Department of Energy
Five Year Plan
FY 2007-FY 2011
Volume II

Environmental Management

March 2006 Office of the Chief Financial Officer Volume II

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EM Five Year Plan
FY 2007-FY 2011

Introduction

The purpose of the EM Five Year Plan is to describe EM's planned strategies, funding and accomplishments over the next five years.

This plan summarizes EM progress to date, presents EM performance measures, discusses assumptions and the EM decision-making process, and provides estimated EM funding over FY 2007-11 time period. Following this summary are sections that provide detailed information on each site including planned accomplishments at target level funding.

Overview

Fifty years of nuclear weapons production and energy research generated millions of gallons of radioactive waste, thousands of tons of spent nuclear fuel and special nuclear material, along with huge quantities of contaminated soil and water. The Environmental Management (EM) program was established in 1989 to clean up the legacy waste and environmental contamination from these operations in a manner safe for the workers, protective of the environment, and respectful of the taxpayer.

Mission

The mission of EM is to complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research. The EM program has made significant progress in the last four years in shifting away from risk management to embracing a mission completion philosophy based on cleanup and reducing risk. As an established, operating cleanup completion and risk reduction program, EM is demonstrating the importance of remaining steadfast to operating principles while staying focused on the mission.

EM has made progress in recent years in cleanup and closure of sites. EM marks a major milestone in 2006 – as many as nine sites will be completed by the end of 2006 including Rocky Flats, Fernald, Miamisburg[1], Columbus, Ashtabula, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory-Main Site, Sandia National Laboratories, and Kansas City Plant.

In addition, EM will continue to maintain a focus on site completion, with an additional eight sites or areas (Argonne National Laboratory – East, Brookhaven National Laboratory, East Tennessee Technology Park at Oak Ridge, Energy Technology Engineering Center, Lawrence Livermore National Laboratory-Site 300; Inhalation Toxicology Laboratory, Pantex Plant; and the Stanford Linear Accelerator Center projected to be completed in by the end of 2009. (EM plans to transfer six Nevada "Off-sites" to the Office of Legacy Management in FY 2007. Three of these sites – the Central Nevada Test Area, Project Shoal Area and the Rio Blanco Site are scheduled to close in 2010.)

In addition to its emphasis on site closures, EM is also focusing on longer term activities required for the completion of the EM cleanup program. These include:

- Constructing and operating facilities to treat radioactive liquid tank waste into a safe, stable form to enable ultimate disposition.
- Securing and storing nuclear material in a stable, safe configuration in secure locations to protect national security.
- Transporting and disposing of transuranic and low-level wastes in a safe and cost-effective manner to reduce risk.

[1] With the possible exception of OU-1 which is being addressed now as a result of the FY2006 Appropriation Acts direction.

- Packaging spent nuclear fuel for disposal in a geologic repository
- Decontaminating and decommissioning facilities that provide no further value to reduce long-term liabilities and remediating the surrounding environment.

Assumptions and Uncertainties

EM is committed to meeting its goals and objectives. Nonetheless, with the size and complexity of a program such as EM, circumstances and conditions can change and thus alter previously expected outcomes. As circumstances change, EM will adapt its methods to accomplish our mission.

With this in mind, EM has identified assumptions that have been taken into account in the preparation of the FY 2007 -2011 Five Year Plan. These assumptions are listed in priority order. The planning assumptions are incorporated into sites' baselines that drive the planning and implementation of cleanup and risk reduction activities. The key assumptions are:

- The EM program will not be subject to new regulations, statutes, orders, or litigation that constrain the program's flexibility in accomplishing the goal of cleanup completion and risk reduction in a fiscally responsible manner while being protective of human health and the environment.
- EM can proceed with key aspects of its planned tank waste programs consistent with the FY 2005 authorization legislation and current status of the litigation related to waste incidental to reprocessing.
- EM's target level funding assumes that no additional new mission requirements or responsibilities will be assigned to the EM program for FY 2007 or in future years. (EM will not assume additional work scope associated with excess facilities from other DOE programs.)
- Fluctuating budgetary requirements relative to market-based contractor pension plan contributions may affect planned accomplishments (milestones and metrics).
- Acquisition strategies will promote contractor efficiencies through competition, performance incentives and through use of appropriate contracting vehicles (such as Indefinite Quantity/Indefinite Delivery).
- EM will be given sufficient flexibility by Congress to execute its budget efficiently within established appropriation control points.

EM believes there are major uncertainties regarding the program's ability to fulfill its cleanup and regulatory obligations. EM's plans were based on highly optimistic assumptions including:

- EM would receive full cooperation from State regulatory officials to implement the most cost-effective disposition of EM waste and materials.
- Performance-based acquisition strategies and other initiatives would greatly improve the cost efficiency of performing cleanup work.
- The scope of the EM program would be limited to a defined scope. No additional work scope or requirements would be added. In fact, work scope that had previously been assumed to be in the EM program (e.g., decontamination and decommissioning of the Portsmouth and Paducah Gaseous Diffusion Plants) was removed from the EM scope.

- A new Office of Future Liabilities would assume responsibility for any additional environmental cleanup work not already in the EM work scope.

However, some of these assumptions have not completely materialized.

- EM's plans were based on highly optimistic estimates of how much cleanup performance could be improved. While there have been significant accomplishments, there have also been complications and setbacks. The most significant setback is with the Waste Treatment Plant at Hanford where a very significant cost increase is likely.
- EM has not received full cooperation from State officials. The most significant is EM's inability to move Hanford's plutonium for off-site storage. This has forced EM to continue storage at Hanford, meaning that EM cannot decontaminate and decommission (D&D) the Plutonium Finishing Plant on the schedule planned.
- New scope and requirements have also been added to the EM program. These include:
    - Enhanced Design Basis Threat requirements that require augmentation of safeguard and security assets and physical improvements to facilities
    - Potential need for a Plutonium Vitrification Facility at Savannah River
    - More robust design criteria for the Salt Waste Processing Facility at Savannah River
    - Decision to remove the mill tailings pile from the Moab Site, rather than leave it in situ
    - Increased cleanup and D&D scope at Los Alamos National Laboratory as a result of the new consent order
    - Increased pension and benefit liabilities at the closure sites

- In addition, with Congress's 2005 rejection of the Office of Future Liabilities, EM is the likely organization to take on additional cleanup work scope from other programs, e.g.:
    - D&D of the Portsmouth and Paducah Gaseous Diffusion Plants
    - D&D of additional excess and unwanted science and nuclear security facilities at the Oak Ridge National Laboratory and Y-12
    - D&D of facilities at Argonne, Brookhaven, and other Office of Science national laboratories

Based on EM's continuing analysis of its environmental liabilities (including factoring in sites' estimates-at-completion that are reported to EM Headquarters as part of EM's implementation of DOE Order 413.3 on project management), DOE believes there is significant uncertainty in its ability to deliver cleanup as currently planned and/or expected. Including contractor performance issues, technical and regulatory issues (e.g., seismic design), emerging scope being included in site cleanup baselines, potential scope (primarily D&D of excess facilities not yet included in EM baselines), programmatic risk, litigation and other factors, EM further believes that its total life cycle cost estimate will increase by a minimum of $25 billion.

At the target funding levels provided in this Plan, EM believes that there are major uncertainties regarding its ability to comply with current requirements in its environmental cleanup agreements and with other requirements. The EM activities

estimated at target are based on the previously planned accelerated site closure strategy. The Department is currently updating these assumptions to reflect known changes in the regulatory and statutory requirements, incorporate changes based on actual program performance, and to incorporate technological and acquisition strategies to meet the Department's long-term environmental commitments.

Most existing cleanup commitments/scope/schedule are part of enforceable DOE regulatory/compliance agreements (e.g., Resource Conservation and Recovery Act compliance agreements; Comprehensive Environmental Remediation, Compensation, and Liability Act decisions; settlement agreements; and court orders). These agreements generally contain legally enforceable milestones. While some degree of flexibility exists within the regulatory framework to negotiate new milestone dates, the Department cannot unilaterally alter or defer milestones without potentially becoming subject to regulatory actions including actions seeking fines and penalties.

Strategic Context

Following publication of the Administration's National Energy Policy, the Department developed a Strategic Plan that defines its mission, four strategic goals for accomplishing that mission, and seven general goals to support the strategic goals. Each appropriation has developed quantifiable goals to support the general goals. Thus, the "goal cascade" is the following:

Department Mission → Strategic Goal (25 yrs) → General Goal (10-15 yrs) → Program Goal (10-15 yrs)

The goal cascade accomplishes two things. First, it ties major activities for each program to successive goals and, ultimately, to DOE's mission. This helps ensure the Department focuses its resources on fulfilling its mission. Second, the cascade allows DOE to track progress against quantifiable goals and to tie resources to each goal at any level in the cascade. Thus, the cascade facilitates the integration of budget and performance information in support of the Government Performance and Results Act (GPRA) and the President's Management Agenda (PMA).

Strategic, General, and Program Goals

The Department's Strategic Plan identifies four strategic goals 1) defense, 2) energy, 3) science, and 4) environmental aspects of the mission plus seven general goals that tie to the strategic goals. The three EM appropriations (Defense Environmental Cleanup, Non-Defense Environmental Cleanup, and Uranium Enrichment Decontamination and Decommissioning Fund) support the following EM goals:

Environmental Strategic Goal: To protect the environment by providing a responsible resolution to the environmental legacy of the Cold War and by providing for the permanent disposal of high-level radioactive waste.

General Goal 6, Environmental Management: Accelerate cleanup of nuclear weapons manufacturing and testing sites, completing cleanup of 108 contaminated sites by 2025.

Annual Performance Results and Targets

EM has developed 16 corporate performance measures to enable the program to monitor annual and life-cycle progress towards meeting the Department's General Goal 6 and EM's Program Goal. These corporate performance measures are:

1. Certified DOE storage/treatment/disposal 3013 containers (or equivalent) of plutonium metal or oxide packaged ready for long-term storage;
2. Certified containers of enriched uranium packaged ready for long-term storage;
3. Plutonium or uranium residues packaged for disposition (kg of bulk material);
4. Depleted and other uranium packaged for disposition (metric tons).
5. Liquid waste eliminated (millions of gallons);
6. Number of liquid tanks closed;
7. Canisters of high-level waste packaged for final disposition;
8. Spent nuclear fuel packaged for final disposition (metric tons of heavy metal);
9. Transuranic waste shipped for disposal at the Waste Isolation Pilot Plant (cubic meters);
10. Low-level waste/mixed low-level waste disposed (cubic meters);
11. Number of material access areas eliminated;
12. Number of nuclear facilities completed;
13. Number of radioactive facilities completed;
14. Number of industrial facilities completed;
15. Number of geographic sites closed; and
16. Number of release sites remediated.

Each of these 16 corporate performance measures is quantitative and focuses on the accomplishment of risk-reducing actions and life-cycle reduction. Each measure is tracked in the context of the total measure (life-cycle) necessary to complete each site as well as the EM program as a whole. The corporate measures are under configuration control, thereby establishing performance expectations and accountability for those expectations within a given target funding level. Through configuration control, EM is able to make corporate decisions that will keep the program on track, monitor and control costs and schedules, and manage site closure expectations. In addition to the corporate measures, performance is also tracked through the establishment of baselines, which are used to demonstrate whether a project and site are on track to achieve agreed upon performance expectations. Current progress against each of the 16 corporate performance measures is available on the EM web site at www.em.doe.gov. EM's performance measure targets for the FY 2007-2011 timeframe is shown in Table 1, below.

Table 1: EM Performance Measure Targets (FY2007-FY2011)

Performance Measure	Complete Through 2007	Complete Through 2008	Complete Through 2009	Complete Through 2010	Complete Through 2011
Geographic Sites Eliminated (Number of Sites)	87	90	94	97	98
Plutonium Metal or Oxide packaged for long-term storage (Number of Containers)	6,314	6,314	6,314	6,314	6,314
Enriched Uranium packaged for disposition (Number of Containers)	7,011	7,278	9,110	9,110	9,110
Plutonium or Uranium Residues packaged for disposition (Kilograms of Bulk)	107,790	107,790	107,790	107,790	107,790
Depleted and Other Uranium packaged for disposition (Metric Tons)	11,493	11,493	40,862	70,231	99,600
Liquid Waste in Inventory eliminated (Thousands of Gallons)	0	0	1,072	1,809	4,832
Liquid Waste Tanks closed (Number of Tanks)	5	9	16	19	25
High-Level Waste packaged for final disposition (Number of Containers)	2,744	2,994	3,224	3,454	3,740
Spent Nuclear Fuel packaged for final disposition (Metric Tons of Heavy Metal)	2,130	2,148	2,148	2,148	2,207
Transuranic Waste shipped for disposal at WIPP (Cubic meters)	51,161	62,725	75,421	86,086	93,236
Low-Level and Mixed Low-Level Waste disposed (Cubic meters)	1,025,689	1,051,609	1,075,841	1,107,604	1,147,197
Material Access Areas eliminated (Number of Material Access Areas)	11	11	11	12	12
Nuclear Facility Completions (Number of Facilities)	86	94	104	124	133
Radioactive Facility Completions (Number of Facilities)	294	311	343	357	379
Industrial Facility Completions (Number of Facilities)	1,421	1,592	1,818	1,881	1,957
Remediation Complete (Number of Release Sites)	6,426	6,670	7,171	7,475	7,631

Decision-making and Trade-offs

As is the case with any organization, resource limitations dictate that decisions and trade-offs be made between competing priorities.

EM's overall priorities are:

- Conduct compliant and safe operations
- Fully establish the disposition capability for radioactive liquid tank waste, special nuclear materials, and spent nuclear fuel
- Dispose contact-handled and remote-handled transuranic waste and low-level radioactive waste
- Decontaminate and decommission facilities no longer needed
- Continue to remediate contaminated soil and groundwater
- Support post-closure benefits and liability requirements

EM's FY 2007-2011 Five Year Plan reflects these priorities. As noted previously, in addition to closing up to nine sites in 2006, EM plans to close an additional eight sites and areas by the end of 2009. After 2011, the focus of the EM program will be continuing cleanup activities at its remaining large sites - Hanford, Idaho, Savannah River and Oak Ridge as well as the Portsmouth and Paducah Gaseous Diffusion Plants (GDPs).

Given these priorities the EM FY 2007 budget request reflects the following decisions:

- Funding was increased for the K-Basins closure activity under the Richland Spent Nuclear Fuel Stabilization and Disposition project at Hanford. K-Basins sludge containerization activities have encountered higher debris quantities than anticipated and extremely persistent water clouding due to suspension of submicron particulates mobilized during sludge collection activities, resulting in missed Tri-Party Agreement compliance milestones as well as missed commitments under the Defense Nuclear Facilities Safety Board Recommendation 2000-1 Implementation Plan. In response, EM has requested increased FY 2007 project funding for changes in sludge collection techniques, including installation of multiple pumping systems to collect sludge simultaneously, use of underwater cameras to overcome poor visibility, improvement of sludge vacuum system end effectors, removal of all fuel racks and significant quantities of debris from the basin to minimize interference with sludge vacuuming, and manufacture of special tooling to facilitate sludge collection in difficult basin conditions.

- Progress on the Savannah River Site Salt Waste Processing Facility has been hindered by additional design requirements to contain radiological releases in the event of an accident to adequately protect workers. The Department has agreed with the design changes recommended by the Defense Nuclear Facilities Safety Board, and this plan includes additional funding to complete facility design in FY 2008 and limited construction funds to support site preparation and long-lead procurement.

- There are also several examples in which funding has been decreased or held constant, in recognition of poor or slower-than-expected implementation performance. EM's FY 2007 request does not support any FY 2007 funding for the Idaho National Laboratory's dry fuel storage project to pay a facility economic price adjustment for fuel packaging operations. EM considered the contractor's delay in securing the necessary facility license, and determined it was unlikely the contractor could begin packaging operations in FY 2007; therefore, the price adjustment was not warranted in FY 2007. In fact, the Foster Wheeler contract for construction and operation of the Idaho Spent Fuel Facility under the Spent Nuclear Fuel Dry Storage Project has been mutually modified, that resulted in not entering the construction phase of the project.

- Funding was also decreased significantly in FY 2007 for cleanup of the Los Alamos National Laboratory in New Mexico. The Los Alamos National Laboratory has yet to formulate an integrated cleanup cost, scope and schedule baseline for EM validation. Funding priority was given to removing legacy transuranic waste in above-ground storage due to wildfire and security risks.

- This budget request for the Waste Treatment Plant at the Office of River Protection is $690M. Until the issues (e.g., seismic design) and uncertainties are resolved, and a revised cost and schedule performance estimate is established, comprehensive funding requirements across the five-year period cannot be accurately estimated at this time. Additionally, progress in the tank farms has been hindered due to performance issues. A reconfirmation of the path forward for tank farm activities, integrated with the Waste Treatment Plant schedules, needs to be conducted. Thus, funding has been decreased for the tank farm activities until the tank waste plans are reconfirmed.

FY 2007-2011 Funding

Table 2 shows the EM target funding for the FY 2007-2011 time period.

Table 2: Five-Year Target Funding Profile (FY2007-FY2011)[2]

Site/Program	FY 2007 Request	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
Closure Sites					
Ashtabula	295	295	295	295	295
Fernald	258,877	-	-	-	-
Miamisburg	34,869	30,633	29,912	29,040	28,637
Rocky Flats	1,000	-	-	-	-
Major Sites					
Carlsbad	213,278	220,238	211,173	208,535	235,892
Idaho	519,604	573,702	525,732	504,495	480,265
Oak Ridge	471,335	367,473	355,878	359,681	297,390
Paducah Gaseous Diffusion Plant	131,776	148,800	148,600	149,970	151,360
Portsmouth Gaseous Diffusion Plant	223,535	141,358	116,302	110,825	110,302
Richland	839,559	788,870	980,648	869,993	932,012
River Protection	964,127	853,891	805,914	729,549	810,919
Savannah River	1,084,394	986,400	1,054,188	981,022	1,041,913
NNSA Sites					
California Site Support	370	370	400	400	400
Lawrence Livermore National Laboratory	11,580	8,680	-	-	-
Los Alamos National Laboratory	91,627	112,944	113,908	78,469	114,792
Nevada	79,668	65,377	63,699	67,472	68,099
NNSA Service Center	1,622	1,511	1,200	1,200	1,200
Pantex	23,726	12,411	-	-	-
Separations Process Research Unit	24,500	27,585	32,949	32,949	32,949
All Other Sites					
Argonne National Laboratory	10,726	437	449	-	-
Brookhaven National Laboratory	28,272	31,493	27,415	7,514	7,318
California Site Support	160	160	172	172	244
Energy Technology Engineering Center	16,000	13,000	4,897	-	-
Inhalation Toxicology Laboratory	2,931	427	100	100	100
Moab	22,865	28,252	28,252	28,252	28,252
Stanford Linear Accelerator Center	5,720	5,900	2,950	-	-
West Valley Demonstration Project	73,400	73,400	73,400	61,400	5,250
Other					
Safeguards and Security	295,840	338,998	288,112	273,769	273,486
Technology Development & Deployment	21,389	21,389	21,389	21,389	21,389
Program Direction	291,216	296,068	306,342	317,096	330,111
Headquarters Support/Other	57,881	53,146	53,930	54,731	55,550
Closure Sites Administration	25,896	9,359	8,923	8,262	8,423
D&D Fund Deposit	452,000	-	-	-	-
D&D Fund Deposit Offset	(452,000)				
EM Total	**5,828,038**	**5,212,567**	**5,257,129**	**4,896,580**	**5,036,548**

[2] The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develo p the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB computer generates amounts for the out -years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

Site Specific Descriptions and Accomplishments

This section contains descriptions of sites where EM cleanup activities are occurring. For each site the following information is provided:

- Site Overview
- Site Description
- Site Cleanup/Scope of Cleanup
- Site Completion and End State
- Regulatory Framework
- Critical Uncertainties and Assumptions
- Interdependencies
- Contract Synopsis
- Cleanup Benefits
- Target Level Accomplishments

The sites are categorized as follows:

- EM Closure Sites
- Major EM Sites
- NNSA Sites
- All Other Sites

EM Closure Sites

Ashtabula

Site Overview

The mission of the Ashtabula Closure Project is to safely remediate the privately owned RMI Titanium Company Extrusion Plant (formerly known as Reactive Metals, Inc.) to allow the Ohio Department of Health and Ohio Environmental Protection Agency to release the site back to the RMI Titanium Company.

The Ashtabula Closure Project consists of remediation of facilities, disposition of equipment, and remediation of affected land areas and groundwater. Facility decommissioning will primarily be accomplished by demolition and disposal of debris in off-site disposal facilities. Contaminated soil, asphalt, and concrete will be shipped to a low-level waste disposal site for burial. Groundwater remediation will be accomplished through source-term removal to on-site release limits. The project end-state of the site is expected to be completed by December 2006. Groundwater remediation will continue as part of the long-term stewardship program. Groundwater monitoring activities may continue for an additional 5-year period after the active groundwater remediation is complete. At the end of the project, 32 facilities will have been demolished or free-released. An estimated 37,000 tons of soil, concrete, and asphalt will have been remediated as part of the cleanup effort. All legacy waste and all equipment formerly used during production will have been shipped for disposal to licensed burial sites.

