857
3	Field Remediation - Misc Restoration	1,347	24	0	0	0	0	1,371
3	Field Remediation - Management and Support	5,776	2,328	0	0	0	0	8,104
2	Waste Operations	43,723	15,108	32,672	28,185	28,923	2,522	151,133
3	200 Area Waste Operations	39,971	12,868	30,365	25,808	26,475	0	135,487
3	Waste Ops-Management and Support	3,752	2,240	2,307	2,377	2,448	2,522	15,646
2	End State/Final Closure	1,944	4,019	1,715	1,223	1,256	351	10,508
3	End State/Final Closure	39,971	12,868	30,365	25,808	26,475	0	8,373
3	Management and Support	3,752	2,240	2,307	2,377	2,448	2,522	2,136
2	Mission Support/General Support (MS/GS)	31,462	21,477	30,778	24,704	18,224	0	126,646
3	MS/GS-Project Integration	4,381	3,426	11,557	10,720	9,877	0	39,961
3	MS/GS-Project Services	14,506	9,785	12,169	9,204	5,871	0	51,535
3	MS/GS-Safety, Health and Quality	6,453	3,482	3,709	2,511	1,306	0	17,461
3	MS/GS-Engineering	510	144	470	317	166	0	1,607
3	MS/GS-Regulatory and Environmental Management	1,526	1,391	981	661	349	0	4,908
3	MS/GS-Office of the Project Gen. Manager	4,086	3,249	1,892	1,291	655	0	11,173
2	WCH Indirect Costs	55,412	66,652	8,791	3,640	2,089	0	136,584
3	WCH Performance & Incentive Fee	55,412	66,652	8,791	3,640	2,089	0	136,584
2	PRC River Zone Environment	6,104	7,262	110,596	74,899	64,792	48,199	311,852

Table C-23. Nuclear Facility D&D-River Corridor Closure Project (PBS RL-0041), Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	100-K Area Regulatory Closure Documents	0	0	262	72	73	59	466
3	100-K Group 1 Remediation	0	559	90,954	46,854	4,280	11,786	154,433
3	100-K Group 2 Remediation	0	0	218	934	456	2,094	3,702
3	100-K Group 3 Remediation	0	0	5,300	6,905	11,222	2,181	25,608
3	KW Deactivation	0	0	3,247	3,378	34,013	23,533	64,171
3	105-KE & 105-KW Reactor Disposition	0	0	2,414	7,190	5,266	3,339	18,209
3	100-K Project Management	6,104	6,703	8,201	9,566	9,482	5,207	45,263
2	Site Infrastructure & Utility/Logistics & Transportation	2,013	2,072	2,124	870	898	571	8,548
3	B Reactor	2,013	2,072	2,124	870	898	571	8,548
2	Site-wide Services	72,568	30,595	30,146	31,281	26,539	6,942	198,071
3	Site-wide Services	72,568	30,595	30,146	31,281	26,539	6,942	198,071
2	RL Directed Activities	5,238	4,940	4,143	0	0	0	14,321
3	GSSC Support	484	367	0	0	0	0	851
3	SAP	3,839	3,658	3,639	0	0	0	11,136
3	Other	915	915	504	0	0	0	2,334
2	UBS Distributions	1,405	516	2,917	2,277	1,760	0	8,875
3	Assessments for MSC Services to PRC	1,405	516	2,917	2,277	1,760	0	8,875
2	Management Reserve	523	2,490	13,548	18,583	15,133	16,005	66,282
3	Fee and Management Reserve	523	382	6,355	5,466	4,674	6,545	23,495
3	G&A Allocations	0	2,108	7,193	13,117	10,459	9,460	42,337
	Total	358,566	258,892	327,761	309,086	268,077	75,028	1,597,410
D&D = decontamination and decommission.		KW = K West.		REA = request for equitable adjustment.				
ISS = interim safe storage.		MSC = Mission Support Contract.		SAP = Service Assessment Pool.				
D4 = deactivation, decontamination, decommissioning, and demolition.		MS/GS = mission support/general support.		UBS = usage-based service.				
GSSC = General Support Services Contract.		PRC = Plateau Remediation Contract.		WCH = Washington Closure Hanford.				

C.1.9 NUCLEAR FACILITY D&D–FAST FLUX TEST FACILITY PROJECT (PBS RL-0042) SCHEDULE AND COST DETAILS

Table C-24. Nuclear Facility D&D–Fast Flux Test Facility Project (PBS RL-0042) Level 3 Scope Summary.