Site Description

The Ashtabula Closure facility is located one mile south of Lake Erie approximately 50 miles northeast of Cleveland, Ohio.

Site Cleanup Strategy/Scope of Cleanup (End State)

The site of the former Reactive Metals, Inc. extrusion plant will be remediated per an approved Ohio Department of Health Decommissioning Plan. Completion will allow the Ohio Department of Health to release the site to the owner, the RMI Titanium Company.

The scope of the Ashtabula Closure Project includes the environmental restoration of three release sites that were contaminated by Weapons Program activities from 1962 to 1988. The three release sites are: Buildings and Equipment; Solid Waste Management Unit soil and groundwater; Non-Solid Waste Management Unit soil. The Buildings and Equipment release site will be remediated principally by demolition or free-release of 32 site buildings and disposal of remediation waste, including equipment, as low-level waste. The Solid Waste Management Unit release site will be remediated by bioremediation followed by soil excavation, ex-situ vapor stripping, and shipment of the remaining radioactively contaminated soil to a disposal site. Remediation of the non-Solid Waste Management Unit soils, including soil beneath site facilities, will be accomplished principally by excavation and shipment to a disposal site. Non-Solid Waste Management Unit soils are estimated at 27,000 tons. Bulk waste shipment of all remediation waste, including contaminated soil, will be by railroad gondola cars. Interim support facilities will be provided during remediation. Remediation of the

trichloroethylene-contaminated soils will be by low temperature thermal desorption. Remediation of groundwater contamination will continue as part of long-term stewardship.

Site Completion (End State)

With the exception of Area C-West, which is owned by the City of Ashtabula, all land involved with the Ashtabula Closure Project is owned by the RMI Titanium Company. Upon Ohio Department of Health regulatory release of the site license, following completion of remediation activities, all property will remain with the current owners. All property is being remediated for "Free and Unrestricted Use." This project end-state for the site land areas will be reached by the end of 2006. As part of long-term stewardship, groundwater monitoring by means of well sampling and analysis will continue for a 5-year period after the end of active groundwater remediation. Although unlikely, additional groundwater treatment would be required if at any time during the monitoring cycle, contamination above regulatory limits is detected in the groundwater.

Regulatory Framework

The Site Treatment Plan provides details of the planned treatment and disposal of Ashtabula Closure Project Mixed Waste to meet the requirements of the Federal Facility Compliance Act. The scope and planned actions necessary to remove the Extrusion Plant Site from service, remediate the site, and to release the site for unrestricted use (termination of the RMI Titanium Company's Nuclear Regulatory Commission license) is being conducted per the requirements of Title 10 Code of Federal Regulations Part 40.

Critical Project Uncertainties and Assumptions (per Project Risk Management Plans)

It is assumed that the contract awarded for final remediation of the Ashtabula Closure Project in the fall of 2005 will allow final site remediation to be completed by the end of 2006, and no additional regulatory issues that impact the scope or pace of cleanup will arise.

Interdependencies

Completing off-site disposition of low-level waste is dependent upon identifying disposition pathways and facilitating off-site transport.

Contract Synopsis

RMI Titanium Company, the site owner, was responsible for performing site cleanup activities through 2003. In December 2003, DOE chose to terminate the contract with the RMI Titanium Company to support comprehensive evaluation of the work to be performed and how it could most efficiently be accomplished. DOE has chosen to complete Ashtabula Closure Project remediation through a competitively bid cost plus incentive fee task order awarded under the EM Indefinite Delivery/Indefinite Quantity contract (small business). The new closure contract was awarded in September 2005.

Cleanup Benefits

Work associated with final remediation and completion of DOE's responsibilities at the Ashtabula Closure Project is planned for completion in 2006. At that time it is expected that the site will have been remediated to satisfy provisions of the Ohio Department of Health Decommissioning Plan. The site will then be released back to the RMI Titanium Company.

Long Team Stewardship

Active groundwater remediation by the selected means may need to continue as part of the LTS program. Close-out activity costs will include final closeout costs such as financial closeout, the last year's records management, etc. Monitoring, well sampling and analysis activities, also part of LTS, will continue for a five-year period after the completion of active groundwater remediation. The final year of LTS will include the cost of well abandonment and final closure activities by the regulator.

Columbus

Site Overview

The Columbus Closure Project, formerly known as the Battelle Columbus Laboratories Decommissioning Project, is a radioactive decontamination project at facilities owned by the Battelle Memorial Institute in central Ohio. The project initially addressed 15 buildings and associated grounds at two separate research facilities. Cleanup of Battelle's King Avenue site was completed in 2000, and the remaining activities are focused on Battelle's former nuclear sciences research park in rural Madison County, Ohio at the West Jefferson North site.

The end-state for the site has been defined in a series of contractual agreements between the Department and Battelle. This end-state is also embodied in a Decommissioning Plan prepared by Battelle Memorial Institute and approved by the U.S. Nuclear Regulatory Commission, the principal regulatory authority for the cleanup (Battelle Memorial Institute, 1993). The Decommissioning Plan describes the project's technical basis for release of buildings, materials and grounds.

Completion of the West Jefferson site accelerated cleanup consists of four primary objectives: 1) decontamination and demolition of three large buildings: JN-1, High Energy Hot Cell Facility (20,200 square feet); JN-2, Critical Assembly Building (13,000 square feet), and JN-3, Reactor Building (10,000 square feet); 2) cleanup of related external areas (contaminated filter beds and buried utilities); 3) waste management activities (packaging, transportation, and disposal of transuranic waste, low-level waste and contaminated soils and debris); and 4) surveillance and maintenance (phased out as site hazards are reduced). The end-state objective is to safely remediate Battelle facilities to levels of residual contamination allowing future use of the site without radiological restrictions by the end of FY 2006 or sooner, thereby releasing DOE from all future liability. All future use decisions will be made by the site owner, Battelle.

Site Description

The Battelle West Jefferson facility is located approximately 10 miles west of Columbus, Ohio.

Site Cleanup Strategy/Scope of Cleanup (End State)

The West Jefferson facility will be remediated per a Nuclear Regulatory Commission approved decommissioning plan which will allow the Nuclear Regulatory Commission license currently held by Battelle to be terminated upon completion. The scope of the Columbus Closure Project is to remove radioactive materials and contamination to levels that will allow future use of Battelle buildings and grounds without radiological restrictions, as defined in project procedures and Nuclear Regulatory Commission requirements. DOE and Battelle have mutually agreed that demolition of buildings JN-1, JN-2, and JN-3 is a cost-effective way of meeting their responsibilities for these three buildings.

Site Completion (End State)

The project end-state will be reached in FY 2006. As a general end-state, areas where buildings have been demolished or contaminated materials have been excavated will be backfilled, compacted to a degree that will enable future construction, and covered with grass. Known contamination will be removed in accordance with project release criteria. Exceptions, such as decontaminating or excavating areas to below release criteria or partially excavating areas above release criteria (e.g., possibly leaving the section of sanitary sewer that runs under the dam in place and filling it with grout material to fix the contamination and render the pipe unusable) will be made on a case-by-case basis by mutual agreement between DOE and Battelle.

Regulatory Framework

The Site Treatment Plan provides details of the planned treatment and disposal of Columbus Closure Project Mixed Waste to meet the requirements of the Resource Conservation and Recovery Act Federal Facility Compliance Act.

Critical Project Uncertainties and Assumptions (per Project Risk Management Plans)

Project completion of the Columbus Closure project is expected to occur in FY 2006.

Interdependencies

None

Contract Synopsis

Between FY 1987 and FY 2003, Battelle performed as the prime contractor for the cleanup, and contributed a 10 percent cost share. In FY 2003, DOE chose to complete the remediation through a competitively bid cost plus incentive fee contract. The new closure contract awarded in FY 2004 mandates adherence to the approved Decommissioning Plan, the established release criteria, and the end-state for the site. Additionally, DOE is responsible for facilitating off-site disposition of transuranic waste.

Cleanup Benefits

Work associated with final remediation and completion of DOE's responsibilities at the West Jefferson site is planned for completion in FY 2006. At that time it is expected that the site will be remediated to support Nuclear Regulatory Commission license termination for Battelle, the site owner.

Long Term Stewardship

The end-state objective is to safely remediate Battelle facilities to levels of residual contamination allowing future use of the site without radiological restrictions by the end of FY06 or sooner, thereby releasing DOE from all future liability. All future decision will be made buy the site owner, Battelle.

Fernald

Site Overview

In 1952 Fernald began its uranium production mission as the Feed Materials Production Center in support of the nation's weapons program. During 37 years of operation, 462 million pounds of pure uranium metal products were produced for use in the production reactors at DOE's Hanford and Savannah River facilities. When operations ceased in 1989, there were 31 million pounds of uranium product present on site, 2.5 billion pounds of waste, and 2.75 million cubic yards of contaminated soil and debris. In addition, a 223-acre portion of the underlying Great Miami Aquifer was found to be affected by uranium at levels above drinking water standards.

In 1992 the site was renamed the Fernald Environmental Management Project and the mission was formally changed to environmental restoration under the Comprehensive Environmental Response, Compensation, and Liability Act. To facilitate restoration, the Comprehensive Environmental Response, Compensation, and Liability Act work scope for the 1,050-acre facility was divided into five operable units: the waste pits (Operable Unit 1); other waste units (Operable Unit 2); the Production Area facilities and legacy-waste inventories (Operable Unit 3); Silos 1 through 4 (Operable Unit 4); and contaminated environmental media, including soil, sediment, and groundwater (Operable Unit 5). Since 1992, Comprehensive Environmental Response, Compensation, and Liability Act remedial investigations and feasibility studies have been completed for each of the operable units, and final Records of Decision to establish cleanup levels and document the cleanup remedies have been signed for each by DOE, United States Environmental Protection Agency, and Ohio Environmental Protection Agency.

Physical cleanup at Fernald is expected to be completed by September 30, 2006, with final contract fee and post closure liabilities due in FY 2007.

Site Description

The Fernald Closure Project environmental restoration site encompasses 1,050 acres in southwestern Ohio, which is divided into five operable units: the waste pits (Operable Unit 1); other waste units (Operable unit 2); the Production Area facilities and legacy waste inventories (Operable Unit 3); Silos 1 through 4 (Operable Unit 4); and contaminated environmental media, including soil, sediment and groundwater (Operable Unit 5).

Site Cleanup Strategy/Scope of Cleanup (End State)

The Fernald wastes include process-generated waste (the most radioactive and/or hazardous waste on-site) from multiple sources. These multiple sources include Silos 1 and 2 that contain radium-bearing residues from the uranium extraction of pitch-blend ores, Silo 3 that contains radium-bearing cold metal oxides, and the waste pits that contain low-level radioactive waste. In addition to these sources, millions of cubic feet of containerized waste material remained from the uranium metals production. The strategy to remediate these sources includes characterization, treatment, packaging, transportation, and final disposition. Following the completion of these activities, all process-generated waste will be dispositioned, and any related structures will be demolished.

Site Completion (End State)

The project end-state will be reached in FY 2006. The final remedial actions include: facility decontamination and dismantlement; on-site disposal of the majority of contaminated soil and decontamination and dismantlement debris; off-site disposal of the contents of the two K-65 Silos (Silos 1 and 2), Silo 3, waste pit material, nuclear product inventory, low-level waste, mixed waste, and limited quantities of soil and decontamination and dismantlement debris not meeting on-site waste acceptance criteria; and treatment of contaminated groundwater to restore the Great Miami Aquifer.

Ultimately, approximately 975 acres of the 1,050-acre property will be restored to beneficial use as an undeveloped park, and approximately 75 acres will be dedicated to the footprint of the On-Site Disposal Facility (OSDF). Contaminated portions of the aquifer will be restored to beneficial use as a drinking water supply, and long-term stewardship actions will be put in place consistent with the final land use.

Regulatory Framework

In 1986 DOE/U.S. Environmental Protection Agency and the Ohio Environmental Protection Agency signed the Comprehensive Environmental Response, Compensation, and Liability Act Federal Facility Agreement. It was further agreed that DOE would undertake particular activities to bring Fernald Closure Project into compliance with the Clean Air Act and Resource Conservation and Recovery Act.

Critical Project Uncertainties and Assumptions (per Project Risk Management Plans)

DOE's plan for Fernald silos residues (wastes) is as follows. Silo 1 and 2 waste is going to Waste Control Specialists, LLC, Texas for storage pending ultimate disposal. Silo 3 waste is going to Envirocare, Utah for disposal.

Interdependencies

In FY 2007 the site will transfer to the Office of Legacy Management for long-term monitoring and maintenance.

Contract Synopsis

Fluor Fernald is the prime contractor comprised of four teaming partners: Fluor Daniel, Inc, Jacobs Engineering, Duratek, and Nuclear Fuel Services. In November 2000, the Department of Energy and Fluor Fernald entered into a closure contract that incentivized Fluor Fernald to reduce the cost and schedule of the Fernald site cleanup.

FY 2007 is the last year of the Fluor Fernald contract; however, Fluor Fernald is on track to complete physical cleanup by September 30, 2006, with final contract fee and post-closure liabilities due in FY 2007.

Cleanup Benefits

Work associated with final remediation and completion of DOE's responsibilities at the Fernald site is planned for completion in FY 2006. Ultimately, approximately 975 acres

of the 1,050-acre property will be restored to beneficial use as an undeveloped park, and approximately 75 acres will be dedicated to the footprint of the On-Site Disposal Facility. Contaminated portions of the aquifer will be restored to beneficial use as a drinking water supply, and long-term stewardship actions will be put in place consistent with the final land use. Upon acceptance of the physical completion by DOE, the site will be transferred to the Office of Legacy Management for long-term monitoring and maintenance.

Long Term Stewardship

- A passive security system at Fernald as defined by Legacy Management. Limited site communication ability will exist for monitoring site wide alarms and emergency notification.
- Surveillance and Maintenance, Aquifer Restoration management, Environmental monitoring and compliance, Consolidated Advanced Waste Water Treatment (CAWWT) operations, extraction well field operations, OSDF leachate transmission system monitoring, and records management. These activities occur after Fluor Fernald submittal and the acceptance of physical completion, anticipated to begin after March 31, 2006.
- Liabilities in alignment with the end of the Fernald Closure Project Prime Contract and claims related to health and welfare benefits and workman's compensation. Based upon the components of the post-closure liabilities, various end-dates are estimated through FY 2070. It is anticipated that there are approximately 12 months of EM-post closure contract closeout activities associated with Program Management, Environmental, Records Management and Procurement.
- Continue to provide funding to the Ohio Environmental Protection Agency in its role of overseeing the clean- up of the Site, Payment in Lieu of Taxes, and Compliance for Cultural Resource.

Miamisburg

Site Overview

In June 2002, DOE, the Ohio Environmental Protection Agency and the United States Environmental Protection Agency signed a letter of intent formalizing an agreement with DOE to accelerate the Miamisburg Closure Project cleanup. The primary goal addressed in the agreement signed by DOE and the regulators was to accelerate cleanup activities such that the site could achieve closure by 2006. On December 5, 2002, DOE awarded a new Cost plus Incentive Fee Miamisburg Closure Project Closure Contract which had a target completion date of March 31, 2006 (the current amended target completion date is September 30, 2006).

Site Description

The Miamisburg Mound plant was built in the late 1940s to support research and development, testing, and production activities for DOE's defense nuclear weapons complex and energy research programs. The plant's mission involved production of components, which contained plutonium-238, polonium-210, tritium, and large quantities of high explosives. This mission continued until 1994, when these activities were transferred to other DOE facilities.

The Miamisburg Closure Project site is located in Miamisburg, Ohio, ten miles southwest of Dayton and 31 miles north of Cincinnati.

Site Cleanup Strategy/Scope of Cleanup (End State)

Solid waste stabilization and disposition activities include the collection, storage, and disposition of waste, primarily waste generated from contaminated soil cleanup and waste from the decontamination and demolition of site buildings. Soil and building contamination is dominated by residual spread of thorium and plutonium. However, other radionuclides such as radium, actinium and cesium are found in lesser amounts. Solid waste stabilization and disposition activities at the Miamisburg Closure Project involve the management of low-level waste, low-level mixed waste, transuranic waste, hazardous waste, and solid waste streams. This includes interim waste storage, shipment of waste to federal and commercial disposal facilities, and, in some cases, minor treatments. Transuranic waste is currently being shipped to the Savannah River Site pursuant to an agreement between the Department of Energy and the State of South Carolina. All legacy transuranic waste was dispositioned by the end of FY 2003. The end-state for this project is the disposition of all waste streams to approved disposal sites by September 30, 2006.

Site Completion (End State)

DOE will complete the Record of Decision for Parcel 6/7/8 before declaring EM completion by late CY 2006.

Regulatory Framework

In 1993 DOE/U.S. Environmental Protection Agency and the Ohio Environmental Protection Agency signed the Federal Facility Agreement.

Critical Project Uncertainties and Assumptions (per Project Risk Management Plans)

As a result of Congressional action in FY 2006, additional environmental closeout activities associated with Operable Unit 1 are being developed. Implementation of the Operable Unit 1 environmental closeout may continue into FY 2007, and may delay closure.

Interdependencies

Off-site shipment of waste will continue without obstruction.

Contract Synopsis

DOE has a cost plus incentive fee closure contract with CH2M Hill Mound, Inc. with a target completion date of September 30, 2006. The contract provided significant incentive to the contractor to complete closure early while maintaining high safety standards, reducing risk, saving the taxpayer money through various means (mortgage reduction, process efficiencies, implementation of new technologies, etc.), and remaining in compliance with all regulatory and enforceable milestones.

Cleanup Benefits

Successful site cleanup, closure and turnover of 24 buildings and 306 acres to the Miamisburg Mound Community Improvement Corporation (MMCIC) are expected to occur in 2007. When site cleanup and transfer occurring, the long-term stewardship mission at Miamisburg Closure Project will be transferred to DOE's Office of Legacy Management.

Long Term Stewardship

- Excavation of additional LLW soil volumes beyond that identified in the contract scope and installation of a Package Plant for sanitary sewage treatment has extended the CH2M Hill Mound, Inc. contract completion date to (approximately) September 30, 2006 for this FY2005 life-cycle budget update. However, DOE DOE-EM/MCP has assumed that transfer of site custodianship to DOE-LM will occur on October 1, 2006 (i.e., beginning of FY2007). This transfer date is consistent with the October 1, 2006 data provided in the Site Transition Plan approved by EM-1 and LM-1 on March 29, 2005.
- Parcel 6/7/8 will be transferred to the MMCIC no later than FY2008, per the February 1, 2008, "out-clause" in the 1998 site sales contract between DOE and the MMCIC. So long as DOE remains the Parcel 6/7/8 property owner, certain activities (e.g., NPDES Permit, building maintenance, PILT payments) must continue to be performed. If the MMCIC has not acquired ownership of Parcel 6/7/8 by sometime in FY2008, the DOE will initiate disposition of the property through the General Service Administration (GSA). Based on DOE experience with the disposition of other excess properties, it may take GSA up to three years (i.e., through FY2011 year-end) to disposition Parcel 6/7/8. Accordingly, this life-cycle budget update includes all costs through FY2011 that will be necessary

for continued Federal ownership of Parcel 6/7/8 throughout a potential three-year process for GSA to broker disposition of the property.

- Post-closure administration for employee benefits, such as pension, retiree medical, and life insurance that are defined under Financial Accounting Standard 87 (Employers' Accounting for Pension), Financial Accounting Standard 106 (Employers' Accounting for Post-Retirement Benefits Other Than Pension), and estimated worker's compensation. In addition, there are contract termination requirements and ongoing litigation of old contracts in FY07.
- DOE will also need to finalize the Record of Decision for Parcel 6/7/8 before declaring EM completion and this activity will likely not occur until early FY07. Accordingly, LTS costs include EM work scope, through the end of FY07, for the following seven functional areas: Program Management, Environmental, Records Management, Information Management, Property Management, Stakeholder and Regulator Relations, and Procurement. Responsibility for these seven functional areas which may not transfer to Legacy Management until October 1, 2007.

Rocky Flats

Site Overview

The mission of the Rocky Flats Field Office is to oversee the cleanup and closure of the Rocky Flats Environmental Technology Site. This mission encompasses the management of the site waste and special nuclear materials and their removal from the site; the deactivation, decommissioning and demolition of the site facilities; and cleanup, closure and conversion of the site to beneficial use in a manner that is safe, environmentally and socially responsible, physically secure, and cost-effective.