Level 2 Work Element	Level 3 Work Element	Scope Summary
FFTF Cleanup	Maintain Safe and Compliant FFTF	Provides for monitoring, surveillance, and maintenance of the FFTF while the facility is in a cold and dark state pending future D&D activities.
	Transition FFTF	Provides for the progressive shutdown of facility support systems, including sodium, electrical substations, and cooling systems.
	Disposition FFTF Sodium	Includes removal of sodium residuals throughout the life of the project, sodium shipment and conversion, and the operation of the Sodium Storage Facility.
	Decommission FFTF Complex	While the final closure of the FFTF has not yet been determined, the planning assumptions include: <ul style="list-style-type: none"> • Demolition of all structures within the 400 Area Protected Area, except for reactor containment, to at least 3 feet below grade followed by backfill and revegetation; decommissioning waste would be disposed to appropriate disposal facilities. • Removal and disposition of the above grade containment dome. • Grouting of the below grade portion of the reactor containment building and the reactor vessel. • Installation of an engineered barrier over the grouted area. • Installation of monitoring wells for long-term monitoring.
	FFTF Project Management	Provides management in support of the project mission.
	Sodium Reaction Facility	Provides for the design, construction, and turnover to operations of a new facility in the Hanford 400 Area to convert FFTF sodium for use as caustic feed to the Waste Treatment Plant.
Site-wide Services	Site-wide Services	Includes proportional share of costs for site services and infrastructure. See Table C-18 for details.
Infrastructure Services	Legal Support and Other Services	Includes critical independent legal counsel and litigation services in support of DOE and its contractors. Other services includes other mission critical support services to DOE and its contractors in key areas such as land transfers, acquisition and contract closeout, acquisition of natural gas utility services, energy conservation and management (including steam), natural resource trusteeship, Tribal Nation support, and other small contracts.
UBS Distributions	Assessments for Mission Support Contract Services to Plateau Remediation Contract	Includes services that are charged based on predetermined rates, and services directly charged to Other Hanford Contractors. Examples of UBSs with predetermined rates include: Training, Reproduction, Waste Sampling and Characterization Facility, Laboratory Sample Analysis, Crane and Rigging, Fleet Maintenance, Desktop and User Services, and Telecommunications. Examples of UBSs that are directly charged to Other Hanford Contractors include: Janitorial, Facility Services, and Motor Carrier Services.
UBS G&A and Direct Distribution	Fee and Management Reserve, Allocated Pensions, G&A Allocations	Fee is contractor's profit. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor. Allocated pensions are for the multi-employer pension plan for the contractor work force. General and administrative costs are allocated to the project.
<p>NOTE: See Tables C-25 and C-26 for schedule and budget information.</p> <p>D&D = decontamination and decommission. PBS = project baseline summary. FFTF = Fast Flux Test Facility. RL = U.S. Department of Energy, Richland Operations Office. G&A = general and administrative. UBS = usage-based services.</p>		

Table C-25. Nuclear Facility D&D-Fast Flux Test Facility Project (PBS RL-0042), Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
FFTF Cleanup	1,924	2,041	2,049	2,215	2,252	14,077	13,436	11,427	15,156	51,804
Site-wide Services	540	302	242	296	297	1,981	2,162	2,236	3,539	11,714
Infrastructure Services	33	26	25	25	24	27	28	29	29	30
UBS Distributions	0	9	9	10	10	0	0	0	0	0
UBS G&A and Direct Distribution	134	111	129	130	158	2,167	2,736	3,418	5,008	18,352
Total	2,630	2,489	2,457	2,676	2,742	18,251	18,362	17,109	23,732	81,899
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
FFTF Cleanup	44,381	45,870	41,528	37,471	41,837	54,361	52,814	29,365	18,630	13,265
Site-wide Services	12,014	15,266	13,584	12,718	14,090	17,867	16,060	10,433	7,498	4,754
Infrastructure Services	31	101	104	106	108	110	110	112	115	118
UBS Distributions	0	0	0	0	0	0	0	0	0	0
UBS G&A and Direct Distribution	15,005	15,431	14,160	12,976	14,673	18,476	17,117	10,982	7,556	5,207
Total	71,430	76,669	69,376	63,271	70,708	90,815	86,102	50,892	33,800	23,343
Fiscal Year	2034	2035	Total							
FFTF Cleanup	635	2	496,536							
Site-wide Services	251	1	147,847							
Infrastructure Services	120	0	1,412							
UBS Distributions	0	0	38							
UBS G&A and Direct Distribution	363	1	164,292							
Total	1,369	4	810,125							
FFTF = Fast Flux Test Facility.				PBS = project baseline summary.						
G&A = general and administrative.				UBS = usage-based services.						

Table C-26. Nuclear Facility D&D-Fast Flux Test Facility Project (PBS RL-0042), Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total	
1	Nuclear Facility D&D-Fast Flux Test Facility Project, PBS RL-0042								
2	FFTF Cleanup	1,924	2,041	2,049	2,215	2,252	14,077	24,557	
3	Maintain Safe and Compliant FFTF Complex	1,917	1,935	1,995	2,157	2,193	7,085	17,282	
3	Transition FFTF Complex	7	7	7	8	8	0	36	
3	FFTF Project Management	0	0	0	0	0	6,392	6,392	
3	Cost and/or Schedule Uncertainty	0	99	48	50	51	600	848	
2	Site-wide Services	540	302	244	296	297	1,981	3,660	
3	Site-wide Services	540	302	244	296	297	1,981	3,660	
2	Infrastructure Services	33	26	25	25	24	27	161	
3	Legal Support	24	24	24	24	24	24	147	
3	Other	9	0	0	0	0	0	9	
3	Cost and/or Schedule Uncertainty – RL Directed	0	2	1	1	0	3	6	
2	Usage Based Services Distributions	0	9	9	10	10	0	38	
3	Assessments for MSC Services to PRC	0	8	9	9	9	0	36	
3	Cost and/or Schedule Uncertainty	0	1	0	0	0	0	2	
2	UBS G&A and Direct Distribution	134	111	129	130	158	2,167	2,829	
3	Fee and Management Reserve	134	111	129	130	158	758	1,421	
3	G&A Allocations	0	0	0	0	0	1,408	1,408	
Total		2,630	2,489	2,457	2,676	2,742	18,251	31,246	
D&D	= decontamination and decommission.	PBS	= project baseline summary.						
FFTF	= Fast Flux Test Facility.	PRC	= Plateau Remediation Contract.						
G&A	= general and administrative.	RL	= U.S. Department of Energy, Richland Operations Office.						
MSC	= Mission Support Contract.	UBS	= usage-based services.						

C.1.10 RICHLAND COMMUNITY AND REGULATORY SUPPORT (PBS RL-0100) SCHEDULE AND COST DETAILS

Table C-27. Richland Community and Regulatory Support (PBS RL-0100) Level 3 Scope Summary.

Level 2 Work Element	Level 3 Work Element	Scope Summary
Regulatory Federal and State Grant Support	Regulatory Federal and State Grant Support	Includes RL support to community activities and regulatory agencies, such as the Hanford Advisory Board, the Oregon Department of Energy, the Natural Resource Trustee Council, the Washington State Department of Ecology, Washington State Department of Health, and other entities through grants, permits, and payment of fees. Includes studies for Natural Resource Damage Assessment but does not include significant restoration of natural resources to resolve any liability of the United States for Natural Resource Damage Assessment and Restoration.
Regulatory Support Essential Services	Regulatory Support Essential Services	
<p>NOTE: See Table C-28 for schedule and budget information.</p> <p>PBS = project baseline summary. RL = U.S. Department of Energy, Richland Operations Office.</p>		

Table C-28. Richland Community and Regulatory Support (PBS RL-0100), Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Community and Regulatory Support	16,892	37,710	50,588	40,158	41,258	41,804	41,866	41,802	42,200	42,550
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Community and Regulatory Support	38,122	38,277	38,575	39,226	39,588	39,914	40,484	40,984	41,368	41,792
Fiscal Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Community and Regulatory Support	42,385	42,741	43,254	43,765	44,252	44,405	44,709	45,090	45,133	45,500
Fiscal Year	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Community and Regulatory Support	45,800	46,039	47,270	48,006	48,375	48,374	48,878	49,062	49,245	49,617
Fiscal Year	2054	2055	2056	2057	2058	2059	Total			
Community and Regulatory Support	49,890	50,143	50,359	50,739	51,332	51,633	2,021,152			
PBS = project baseline summary. RL = U.S. Department of Energy, Richland Operations Office.										

C.1.11 LONG-TERM STEWARDSHIP (PBS RL-LTS) SCHEDULE AND COST DETAILS

Scope information for Long-Term Stewardship, PBS RL-LTS, is presented in Table C-29. This PBS is not broken down to Level 3 scope, and there are no near-term cost details for this PBS due to when the work is planned to begin.

Table C-29. Long-Term Stewardship (PBS RL-LTS) Level 2 Scope Summary.