Site Description

The Rocky Flats Environmental Technology Site is located about 10 miles northwest of Denver, Colorado, on about 11 square miles at the base of the Rocky Mountains. The Atomic Energy Commission established the Rocky Flats Plant in 1951with a mission to manufacture nuclear weapons components from materials such as plutonium, beryllium, and uranium. When operations ceased, large amounts of plutonium, plutonium compounds, and metallic residues remained at the various site facilities. Significant volumes of hazardous and radioactive waste generated during production operations were also present throughout numerous buildings and soil was contaminated, resulting in the site being placed on the National Priorities List. In 1991, EM acquired the Rocky Flats Plant and the site transitioned to a new mission: cleaning up the contamination and waste from past production activities. It was at this time that the Rocky Flats Plant became the Rocky Flats Environmental Technology Site. By the end of 2005, all site facilities were demolished; all waste removed, and contamination reduced to regulatory agreed upon levels. The site will transition to a National Wildlife Refuge under a Memorandum of Understanding with the U.S. Department of Interior. In FY 2007, the long-term stewardship mission at the site will transfer to the Office of Legacy Management.

Site Cleanup Strategy/Scope of Cleanup (End State)

All cleanup activities at the Rocky Flats Site were completed in FY 2006. In FY 2007, the final Comprehensive Environmental Response, Compensation, and Liability Act Record of Decision will be filed completing the regulatory activities at the Site. Contract close out will be addressed on an accelerated pace and regulatory closeout activities will dominate site activities.

Site Completion (End State)

The final Comprehensive Environmental Response, Compensation, and Liability Act Record of Decision will be filed completing the regulatory activities at the Site. Contract close out will be addressed on an accelerated pace and regulatory closeout activities will dominate site activities.

Regulatory Framework

In 1996 DOE, U.S. Environmental Protection Agency and Colorado Department of Public Health and Environment signed the Rocky Flats Cleanup Agreement.

Critical Project Uncertainties and Assumptions (per Project Risk Management Plans)

Project completion at the Rocky Flats Site occurred in FY 2006.

Interdependencies

The site will transition to a National Wildlife Refuge managed by the U.S. Department of Interior. In FY 2007 the long-term stewardship mission at the site will transfer to the Office of Legacy Management.

Contract Synopsis

On February 1, 2000, Kaiser-Hill Company, LLC and the Rocky Flats Field office signed the Rocky Flats Closure Contract. This is a cost plus incentive fee contract which incentivized Kaiser-Hill to reduce the cost and schedule of the Rocky Flats site cleanup.

Cleanup Benefits

The site will transition to a National Wildlife Refuge.

Long Term Stewardship

- Continue safeguards and security protection program operations, personnel security, information security, computer security, and access control activities at required levels.
- Pension and retiree medical/life insurance payment. Provide support for completing final Record of Decision and completing certification of final project closeout.
- Support site litigation activities and former site management and operating and existing site contractor contract closeouts. Post closure contract liabilities support provides for projected pension, retiree medical and life insurance, and workmen's compensation requirements subsequent to site closure. The current scope of these activities is defined under Federal Accounting Standard 87 (Employers' Accounting for Pension), Federal Accounting Standard 106 (Employers' Accounting for Post-Retirement Benefits Other Than Pension), and estimated workmen's compensation. The projected end date for this activity is 2070.
- Support to the Colorado Department of Public Health and Environment, the U.S. Fish and Wildlife Service, and the Local Stakeholder Organization (LSO) will continue commensurate with the site closure responsibilities of these organizations. Support for additional site environmental monitoring may be required in support of transition of the site to the Fish and Wildlife Service control. End date is December 2006.

Major EM Sites

Carlsbad

Site Overview

The Carlsbad Field Office, located in Carlsbad, New Mexico, was created to serve as the focal point for the nation's transuranic waste management efforts since transuranic waste is currently stored at many DOE sites across the country. The Carlsbad Field Office has the responsibility for management of the National Transuranic Waste Program, whose mission is the implementation and management of a national system that safely and cost-effectively provides for the certification, transportation, and disposal of defense-generated transuranic waste. The Waste Isolation Pilot Plant is an integral part of the National Transuranic Waste Program and is managed by the Carlsbad Field Office. This Plant, near Carlsbad, New Mexico, is the Nation's only mined geologic repository for the permanent disposal of defense-generated transuranic waste. The waste disposal area is 2,150 feet (almost one-half mile) below the surface located in 200-million year old stable salt beds. The transuranic waste, from all the generator sites that are eligible for disposal at the Waste Isolation Pilot Plant, must ultimately be transported to this repository for receipt, handling, and disposal.

Site Description

The Waste Isolation Pilot Plant was the world's first permitted deep geologic repository for the permanent disposal of radioactive waste. It is located in Eddy County in southeastern New Mexico, 26 miles southeast of Carlsbad. The Plant's total land area consists of 10,240 acres with the fenced surface portion of the active site being about 35 acres in size. It is located in an area of low population density and the area surrounding the facility is used primarily for grazing, and development of potash, oil, salt, and natural gas resources.

Site Cleanup Strategy/Scope of Cleanup

The Waste Isolation Pilot Plant is an operating facility, supporting the cleanup of transuranic waste from waste generator and storage sites. It is not a cleanup site.

Site Completion and End State

The DOE EM's end-state for Waste Isolation Pilot Plant is to cease disposal of legacy and newly generated transuranic waste from the DOE complex to the Waste Isolation Pilot Plant in 2030. Decommissioning of the surface facilities and permanent closure of the underground will be completed in 2035 at which time passive institutional controls will be constructed.

Regulatory Framework

Authorized by Congress in 1979, the Waste Isolation Pilot Plant was constructed during the 1980's. Congress established the regulatory framework in the Waste Isolation Pilot Plant Land Withdrawal Act in the 1990's. The Plant operates under a Resource Conservation and Recovery Act, Part B, Hazardous Waste Permit issued by the New

Mexico Environment Department in October 1999. The Environmental Protection Agency issued regulatory standards for waste containment during handling and after disposal in 40 CFR 191. Then the Environmental Protection Agency formulated Waste Isolation Pilot Plant-specific criteria in 40 CFR 194 that required DOE to demonstrate that the Waste Isolation Pilot Plant would meet its containment standards. The Environmental Protection Agency initially certified the Waste Isolation Pilot Plant's compliance with these regulations on May 18, 1998.

The Waste Isolation Pilot Plant has four primary regulators, responsible for the following areas: 1) the Environmental Protection Agency that regulates repository certification and radionuclide regulation in accordance with the Waste Isolation Pilot Plant Land Withdrawal Act, as amended, of 1996 and the regulation of polychlorinated biphenyls; 2) the New Mexico Environment Department that regulates Resource Conservation and Recovery Act hazardous constituents, water discharge, and ground water; 3) the Nuclear Regulatory Commission that certifies Type B transportation packaging; 4) and the Department of Transportation that regulates highway transportation and Type A transportation packaging.

Agreements with States at the Waste Isolation Pilot Plant's generator sites may impact the Waste Isolation Pilot Plant. For instance, the *Idaho Settlement Agreement* contains transuranic waste shipment milestones for the Idaho National Laboratory and the *Letter of Intent for Meeting Environmental Responsibilities at New Mexico DOE Facilities* commits to accelerated cleanup of transuranic waste at Sandia National Laboratories and the Los Alamos National Laboratory in the State of New Mexico.

Critical Site Uncertainties and Assumptions

The Waste Isolation Pilot Plant's key uncertainty is obtaining permit approval for remote-handled transuranic waste disposal by the New Mexico Environment Department in 2006. The remote-handled permit modification is to allow the Waste Isolation Pilot Plant to manage, store, and dispose of this waste at the Waste Isolation Pilot Plant. At New Mexico Environment Department's request, the remote-handled permit modification has been combined with the Section 310/311 permit modification. Congress added Section 311 to the 2004 Energy and Water Development Appropriations Act and Section 310 to the 2005 Consolidated Appropriations Act and directed DOE to submit a request to the New Mexico Environment Department to make changes in waste analysis activities and the Waste Isolation Pilot Plant facility monitoring. Section 310/311 provisions will reduce the DOE life-cycle costs for transuranic waste characterization/confirmation overall. The combined permit modification will facilitate cost-effective, safe cleanup and disposal of the Nation's defense transuranic waste.

Interdependencies

The Waste Isolation Pilot Plant is dependent on the waste generator/storage sites to provide waste for certification and disposal. The Waste Isolation Pilot Plant is also dependent on its regulators and their decisions that impact operations, certification of the Waste Isolation Pilot Plant, permit modifications, licenses, shipping, and transportation.

The New Mexico Environment Department issued a combined draft remote-handled and section 310/311 permit in November 2005. The public comment period ended on January 23, 2006, and the public hearing will take place on this draft permit in March 2006.

Contract Synopsis

The Carlsbad Field Office currently has four major contracts in place. The Management and Operating Contract for the Waste Isolation Pilot Plant were recently extended through September 2010. A technical assistance contract responsible for implementing the independent DOE quality assurance program for the National Transuranic Waste Program through August 2010 was awarded on August 11, 2005. In addition, two contracts for transportation carrier services will be re-competed in the CY 2006 timeframe.

Cleanup Benefits

The Waste Isolation Pilot Plant is crucial to DOE completing its cleanup/closure mission. Because the temporary storage facilities located across the United States were never intended to become permanent disposal sites, the Waste Isolation Pilot Plant has become the essential element in reducing the risks to public health, workers, and the environment.

Target Level Accomplishments

FY 2007

- Maintain CH TRU disposal throughput capability
- Maintain disposal throughput capability at 2 RH TRU containers per week
- WIPP capable of handling TRUPACT-III

FY 2008

- Maintain CH TRU disposal throughput capability
- Maintain disposal throughput capability at 3 RH TRU containers per week
- Initiate SRS large box container shipments

FY 2009

- Maintain CH TRU disposal throughput capability
- Maintain disposal throughput capability at 3 RH TRU containers per week
- Submit second Compliance Recertification Application to the Environmental Protection Agency
- Submit new RCRA Hazardous Waste Facility Permit application to the New Mexico Environment Department

FY 2010

- Maintain CH TRU disposal throughput capability (includes 4 TRUPACT III container per week)
- Maintain disposal throughput capability at 3 RH TRU containers per week

FY 2011

- Maintain CH TRU disposal throughput capability (includes 8 TRUPACT III container per week)
- Maintain disposal throughput capability at 12 RH TRU containers per week

Idaho National Laboratory

Site Overview

Since its establishment in 1949, the Idaho National Laboratory has fulfilled numerous Department of Energy (DOE) missions including designing and testing of 52 nuclear reactors and reprocessing spent nuclear fuel to recover fissile materials. These activities have resulted in an inventory of high-level, transuranic, mixed low-level and low-level wastes, which are being disposed in accordance with applicable laws and regulations. The laboratory is also responsible for storing and dispositioning approximately 250 metric tons of spent nuclear fuel from a number of sources, including the Navy, foreign and domestic research reactors, and some commercial reactors, along with DOE owned fuel. In addition, the site is on the United States Environmental Protection Agency's National Priorities (Superfund) List, and environmental remediation activities are required at ten Waste Area Groups encompassing 100 operable units, including Naval Reactors Facility Waste Area Group 8 and Argonne National Laboratory-West Waste Area Group 9.

The Idaho National Laboratory's Environmental Management (EM) Program is responsible for managing a variety of radioactive and hazardous wastes and materials that originate from those missions and from other DOE facilities. The EM program is treating, storing and disposing of a variety of waste streams, cleaning up the environment, removing or deactivating unneeded facilities, and will remove DOE's inventory of spent nuclear fuel and high-level waste from Idaho. The EM end-state vision consists of achieving the following:

- By 2012, the Idaho National Laboratory will have achieved significant risk reduction and will have placed materials in safe storage ready for disposal.
- By 2020, the Idaho National Laboratory will have completed all active cleanup work.

Site Description

The Idaho National Laboratory is located in southeast Idaho, near the northeast end of Idaho's Snake River Plain, which extends in a broad arc from the Idaho-Oregon border on the west to the Yellowstone Plateau on the east. In 1991, the Environmental Protection Agency designated the Snake River Plain Aquifer a sole-source aquifer.

Although the total land mass is 890 square miles, most of the work at the Idaho National Laboratory is performed within the site's primary facility areas: Idaho Nuclear Technological and Engineering Center, Radioactive Waste Management Complex, Test Area North, and Reactor Technology Complex (formerly the Test Reactor Area).

Idaho Nuclear Technology and Engineering Center

Idaho Nuclear Technological and Engineering Center is situated on 210 acres within a perimeter fence and approximately 55 acres located outside the fence. The Center was built in the 1950s to reprocess spent nuclear fuel to recover uranium. It consists of 290 facilities (approximately 1.2 million square feet). High-level waste calcine in bin sets, sodium-bearing waste within tanks and spent nuclear fuel in wet and dry storage represent the major cleanup activities in addition to remediation of two active

Comprehensive Environmental Response, Compensation, and Liability Act Operable Units.

Radioactive Waste Management Complex

The Radioactive Waste Management Complex consists of 86 facilities and is a controlled area for management and disposal of solid radioactive wastes. It includes a 97-acre Subsurface Disposal Area within a security fence, buildings for Resource Conservation and Recovery Act compliant storage of mixed transuranic waste, and administration and support buildings. The Subsurface Disposal Area is an unlined landfill that received radioactive waste from Idaho National Laboratory operations and other DOE sites, including large amounts of transuranic waste and alpha-contaminated mixed low-level waste from DOE's Rocky Flats facility in Colorado. The Subsurface Disposal Area will be remediated under a future Comprehensive Environmental Response, Compensation, and Liability Act action. The above-ground, stored transuranic waste is being treated at the Advanced Mixed Waste Treatment Facility and shipped to the Waste Isolation Pilot Plant for disposal. The Subsurface Disposal Area continues to receive low-level radioactive waste from Idaho National Laboratory operations.

Test Area North

The Test Area North area covers about 220 acres at the north end of the Idaho National Laboratory. Test Area North was established in the 1950s by the United States Air Force and the Atomic Energy Commission Aircraft Nuclear Propulsion Program to support nuclear-powered aircraft research. Upon termination of this research, the facilities were converted to support a variety of other DOE research projects. Some Comprehensive Environmental Response, Compensation, and Liability Act remediation and high-risk facility deactivations and demolitions remain.

Reactor Technology Complex

The Reactor Technology Complex covers about 102 acres in the southwest portion of the Idaho National Laboratory. The major mission of the Reactor Technology Complex is to conduct scientific and engineering experiments for both nuclear and non-nuclear programs. The Reactor Technology Complex was established in the early 1950s with the development of the Materials Test Reactor followed by two other major reactors, the Engineering Test Reactor and the Advanced Test Reactor. The Advanced Test Reactor continues to operate today. Reactor disposition remains to be completed.

Site Cleanup Strategy/Scope of Cleanup

Over the past decade, the following considerable progress has been made toward addressing legacy waste and contamination at the Idaho National Laboratory:

- Of the 596 Comprehensive Environmental Response, Compensation, and Liability Act sites identified as being potentially contaminated, 75 percent have been cleaned up or determined not to pose any risk;
- Over two million gallons of high-level liquid waste have been calcined (dried into a powdered form), reducing the volume of liquid waste remaining in the tank farm to approximately one million gallons of sodium-bearing waste and emptying seven of 11 tanks to the heel;

- Stored transuranic waste is being sent for permanent disposal on a routine basis to the Waste Isolation Pilot Plant in New Mexico;
- Over 44,000 m^3 of low-level and mixed low-level waste have been disposed.
- By weight, 92 percent of Idaho National Laboratory EM-owned spent nuclear fuel has been consolidated into dry storage;
- Substantial quantities of volatile organic compounds have been extracted and destroyed from the vadose zone beneath the Radioactive Waste Management Complex.

Site Completion and End State

The following EM cleanup activities must be completed to reach the anticipated end-state for the Idaho National Laboratory:

Idaho Nuclear Technology and Engineering Center

- Demolish or disposition all excess facilities;
- Treat and dispose liquid sodium-bearing waste;
- Empty and disposition all Tank Farm Facility tanks;
- Place all EM spent nuclear fuel in safe dry storage;
- Deactivate EM spent nuclear fuel wet storage basins (Chemical Processing Plant 603);
- Dispose or disposition all excess nuclear material;
- Complete Waste Area Group 3 remediation; Idaho will issue the last Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Record of Decision for release site 14 for the soil under buildings.

Radioactive Waste Management Complex

- Retrieve stored remote-handled transuranic waste and dispose at the Waste Isolation Pilot Plant or transfer to the Argonne National Laboratory-West;
- Demolish and remove facilities no longer needed;
- Complete remediation of buried transuranic waste, including exhumation and disposal as necessary;
- Complete and implement Final Comprehensive Record of Decision for Waste Area Group 7 (Operable Unit 7-13/14);
- Complete shipments of stored transuranic waste to the Waste Isolation Pilot Plant.

Test Area North

- Demolish all EM facilities (only facilities required for groundwater remediation remain);
- Complete all remediation of contaminated soils and tanks at Test Area North (Operable Unit 1-10);
- Continue Comprehensive Environmental Response, Compensation, and Liability Act remedial pump and treat activities (Operable Unit 1-07B).
- Waste Area Group1 Records of Decision have all been issued; if there are future Comprehensive Environmental Response, Compensation, and Liability Act of 1980 actions they will be covered under the site-wide Record of Decision 10-08, scheduled for FY 2010.

Reactor Technology Complex

- Demolish all EM-owned facilities;
- Disposition the Engineering Test Reactor and Materials Testing Reactor; Idaho will disposition under Comprehensive Environmental Response, Compensation, and Liability Act of 1980 currently in the engineering evaluation/cost analysis phase.

Regulatory Framework

There are three primary regulators of the Idaho National Laboratory: the United States Environmental Protection Agency, the United States Nuclear Regulatory Commission and the State of Idaho Department of Environmental Quality. Several compliance agreements, amendments and consent orders executed between 1991 and 2000 govern cleanup work at the Idaho National Laboratory. Those agreements encompass the majority of the cleanup requirements and commitments. The five primary agreements are:

Federal Facility Agreement and Consent Order – 1991

In November 1989, the United States Environmental Protection Agency listed the Idaho National Laboratory on the Comprehensive Environmental Response, Compensation, and Liability Act National Priorities List. The resulting *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* between the DOE, the United States Environmental Protection Agency, and Idaho Department of Environmental Quality established a strategy and plan for cleanup at the Idaho National Laboratory. The agreement divides the Idaho National Laboratory into 10 waste area groups based on similar characteristics or geographic boundaries. Nine groups generally correspond to the Site's major facility areas. The tenth group assesses overall risk to the aquifer beneath the Site, addresses sites outside the boundaries of the Idaho National Laboratory's primary facility areas, and allows for inclusion of newly identified release sites. These Waste Area Groups are further divided into operable units. Under the agreement, the DOE conducts an environmental investigation at each site that may be contaminated. At the end of each investigation, if it is determined the area needs cleanup, DOE presents for public comment a proposed plan that documents the results of the investigation and proposes alternative cleanup actions. After reviewing and addressing any comments, the DOE, the United States Environmental Protection Agency, and State of Idaho reach a final decision, which is documented in a Record of Decision. Cleanup design and construction can then begin.

Notice of Non-Compliance Consent Order – 1992

This consent order (between DOE, the State of Idaho Department of Environmental Quality, and the United States Environmental Protection Agency) establishes actions and milestones to resolve Resource Conservation and Recovery Act inspection issues including configuration of stored transuranic waste and high-level waste in the Idaho Nuclear Technology and Engineering Center tank farm.

Idaho Settlement Agreement – 1995

This agreement (between DOE, State of Idaho, and United States Navy) resolved a lawsuit regarding the receipt of spent nuclear fuel at the Idaho National Laboratory. The agreement specifies milestones toward the removal of all spent nuclear fuel and certain radioactive waste from Idaho National Laboratory by 2035. Some of the upcoming key milestones include:

- DOE shall issue a Record of Decision for the treatment of calcined wastes no later than December 31, 2009.
- DOE shall complete calcination of sodium-bearing liquid high-level wastes by December 31, 2012.
- DOE shall ship all transuranic waste subject to the agreement to the Waste Isolation Pilot Plant or other such facility designated by DOE no later than December 31, 2018.
- DOE shall complete the transfer of all spent fuel from wet storage facilities by December 31, 2023.
- DOE shall treat all high-level waste so that it is ready to be moved out of the State of Idaho by 2035.
- DOE shall remove all spent fuel from Idaho by January 1, 2035.

Voluntary Consent Order – 2000

The *Consent Order* (Idaho Department of Environmental Quality 2000) is an enforceable agreement with the Idaho Department of Environmental Quality that governs resolution of self-disclosed Resource Conservation and Recovery Act issues, most of which were related to the closure of 912 tanks and tank systems.

Site Treatment Plan

In fulfillment of the 1992 Federal Facility Compliance Act, the Idaho National Engineering Laboratory prepared the *Idaho National Engineering Laboratory Site Treatment Plan* to address the treatment and long-term storage of mixed low-level waste (radioactive waste mixed with hazardous chemicals). This enforceable plan was approved by the State of Idaho and is updated annually.

Critical Site Uncertainties and Assumptions

DOE will identify disposal pathways and schedules for liquid sodium-bearing waste, tank farm closure and wastes with no existing path for disposal in time to meet key Idaho National Laboratory commitments. In addition, the remediation of the subsurface disposal area (including the buried waste) is dependent on the outcome of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 process. In addition, it is assumed that the outcome of litigation with State of Idaho and Waste Area Group 7 Record of Decision will not change the path forward for remediation of buried waste in the RWMC SDA.

Interdependencies

The Idaho site's current interdependencies are the availability of shipping containers and trailers for transuranic waste (TRUPACT IIs) for the shipment of transuranic waste to the Waste Isolation Pilot Plant; the future availability of casks and transporters for the shipment of remote-handled transuranic waste; delivery of the remote-handled transuranic waste acceptance criteria; receiver sites for nuclear materials; availability of spent nuclear fuel data and inter-site coordination for foreign and domestic research reactor receipts. The availability of a geologic repository is required for the off-site disposition of the high-level waste and spent nuclear fuel. After cleanup, long-term stewardship responsibilities will transition to DOE's Office of Nuclear Energy, Science and Technology as the site landlord.

Contract Synopsis

In mid-2003, the Idaho National Laboratory was restructured into two distinct business units—one for cleanup activities and one for laboratory missions. This was done to allow each organization to focus on its distinct mission. The laboratory focuses on nuclear technology development, and the Idaho National Laboratory EM Program focuses on cleaning up historic contamination at the site. As of February 2006, the primary EM site contractors are Bechtel BWXT Idaho, LLC (operation of the Advanced Mixed Waste Treatment Project, which supports transuranic waste shipments to the Waste Isolation Pilot Plant), and the CH2M Hill Washington Group which extends through 9/30/2012 (balance of site cleanup actions). The Foster Wheeler contract for construction and operation of the Idaho Spent Fuel Facility under the Spent Nuclear Fuel Dry Storage Project has been mutually modified, that resulted in not entering the construction phase of the project.

Cleanup Benefits

Cleanup of the Idaho National Laboratory will reduce the risk of contamination of the Snake River Plain Aquifer from nuclear and hazardous waste. DOE will reduce the risk to workers, the environment, and the public by cleaning up, stabilizing, and disposing of waste. Cleanup will eliminate infrastructure costs by aggressively reducing footprint through consolidation of cleanup operations, primarily to the Idaho Nuclear Technology and Engineering Center, and inactivation and decommissioning of facilities at several other Idaho National Laboratory areas. Consolidating activities to the Idaho Nuclear Technology and Engineering Center significantly reduces infrastructure, surveillance and maintenance costs.

By 2009, the Idaho site will have packaged and shipped all nuclear material off-site. By 2012, the west side of the Tank Farm Facility will be closed, all remediation completed, and most facility demolition at two facility areas (Power Burst Facility and Test Area North). The remaining facilities will be in a cold, dark, and dry status, awaiting final disposition by 2012.

By 2009, all EM-owned spent nuclear fuel will be stabilized in interim dry storage. By 2012, the targeted transuranic waste will have been removed from the Subsurface Disposal Area and shipped to the Waste Isolation Pilot Plant, the remote-handled transuranic waste will be packaged and shipped to the Waste Isolation Pilot Plant, the

liquid sodium bearing waste will have been stabilized and the remaining Tank Farm Facility tanks closed, and the EM footprint will have been consolidated to two facility areas.

Target Level Accomplishments

FY 2007

- Issue Tank Farm soils Record of Decision
- Complete active Test Area North (WAG 1) remediation
- Complete the repackaging and shipment of Light Water Breeder Reactor/U-233 to final offsite disposal
- Ship 8,000 m^3 of transuranic and other mixed waste to an appropriate location to meet State Agreement commitments
- Complete the design and initiate sodium-bearing waste treatment facility construction, including efforts to gain necessary regulatory approvals for sodium bearing waste treatment and disposal
- Close three emptied tanks in accordance with criteria/process in Section 3116 of the FY 2005 National Defense Authorization Act
- Continue retrieval project in Pits 4 and 6
- Continue characterization, deactivation and decontamination for several high-risk facilities

FY 2008

- Issue Subsurface Disposal Area (WAG 7) Record of Decision
- Initial start-up of SNF drying and packaging in existing faculties
- Complete closure of the west side of high-level tanks within the Tank Farm Facility
- Complete demolition of TAN-630/650
- Ship 8,000 m^3 of transuranic and other mixed waste to an appropriate location to meet State Agreement commitments
- Complete the sodium-bearing waste treatment facility construction
- Close four emptied tanks in accordance with criteria/process in Section 3116 of the FY 2005 National Defense Authorization Act
- Continue retrieval project in other Subsurface Disposal Area Pits, if consistent with WAG 7 ROD

FY 2009

- Issue calcine Record of Decision
- Complete SNF wet to dry storage transfers
- Retrieve, rebasket, and repackage fuel in standard canisters
- Complete Unirradiated NM transfers off-site
- Start sodium-bearing waste treatment operation
- Ship 8,000 m^3 of transuranic and other mixed waste to an appropriate location to meet State Agreement commitments
- Continue retrieval project in other Subsurface Disposal Area Pits, if consistent with WAG 7 ROD
- Continue packaging of SNF in dry storage

FY 2010

- Retrieve, rebasket, and repackage fuel in standard canisters
- Complete Subsurface Disposal Area retrieval actions, if consistent with WAG 7 ROD
- Complete Engineering Test Reactor demolition
- Complete remote-handled TRU waste shipments to WIPP
- Make sodium bearing waste (SBW) canister shipments to WIPP, if WIPP is permitted to accept this waste
- Ship 8,000 m^3 of transuranic and other mixed waste to an appropriate location to meet State Agreement commitments
- Continue packaging of SNF in dry storage

FY 2011

- Complete OU 3-14 Tank Farm soils removal
- Retrieve, rebasket, and repackage fuel in standard canisters
- Complete CPP-603A demolition
- Make SBW canister shipments to WIPP, if WIPP is permitted to accept this waste
- Ship 8,000 m^3 of transuranic and other mixed waste to an appropriate location to meet State Agreement commitments
- Continue packaging of SNF in dry storage

Oak Ridge

Site Overview

The cleanup program mission in Oak Ridge will be complete when cleanup has safely reduced risks to the public, workers, and the environment at the East Tennessee Technology Park, Oak Ridge National Laboratory, Y-12 National Security Complex, and Off-site Areas. These risks include potential exposure to contamination and industrial hazards resulting from decades of uranium enrichment, research, and nuclear weapons-related operations.

Site Description

The Oak Ridge Reservation encompasses about 37,000 acres in east Tennessee and is comprised of three facilities: the East Tennessee Technology Park; the Oak Ridge National Laboratory; and the Y-12 Plant. These facilities are described in detail below. In addition, there are some private properties that are not located on the Oak Ridge Reservation (the Atomic City Auto Parts Site and the David Witherspoon Sites) that are being cleaned up under the auspices of the Oak Ridge program.

Oak Ridge - East Tennessee Technology Park

The East Tennessee Technology Park site occupies approximately 5,000 administrative acres adjacent to the Clinch River, approximately 13 miles west of Oak Ridge, Tennessee. It was originally built as a uranium enrichment facility for defense programs. The majority of the 125 major buildings on the site have been inactive since uranium enrichment production ceased in 1985. The site will be closed in FY 2009.

Oak Ridge National Laboratory

Activities carried out at the 3,300-acre Oak Ridge National Laboratory historically have supported both the defense production operations and civilian energy research effort. Cleanup addresses contamination from a variety of research and development activities, which were supported by multiple DOE programs over a long period of time. The Oak Ridge National Laboratory currently conducts applied and basic research in energy technologies and the physical and life sciences. Cleanup includes environmental remediation, decontamination and decommissioning of radioactively-contaminated facilities, and disposition of legacy low, mixed low-level, and transuranic waste.

Oak Ridge - Y-12

The Y-12 site is approximately 811 acres and is located about two miles southwest of Oak Ridge, Tennessee. The Y-12 site originally was a uranium processing facility and now dismantles nuclear weapons components and serves as one of the nation's storehouses for special nuclear materials. The Y-12 site has 15 operable units within three areas: Chestnut Ridge, Upper East Fork of Poplar Creek, and Bear Creek Valley. The types of contamination include radioactive, hazardous, and mixed wastes. The sanitary landfills for all of the Oak Ridge Reservation are located at Y-12. The Environmental Management Waste Management Facility (a Comprehensive Environmental Response, Compensation and Liability Act disposal facility supporting the cleanup) is located in Bear Creek Valley of the Y-12 area.

Site Cleanup Strategy/Scope of Cleanup

The Oak Ridge cleanup strategy is a risk-based approach that focuses first on those contaminant sources that are the greatest contributors to risk. The overall strategy is based on surface water considerations, encompassing five distinct watersheds that feed the Clinch River and are impacted by the DOE sites. To date, key records of decision have been signed for four of the five watersheds.

While risk reduction is the major cleanup driver, other factors that must be considered to achieve risk reduction are execution logic and mortgage reduction. The reduction of mortgage costs provides a dramatic benefit due to the reinvestment of these saved funds into accelerated risk reduction and reduces the amount and duration of funding needed.

Having established the risk-based prioritization for the work, a number of substantive changes to work practices have been implemented that will facilitate work execution. These can be categorized as either improved work flow or alternative technical approaches, and these are considered to be enabling innovations for the plans to complete cleanup.

Site Completion and End State

At the end of cleanup, planned by 2015, the Oak Ridge National Laboratory will continue to operate as a world-class research facility. In addition, Y-12 will continue to operate, fulfilling its national security mission. The East Tennessee Technology Park will be available for use as a private-sector industrial park.

Short-Term Projects:

Melton Valley: Melton Valley remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act will be completed in 2006. Melton Valley remediation involves both containment and treatment of contaminants. Specific activities include: (1) hydrologic isolation of burial grounds and seepage pits, (2) in situ stabilization of liquid waste trenches, (3) demolition of surface structures, (4) removal of impoundments, (5) removal or isolation of contaminated soil, (6) retrieval of transuranic waste, (7) plugging and abandonment of hydrofracture wells, (8) removal or grouting of inactive waste pipelines, (9) shipment of spent nuclear fuel to the Idaho National Laboratory, and (10) stabilization of inactive waste tanks. Because waste will remain in Melton Valley, the burial ground area will continue to be a waste management area with access restrictions. A future Record of Decision will be generated to address the remaining groundwater, sediment and ecological concerns within the area after the remediation efforts completed have a chance to show the expected positive cleanup results.

East Tennessee Technology Park: The East Tennessee Technology Park scope addresses decommissioning of facilities and remedial actions for contaminated sites by the end of FY 2009. There are approximately 2,200 acres with potential contamination, including known groundwater contaminant plumes from former burial grounds and contaminated soils, resulting in approximately 167 known release sites to be remediated. In addition, there are approximately 500 facilities, including 125 major buildings that require decommissioning. The strategy is to complete targeted remedial

actions in Zone 1 (1,400 acres located outside the fenced Main Plant area) and facility decommissioning and then follow with a comprehensive remedial action for the Main Plant area Zone 2 (800 acres inside the Main Plant area inside fence). This includes the Three-Building Decontamination and Decommissioning Recycle subproject, which includes over 110 acres of floor undergoing decontamination and decommissioning, which was completed in FY 2005. An additional site-wide Record of Decision is also being prepared to address any groundwater, surface water, and ecological concerns at the site. This document will also address the long-term stewardship concerns and requirements for the site.

Y-12: Specific high-risk reduction actions are planned for completion by FY 2008, they include mitigation of off-site mercury surface water releases; bioremediation of an off-site volatile organic compound release; and, excavation of uranium hot spots and hydraulic isolation of other contaminant sources in the Boneyard/Burnyard.

The scope of this work reduces risk through the cleanup at the Y-12 National Security Complex; designs, builds, operates, and closes the on-site Environmental Management Waste Management Facility; and performs surveillance and maintenance of surplus facilities at the Y-12 National Security Complex. Additional records of decision will be necessary for this area.

Bethel Valley at Oak Ridge National Laboratory: Specific high-risk reduction actions include completing an engineering evaluation to identify further sources of groundwater contamination; completing the Corehole 8 (Tank W-1A) removal action; disposition of the excavated highly contaminated sediment from surface impoundments in the center of the Oak Ridge National Laboratory; remediation of the Hot Storage Garden to ensure worker safety; and removing the Molten Salt Experiment fuel salts.

Offsite Areas: This project reduces risk and cleans up three privately owned properties that were contaminated due to the sale of contaminated materials from the DOE to private companies. DOE is responsible for the cleanup of these sites under the Tennessee Superfund law. The three sites are the Atomic City Auto Parts Site in Oak Ridge and the David Witherspoon, Inc. 901 and 1630 sites in Knoxville. The properties, which cover 64 acres combined, are in residential and commercial areas and are accessible to the public. Primary contaminants include uranium, polychlorinated biphenyls, and heavy metals. These three sites will be completed by FY 2008. The cleanup actions at these sites will consist of removing, treating, and disposing of contaminated materials, equipment, soil, and sediment; demolishing facilities; and remediating groundwater actions.

Longer Term Projects:

All of the remaining actions to complete the EM mission are summarized below.

Y-12: The remaining cleanup activities, including facility deactivation and decommissioning and soil/sediment removal and groundwater concerns will be completed after FY 2008. Surveillance and maintenance activities for the Y-12 National Security Complex, and the coordination of environmental monitoring throughout the Oak Ridge Reservation to assess the effectiveness of cleanup actions,

are included in the scope. By 2015, all cleanup actions at the Y-12 National Security Complex, Chestnut Ridge and Bear Creek Valley (including the White Wing Scrap Yard) are planned to be completed, allowing for the continued use of the site as DOE industrial/waste management facilities.

Oak Ridge National Laboratory: Cleanup of all remaining contaminated areas at the Oak Ridge National Laboratory will be completed by FY 2015, including the decontamination and decommissioning of remaining inactive facilities, capping of buried waste areas, bioremediation of groundwater contamination, and contaminated soil/sediment removal. Disposition of U-233 stored in Building 3019.

Long-Term Stewardship: The Comprehensive Environmental Response, Compensation, and Liability Act process will determine any necessary final actions for groundwater in the five watersheds subsequent to completion of the actions described above. Most of the major remedial actions on the Reservation will require the need for long-term stewardship actions, including surveillance and maintenance of installed structures and systems.

Most of the contaminated sites, media, and facilities left standing never will be remediated sufficiently to permit unrestricted use of soil, groundwater, and surface water due to factors such as technical impracticability, public and worker risk and environmental damage, and costs. Since residual contamination will remain in most cases, DOE is committed to conduct activities to assure that remedies remain protective.

Regulatory Framework

Cleanup of the Oak Ridge Reservation is primarily governed by three regulatory agreements/compliance orders. The first, the *Federal Facility Agreement for the Oak Ridge Reservation*, was signed by DOE, the United States Environmental Protection Agency, and the Tennessee Department of Environment and Conservation and implemented on January 1, 1992, to establish a procedure framework and schedule for developing, implementing, and monitoring appropriate site response actions under the Comprehensive Environmental Response, Compensation, and Liability Act. This agreement establishes major milestones to complete cleanup of offsite locations by 2010 and the Oak Ridge Reservation by 2015. Some no further action decision documents (Records of Decision) will be necessary after this date to document the final agreements for the Reservation and land use controls.

In conjunction with the FFA, DOE, the Environmental Protection Agency and the Tennessee Department of Environment and Conservation signed the *Oak Ridge Accelerated Cleanup Plan Agreement* on June 18, 2002. The purpose of this Agreement was to describe a streamlined decision making process to facilitate the accelerated implementation of cleanup, to resolve the current Oak Ridge Reservation Federal Facility Agreement milestone dispute, and to establish future actions needed to complete the plan for accelerated cleanup.

The second, the *Oak Ridge Reservation Compliance Order*, was signed on September 26, 1995 by DOE and the Tennessee Department of Environment and Conservation, to

enforce treatment of mixed low-level wastes under the Resource Conservation and Recovery Act. This order establishes milestones to complete treatment of all Oak Ridge mixed low-level wastes by 2012.

The third, the *Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement*, was signed by DOE and the Environmental Protection Agency on October 28, 1996, to establish a framework for treatment of polychlorinated biphenyl-contaminated wastes under the Toxic Substances Control Act. This agreement establishes milestones to complete treatment of all Oak Ridge polychlorinated biphenyl-contaminated wastes by 2010.

Critical Site Uncertainties and Assumptions

One project uncertainty for Oak Ridge is whether the Waste Isolation Pilot Plant will accept remote-handled transuranic waste from Oak Ridge on the planned schedule in the baseline. Another uncertainty is the disposition strategy for the U-233 stored in Building 3019, a new mission for EM in FY 2006. Other uncertainties include: final agreement with the regulators on the extent of remediation to be accomplished under future Records of Decision and cleanup plans, and the extent of reindustrialization of the decontaminated gaseous diffusion plant buildings (which will determine the amount of decontamination and decommissioning to be ultimately carried out at the East Tennessee Technology Park). Finally, a significant uncertainty exists with regard to program responsibility and cost for the ultimate cleanup of the remaining decontamination and decommissioning work scope at Y-12 and Oak Ridge National Laboratory that is not currently in the EM scope.

Interdependencies

The success of the Oak Ridge Environmental Management Program requires effective project interfaces, including:

Idaho National Laboratory: The remaining spent nuclear fuel stored in Melton Valley will be shipped to the Idaho National Laboratory for long-term storage. This includes coordinating with the states and Indian Nation tribes relative to the shipments as well as working with the Idaho Operations Office.

Other DOE Sites: The Oak Ridge Toxic Substances Control Act Incinerator accepts waste from a number of other DOE sites throughout the DOE complex. In addition, interfaces exist with several waste disposal sites including the Hanford Site, the Nevada Test Site, Envirocare, and the Waste Isolation Pilot Plant.

National Nuclear Security Administration (NNSA): NNSA owns some material at East Tennessee Technology Park that needs to be removed prior to the demolition of the K-25 Building. During the equipment removal in the K-25 and K-27 Buildings, visible highly enriched uranium material will be removed and packaged to meet Nuclear Criticality Safety requirements. In addition the NNSA performs landlord functions at Y-12.

United States Enrichment Corporation: United States Enrichment Corporation has a lease with DOE to access the K-1600 building and its centrifuge technology. The United States Enrichment Corporation is further developing the technology in order to construct

a demonstration facility at Portsmouth. The oversight of this activity is through DOE-Oak Ridge Operation's Office of Nuclear Fuel Security and Uranium Technology.

Office of Science and Office of Nuclear Energy, Science & Technology: Coordination is critical with these offices to transition material disposition activities for safe storage of the U-233 in Building 3019 at Oak Ridge to the Office of Environmental Management.

Contract Synopsis

Oak Ridge Reservation currently utilizes two different prime contracts to implement its cleanup strategy: (1) Oak Ridge Environmental Management Cleanup Contract; and (2) the Transuranic Waste Treatment Contract.

Oak Ridge Environmental Management Cleanup Contract: The Oak Ridge Closure Contract between DOE and Bechtel Jacobs Company, LLC was signed September 2003 with the singular focus of achieving well defined end states in the safest, most cost effective manner by September 2008. This contract is a cost-plus-incentive-fee contract with cost and milestone incentives.

Transuranic Waste Treatment Contract: A privatization contract was signed with Foster Wheeler Environmental Corporation in August 1998 for the treatment of remote-handled alpha low-level waste, and contact- and remote-handled transuranic waste. Foster Wheeler Environmental Corporation has constructed the Transuranic Waste Treatment Facility and has completed the processing of remote-handled supernate waste. Processing of contact-handled transuranic waste began in December 2005 with all work scheduled to be completed in 2012.

Cleanup Benefits

Near Term

Cleanup of Melton Valley Area is the top priority risk reduction action on the Oak Ridge Reservation with a scheduled completion date of FY 2006. The Melton Valley Area will be designated as a waste management area with access restrictions. The cleanup actions will ensure that the waste is contained; on-site surface water quality is improved to meet required standards; and off-site users of the Clinch River remain protected.

Longer Term

Closure of the East Tennessee Technology Park site by the end of 2009 is the next complex-wide opportunity for the EM Program to divest itself of a major liability. While risk reduction is the major driver of our plan, the rapid reduction of the East Tennessee Technology Park site mortgage costs to free the money for reinvestment in other near-term risk reduction projects is a benefit as well. In addition, there will be benefits for the Oak Ridge community derived from completion of the cleanup of the site, which will be reused as a commercial industrial park.

The off-site work at the Atomic City Auto Parts and David Witherspoon, Inc. will be completed.

Remedial action work will be initiated at the Y-12 National Security Complex and Oak Ridge National Laboratory facility for Records of Decisions currently approved and signed by the DOE and regulatory parties.