Work Element	Scope Description
Infrastructure	Includes operation and maintenance of site infrastructure following cleanup activities. Specific scope will include supplying electrical and water utilities, operating and maintaining emergency services (Hanford Fire Department), and maintaining roads as needed to support site LTS activities.
Waste Management	Includes operation and maintenance of 200 Area Liquid Effluent Facilities in support of groundwater treatment and monitoring activities.
Site and Environmental Monitoring	Includes ongoing site and environmental monitoring of groundwater, soil, and the vadose zone, and monitoring for public safety and resource protection.
Post-Closure Surveillance and Maintenance	Includes real estate and site planning, land management, and surveillance and maintenance activities for the 100 and 200 Areas.
Environmental Compliance	Includes activities to ensure environmental compliance and protection.
Stakeholder Participation	Includes continued support of stakeholder participation through grants, and payment of fees in lieu of taxes.
Management and Administration	Provides for management and administration of these LTS activities.
<p>NOTE: See Table C-30 for schedule and budget information.</p> <p>LTS = Long-Term Stewardship. PBS = project baseline summary.</p>	

Table C-30. Long-Term Stewardship (PBS RL-LTS) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069
Environmental Compliance	4,565	4,441	4,320	4,203	4,088	3,977	3,869	3,764	3,661	3,562
Infrastructure	27,367	26,623	25,900	25,194	24,510	23,843	23,194	22,563	21,950	21,352
Management and Administration	25,036	24,355	23,692	23,048	22,421	21,811	21,218	20,641	20,079	19,533
Post-Closure S&M	51,155	49,764	48,410	47,093	45,812	44,566	43,354	42,175	41,028	39,912
Site and Environmental Monitoring	54,967	53,472	52,017	50,602	49,226	47,887	46,584	45,318	44,085	42,886
Stakeholder Participation	20,781	20,216	19,666	19,131	18,611	18,104	17,612	17,133	16,667	16,214
Waste Management	91,520	89,031	86,609	84,254	81,962	79,732	77,564	75,454	73,402	71,405
Total	275,391	267,902	260,614	253,525	246,630	239,920	233,395	227,048	220,872	214,864
Fiscal Year	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079
Environmental Compliance	3,428	3,300	3,176	3,058	3,131	2,885	2,659	2,451	2,510	2,570
Infrastructure	20,554	19,784	19,042	18,331	18,770	17,298	15,942	14,693	15,045	15,407
Management and Administration	18,802	18,098	17,420	16,768	17,170	15,824	14,584	13,440	13,763	14,093
Post-Closure S&M	38,418	36,979	35,594	34,262	35,084	32,333	29,799	27,463	28,122	28,796
Site and Environmental Monitoring	41,280	39,734	38,247	36,815	37,699	34,743	32,019	29,509	30,217	30,942
Stakeholder Participation	15,606	15,022	14,460	13,918	14,252	13,135	12,105	11,156	11,424	11,698
Waste Management	68,732	66,158	63,681	61,297	62,768	57,847	53,312	49,132	50,312	51,519
Total	206,820	199,075	191,620	184,449	188,874	174,065	160,420	147,844	151,393	155,025
Fiscal Year	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089
Environmental Compliance	2,631	2,695	2,621	2,684	2,749	2,815	2,882	2,951	3,022	3,095
Infrastructure	15,775	16,154	15,715	16,092	16,479	16,874	17,279	17,694	18,118	18,553
Management and Administration	9,156	9,376	9,121	9,339	9,564	9,793	10,028	10,270	10,517	10,770
Post-Closure surveillance & maintenance	29,488	30,195	29,374	30,079	30,801	31,540	32,297	33,072	33,866	34,679
Site and Environmental Monitoring	31,685	32,445	31,562	32,320	33,096	33,891	34,703	35,536	36,389	37,263
Stakeholder Participation	11,979	12,266	11,933	12,219	12,512	12,813	13,120	13,435	13,757	14,088
Waste Management	0	0	0	0	0	0	0	7	13	20
Total	100,714	103,131	100,326	102,733	105,201	107,726	110,309	112,965	115,682	118,468
Fiscal Year	2090	Total								
Environmental Compliance	3,169	100,932								
Infrastructure	18,998	605,093								
Management and Administration	11,029	490,759								
Post-Closure surveillance & maintenance	35,511	1,131,021								
Site and Environmental Monitoring	38,157	1,215,296								
Stakeholder Participation	14,426	459,459								
Waste Management	28	1,395,759								
Total	121,318	5,398,319								

C.1.12 FINAL REACTOR DISPOSITION SCHEDULE AND COST DETAILS

Scope information for Final Reactor Disposition is presented in Table C-31. This work is not broken down to Level 3 details, so no additional scope is presented and there are no near-term cost details due to when the work is planned to begin.

Table C-31. Final Reactor Disposition Level 2 Scope Summary.

Work Element	Scope Description
Final Reactor Disposition	Includes final reactor disposition of the 100 Area surplus production reactors (except for B Reactor which has been recommended to Congress for inclusion in a Manhattan Project National Historic Park). Following a safe storage period of up to 75 years final reactor disposition would include demolition of the interim safe storage enclosure and transport of each of the eight reactor blocks intact on a tractor-transporter from its present location in the 100 Areas to the Central Plateau Inner Area for disposal. Following reactor removal, the site formerly occupied by each reactor would be backfilled, graded, and seeded. Although the final end state of N Reactor has not been determined, the planning case is to disposition it the same as the other reactors.
NOTE: See Table C-32 for schedule and budget information.	