Target Level Accomplishments

FY 2007

- Complete East Tennessee Technology Park Zone 1 Remediation
- Approval of ETTP Site Wide Record of Decision
- Complete construction of final phase of Environmental Management Waste Management Facility expansion to meet Accelerated Cleanup Plan requirements
- Complete Tank W-1A (Corehole 8) remediation of radioactive contaminated soil
- Complete CH-TRU processing

FY 2008

- Complete all remediation activities at the David Witherspoon, Inc site
- Complete disposition of all remaining Legacy Waste on the Oak Ridge Reservation
- Start RH-TRU sludge processing
- Initiate U-233 disposition activities in Building 3019

FY 2009

- Start Bethel Valley Groundwater Source Action
- Complete demolition of K-25/27
- Demolition of all EM facilities at East Tennessee Technology Park
- Continue U-233 disposition activities in Building 3019

FY 2010

- Start Bear Creek Valley S-3 Ponds Remedial Actions
- Continue U-233 disposition activities in Building 3019

FY 2011

- Complete MSRE Decontamination and Decommissioning
- Continue U-233 disposition activities in Building 3019

Paducah Gaseous Diffusion Plant

Site Overview

For approximately 50 years, the Portsmouth Gaseous Diffusion Plant in Portsmouth, Ohio and the Paducah Gaseous Diffusion Plant in Paducah, Kentucky supported Federal Government and commercial nuclear power missions. Decades of nuclear energy and national security missions left radioactive and chemical contamination at both sites. The missions of the sites are transitioning from primarily enrichment operations to shared missions with environmental cleanup, waste management, depleted uranium conversion, deactivation and decommissioning, re-industrialization, and long-term stewardship. DOE established the Portsmouth/Paducah Project Office in October 1, 2003, to provide focused leadership to the sites' changing missions and to oversee cleanup and disposition of the Department's stockpile of depleted uranium hexafluoride stored at the sites.

Paducah

The original mission at the Paducah Gaseous Diffusion Plant was to produce low-assay enriched uranium for use as commercial nuclear reactor fuel. Initial production of enriched uranium began in 1952. In 1953, recycled uranium from nuclear reactors was introduced into the Paducah enrichment process, which continued through 1964. In 1964, feed material was switched to virgin-mined uranium. Use of recycled uranium resumed in 1969 and continued through 1976, when it permanently ceased.

In 1993, uranium enrichment operations were turned over to the United States Enrichment Corporation in accordance with the Energy Policy Act of 1992. Under the United States Enrichment Corporation, production of enriched uranium for use in the United States and abroad continues today. While the United States Enrichment Corporation operates the enrichment program, the Department owns the physical plant and is responsible for the environmental cleanup. The United States Enrichment Corporation is responsible for the operation and maintenance of all primary process facilities and auxiliary facilities at Paducah.

In 2001, the United States Enrichment Corporation selected Paducah as the site to continue gaseous diffusion operations pending successful pilot plant demonstration (lead cascade) and deployment of the next generation of enrichment technology.

The Paducah site will maintain gaseous diffusion operations through this budget period. DOE continues to be responsible for management of the site, administration of the lease with the United States Enrichment Corporation, environmental remediation, and legacy waste/materials management.

Depleted Uranium Hexafluoride Conversion Facilities

Since the 1950s, the depleted uranium hexafluoride (DUF_6) produced during enrichment operations at the Portsmouth and Paducah Gaseous Diffusion Plants (and the East Tennessee Technology Park in Tennessee) has been stored in large steel cylinders at the sites. DOE is currently responsible for the management of approximately 700,000 metric tons of DUF_6 stored in about 60,000 cylinders. DOE awarded a contract and started construction in July 2004 on two depleted uranium conversion facilities, one each at Portsmouth and Paducah, to convert the DUF_6 cylinders to a more stable form for reuse

or disposal. These facilities will operate over the next two decades. DOE is ultimately responsible for the deactivation and decommissioning of the facilities.

The Department is committed to clean up both the Portsmouth and the Paducah Gaseous Diffusion Plants to industrial reuse standards. Limited land areas will require institutional controls following remediation. Excess buildings at Portsmouth and Paducah that are not being leased are being assessed for reuse by the Department and will be scheduled for demolition if they are not suitable for reuse. Equipment and material removed from buildings will be decontaminated, reused, or recycled to the extent practicable. The current focus of the reindustrialization effort is to provide limited facilities and land to governmental and commercial users, and to transfer facilities and land to users through direct leasing or other initiatives.

Site(s) Description

The Paducah site, comprising approximately 3,400 acres, is located in rural western Kentucky, 15 miles west of Paducah, Kentucky, near the confluence of the Ohio and Mississippi rivers.

The Portsmouth/Paducah Project Office is centrally located between the two sites in Lexington, Kentucky. The project office provides management oversight, strategic planning, and project coordination for both sites.

Site Cleanup Strategy/Scope of Cleanup

Historic operations at Paducah produced contaminated areas onsite and beyond site boundaries. Principal contaminants of concern include uranium (from enrichment processing), transuranic waste, technetium, trichloroethylene, and polychlorinated biphenyls. Through spills and disposal operations, these contaminants have entered groundwater aquifers, formed plumes, and in some cases, migrated offsite and contaminated private drinking water wells. Since its inception, the Paducah site has generated, stored, and disposed of hazardous, nonhazardous, radioactive, and mixed waste as well as large quantities of scrap metal.

Paducah is focusing on cleanup of high-risk areas first. The site has completed a wide variety of characterization projects, installed groundwater treatment facilities, dispositioned scrap materials, and disposed of legacy waste streams.

Site Completion and End State

The current end state completion in the baseline for Paducah is 2030. The overall environmental cleanup strategy at Paducah is based on taking near term actions to control or eliminate ongoing sources of contamination along with continued investigation of other potential sources. In FY 2003, DOE signed a Letter of Intent with the Commonwealth of Kentucky that includes completion milestones for groundwater in 2010, soils in 2015, surface water in 2017, and burial grounds in 2019. FY 2005 through FY 2010 represents a critical period for continued preparation and progress. In addition, Paducah will complete construction and begin operating a DUF_6 conversion facility. The conversion operations are estimated to be 25 years.

Future use planning will support ongoing and anticipated DOE missions, the United States Enrichment Corporation enrichment operations, and other current users of the sites. Portions of the sites will be used to promote the development of private-sector enterprises in ways that are consistent with and complementary to current site missions. Other power distribution functions and facility utilization by the private sector at sites is not expected to substantially change. Support has been expressed for various forms of passive recreational and public use that are compatible with anticipated industrial, and conservation uses of the reservations.

Regulatory Framework

Regulatory requirements to address contaminated groundwater at the Paducah site were initially included in an Administrative Consent Order issued by the Environmental Protection Agency in 1988. The Commonwealth of Kentucky and Environmental Protection Agency issued a Resource Conservation and Recovery Act permit in 1991 for storage and treatment of hazardous wastes at Paducah and a permit for the remediation of solid waste management units under Resource Conservation and Recovery Act. In May 1994, the Paducah site was placed on Environmental Protection Agency's National Priorities List under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. The 1997 Federal Facilities Agreement among the Department, the Commonwealth of Kentucky, and Environmental Protection Agency Region IV established the framework for cleanup at Paducah, institutes enforceable milestones, and coordinates site-specific cleanup requirements under the Comprehensive Environmental Response, Compensation and Reliability Act and the Resource Conservation and Recovery Act. The Department also resolved long-standing regulatory disputes through the Agreed Order with the Commonwealth of Kentucky.

Environmental Protection Agency and the Kentucky Division of Waste Management are the regulatory agencies for DOE waste management operations. Applicable requirements and the DOE Order governing waste management include Resource Conservation and Recovery Act, Part B, Hazardous Waste Management Permit; Toxic Substances Control Act regulations for polychlorinated biphenyls wastes; DOE Order 435.1 Radioactive Waste Management; and Kentucky solid waste regulations for other wastes.

Agreements related to the implementation of these regulations and the DOE Order follow the Site Treatment Plan and associated Agreed Order under the Federal Facility Compliance Act for characterization, treatment, and disposal of mixed hazardous/radioactive wastes; Toxicity Characteristic Leaching Procedure Federal Facility Compliance Act for characterization under the Resource Conservation and Recovery Act for waste generated prior to September 25, 1990; and Toxic Substances Control Act, Federal Facility Compliance Act for use, cleanup, storage, treatment, and disposal of.

Critical Site Uncertainties and Assumptions

The following are project uncertainties and assumptions:

- DOE missions will be given priority in all other future uses of the sites.

- The United States Enrichment Corporation needs for continued operation and use of site facilities for uranium enrichment activities will be a priority at both sites.
- DOE will be able to continue the barter agreement for removing technetium-99 contamination from uranium feed.
- The extent of cleanup at Paducah is subject to future regulatory decisions.
- The current baseline excludes any costs associated with the future decontamination and decommissioning of the Paducah gaseous diffusion plant.

Interdependencies

Some or all of the Oak Ridge natural and enriched uranium cylinders may be shipped to Paducah for inventory consolidation and subsequent use or disposition.

Contract Synopsis

The Portsmouth/Paducah Project Office issued remediation and infrastructure contracts in 2005 and 2006. This strategy allows the optimum potential for both incentivizing and achieving accelerated performance for the remediation and infrastructure effort. The infrastructure contract provides information technology, human resources, mail, site security planning, road and ground maintenance, janitorial, and real and personal property inventory and disposition. The infrastructure contract at Paducah is with Swift & Staley Mechanical Contractors, Inc. The remediation contract is with Paducah Remediation Services, LLC and provides cleanup and closure of all facilities not leased to the United States Enrichment Corporation and cleanup of soils, groundwater, landfills, storage yards, as well as disposal of legacy waste (excluding the United States Enrichment Corporation leased units). Deactivation and decommissioning of the diffusion plant process facilities is not part of the remediation contract.

Cleanup Benefits

The intent of the federal government is to manage the sites and the missions in an integrated manner. DOE retains overall responsibility for the sites. Significant portions of the site footprints are managed by the United States Enrichment Corporation under the provisions of a lease with DOE. Key DOE responsibilities in environmental cleanup and legacy material disposition will continue in support of DOE missions. Future uses of the sites will include a mixture of activities that are compatible with and contribute to ongoing and anticipated DOE missions. According to current plans, the reservation will be used to support many of the same programs it currently supports while adapting to emerging technology deployment by the United States Enrichment Corporation, transition to decontamination and decommissioning, depleted uranium material conversion, and long-term stewardship.

FY 2007 – FY 2011 represents a critical period for the continued preparation and progress towards the ultimate Paducah completion date in FY 2019. The DUF_6 conversion facility will complete construction and initiate the operations phase in FY 2007. From FY 2007 – FY 2011, the DUF_6 conversion facility will continue operations. Also, during this time period, Paducah will complete numerous projects. These include the completion of the scrap metal removal project, completion of the mixed low level waste program, completion of the C-400 groundwater remedial action, completion of

disposal of all DOE Material Storage Areas, and completion of the Southwest Plume/Source.

Target Level Accomplishments

FY 2007

- Complete scrap metal removal.
- Continue decontamination and decommissioning of C-410 Complex.
- Complete mixed low level waste.

FY 2008

- Complete construction and initiate operations of the DUF6 conversion facility
- Complete remedial investigation/feasibility study for burial grounds.
- Continue decontamination and decommissioning of C-410 complex.

FY 2009

- Complete C-400 groundwater remedial action.
- Issue Record of Decision for burial grounds operable unit.
- Initiate remedial investigation for soils.
- Continue operations of the DUF6 conversion facility.

FY 2010

- Complete disposal of all DOE Material Storage Areas.
- Complete remedial investigation for soils.
- Complete remediation of Southwest Plume/Source.
- Initiate remedial action for burial grounds.

FY 2011

- Complete legacy waste disposal.

Portsmouth Gaseous Diffusion Plant

Site Overview

For approximately 50 years, the Portsmouth Gaseous Diffusion Plant in Portsmouth, Ohio and the Paducah Gaseous Diffusion Plant in Paducah, Kentucky supported Federal Government and commercial nuclear power missions. Decades of nuclear energy and national security missions left radioactive and chemical contamination at both sites. The missions of the sites are transitioning from primarily enrichment operations to shared missions with environmental cleanup, waste management, depleted uranium conversion, deactivation and decommissioning, re-industrialization, and long-term stewardship. DOE established the Portsmouth/Paducah Project Office in October 1, 2003, to provide focused leadership to the sites' changing missions and to oversee cleanup and disposition of the Department's stockpile of depleted uranium hexafluoride stored at the sites.

Portsmouth

Construction of the Portsmouth Gaseous Diffusion Plant began in late 1952 with a mission to increase the national production of enriched uranium and maintain the nation's superiority in the development and use of nuclear energy. The first enrichment diffusion cells went on line in September 1954, and the facility was fully operational in March 1956. The enriched uranium was provided to both government and commercial users.

In the mid-1980s, the facilities and equipment required for the next generation of enrichment facilities technology, the Gas Centrifuge Enrichment Process, were constructed and installed at Portsmouth. However, the project was terminated in 1985, before going into full production, due to a significant reduction in the worldwide market for enriched material. The newly constructed facilities were placed in shutdown mode until, ultimately, much of the process-unique equipment was removed and a substantial number of the remaining buildings were renovated into office space, warehouses, or storage facilities, including permitted storage for hazardous and mixed waste. The United States Enrichment Corporation selected the Portsmouth site in 2004 as the location for deployment of a commercial centrifuge plant by the end of the decade.

From 1991 until production ceased in 2001, the Portsmouth plant produced only low-enriched uranium for commercial power plants. In 1993, uranium enrichment operations were turned over to the United States Enrichment Corporation, in accordance with the Energy Policy Act of 1992. The United States Enrichment Corporation was privatized in 1998, and a corporate business decision was made in January 2000 to terminate uranium enrichment at Portsmouth, while maintaining the Paducah facility in operation. Some of the facilities were no longer required by the United States Enrichment Corporation and subsequently returned to DOE.

A significant portion of the Department's surplus (excess to defense requirements) uranium inventory is contaminated with technetium-99, dramatically reducing the value of this asset in the commercial market. The only operational facility for removing technetium-99 contamination from uranium feed in the United States is leased and operated by the United States Enrichment Corporation under their Nuclear Regulatory Commission license at the Department's Portsmouth site, with the resultant product being further processed at the Paducah Gaseous Diffusion Plant. The United States Enrichment

Corporation has agreed to process contaminated uranium for the Department in exchange for an amount of marketable uranium equivalent in value to the costs of their operation. This self-funded arrangement (barter) capitalizes the value of surplus uranium in exchange for services restoring the market value of an asset that if left untreated would be dispositioned as waste. The Department began this arrangement in December of FY 2005.

Depleted Uranium Hexafluoride Conversion Facilities

Since the 1950s, the depleted uranium hexafluoride (DUF_6) produced during enrichment operations at the Portsmouth and Paducah Gaseous Diffusion Plants (and the East Tennessee Technology Park in Tennessee) has been stored in large steel cylinders at the sites. DOE is currently responsible for the management of approximately 700,000 metric tons of DUF_6 stored in about 60,000 cylinders. DOE awarded a contract and started construction in July 2004 on two depleted uranium conversion facilities, one each at Portsmouth and Paducah, to convert the DUF_6 cylinders to a more stable form for reuse or disposal. These facilities will operate over the next two decades. DOE is ultimately responsible for the deactivation and decommissioning of the facilities.

The Department is committed to clean up both the Portsmouth and the Paducah Gaseous Diffusion Plants to industrial reuse standards. Limited land areas will require institutional controls following remediation. Excess buildings at Portsmouth and Paducah that are not being leased are being assessed for reuse by the Department and will be scheduled for demolition if they are not suitable for reuse. Equipment and material removed from buildings will be decontaminated, reused, or recycled to the extent practicable. The current focus of the reindustrialization effort is to provide limited facilities and land to governmental and commercial users, and to transfer facilities and land to users through direct leasing or other initiatives.

Site Description

The Portsmouth site is located approximately 75 miles south of Columbus, Ohio in the foothills of the Appalachian Mountains.

The Portsmouth/Paducah Project Office is centrally located between the two sites in Lexington, Kentucky. The project office provides management oversight, strategic planning, and project coordination for both sites.

Site Cleanup Strategy/Scope of Cleanup

The Portsmouth site's use of recycled reactor fuel (or reactor returns) as feed material in the 1950s introduced such fission products as technetium, cesium, and strontium into the system, as well as small quantities of transuranics, primarily plutonium and neptunium. Spills and waste disposal during past operations also resulted in contamination from various industrial solvents (e.g. trichloroethylene) and uranium, technetium, and metals. Groundwater contamination is limited to a shallow aquifer that is not used as a drinking water source; thus, groundwater contamination has been contained onsite. Vertically, a layer of bedrock only 30-feet beneath the surface contains the groundwater plumes. Minor levels of contaminants have been detected in nearby stream sediments; however,

the regulatory agencies have agreed that cleaning up such low levels of contaminants would cause greater ecological disturbance than leaving the contaminants in place.

Portsmouth has focused on cleanup of high-risk areas first. DOE has completed all initial assessments required under the Resource Conservation and Recovery Act, contained all groundwater plumes onsite, and remediated several hazardous and solid waste units.

Site Completion and End State

FY 2005 through FY 2010 represents critical years for the environmental cleanup program at Portsmouth. The current end state completion in the baseline for Portsmouth is 2025. The primary objectives of the cleanup program during this period will be to install the last remaining approved remediation at the X-701B Area (land sites and groundwater), to continue operations of groundwater treatment facilities in support of installed remedies, and to remove all currently stored legacy low-level waste streams, including those contaminated with hazardous or toxic chemicals. Portsmouth will also decontaminate and decommission identified inactive facilities and complete disposition of currently stored highly enriched uranium. In addition, Portsmouth will complete construction and begin operating a DUF_6 conversion facility. The conversion operations are estimated to be 20 years.

Regulatory Framework

Oversight of cleanup activities at the Portsmouth site is the responsibility of the Environmental Protection Agency Region V and the Ohio Environmental Protection Agency. The program is being conducted in accordance with a State of Ohio Consent Decree and an Environmental Protection Agency Administrative Consent Order. The 1989 Administrative Consent Order was amended in 1997 to streamline environmental oversight by identifying Ohio Environmental Protection Agency as the lead agency responsible for day-to-day oversight.

The primary role of Environmental Protection Agency is to concur in the remedy decisions for final actions. The Portsmouth site is not on the Comprehensive Environmental Response, Compensation and Reliability Act's National Priorities List but undertakes cleanup in compliance with both Resource Conservation and Recovery Act and Comprehensive Environmental Response, Compensation and Reliability Act requirements. To facilitate site investigations and final cleanup actions, the Portsmouth site was divided into four quadrants based on groundwater characteristics. Each contains multiple solid waste management units.

Critical Site Uncertainties and Assumptions

The following are project uncertainties and assumptions:

- DOE missions will be given priority in all other future uses of the sites.
- The Portsmouth gaseous diffusion enrichment facilities will transition to deactivation and decommissioning within the planning period.
- The United States Enrichment Corporation needs for continued operation and use of site facilities for uranium enrichment activities will be a priority at both sites.

- DOE will be able to continue the barter agreement for removing technetium-99 contamination from uranium feed
- The extent of cleanup at Portsmouth is subject to future regulatory decisions.
- Although DOE recently approved CD-0 (Mission Need) for the D&D of the Portsmouth Gaseous Diffusion Plant, the current baseline excludes any costs associated with the future decontamination and decommissioning of the Portsmouth and Paducah gaseous diffusion plants.

Interdependencies

Portsmouth will receive all the DUF_6 cylinders stored at Oak Ridge's East Tennessee Technology Park in Tennessee by the end of FY 2006.

Contract Synopsis

The Portsmouth/Paducah Project Office issued remediation and infrastructure contracts in 2005 and 2006 at both the Portsmouth and Paducah sites. This strategy provides for incentivizing performance for the remediation and infrastructure effort. The infrastructure contracts provide information technology, human resources, mail, site security planning, road and ground maintenance, janitorial, and real and personal property inventory and disposition. The infrastructure contracts include Theta Pro2Serve Management Company, LLC at the Portsmouth site. The infrastructure contract is a cost-plus-award-fee contract. The remediation contract provides cleanup and closure of all facilities not leased to the United States Enrichment Corporation and cleanup of soils, groundwater, landfills, storage yards, as well as disposal of legacy waste (excluding the United States Enrichment Corporation leased units). The remediation contractor is LATA/Parallax Portsmouth, LLC at the Portsmouth site. The remediation contract is a cost-plus-incentive-fee contract. Deactivation and decommissioning of the diffusion plant process facilities is not part of the remediation contract.

Cleanup Benefits

The intent of the Federal Government is to manage the sites and the missions in an integrated manner. DOE retains overall responsibility for the sites. Significant portions of the site footprints are managed by the United States Enrichment Corporation under the provisions of a lease with DOE. Key DOE responsibilities in environmental cleanup and legacy material disposition will continue in support of DOE missions. Future uses of the sites will include a mixture of activities that are compatible with and contribute to ongoing and anticipated DOE missions. According to current plans, the reservation will be used to support many of the same programs it currently supports while adapting to emerging technology deployment by the United States Enrichment Corporation, transition to decontamination and decommissioning, depleted uranium material conversion, and long-term stewardship.

Target Level Accomplishments

FY 2007

- Complete necessary Resource Conservation and Recovery Act closure in X-7725 building.

- Complete cleanout of Gas Centrifuge Enrichment Plant.
- Continue operation of X-701B oxidant injections system.

FY 2008

- Complete construction and initiate operations of the DUF6 conversion facility.
- Complete legacy waste disposition.
- Complete inactive facility removal.
- Complete highly enriched uranium (HEU) disposition activities.

FY 2009

- Continue operation of X-701B oxidant injections system.
- Continue operations of the DUF6 conversion facility.

FY 2010

- Complete operations of X-701B oxidant injections system.
- Initiate installation of X-701B phytoremediation.
- Initiate design of X-701B soils final caps.

FY 2011

- Continue operations of the DUF6 conversion facility.

Richland Operations Site

Site Overview

The Richland Operations Office manages cleanup of the Hanford Site, with the exception of the waste tank farms (managed by the Office of River Protection), and the Pacific Northwest National Laboratory (managed by the Office of Science, Pacific Northwest Site Office).

The site was established during World War II to produce plutonium for the nation's nuclear weapons. Peak production years were reached in the 1960s when nine production reactors were in operation along the Columbia River. The last reactor to be shutdown was the N-Reactor, and its spent nuclear fuel that was originally stored in the K-Basins has since been relocated to dry storage in the Central Plateau (also known as the 200 Area.) Support facilities are located in the 1100 Area, most of which have been turned over to the local community. Soil and groundwater contamination from past operations resulted in placement of the site on the National Priorities (Superfund) List. The Hanford mission is now primarily site cleanup/environmental restoration to protect the Columbia River. The cleanup is addressed in commitments in a 1989 consent agreement, known as the Tri-Party Agreement. Parties to the agreement include the DOE, the U.S. Environmental Protection Agency, and the Washington State Department of Ecology.

Site Description: Hanford Site - Richland Operations Office

Hanford Site - Richland Operations Office As noted above, the Richland Operations Office manages the majority of the Hanford Site in southeastern Washington State. The 1,533 square kilometer (586 square mile) site contains the Central Plateau, River Corridor, and the Fast Flux Test Facility project.

Central Plateau

The central part of the site is known as the 200 Area or the Central Plateau. It is called the "plateau" because it is elevated about 61 – 67 meters (200 -250 feet) above the water table at the Columbia River shore (100 and 300 areas). The 200 Area is where fuel irradiated in the production reactors was chemically processed to separate and recover plutonium for use in nuclear weapons. Several other valuable isotopes were also recovered. During World War II, the two 200 Areas (East and West) were constructed about five miles apart and in such a manner that it would be difficult for an enemy aerial attack to destroy all of the chemical separations buildings. Originally four separation plants were to be built, two in each area. Three plants were built, but the process worked so well that only two plants were needed. The third plant, U Plant, was used to train operators for the other two plants. During the 1950s, U Plant had a special mission in recovering uranium that had been placed in waste tanks during the rush of World War II.

The Central Plateau contains the following areas:

200 East Area: The 200 East Area covers approximately 9.1 square kilometers (3.5 square miles). The area has two processing plants, B Plant and the Plutonium Uranium Extraction Plant (PUREX).

200 West Area: The 200 West Area has three processing plants, T Plant, U Plant and Reduction-Oxidation. T Plant and U Plant were nearly identical in function at the time they were constructed in 1943 and 1944. Reduction-Oxidation was a second-generation processing plant that began operation in 1952. The duplication of facilities was done for safety as well as security. U Plant and Reduction-Oxidation have been shut down, and T Plant operates as the site's decontamination facility. It has not conducted plutonium processing since 1956. Connected to Reduction-Oxidation is the 233-S Plutonium Concentration Facility, a building originally built for concentrating plutonium before it was sent to the Plutonium Finishing Plant. The 200 West Area covers just under 13 square kilometers (5 square miles) and is located about 13 kilometers (8 miles) from the Columbia River and 40 kilometers (25 miles) from Richland.

River Corridor

The River Corridor contains the following areas:

300 Area: The 300 Area's two main functions were production (or fabrication) of fuel for the reactors (performed in the north end of the area) and chemical research to improve the entire production process. Some of the buildings in the 300 Area were constructed during World War II. During the Cold War, many of the 300 Area laboratories performed research to expand and improve the efficiency of weapons production. Now, many of them are undergoing cleanout and deactivation. The 300 Area buildings that remain active include laboratories, technical shops, engineering offices, and support facilities whose main mission is environmental research.

100 B & C Areas: B Reactor, the first full-size nuclear reactor in the world, was the first reactor built on the Hanford Site. It has received several national awards as a nuclear and engineering landmark, and has the distinction of being listed on the National Register of Historic Places. Near B Reactor, in an area between the Columbia River and the reactor, is a site where contaminated soil is being remediated. When the reactors operated, water pumped from the Columbia River circulated around the radioactive fuel to cool it while it was in the reactor. This water was then sent through underground pipes to pond sites. The water was temporarily kept there to allow it to both cool off in temperature and to let some of the short-lived radioactivity decay. The water was then discharged to the river. The dirt under and around the ponds became contaminated and it is this soil that is being excavated and taken to the on-site Environmental Restoration Disposal Facility for placement in safe, long-term storage.

C Reactor has been placed in a safe storage condition for up to 75 years. This has involved removing the fuel storage basin, the fuel examination facility, the surrounding support buildings, and portions of the C Reactor building structure. This reduced the size of the original footprint by 81 percent. A new weatherproof roof and a remote monitoring system were then put in place. Putting the reactor into a safe condition not only will shield the reactor core for up to 75 years, but it will also reduce the time and money needed for regular surveillance and maintenance. Site personnel will only be required to enter the reactor once every five years to check conditions. In the meantime, the reactor is checked via a remote system.

100 KW & KE Areas: K-West and K-East were built in 1955 and were shut down in 1970 and 1971. Even though the reactors are shut down, their fuel storage basins contained nearly 2,300 tons of spent reactor fuel. The fuel came from N Reactor operations during the 1970s and 1980s. The fuel was not processed in the usual manner because the PUREX plant that normally dissolved and separated reactor fuel was shut down in 1972 because there was no need for additional plutonium. Removing the highly radioactive spent nuclear fuel from the K Basins and safely storing it away from the Columbia River is one of the highest cleanup priorities at the Hanford Site. Significant risk reduction has occurred with the packaging and movement of approximately 2,100 metric tons of degrading spent nuclear fuel to dry storage in the 200 Area Central Plateau

100 N Area: N Reactor operated from 1963 to January 1987 when it was shut down for maintenance, refueling, and safety upgrades. In April 1986 the accident at the Chernobyl nuclear plant in the Soviet Union drew public attention to N Reactor. After the Energy Department ordered safety enhancements, restart was planned. However, in early 1988 DOE decided to place N Reactor on standby. With the end of the Cold War, there was no longer a need for plutonium production and thus, N Reactor was never restarted. The N Reactor Area has been deactivated. This area contains slightly more than 100 buildings of which 10 have been demolished and 83 have been cleaned out and closed. The N Reactor spent fuel was put into canisters and will eventually be processed for storage and stored with spent fuel from the K Basins.

100 D & DR Areas: D Reactor was one of the three original reactors built in World War II. The reactor next to it is known as DR, or the D Replacement. The two reactors operated side-by-side until the mid-1960s. The D and DR Reactors are being placed into safe storage, or a "cocooned" state. Cleanup of soil in the 100-D Area began in 1996. Since then over 600,000 tons of contaminated soil has been moved away from the nearby Columbia River to the Environmental Restoration Disposal Facility.

100 H Area: Construction of H Reactor began in March 1948 and began operation in 1949. It was shut down in 1965. It was built as part of Hanford's first Cold War expansion, in response to some of the earliest events of the Cold War. Current plans call for placing H Reactor into safe storage.

100 F Area: F Reactor is partially torn down and approaching the "cocooned" state. It went into production in February 1945 during World War II and was shut down in 1965. Upon completion, 100-F Area contained 29 permanent buildings and 24 facilities.

Fast Flux Test Facility Project

Fast Flux Test Facility planning began in 1965, during the heyday of nuclear power building and experimentation. Four years later the conceptual design was completed. Construction was completed in 1980, and full critical operations got underway in late 1982. The reactor, built to be the prototype for America's breeder reactor program, was to be a bridge to a newer, non-defense role for the Hanford Site. Fast Flux Test Facility was the world's largest test reactor of its kind. It was designed primarily to test fuels and materials for the nation's advanced reactor program.

1100 Area

Hanford's 1100 Area served for half a century as the hub of the site's support services, including vehicle maintenance and motor pool; warehousing and property receiving and distribution; mail services; and other infrastructure services. The area also was the hub for the site's approximately 201 kilometers (125 miles) of rail track. The largest building here, the 1171 Building, has rail tracks running through it, and housed a rail overhaul and repair shop.

However, on September 30, 1998, the 1100 Area, the 26 facilities within it, and the 16 southern-most miles of the Hanford Railroad were transferred by DOE to Richland's Port of Benton for use in regional economic development. Transfer of the 768-acre 1100 Area (about 3.6 square kilometers [1.4 square miles]) pushed the Hanford Site border north by about a mile.

Site Cleanup Strategy/Scope of Cleanup

The primary cleanup focus is the safe storage, treatment and disposal of Hanford's legacy wastes and environmental restoration. The cleanup strategy is a risk-based approach that focuses first on those contaminant sources that are the greatest contributors to risk. Risk to the public, workers, and environment will be reduced by removing contamination before it migrates to the Columbia River. This includes cleanup of facilities/waste sites in the 100 Area, 200 Area and 300 Area, as well as retrieval of suspect transuranic waste for final disposition off-site. The final focus is the cleanup of the Central Plateau with priority on the decontamination and decommissioning of the Plutonium Finishing Plant and completion of groundwater remediation. Safe and secure interim storage of special nuclear material and spent nuclear fuel will be continued.

Site Completion and End State

The Federal government is expected to maintain ownership of most of the site once cleanup is complete, planned for 2035. To date, about 50 percent of Hanford Site lands have been cleaned up or transferred for alternate uses. The North Slope has been put under the management of other federal and Washington state agencies but remains under DOE ownership to maintain a safety buffer zone and pristine habitat. In 1999, DOE completed an environmental impact statement for the Final Comprehensive Land Use Plan. Final decisions on the level of cleanup to be performed on individual waste sites continue to be made through the Comprehensive Environmental Response Compensation and Liability Act and the Resource Conservation and Recovery Act decision processes.

K Basin Closure: The K Basins are the highest risk reducing projects. Significant risk reduction has occurred with the packaging and movement of approximately 2,100 metric tons of degrading spent nuclear fuel to dry storage in the 200 Area Central Plateau. Removal of radioactive sludge from wet storage in the K Basins near the Columbia River is currently underway. Sludge treatment into a waste disposal form is planned to be completed by FY 2009. Removal and disposal of the K Basins themselves is planned to be completed by end of FY 2010. This project's completions will mean the removal of more than 55 million curies of radioactivity from near the Columbia River to the 200 Area Central Plateau – more than 95 percent of the radioactivity in Hanford's River Corridor.

Plutonium Finishing Plant (PFP): The PFP consists of over 60 facilities that were used for production of plutonium from 1950 to 1989. The project will stabilize and package special nuclear materials and residues from the PFP Complex; provide storage of special nuclear materials, and maintain the facilities in a safe and secure manner until the completion of demolition. Upon removal of all SNM to a long-term storage facility, the security area will be reduced and the PFP Complex will be demolished to slab-on-grade.

Fast Flux Test Facility: By FY 2007, DOE plans to have completed deactivation, including reactor defueling; fuel washing, dry packaging, storage (in storage casks), and disposition of 376 reactor fuel assemblies; and draining of 260,000 gallons of sodium in operating plant systems, reactor vessel and fuel storage vessels. DOE will then transition the facility into long-term surveillance and maintenance.

River Corridor Closure Project: The River Corridor Closure Project will remediate 761 contaminated waste sites (including 50 burial grounds); deactivate, decontaminate, decommission and demolish 379 facilities adjacent to the Columbia River; and place eight reactors into interim safe storage condition. The work includes excavating and disposing of contaminated soil, backfilling with clean soil, constructing interim safe storage for the reactors, and demolishing the old reactor complexes and facilities in the 300 Area. The project has the goal of ensuring that the land is sufficiently clean to support land transfer to the Department of Interior. At that time, the footprint of active Hanford cleanup will be reduced from the present 586 square miles to about 75 square miles.

Transuranic Retrieval: All contact-handled suspect transuranic waste in the low-level burial grounds will be retrieved by 2012, with an expectation that about half will be disposed as transuranic waste and half as low-level waste and mixed low-level waste. Retrieval of the remote handled caissons will be performed by 2015. Processing of transuranic waste for shipment to the Waste Isolation Pilot Plant will occur in the Waste Receiving and Processing facility. Upon completion of this cleanup work, all waste will have been retrieved and transferred to a treatment, storage, and/or disposal facility.

Groundwater Remediation: This project includes remediation and monitoring of groundwater/vadose zone to address contamination by carbon tetrachloride, chromium, technetium, strontium, and uranium. Response actions for the 100 Area groundwater plumes are to be completed by December 2012. The end-state and exit strategy for the groundwater issues will be fully developed and implemented by 2012, except for contamination related to tank farm operable units. Groundwater completion activities will follow waste tank and waste site closure activities through the 2024 time frame.

Solid Waste Disposal: About 70,000 cubic meters of mixed low-level waste will be treated to meet regulatory requirements and then disposed of on-site in the mixed waste trenches or the Environmental Restoration Disposal Facility. About 130,000 cubic meters of low-level waste will be disposed of through site closure. In addition, liquid waste will be treated through the Effluent Treatment Facility, the Liquid Effluent Retention Facility, and the Treated Effluent Disposal Facility. Hanford will continue to operate facilities for the disposal of low-level and mixed low-level waste from Hanford and offsite generators.

Central Plateau Cleanup: One legacy of Hanford operations is a significant waste inventory of radioactive and regulated chemical materials. Past releases of these materials have contaminated Hanford's facilities, groundwater, soils, and environment. Over 625,000 cubic meters of solid waste were buried in Hanford site soils, while more than 1.7 trillion liters of liquid waste containing radioactive and chemical contamination have been discharged to the ground. DOE will clean up radioactivity and chemical contamination in about 800 waste sites that have the potential to impact ground water; clean up approximately 1,000 facilities on the Central Plateau and South Hanford Industrial Area; and disposition Cold War legacy wastes remaining at the Pacific Northwest National Laboratory.

Regulatory Framework

As noted earlier, the U. S. Department of Energy, the U. S. Environmental Protection Agency, and the State of Washington Department of Ecology signed a comprehensive cleanup and compliance agreement on May 15, 1989. The *Hanford Federal Facility Agreement and Consent Order*, or Tri-Party Agreement, is an agreement for achieving compliance with the Comprehensive Environmental Response Compensation and Liability Act remedial action provisions and with the Resource Conservation and Recovery Act treatment, storage, and disposal unit regulations and corrective action provisions. More specifically, the Tri-Party Agreement: 1) defines and ranks cleanup commitments, 2) establishes responsibilities, 3) provides a basis for budgeting, and 4) reflects a concerted goal of achieving full regulatory compliance and remediation, with enforceable milestones in an aggressive manner.

Tri-Party Agreement/Compliance Milestones:

Tri-Party Agreement major milestones for K Basin Closure

- M-034-00A, complete Removal of the K Basins and their Content by March 2009
- M-016-69, Complete All Interim 300 Area Remedial Actions by September 2015

Tri-Party Agreement major milestones for Plutonium Finishing Plant Project

- M-083-00A, PFP Facility Transition and Selected Disposition Activities by September 2016

Tri-Party Agreement major milestones for Transuranic Retrieval

- M-091-40, Complete Retrieval of Contact-Handled Waste by December 2010
- M-091-41A, Complete Retrieval of Non-Caisson Remote-Handled Waste by December 2014
- M-091-44B, Complete Retrieval of the 200A Caisson Remote-Handled Waste in 218-W-4B by December 2018

Tri-Party Agreement major milestones for Fast Flux Test Facility

- M-081-14, Complete Fast Flux Test Facility Sodium Drain by September 2009
- M-081-00A, Complete Fast Flux Test Facility Transition by February 2011

Tri-Party Agreement major milestones for River Corridor Closure Project

- M-016-00A, Complete All Interim Response Action for the 100 Areas by December 2012

Tri-Party Agreement major milestones for the Central Plateau clean up activities

- M-15-00, Complete 200 Area Remedial Investigation/Feasibility Study Process for all Non-Tank Farm Operable Units by December 2008
- M-20-00, Submit Part B Permit Application or Closure/Post Closure Plans for all RCRA Treatment, Storage, and Disposal Units by December 2008
- M-16-00, Complete Remedial Actions for all Non-Tank Farm Operable Units by December 2024

Critical Site Uncertainties and Assumptions

Richland is currently addressing a number of significant known uncertainties including:

- Waste Isolation Pilot Plant receiving schedule for transuranic waste from Hanford
- The opening date of Federal repository for spent nuclear fuel and subsequent receipt of spent nuclear fuel from the Hanford Site
- The acceptance of cleanup levels in Interim Records of Decision by regulators to support deletion of the Hanford Site from the National Priority List
- Records of Decision for the Central Plateau Area
- Unexpected contamination at some waste sites or facilities
- The availability of off-site storage for shipment of the plutonium currently stored in the Plutonium Finishing Plant
- Completion of the Tank Closure and Waste Management EIS and Hanford's availability to receive off-site LLW and MLLW for disposal.

Interdependencies

Richland has identified the following near term interdependencies needed for mission execution:

- Transuranic Waste Shipments: About 27,000 cubic meters of transuranic waste is to be processed and shipped to the Waste Isolation Pilot Plant from the Hanford Site
- Department of Defense Naval Reactors: Over 200 defueled naval reactor compartments will be disposed in a dedicated trench at the Hanford Site in the 200 Area
- Spent Fuel: Approximately 2,100 metric tons of spent nuclear fuel currently in interim storage at the Hanford Site is to be transported to a Federal repository for disposal
- Remediation of Central Plateau waste sites will need to be coordinated with the Office of River Protection's tank farm activities
- Plutonium consolidation: An off-site location is needed for the Plutonium stored in the Plutonium Finishing Plant, so that this facility can be fully decontaminated and decommissioned

Contract Synopsis

At the end of FY 2006, two major contracts to implement the cleanup strategy across the Hanford Site will expire: the Project Hanford Management Contract (RL) and the Tank Farm Management Contract (ORP). EM is developing an acquisition strategy for new contract(s); the majority of cleanup activities will be placed under new contracts in FY 2007.

The River Corridor Closure contract, a cost plus incentive fee type contract awarded in June 2005, is responsible for the cleanup of the nuclear reactor sites and the industrial 300 area along the Columbia River as well as facilities in the 400 Area and two burial grounds in the 600 Area. The cost plus incentive fee type contract was implemented to increase efficiency and accelerate the schedule for cleanup.

Cleanup Benefits

Near Term

- Spent Nuclear Fuel project completion will have removed more than 55 million curies of radioactivity – more than 95 percent of the radioactivity in Hanford's River Corridor
- Complete Reactor Interim Safe Storage for five of nine reactors at Hanford
- Plutonium legacy hold-up removal completed in the Plutonium Finishing Plant
- Reduce risks associated with the radioactive fuel and liquid sodium coolant at the Fast Flux Test Facility

Longer Term

- Complete final Records of Decision for the Central Plateau and initiate remediation activities.
- Contact-Handled transuranic waste retrieval completed by 2010 reducing the environmental risks in the 200 Area
- Complete remedial actions and facility demolition in the 100 B/C, 100F and 100H areas
- Begin interim safe storage for KE, KW and N reactors – the last of the eight reactors to be placed in interim safe storage

Target Level Accomplishments

FY 2007

- Complete interim remedial action of 33 of the remaining 330 waste sites
- Remove and treat K-East and K-West sludge for disposition
- Demolish 10 facilities in the River Corridor Project
- Retrieve 2400 cubic meters of suspect transuranic waste
- Treat and dispose of approximately 2200 cubic meters of mixed low level waste

- Complete FFTF Sodium Drain and SNF disposition, and transition to surveillance and monitoring phase

FY 2008

- Remediate 45 waste sites in the River Corridor
- Complete demolition of 38 facilities in the 100 and 300 Areas
- Retrieve 2400 cubic meters of suspect transuranic waste
- Complete Tank Waste Closure and Waste Management EIS
- Begin shipment of plutonium to off-site consolidation location

FY 2009

- Complete remediation of 100-F Area
- Complete shipment of plutonium to off-site consolidation location
- Restart Plutonium Finishing Plant D&D
- Complete demolition of 34 facilities in the 100 and 300 Areas
- Eliminate backlog of mixed low level waste requiring treatment

FY 2010

- Complete contract-handled suspect TRU retrieval
- Complete demolition of forty-one surplus facilities in the 300 Area (including 324/327)
- Complete remedial actions for the six waste sites in the 300-FF-2 Operable Unit
- Complete decommissioning high risk groundwater wells
- Continue Plutonium Finishing Plant D&D

FY 2011

- Complete remediation of 100-H Area
- Complete demolition of 60 facilities in the 100 and 300 Areas
- Complete demolition of 23 facilities in the Central Plateau (200 Areas)
- Complete Fast Fuel Test Facility deactivation (400 Area)
- Continue Plutonium Finishing Plant D&D

Office of River Protection

Site Overview

In order to more effectively manage the River Protection Project and in response to Section 3139 of the *Strom Thurmond National Defense Authorization* Act for Fiscal Year 1999, the Secretary of Energy established the Office of River Protection at the Hanford Site in the State of Washington. The Office is responsible for the storage, retrieval, treatment, immobilization, and disposal of tank waste and the operation, maintenance, engineering, and construction activities in the 200 Area Tank Farms. These Tank Farms include 177 underground storage tanks (149 single-shell tanks and 28 double-shell tanks) that contain approximately 190 million curies in approximately 53 million gallons of chemically hazardous radioactive waste from past processing operations. A multi-year construction project to build a Waste Treatment and Immobilization Plant to process and immobilize the tank waste is ongoing.