Table C-32. Final Reactor Disposition Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2054	2055	2056	2057	2058	2059	2060
Final Reactor Disposition	18,811	37,623	37,623	56,434	94,057	94,057	131,679
Fiscal Year	2061	2062	2063	2064	2065	2066	2067
Final Reactor Disposition	282,170	282,170	282,170	188,113	188,113	94,057	56,434
Fiscal Year	2068						
Final Reactor Disposition	37,623						
Total	1,881,134						

C.2 OFFICE OF RIVER PROTECTION PROJECT BASELINE SUMMARY INFORMATION

The DOE, Office of River Protection (ORP) manages their assigned cleanup mission through the following PBSs (at Level 1):

- Radioactive Liquid Tank Waste Stabilization and Disposition, PBS ORP-0014
- Major Construction – Waste Treatment Plant, PBS ORP-0060.

Scope information for PBS ORP-0014 and PBS ORP-0060 is presented in Chapter 5.0 of the LCR. No additional scope is presented here. Near-term and estimated costs are presented below.

Table C-33. Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated). (2 pages)

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Base Operations	356,555	366,504	367,605	393,976	380,201	491,668	472,975	445,198	466,041	455,013
Retrieve and Close SSTs	8	3,484	1,923	912	0	4,604	6,400	2,579	2,893	5,985
Waste Feed Delivery/Treatment Planning/ DST Retrieval/Closure	62,587	124,749	238,683	225,082	268,002	218,964	126,326	136,401	108,806	71,703
Supplemental Treatment	44,243	97,424	213,596	304,519	314,010	328,815	30,074	23,061	169,656	171,626
Treat Waste	34,101	39,498	43,420	59,917	62,353	48,354	45,702	45,055	45,931	47,175
Facility Closure	19,834	20,310	33,995	105,413	195,452	411,621	410,079	406,116	413,095	420,508
TOC-ORP Project Support	149,250	189,060	188,453	226,248	197,347	189,059	187,686	168,954	166,352	175,096
Total	666,578	841,029	1,087,674	1,316,067	1,417,366	1,693,084	1,279,242	1,227,364	1,372,775	1,347,106
Fiscal Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Base Operations	470,788	496,480	485,865	508,862	567,468	539,960	567,671	548,172	576,550	582,060
Retrieve and Close SSTs	45,140	7,779	4,728	1,394	1,729	1,336	3,214	2,319	1,882	1,844
Waste Feed Delivery/Treatment Planning/ DST Retrieval/Closure	54,898	115,761	115,140	174,473	297,347	206,817	163,133	208,752	266,322	294,811
Supplemental Treatment	176,101	179,975	183,935	187,981	192,117	195,564	200,663	205,078	210,421	214,200
Treat Waste	52,460	49,210	51,056	51,332	54,637	58,005	56,796	55,192	59,837	60,673
Facility Closure	431,471	440,964	450,665	460,580	470,712	479,159	491,651	502,468	515,560	524,820
TOC-ORP Project Support	182,990	161,213	151,475	160,483	166,190	163,649	151,105	145,680	146,634	148,180
Total	1,413,849	1,451,382	1,442,862	1,545,104	1,750,201	1,644,491	1,634,233	1,667,660	1,777,206	1,826,588
Fiscal Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Base Operations	632,972	652,033	648,968	628,511	640,206	646,170	557,148	484,417	462,563	447,632
Retrieve and Close SSTs	2,596	11,213	7,983	11,725	4,113	1,326	747	11,530	10,195	15,046
Waste Feed Delivery/Treatment Planning/ DST Retrieval/Closure	418,713	470,008	544,391	458,892	456,142	376,011	216,360	175,960	181,184	104,817
Supplemental Treatment	218,044	222,841	225,396	229,445	234,492	239,651	243,952	250,312	255,819	260,935
Treat Waste	65,146	64,184	69,834	71,263	68,816	73,029	70,324	72,943	69,655	73,186
Facility Closure	534,237	545,990	562,448	572,550	585,146	598,020	608,751	624,622	559,604	544,302
TOC-ORP Project Support	150,839	157,589	168,245	177,266	204,992	225,126	238,573	265,977	295,917	343,051
Total	2,022,547	2,123,858	2,227,265	2,149,651	2,193,908	2,159,333	1,935,853	1,885,761	1,834,937	1,788,968