Site Description: Hanford Site - Richland Operations Office

The site is the largest of the three original defense production sites founded in World War II as part of the Manhattan Project. Hanford is about half the size of the State of Rhode Island, at 586 square miles. Over its 40 years of operations, the site produced approximately 74 tons of plutonium – nearly two-thirds of all the plutonium recovered for government purposes in the United States. Between 1943 and 1963, nine plutonium production reactors were built along the Columbia River. Plutonium and reusable uranium were separated from irradiated fuel using various chemical precipitation and solvent extraction techniques. The plutonium was exported to other DOE sites for eventual defense use in United States nuclear weapons.

During the plutonium production days, highly radioactive waste from site operations was piped to underground tanks. In some cases less radioactive waste was discharged underground. For example, uncontaminated and slightly contaminated liquids and cooling water were pumped to ditches and ponds. Contaminated water discharged from the reactors was pumped to nearby soil as well as into the Columbia River. Solid waste was buried in shallow trenches or stored inside facilities. The result is more than 1,600 identified waste sites and more than 500 waste facilities at Hanford. Forty percent of the approximately one billion curies of human-made radioactivity that exist across the nuclear weapons complex reside at Hanford. These materials must be dealt with in a safe and protective manner.

Hanford cleanup is managed by two Department of Energy offices, the DOE Richland Operations Office and the DOE Office of River Protection. Each office reports to the Office of Environmental Management.

The DOE Office of River Protection is responsible for the clean up of the approximately 53 million gallons of waste in 177 underground storage tanks, as well as contaminated equipment and soils in the 18 tank farms where these tanks are located. Sixty-seven of the 177 tanks are suspected to have leaked.

Site Cleanup Strategy/Scope of Cleanup

Office of River Protection's cleanup strategy is a risk-based approach that focuses first on those contaminant sources that are the greatest contributors to risk by 2035. Significant clean-up progress has occurred, for instance:

- Interim stabilization (removal of three-million gallons of pumpable liquids), from Hanford's 149 single-shell tanks has been completed, reducing the risk of future tank leaks to the environment.
- The Waste Treatment and Immobilization Plant is being designed and constructed to vitrify the radioactive tank waste. It will be the largest radiochemical processing facility in the world.
- Retrieval of sludge/saltcake waste from single-shell tanks continues.
- Construction of the Hanford integrated disposal facility, which will be used for the disposal of mixed low-activity wastes and low-level wastes, is underway and will be completed in FY 2006.

Site Completion and End State

The River Protection Project end state goal is by 2035 to clean up the tank waste and tank farms in a compliant manner; immobilize and safely dispose of associated radioactive and chemical wastes; and protect human health, the environment, and Columbia River resources. The following will have been accomplished at the completion of the Office of River Protection Mission:

- High-level waste will be vitrified and shipped to the Federal repository.
- Low-activity wastes will be stabilized and disposed of onsite.
- Appropriate remediation measures will be implemented for contaminated soils.
- Tanks and related equipment will be stabilized in place.
- Waste treatment systems will be decommissioned.
- Measures will be implemented to ensure the durability of protective conditions established through cleanup (e.g., durable surface barriers, long-term monitoring, markers, records, etc.).

Regulatory Framework

The principal regulatory drivers at the Hanford Site are the Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; and the Atomic Energy Act. In May 1989, DOE, the U.S. Environmental Protection Agency and the Washington State Department of Ecology (Ecology) signed the Hanford Federal Facility Agreement and Consent Order, commonly known as the Tri-Party Agreement. The Tri-Party Agreement defines legally-enforceable milestones for Hanford cleanup in accordance with Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act:

- Hanford is one of DOE's most complex sites with regard to its regulatory environment and key stakeholder interfaces. This requires significant investment of time to communicate, coordinate, and reach agreement between the various parties.

- Near-term Tri-Party Agreement milestones include:
  - M-62-08 -- Submit Hanford Tank Waste Supplemental Treatment technologies report by June 2006
  - M-90-11 -- Complete Canister Storage Building construction by August 2010
  - M-47-00 -- Complete startup/turnover of required transfer systems for first High-Level Waste feed by February 2018
  - M-45-00 – Complete closure of all single shell tank farms by September 2024.

Critical Site Uncertainties and Assumptions

The River Protection Project is currently addressing a number of significant known uncertainties that are impacting the ability of the Hanford Site to disposition waste and complete the cleanup mission. Some of these uncertainties include:

- The revised cost and schedule for the Waste Treatment Plant, once the seismic and other design issues have been addressed in the FY 2006 rebaselining effort.
- Delayed start of Waste Treatment and Immobilization Plant operations impacts the rates and timing of retrieval, treatment, disposal, and closure activities.
- Completion of an Environmental Impact Statement addressing tank closure and Hanford Site waste management and issuance of a Record of Decision.
- Any significant delays in the availability of the Federal repository will delay project completion and increase storage costs of the vitrified canisters of high-level waste.
- Uncertainties regarding tank waste determination decisions due to the State of Washington not being a "covered State" under Section 3116 of the National Defense Authorization Act for FY 2005 can impact tank closures.
- The retrieval, treatment, and disposal of any tank waste as transuranic waste at the Waste Isolation Pilot Plant is affected by the timing of National Environmental Policy Act decisions, a Waste Isolation Pilot Plant Class III permit modification decision, and a State of Washington Resource Conservation and Recovery Act permit.
- Potential impediments to completing single-shell tank retrievals and conducting single-shell tank closures are attributable to the Cleanup Priority Act passed by Washington State voters in November 2004, and currently being challenged in Federal Court.
- Demonstration of the bulk vitrification technology as the supplemental immobilization path for low-activity waste.

Interdependencies

The Office of River Protection has identified the following near term interdependencies needed for mission execution:

- Technical consultation by the Nuclear Regulatory Commission on allowable waste residuals in the Hanford single-shell tanks.

- U.S. Environmental Protection Agency approval of the Hanford transuranic tank waste inventory inclusion in the Waste Isolation Pilot Plant compliance recertification application.

- State of New Mexico Department of Environment approval of the Waste Isolation Pilot Plant Class III Permit Modification for disposition of Hanford transuranic tank waste.
- Availability of the Federal repository for disposal of high-level waste.

Contract Synopsis

At the end of FY 2006, two major contracts to implement the cleanup strategy across the Hanford Site will expire: the Project Hanford Management Contract (RL) and the Tank Farm Management Contract (ORP). EM is developing an acquisition strategy for new contract(s), with the majority of cleanup activities placed under new contracts beginning in FY 2007.

The Office of River Protection currently has two prime contracts to implement its cleanup strategy. The Tank Farm Management contract with CH2M Hill Hanford, Inc. addresses the following: (1) safely store, operate, and interim stabilize Hanford tank waste; (2) retrieve and dispose waste from, and interim close, single shell tanks; retrieve and dispose of waste from double shell tanks, including completion of upgrades and waste retrieval and transfer systems; (3) construct, operate, and maintain facilities necessary for storage/disposal of immobilized waste whether onsite or offsite, including balance of plant construction; (4) stabilize facilities and preparation of tank closure plans for single-shell tanks; and (5) perform decommissioning and decontamination to support improved long term operational efficiencies. This contract is a cost type site facilities management contract with performance based incentives.

The Waste Treatment and Immobilization Plant contract with Bechtel National, Inc. includes the design, construction, and commissioning of the Waste Treatment and Immobilization Plant which includes: transitioning of the Waste Treatment and Immobilization Plant Conceptual Design from the Tank Farm Management Contractor; completing the Process and Facility Design; managing construction and procurement; conducting acceptance testing; commissioning of the facility; conducting all required environment, safety, quality, and health actions; assuming Full Design Authority; and having full accountability for performance, cost, and schedule. This contract type is a cost plus incentive fee with cost, schedule, and operational incentives.

Cleanup Benefits

Near Term

- Retrieve waste from single-shell tanks and transfer the waste to double-shell tanks for safe storage until the waste can be treated through the Waste Treatment and Immobilization Plant.
- In FY 2006, complete construction of the integrated disposal facility for future use in disposing of low-activity waste and mixed low-level.
- Complete design of bulk vitrification in FY 2006 as a supplemental technology to increase the ability to treat and dispose of Hanford's low-activity tank waste.

Longer Term

- Continue to retrieve and treat Hanford's tank waste and begin closure of the tank farms to protect the Columbia River.
- Implement a supplemental technology (e.g., bulk vitrification) to treat low-activity waste that has low-curie content.

Target Level Accomplishments

FY2007

- Continue design and construction of the Waste Treatment and Immobilization Plant (WTP)
- Maintain the Tank Farms in a safe and compliant manner
- Continue to retrieve Single-Shell Tank waste at a reduced pace
- Complete Tank Integrity Assessment to support double-shell tank systems
- Ready to accept placement of Immobilized Low Activity Waste in the Hanford Integrated Disposal Facility (IDF)
- Complete design and project baseline for the supplemental treatment and Demonstration Bulk Vitrification System (DBVS)

FY2008

- Continue design and construction of the Waste Treatment and Immobilization Plant (WTP)
- Maintain the Tank Farms in a safe and compliant manner
- Continue to retrieve Single-Shell Tank waste at a reduced pace
- Initiate construction of the DVBS

FY2009

- Continue design and construction of the Waste Treatment and Immobilization Plant (WTP)
- Maintain the Tank Farms in a safe and compliant manner
- Continue to retrieve Single-Shell Tank waste at a reduced pace
- Continue construction of the DVBS

FY2010

- Continue design and construction of the Waste Treatment and Immobilization Plant (WTP)- HLW and PT
- Maintain the Tank Farms in a safe and compliant manner
- Continue to retrieve Single-Shell Tank waste at a reduced pace

- Complete construction of the DVBS

FY2011

- Continue design and construction of the Waste Treatment and Immobilization Plant (WTP)
- Maintain the Tank Farms in a safe and compliant manner
- Continue to retrieve Single-Shell Tank waste at a reduced pace
- Begin operation of the DVBS

Savannah River Site

Site Overview

The Savannah River Site is a key Department of Energy (DOE) industrial complex dedicated to the National Nuclear Security Administration program, that supports the DOE national security and non-proliferation programs, and the EM program that addresses the reduction of risks through safe stabilization, treatment, and disposition of legacy nuclear materials, spent nuclear fuel, and waste.

The Savannah River Site encompasses over 300 square miles with more than 1,000 facilities concentrated within only 10 percent of the total land area. As cleanup activities are completed, operations will be concentrated to the site central core area. The land surrounding the central core area provides a protective buffer. All EM facilities and inactive waste units are being deactivated, decommissioned, and remediated. Facility decommissioning alternatives include demolition and in-situ disposal. However, if a viable reuse is identified, the DOE Savannah River Operations Office will remove a facility or group of facilities from the decommissioning scope.

Site Description

The Savannah River Site is divided into 18 site areas, according to the types of mission activities that occurred at each. All waste types will be treated, stored and disposed. All nuclear material will be stabilized and safely stored. Groundwater contaminant plumes will be remediated to meet drinking water standards.

Site Cleanup Strategy/Scope of Cleanup

Work scope is planned and executed at the Savannah River Site by treating each discrete cleanup program scope of work, as well as the total scope of work, as a project. Specifically, the scope, end state, cost, and schedule for each project is clearly defined and managed consistent with Departmental guidance for project management. The scope of this cleanup project is stabilization and disposition of all EM-owned nuclear material; receipt and disposition of spent nuclear fuel; removal of waste from and closure of all radioactive liquid waste tanks; treatment and disposition of solid waste; decommissioning of all Savannah River Site EM facilities; and remediation of groundwater plumes and soil contamination.

The Savannah River cleanup strategy has three primary objectives: (1) Eliminate the highest risks first through safe stabilization, treatment, and disposition of EM owned nuclear materials, spent nuclear fuel, and waste; (2) Significantly reduce costs of continuing operations and surveillance and maintenance; (3) Decommission all EM-owned facilities and remediate groundwater and contaminated soils, using an area closure approach.

Site Completion and End State

The EM Cleanup Project and mission will be complete by 2025, and ongoing National Nuclear Security Administration nuclear industrial missions will continue. The Savannah River Site is a site with an enduring mission and is not a closure site

Regulatory Framework

The Savannah River Site works closely with various oversight groups, environmental regulators, and stakeholders in accomplishing its work. The site is proud of the collaborative relationships with these external parties and credits the cooperative nature of these relationships with many cleanup accomplishments. In addition, local communities and Congressional, state, and local officials typically are very supportive of Savannah River Site, understanding well the critical role Savannah River Site plays within the region and the nation and the important nature of the cleanup work.

Savannah River and its contractors will continue to proactively work with the South Carolina Department of Health and Environmental Control, the Environmental Protection Agency, the Nuclear Regulatory Commission, the Defense Nuclear Facilities Safety Board, oversight groups, and stakeholders to facilitate the accomplishment of the environmental cleanup and risk reduction objectives at Savannah River Site. There are several key agreements that facilitate the cleanup of the Site as described as follows.

The Savannah River Site Federal Facility Agreement - In August 1993, Savannah River, the Environmental Protection Agency, and the South Carolina Department of Health and Environmental Control, referred to as "the parties," reached agreement on the cleanup of Savannah River Site and signed the *Federal Facility Agreement*. The *Federal Facility Agreement* governs environmental remediation and waste tank closure programs. The major purpose of the *Federal Facility Agreement* is to ensure that the environmental impacts associated with past and present activities are investigated and that appropriate action is taken as necessary to protect the human health and the environment. The document establishes the roles and responsibilities of the three parties, lays the foundation for timely remediations conducted under the Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act, and describes the remediation process and associated priority of environmental remediation projects. Appendices to the *Federal Facility Agreement* specify the work to be done for each year and are negotiated annually among all three parties. The current *Federal Facility Agreement Appendix E*, "Out Year Milestones," has been revised to align the Savannah River Site enforceable agreements with the renegotiated management and operations contract and with the closure strategy.

Federal Facility Compliance Act- This agreement defines requirements for preparing and submitting a site treatment plan for mixed low-level waste (radioactive waste mixed with hazardous chemicals) to the South Carolina Department of Health and Environmental Control, including options and schedules for treatment of identified waste.

Critical Site Uncertainties and Assumptions

Program-specific uncertainties that could have significant impacts to individual projects and may impact the overall cleanup scope, schedule, and costs have been identified:

- Loss of any major process facility for an extended period of time would impact cleanup and other Savannah River Site missions;
- Delays in the availability of the Federal Repository for disposal of HLW and SNF would delay site completion and increase storage costs;
- Uncertainties within the radioactive liquid waste disposition program (i.e., the waste determination process under section 3116 of the FY 2005 National Defense

Authorization Act) could delay tank closures; and significantly impact life-cycle costs;
- Uncertainties in the disposition strategy for excess plutonium stored on site by EM; and
- The disposition strategy (treatment and/or packaging) for SNF to ensure acceptance at the Federal Repository.

Interdependencies

Execution of the EM Cleanup Project at Savannah River Site involves numerous interfaces with other organizations both on and offsite. Since EM is the major Savannah River Site program, it provides landlord services to other organizations, primarily the National Nuclear Security Administration. Major interfaces are described below for both on and offsite entities. The EM role as landlord will end with the completion of work scope by the end of FY 2025, at which time landlord and interface responsibilities will transition to the National Nuclear Security Administration (FY 2026). Activities to ensure a smooth transition will be required.

Major program interfaces are described briefly below.

National Nuclear Security Administration – Defense Programs – Tritium
The National Nuclear Security Administration-Defense Programs mission includes maintaining technical expertise in tritium operations, production, and engineering to support the national nuclear weapons stockpile. The tritium program generates both liquid and solid low-level waste that is disposed at Savannah River Site.

National Nuclear Security Administration – Nuclear Nonproliferation – Plutonium Disposition
Savannah River Site has been selected as the location for the construction and operation of facilities to dispose of approximately 33 metric tons of surplus weapons-usable plutonium in a manner that meets the "Spent Fuel Standard." The Spent Fuel Standard is achieved when weapons-usable plutonium is made as inaccessible and unattractive for weapons use as is the plutonium that exists in spent nuclear fuel from commercial reactors.

Three new facilities (the Pit Disassembly and Conversion Facility, the Mixed Oxide Fuel Fabrication Facility, and the Waste Solidification Building) will be required to accomplish this plutonium disposition mission. Implementation of these new plutonium missions may result in additional waste generation that may require EM disposition. New plutonium missions constitute a small percentage increase in waste volumes over existing waste management obligations. Assumptions are that the National Nuclear Security Administration will deactivate and decommission their own facilities and will be responsible for any new waste generated.

National Nuclear Security Administration – Nuclear Nonproliferation Program – Enriched Uranium Blend Down
The United States has declared a total of 174.3 metric tons of highly enriched uranium surplus to future weapons needs. Existing EM facilities along with a new low-enriched uranium loading facility are being used to dilute approximately 16 of the 21 metric tons

of highly enriched uranium located at Savannah River Site and owned by the EM program. The remaining five metric tons of highly enriched uranium are being shipped directly to a Tennessee Valley Authority vendor for dilution.

Savannah River National Laboratory

The Savannah River National Laboratory is expected to be an enduring laboratory. Its mission is to conduct applied research and development to meet the science and technology needs of the Savannah River Site and the Nation, with its primary focus on Environmental Management, National Security, and Energy Security. A key role for the laboratory is to explore further development/improvement of regional and national relationships with industry, universities and state governments to enhance research programs by integrating capabilities of industry and academia into the work of the lab. Lastly, the Savannah River National Laboratory will be expected to maintain operable essential infrastructure elements of technical area facilities through 2025 to serve EM and the National Nuclear Security Administration needs, most notably shielded cells used to analyze high activity waste. Savannah River National Laboratory has provided significant support to the Hanford Waste Treatment Research and Technology Program. Primary areas of support have been in areas of waste characterization, process and design confirmation, obtaining basic data to support design, and obtaining regulatory data to support environmental permitting and waste form qualification. The Savannah River National Laboratory is indirectly funded by EM and the National Nuclear Security Administration. EM funding that is through other EM site PBSs was $50,900,000 in FY 2005; and is projected to be $49,207,000 in FY 2006; and is estimated to be $43,300,000 FY 2007.

Office of Science – Savannah River Ecology Laboratory

The Savannah River Ecology Laboratory provides site ecological evaluations and research. The University of Georgia, which manages the Savannah River Ecology Laboratory, employs approximately 120 employees.

United States Forest Service – Savannah River Forest Station

The Savannah River Forest Station is an independent unit of the U.S. Forest Service, which manages Savannah River Site forest resources, provides forest fire protection, manages Savannah River Site secondary road systems, conducts erosion control, performs soil restoration, and conducts exterior boundary maintenance. Funding for services provided by U.S. Forest Service is reimbursed by the EM program. There are approximately 90 Savannah River Forest Station employees at Savannah River Site.

Waste Isolation Pilot Plant

Transuranic waste resulting from nuclear material stabilization activities has been stored at Savannah River Site for years. Transuranic waste poses a significant risk due to waste characterization uncertainties and the potential for build-up of hazardous gases that could lead to an environmental release of contamination. Transuranic waste is being characterized and processed to ship to the Waste Isolation Pilot Plant. Shipments of transuranic waste drums began in FY 2001. The Waste Isolation Pilot Plant provides personnel at Savannah River Site who package material for shipment and provides certain equipment required for transuranic waste processing. Deinventory of the transuranic waste inventory at Savannah River Site depends on the continued operation and acceptance of transuranic waste at the Waste Isolation Pilot Plant.

Federal Repository
Operation of a Federal Repository is critical to the completion of the EM cleanup for disposition of high level waste and spent nuclear fuel at Savannah River Site.