Table C-34. Radioactive Liquid Tank Waste Stabilization and Disposition (PBS ORP-0014), Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated). (2 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
2	Waste Feed Delivery/Treatment Planning/DST Retrieval/Closure	149,250	189,060	188,453	226,248	197,347	189,059	1,139,417
3	WTP Feed Delivery Program	20,575	22,203	23,467	24,669	24,879	26,169	141,961
3	Construct DST Systems	59,979	53,872	41,408	40,058	44,232	57,929	297,478
3	Immobilization Program	22,978	51,315	32,497	54,628	33,770	18,446	213,634
3	WTP Operational Readiness	4,425	4,122	4,221	4,322	4,426	344	21,861
3	Tank Waste Pretreatment Project	27,083	31,145	39,387	52,772	45,406	45,036	240,830
3	Secondary Waste Treatment/ETF	14,209	26,402	47,473	49,799	44,635	41,135	223,653
2	Supplemental Treatment	44,243	97,424	213,596	304,519	314,010	328,815	1,302,607
3	Supplemental Treatment	44,243	97,424	213,596	304,519	314,010	328,815	1,302,607
2	Treat Waste	19,834	20,310	33,995	105,413	195,452	411,621	786,623
3	Waste Treatment Facility	19,834	20,310	33,995	105,413	195,452	411,621	786,623
2	Facility Closures	8	3,484	1,923	912	0	4,604	10,931
3	TFC Facility and Other Closure	8	3,484	1,923	912	0	4,604	10,931
2	Tank Operations Contract - ORP Project Support	34,101	39,498	43,420	59,917	62,353	48,354	287,644
3	Tank Operations Contract - ORP Project Support	34,101	39,498	43,420	59,917	62,353	48,354	287,644
Total		666,578	841,029	1,087,674	1,316,067	1,417,366	1,693,084	7,021,797
DST = double-shell tank.				SST = single-shell tank.				
ETF = Effluent Treatment Facility.				TFC = Tank Farm Contractor.				
ORP = U.S. Department of Energy, Office of River Protection.				TOC = Tank Operations Contract.				
PBS = project baseline summary.				WTP = Waste Treatment and Immobilization Plant.				

Table C-35. Major Construction – Waste Treatment Plant (PBS ORP-0060) Remaining Lifecycle Schedule and Costs, Level 2, by Fiscal Year (\$1,000, Escalated).

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	Total
Analytical Laboratory	28,416	26,726	39,691	28,184	17,030	18,590	1,345	159,982
Balance of Facilities	54,965	80,098	52,759	24,728	12,691	10,507	484	236,232
High-Level Waste	147,372	134,006	97,297	64,996	64,624	64,501	18,718	591,514
Low-Activity Waste	46,715	33,682	80,325	60,474	31,348	42,382	1,208	296,134
Plant Wide	266,486	236,250	179,672	132,785	52,156	1,660	0	869,009
Pretreatment	303,973	210,179	131,306	100,888	76,461	103,515	5,436	931,758
Total	847,927	720,941	581,050	412,055	254,310	241,155	27,191	3,084,629
PBS = project baseline summary.								

**Table C-36. Major Construction – Waste Treatment Plant (PBS ORP-0060) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(4 pages)**

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
1	Major Construction - Waste Treatment Plant, PBS ORP-0060							
2	Pretreatment Facility (PT)	303,973	210,179	131,306	100,888	76,461	103,515	926,322
3	Engineering Design - PT	6,542	1,425	480	0	0	0	8,447
3	Plant Equipment - PT	59,259	13,722	8,976	0	0	0	81,957
3	Environmental and Nuclear Safety - PT	2,246	2,544	3,444	2,963	2,214	128	13,539
3	Plant Material - PT	14,222	0	0	0	0	0	14,222
3	Startup - PT	286	10,982	15,768	0	0	0	27,036
3	Construction Field Non Manual - PT	16,788	13,079	3,427	0	0	0	33,294
3	Crafts (Construction) - PT - Civil	21,521	12,360	3,625	0	0	0	37,506
3	Crafts (Construction) - PT - Distribs	3,238	2,680	656	77	0	0	6,651
3	Crafts (Construction) - PT - Electrical	16,037	18,336	4,395	0	0	0	38,768
3	Crafts (Construction) - PT - Mechanical	13,895	9,517	396	0	0	0	23,808
3	Crafts (Construction) - PT - Piping and Instrumentation	44,843	31,501	7,464	0	0	0	83,808
3	Construction Subcontracts - PT	23,909	19,368	3,249	0	0	0	46,526
3	Liner Plate and Vessel Const Subcontract - PT	3,664	1,341	0	0	0	0	5,005
3	Special Protective Coating Const Subcontract - PT	4,782	599	3	0	0	0	5,384
3	Intermech Construction Subcontract - PT	8,473	2,358	0	0	0	0	10,831
3	Commissioning - PT	5,865	18,664	32,688	57,052	33,196		147,465
-	Fee	16,738	17,279	9,343	18,955	29,886	50,137	142,338
-	Cost and/or Schedule Uncertainty	41,665	34,424	37,392	21,841	11,165	53,250	199,737
2	Low-Activity Waste Facility (LAW)	46,715	33,682	80,325	60,474	31,348	42,382	294,926
3	Engineering Design - LAW	456	194	19	0	0	0	669
3	Plant Equipment - LAW	3,795	0	20,780	95	(23,362)	0	1,308
3	Equipment Engineering - LAW	14	14	15	0	0	0	43
3	Environmental and Nuclear Safety - LAW	1,106	1,043	2,386	2,219	1,642	33	8,429
3	Research and Technology - LAW	232	239	247	0	0	0	718
3	Startup - LAW	2,594	8,345	2,136	0	0	0	13,075
3	Construction Field Non Manual - LAW	5,926	1,318	115	0	0	0	7,359

Table C-36. Major Construction – Waste Treatment Plant (PBS ORP-0060) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(4 pages)

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	Crafts (Construction) - LAW	10,424	0	0	0	0	0	10,424
3	Crafts (Construction) - LAW - Distribs	1,507	1,082	339	40	0	0	2,968
3	Construction Subcontracts - LAW	1,443	0	0	0	0	0	1,443
3	Special Protective Coating Const Subcontract - LAW	7	0	0	0	0	0	7
3	Intermech Construction Subcontract - LAW	129	0	0	0	0	0	129
3	Commissioning - LAW	5,363	11,330	29,573	38,461	41,717	0	126,444
-	Fee	8,076	914	3,191	10,114	18,304	23,613	64,212
-	Cost and/or Schedule Uncertainty	5,643	9,203	21,524	9,545	(6,953)	18,736	57,698
2	High-Level Waste Facility (HLW)	147,372	134,006	97,297	64,996	64,624	64,501	572,796
3	Engineering Design - HLW	1,223	1,235	563	20	0	0	3,041
3	Plant Equipment - HLW	17,137	12,277	725	4,857	(13,880)	0	21,116
3	Equipment Engineering - HLW	4	34	177	89	0	0	304
3	Environmental and Nuclear Safety - HLW	1,584	2,209	3,337	2,523	1,969	95	11,717
3	Research and Technology - HLW	451	370	252	261	135	0	1,469
3	Startup - HLW	158	255	11,151	5,560	0	0	17,124
3	Construction Field Non Manual - HLW	11,138	8,868	3,504	0	0	0	23,510
3	Crafts (Construction) - HLW - Civil	16,757	10,700	3,154	0	0	0	30,611
3	Crafts (Construction) - HLW - Distribs	2,229	1,679	549	60	0	0	4,517
3	Crafts (Construction) - HLW - Electrical	7,497	10,714	7,527	0	0	0	25,738
3	Crafts (Construction) - HLW - Mechanical	9,612	7,449	2,275	0	0	0	19,336
3	Crafts (Construction) - HLW - Piping and Instrumentation	18,916	18,588	6,387	0	0	0	43,891
3	Construction Subcontracts - HLW	12,477	15,671	4,835	0	0	0	32,983
3	Liner Plate and Vessel Const Subcontract - HLW	449	14	0	0	0	0	463
3	Special Protective Coating Const Subcontract - HLW	2,913	1,082	0	0	0	0	3,995
3	Intermech Construction Subcontract - HLW	6,723	4,306	2,878	0	0	0	13,907
3	Commissioning - HLW	2,341	8,368	15,456	27,350	41,118	0	94,633
-	Fee	10,079	6,189	6,177	12,324	26,596	21,091	82,456
-	Cost and/or Schedule Uncertainty	25,684	23,998	28,350	11,952	8,686	43,315	141,985
2	Balance of Facilities (BOF)	54,965	80,098	52,759	24,728	12,691	10,507	235,748
3	Engineering Design - BOF	1,080	466	22	25	0	0	1,593

**Table C-36. Major Construction – Waste Treatment Plant (PBS ORP-0060) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(4 pages)**

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	Plant Equipment - BOF	1,980	18,633	0	0	0	0	20,613
3	Environmental and Nuclear Safety - BOF	432	484	502	432	280	16	2,146
3	Plant Material - BOF	539	0	0	0	0	0	539
3	Startup - BOF	11,310	9,153	5,497	0	0	0	25,960
3	Construction Field Non Manual - BOF	4,752	5,236	3,000	0	0	0	12,988
3	Crafts (Construction) - BOF	12,661	12,070	5,265	62	0	0	30,058
3	Crafts (Construction) - BOF - Distributions	1,054	834	301	26	0	0	2,215
3	Construction Subcontracts - BOF	5,665	4,184	2,709	144	0	0	12,702
3	Commissioning - BOF	6,414	13,258	22,122	20,996	16,768	0	79,558
-	Fee	3,034	3,935	1,902	3,510	2,195	1,059	15,635
-	Cost and/or Schedule Uncertainty	6,044	11,845	11,439	(467)	(6,552)	9,432	31,741
2	Analytical Laboratory (Lab)	28,416	26,726	39,691	28,184	17,030	18,590	158,637
3	Engineering Design - Lab	66	50	0	0	0	0	116
3	Plant Equipment - Lab	6,371	1,671	1,398	0	0	0	9,440
3	Equipment Engineering - Lab	148	0	0	0	0	0	148
3	Environmental and Nuclear Safety - Lab	691	792	773	689	561	32	3,538
3	Startup - Lab	5,507	643	0	0	0	0	6,150
3	Construction Field Non Manual - Lab	400	0	0	0	0	0	400
3	Crafts (Construction) - Lab	216	0	0	0	0	0	216
3	Crafts (Construction) - Lab - Distributions	249	195	66	7	0	0	517
3	Commissioning - Lab	11,657	19,546	28,499	27,408	22,960	0	110,070
-	Fee	879	1,089	1,508	4,678	2,997	5,679	16,830
-	Cost and/or Schedule Uncertainty	2,232	2,740	7,447	(4,598)	(9,488)	12,879	11,212
2	Plant Wide	266,486	236,250	179,672	132,785	52,156	1,660	869,009
3	Safety Assurance - General	3,033	2,678	2,941	2,916	3,011	41	14,620
3	Procurement & Subcontracts Freight - Plant Wide	1,529	403	215	115	12	0	2,274
3	Project Controls - General	9,030	8,145	7,038	5,082	3,015	121	32,431
3	Engineering Design - Plant Wide	4,891	3,105	1,001	409	36	14	9,456
3	Engineering Design LOE - Plant Wide	5,853	5,300	3,729	3,368	2,394	306	20,950

**Table C-36. Major Construction – Waste Treatment Plant (PBS ORP-0060) Near-Term Schedule and Costs, Level 3, by Fiscal Year (\$1,000, Escalated).
(4 pages)**

Schedule Level	Scope	2014	2015	2016	2017	2018	2019	Total
3	Engineering Management - Plant Wide	5,957	3,893	297	260	0	0	10,407
3	Equipment Engineering - Plant Wide	5,518	2,464	228	175	176	11	8,572
3	Environmental & Nuclear Safety - Plant Wide	5,115	6,202	4,970	4,318	5,738	448	26,791
3	Environmental & Nuclear Safety LOE - Plant Wide	3,068	3,358	3,426	2,581	2,546	220	15,199
3	Material Craft Services - Plant Wide	1,625	1,108	120	0	0	0	2,853
3	Procurement & Subcontracts - Procurement - Shared Services	11,875	6,555	3,810	1,516	770	0	24,526
3	Quality Assurance - General	7,646	7,521	6,534	6,464	3,488	55	31,708
3	Process Engineering and Flowsheet Modeling - Plant Wide	414	701	302	33	913	93	2,456
3	Startup - Plant Wide	4,553	4,642	3,268	605	0	0	13,068
3	Shared Services - General	48,019	43,266	40,787	33,747	25,670	766	192,255
3	Construction Field Non Manual – Shared Services	33,731	33,797	26,366	12,316	4,923	0	111,133
3	Crafts (Construction) - Shared Services - Distributions	27,051	17,783	(7,386)	(6,961)	0	0	30,487
3	Construction Subcontracts - Plant Wide	5,019	4,412	3,494	0	0	0	12,925
3	CB&I Construction Subcontract - Plant Wide	2,619	0	0	0	0	0	2,619
3	Construction Subcontracts - Shared Services - Distributions	3,958	3,689	1,230	0	0	0	8,877
3	Intermech Construction Subcontract - Plant Wide	3,489	111	0	0	0	0	3,600
3	Bulk Material (Civil) - Plant Wide	3,015	135	461	0	0	0	3,611
3	Bulk Material (Electrical) - Plant Wide	4,449	4,608	2	0	0	0	9,059
3	Bulk Material (Piping & Instrumentation) - Plant Wide	108	19	0	0	0	0	127
3	Commissioning - General	61,336	68,644	72,948	63,420	(2,146)	(520)	263,682
3	Project Operations - General	3,585	3,711	3,891	2,421	1,610	105	15,323
Total		848,111	720,941	581,050	412,055	254,310	241,155	3,057,438

¹ Negative numbers are Bechtel National, Inc., planned give backs.

BOF = Balance of Facilities.
HLW = High-Level Waste (Facility).

LAB = Analytical Laboratory.
LAW = Low-Activity Waste (Facility).
LOE = level of effort.

ORP = U.S. Department of Energy, Office of River Protection.
PBS = project baseline summary.
PT = Pretreatment (Facility).

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