Hazardous and Mixed Waste Disposal (Commercial)
Hazardous waste and mixed low-level waste (radioactive waste which also contains hazardous constituents) is treated and disposed of offsite.

Low-Level Waste Disposal
Low-level waste is disposed of either onsite in E Area or offsite at other DOE sites and at commercial disposal facilities.

Receive Waste (Naval Reactors)
Classified waste, such as reactor components, is routinely received from Naval Reactors. These components are disposed of in E Area.

Tennessee Valley Authority
As previously mentioned, excess highly enriched uranium at Savannah River Site is being dispositioned by both dilution and shipment, and by direct shipment, to the Tennessee Valley Authority vendor. The vendor also provides natural uranium for the blending. Savannah River Site depends on the Tennessee Valley Authority to provide and accept these materials to enable deinventory of H Area and K Area.

Idaho National Laboratory
Deinventory of H Canyon is dependent on transferring excess Neptunium to the Idaho National Laboratory for use in producing plutonium (shipments are in progress).

Oak Ridge Toxic Substances Control Act Incinerator
Savannah River Site sends waste to the Oak Ridge Toxic Substances Control Act Incinerator for thermal treatment. Although primarily available for treatment of radioactive polychlorinated biphenyl waste, the incinerator is also permitted for mixed low-level waste.

Spent Nuclear Fuel
Savannah River Site receives, stores, and will ultimately ship (for permanent disposal) spent nuclear fuel from both domestic and foreign research reactors. This program requires extensive interface with reactor owners, and other DOE programs.

Contract Synopsis

The majority of cleanup scope falls within the Management and Operating contract (currently Westinghouse Savannah River Company) which expires December 31, 2006. Savannah River is employing new strategies to achieve Departmental objectives. EM is developing an acquisition strategy for new contract(s), with the majority of cleanup activities under new contracts in 2007.

Cleanup Benefits

Specific program benefits realized from the EM Cleanup Project are significant. For example, removal of radioactive liquid waste will be completed by 2025 and will produce 17 percent fewer Defense Waste Processing Facility canisters than originally planned. H Canyon and HB Line will remain as the only operational chemical separations facilities after FY 2006. Savannah River Site has consolidated spent nuclear fuel from three storage basins to a single storage basin. Legacy transuranic waste is being shipped to the Waste Isolation Pilot Plant nearly three decades ahead of the original baseline, and the soil and groundwater project will be completed by FY 2025.

Target Level Accomplishments

FY2007

- Defense Waste Processing Facility produce 250 canisters of vitrified High Level Waste
- Complete F Canyon and FB Line Deactivation
- Continue design and construction of the Salt Waste Processing Facility
- Initiate deactivation of F-area Material Storage Building
- Start construction on the 3013 Container Surveillance and Storage Capability
- Interim Salt Processing System - start Actinide Removal Process hot operations

FY2008

- Defense Waste Processing Facility produce 250 canisters of vitrified High Level Waste
- Meet site integrated schedule commitments associated with the Design Basis Threat requirements
- Finish design and continue construction of the Salt Waste Processing Facility
- Complete General Separations Area Consolidated Unit Closure
- Dynamic Underground Stripping --- remove 1 million pounds of solvents
- Implement consolidation and disposition plan for excess special nuclear materials
- Implement disposition strategy for treatment and storage of on-site spent nuclear fuel
- Continue construction on the 3013 Container Surveillance and Storage Capability Project

FY2009

- Defense Waste Processing Facility produce 230 canisters of vitrified High Level Waste

- Complete M Area Record of Decision (ROD)
- Continue construction of the Salt Waste Processing Facility
- Complete Container Surveillance and Storage Capability in K Area
- Begin construction of Canister Shipping Facility
- Implement consolidation and disposition plan for excess special nuclear materials
- Implement disposition strategy for treatment and storage of on-site spent nuclear fuel
- Continue construction on the 3013 Container Surveillance and Storage Capability Project

FY2010

- Defense Waste Processing Facility produce 230 canisters of vitrified High Level Waste
- Complete P Area Record of Decision (ROD)
- Complete disposition of all legacy low level waste / mixed low level waste / hazardous waste / and transuranic waste
- Implement consolidation and disposition plan for excess special nuclear materials
- Implement disposition strategy for treatment and storage of on-site spent nuclear fuel
- Complete construction of the 3013 Container Surveillance and Storage Capability
- Begin operations of the Interim Salt Waste Processing System

FY2011

- Defense Waste Processing Facility produce 230 canisters of vitrified High Level Waste
- Complete R Area Record of Decision (ROD)
- Complete remedial action and closure of M Area
- Complete construction of Salt Waste Processing Facility (SWPF)
- Complete decommissioning of F-area material storage building
- Initiate operations of Salt Waste Processing Facility (SWPF)
- Implement consolidation and disposition plan for excess special nuclear materials
- Implement disposition strategy for treatment and storage of on-site spent nuclear fuel

NNSA Sites

Lawrence Livermore National Laboratory

Site Overview

Lawrence Livermore National Laboratory (LLNL) is a National Nuclear Security Administration (NNSA) multi-disciplinary research and development center focusing on weapons development and stewardship and homeland security. The Environmental Management program has been accelerated resulting in the completion of the Legacy Waste Project at the end of FY 2005 and transfer of the Newly Generated Waste Program to the National Nuclear Security Administration in FY 2006. Completion of the Livermore Site remedial activity build-out and transition to Long-Term Remedial Action is scheduled for the end of FY 2006. Completion of the LLNL Site 300 remedial activity build-out and transition to Long-Term Response Actions is scheduled for the end of FY 2008. This plan will focus on the LLNL Site 300 Environmental Restoration Project as it will transfer from Environmental Management to NNSA at the end of FY 2008.

Site(s) Description

Livermore Site 300 is an 8,000-acre site with limited development primarily used for research, development, and testing of high explosives and analysis of non-nuclear weapons components. The site is located in the Altamont Hills approximately 17 miles southeast of Livermore and 8 miles southwest of Tracy, California. The surrounding area is sparsely populated rural agricultural and recreational. There is soil and groundwater contamination on-site and limited groundwater contamination off-site.

Site Cleanup Strategy/Scope of Cleanup

The cleanup strategy is a risk-based and regulatory compliant approach that focuses first on those contaminant plumes and sources that are the greatest contributors to risk. The overall goal is to ensure that risks to the public and workers are controlled, followed by work to cleanup soil and groundwater using a risk-based methodology.

During past Site 300 operations, surface spills and piping leaks, leaching from unlined landfills and pits, high-explosive test detonations, and disposal of waste fluids in lagoons and sumps resulted in contamination releases to soil, bedrock, surface water and ground water. Volatile organic compounds, high explosive compounds, perchlorate, nitrate, tritium, and depleted uranium have been detected in ground water at concentrations exceeding drinking water standards. To date, 20 ground water extraction and treatment and soil vapor extraction facilities are installed and operating, four landfills and six high explosive lagoons have been capped and closed, contaminated soil has been removed from source areas, and the monitoring network has been installed to track plume migration and remediation progress.

Site Completion and End State

For the cleanup projects, all required treatment facilities would be constructed and fully operational at completion. Soil and groundwater remediation activities will continue, as well as monitoring and regulatory reporting.

Short-Term Projects

Site 300: Site 300 Completion consists of construction of one additional groundwater extraction and treatment facility, expansion of wellfields at five existing groundwater extraction and treatment facilities, implementation of the remedial remedy for the contaminated soil at the Building 850 firing table, implementation of the remediation remedy at the Pit 7 complex, and completion of the Comprehensive Environmental Restoration, Compensation, and Liability Act regulatory documents, including the final Record of Decision for the Site.

Longer Term Projects

The environmental restoration project at LLNL Site 300 requires Long Term Stewardship which includes but is not limited to the operation and maintenance of the remediation systems, compliance monitoring and reporting, risk and hazard management, and evaluation of progress to meet clean up standards.

Regulatory Framework

The site-specific Comprehensive Environmental Response, Compensation and Liability Act federal facility agreements for LLNL Site 300 governs the Environmental Restoration activities at the site. The Site 300 federal facility agreement was signed in 1991. Subsequently, an interim Record of Decision was signed in 2002 to evaluate the practicality of applying the state "Non-degradation Policy" to the cleanup of soil and groundwater at Site 300. Based on this evaluation of cleanup efficacy, a Final Record of Decision is proposed for negotiation in 2008.

Critical Site Uncertainties and Assumptions

At Site 300, where cleanup work continues in FY 2007-2008, the major uncertainty is the final groundwater cleanup levels. The ground water cleanup standards selected in the Final Site-Wide ROD (scheduled for 2008) are anticipated to be no lower than drinking water Safe Drinking Water Act, National Primary Drinking Water Regulations Maximum Contaminant Levels. The State of California may require that cleanup standards be set at background, or at concentrations between background and drinking water standards. The establishment of these more stringent standards would extend the time required to achieve cleanup and possibly necessitate the installation of additional treatment systems and ground water and/or soil vapor extraction wells. Remediation in areas not now requiring action may also be needed.

Interdependencies

At Site 300, final cleanup levels still need to be negotiated with the State of California and Environmental Protection Agency based on both state and federal requirements. The build out of treatment facilities is based on the assumption that risk based cleanup levels

on and off site for both soil and groundwater will be agreed to for Site 300. These are the levels that the state and Environmental Protection Agency have agreed to at the Livermore Site. If cleanup levels cannot be achieved and DOE needs to negotiate technical impracticability, waivers need to be negotiated in lieu of the Record of Decision based cleanup levels. Both Environmental Protection Agency and the state will need to agree to this alternative.

Contract Synopsis

The environmental restoration work is currently managed by the Lawrence Livermore National Laboratory Management and Operating contractor (the University of California). Environmental Restoration performance is assessed in accordance with the contract. The Management and Operating contract with the University of California expires on Sept. 30, 2007. Preparations are underway to develop the Request for Proposal for a new contract to begin on October 1, 2007.

Cleanup Benefits

Site 300 is scheduled to be completed with final cleanup levels negotiated and treatment facilities constructed and operational by the end of FY 2008.

Target Level Accomplishments

FY2007

- Building 834 Final 5-Year Review
- Site-Wide Final Proposed Plan for the Final Record of Decision
- High Explosive Process Area (HEPA) Final 5-Year Review
- Expand four ground water extraction wellfields

FY2008

- Site-Wide Final Record of Decision (ROD)
- Site-Wide Final Revised Remedial Design Workplan

FY2009

- Building 854 Final 5-Year Review
- Site-Wide Final Revised Compliance Monitoring Plan/Contingency Plan

Los Alamos National Laboratory

Site Overview

The Environmental Management program at Los Alamos National Laboratory has three primary components: (1) characterization and cleanup of environmental media (i.e., soil and groundwater), (2) disposition of legacy waste, and (3) decontamination and decommissioning of excess nuclear facilities in the path of environmental restoration. Collectively, these three components address legacy waste resulting from past nuclear weapons development and nuclear research operations. The end state at Los Alamos National Laboratory includes: remediation of all potential release sites, decontamination and decommissioning of all facilities affecting remediation, implementation of a long-term monitoring program to include early warning detection systems in place for all drinking water supply wells, and final disposition of all legacy waste. This end state will be risk based and commensurate with the current and projected land use.

Site(s) Description

Los Alamos National Laboratory is located in Los Alamos County, north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The site is approximately 40 square miles and is situated on the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep east-west-oriented canyons cut by streams. The surrounding land is largely undeveloped with large tracts of land North, West, and South of Los Alamos National Laboratory held by other Federal agencies as well as four Native American Pueblos bordering the laboratory. In addition, there are four other distinct geographical areas associated with Los Alamos National Laboratory:

Townsite
This area includes potential release sites associated with the Manhattan Project and early Cold-War-era Los Alamos National Laboratory operations and support. These sites are found on property currently owned by private citizens and governments.

Technical Area 21
Includes evaluation and implementation of corrective measures for material disposal areas A, B, T, U and V, the former process waste lines, and a broad category of environmental sites, referred to as the Delta Prime Site Aggregate all of which served the process facilities in Delta Prime West and Delta Prime East including the Tritium Systems Test Assembly facility, and over 136,000 sq ft of process contaminated facilities that must be decontaminated and decommissioned ahead of environmental restoration actions.

Sandia, Mortandad, Pajarito, Water/Valle, and Ancho Watersheds
Within these areas are over 500 legacy waste sites requiring investigations and subsequent remediation of potential release sites intermixed with active Los Alamos National Laboratory operations.

Technical Area 54
Located in the Pajarito Watershed, contains former and active waste disposal areas for Los Alamos National Laboratory, and includes decontamination and decommissioning and remedies for several major material disposal areas (G, H, and L).

Site Cleanup Strategy/Scope of Cleanup

Cleanup of potential release sites and the shipment of legacy transuranic wastes is a requirement for maintaining the operating permit and continued operation of Los Alamos National Laboratory. As such, the Environmental Management program supports the National Nuclear Security Administration weapons mission. Los Alamos National Laboratory conducts assessments and corrective actions at contaminated sites to reduce unacceptable human health and ecological risks, and to reduce the inventory of legacy transuranic waste. The strategy for the environmental restoration is through a risk-based methodology that complies with regulatory requirements and adheres to future land use scenarios. The legacy waste cleanup strategy is through the disposition of transuranic waste, by characterizing, packaging, and shipping to Waste Isolation Pilot Plant. Primary functions of the Environmental Management program at Los Alamos National Laboratory are to: (1) cleanup contaminated sites on Los Alamos National Laboratory and surrounding private and government-owned lands to levels appropriate for the intended land use; (2) protect and monitor the regional aquifer; (3) decontaminate and decommission excess facilities affecting environmental restoration actions; and (4) retrieve legacy transuranic wastes and ship to Waste Isolation Pilot Plant; and (5) conduct long-term surveillance and monitoring until turned over to the National Nuclear Security Administration.

The original Environmental Restoration scope was for investigation and/or cleanup of 2,124 Solid Waste Management Units and Areas of Concern in eight watersheds spread over the approximately 40 sq mi of the Pajarito Plateau and surrounding canyons. Of these, 1300 sites have been completed to date. There are 767 Solid Waste Management Units and Areas of Concern remaining for completion. The decontamination and decommissioning component includes those facilities that require demolition so that assessments and corrective actions under the Consent Order can be completed.

The scope of the Legacy Waste Disposition Project is to dispose of legacy mixed low-level and transuranic wastes (now located at Technical Area 54) so that environmental corrective actions can be completed by 2015 to enable Laboratory compliance with the requirements of the Consent Order. By the end of 2005, all mixed low-level waste will have been disposed leaving approximately 42,000 drum equivalents or 8400 m^3 of legacy transuranic and mixed transuranic waste which will be disposed of at the Waste Isolation Pilot Plant. Non-legacy waste liabilities (e.g., mixed low-level waste) and newly generated transuranic belong to National Nuclear Security Administration under current agreements.

The framework for investigation and remediation of contamination resulting from historical releases of hazardous waste and hazardous constituents at the Laboratory is contained in the Compliance Order on Consent (Consent Order). The Consent Order, signed March 1, 2005 by New Mexico Environment Department, DOE, and the University of California, is the principal regulatory driver for the Environmental

Restoration Project. In addition, the Consent Order replaces the corrective action requirements of Module VIII of the Laboratory's Hazardous Waste Facility Permit. Investigation and remediation of radionuclides at the Laboratory is conducted under DOE's authority pursuant to the Atomic Energy Act and is not subject to requirements under the Consent Order. The Consent Order contains requirements for the investigation and cleanup of Solid Waste Management Units and Areas of Concern at the Laboratory. These requirements include enforceable deadlines for submitting corrective action documents such as investigation work plans, investigation reports, periodic monitoring reports, and corrective measure evaluations. Each year, the NMED selects 15 documents subject to stipulated penalties from the Consent Order schedule. Failure to meet the enforceable deadlines can result in penalties up to $3,000 per day. The Consent Order also contains specific technical requirements for implementing investigations, conducting corrective measures, managing investigation-derived wastes, and preparing documents, and establishes cleanup levels for groundwater, soil, and surface water. In addition, the Consent Order contains a document approval process whereby New Mexico Environment Department may modify a document submitted by the Laboratory (e.g., by increasing the number of samples or analyses required) and approve the document with modifications. The New Mexico Environment Department modifications then become enforceable conditions of the Consent Order.

Site Completion and End State

The end state for the Environmental Management program at Los Alamos National Laboratory is: (1) complete corrective actions at all potential release sites, approximately 767 sites remaining, (2) protect and monitor the regional aquifer, (3) off-site dispose all legacy transuranic waste and mixed low-level waste, approximately 93% of transuranic waste remains to be dispositioned, and (4) implement a long-term surveillance and monitoring program.

Short-Term Projects

Material Disposal Area H: Material disposal area H is an inactive 0.3-acre site used historically (1960 to 1986) for the disposal of security-classified solid-form waste. It consists of nine 60-feet deep shafts containing, both radioactive and non-radioactive metals. This project follows a corrective measures process for evaluation and implementation. New Mexico Environment Department has the authority and responsibility for selection of the final remedy or, corrective action at material disposition area H. Completion for corrective actions is currently scheduled for September 2006.

Technical Area 73 (Los Alamos County Airport) Remediation: The Airport Landfill consists of a historic sanitary landfill at the former Technical Area 73. The Ash Pile project consists of a solid waste incinerator facility and ash debris, from that incinerator. Corrective actions at the airport are scheduled for completion in FY 2007. Redesign of the main landfill cover began on March 21, 2005. A remedy completion report is due to New Mexico Environment Department by March 30, 2007.

Cañon de Valle/260 Outfall: Includes the characterization and remediation at 140 potential release sites located within Technical Area-14, -15, and -16. These sites will

be remediated to industrial standards and will require New Mexico Environment Department approval.

Longer-Term Projects

Technical Area-21: Project will characterize and remediate, if necessary, all Solid Waste Management Units in the vicinity of Technical Area-21, including five material disposition areas. This project is scheduled for FY 2007 – 2012.

Corrective Actions: Project includes all investigations and subsequent remediation of potential release sites intermixed with active Los Alamos National Laboratory operations. The investigation and cleanup activities for these Solid Waste Management Units (numbering approximately 550) will be coordinated with managers for active mission projects to ensure no disruption of operations. This project includes Solid Waste Management Units in eight watersheds and 20 aggregates. The New Mexico Environment Department Consent Order requires completion of corrective action at material disposition area C by October 31, 2009, and investigation and remediation of all other Solid Waste Management Units in the aggregate by 2012.

Watershed Integration: Work includes the activities of the Canyons Aggregates, the Facility-Wide Groundwater Monitoring Project, and the Federal Facilities Compliance Agreement and Order. The integration of these work components is intended to facilitate efficiencies in the collection, management and reporting of environmental data, and the utilization of combined data in support of site decisions, not only for ground and surface water, but for other projects such as corrective measures at material disposition areas. The New Mexico Environment Department Consent Order drives work conducted for the canyons and site-wide monitoring aggregates, whereas the Federal Facilities Compliance Agreement/Federal Facilities Compliance Order requirements (pending issuance of an individual permit) are separate from the Consent Order. This project is scheduled for FY 2007 – FY 2015.

Technical Area-54 Closure: Area includes evaluation and implementation of corrective measures for material disposition areas G, H, and L. The corrective measures are presumed to be the construction of engineered covers, installation and operation of a soil vacuum extraction system at material disposition area L and monitoring to ensure and evaluate long-term performance. This area also includes the demolition of the waste staging and characterization buildings at Area L and Area G to facilitate the implementation of the final covers. This work includes the closure of former and active radioactive waste disposal areas for Los Alamos National Laboratory.

Transuranic Waste: Approximately 9,000 m^3 in drums and large boxes at Los Alamos National Laboratory must be characterized, certified, and shipped in accordance with the Carlsbad Field Office procedures. DOE-Los Alamos Site Office and DOE-Carlsbad Field Office signed a Memorandum of Agreement in April 2005 specifying that the Carlsbad Field Office's Central Characterization Project will characterize, certify, and ship Los Alamos National Laboratory transuranic waste to the Waste Isolation Pilot Plant.

Pit 9 Transuranic Waste: Project is to retrieve transuranic waste stored in Pit 9 and package in inspectable storage configuration by August 2009.

Trenches A-D: Trenches A–D - are 363 concrete casks containing 721 drums of high activity waste. This project includes cask retrieval from the trenches and repackaging of the drums into inspectable storage configuration by August 2009.

Remote Handled Transuranic Waste: Project is to retrieve transuranic waste from thirty-three lined shafts and six unlined shafts, canisters and torpedoes and package in inspectable storage configuration (if required) by August 2009. This project also includes site stabilization and eradication of any contaminated soils resulting from any breeched containers.

Regulatory Framework

The primary regulatory driver for the Environmental Management Projects at Los Alamos National Laboratory is the March 1, 2005, New Mexico Environment Department *Compliance Order on Consent*. The Consent Order prescribes a specific corrective action scope and timeframe for Los Alamos National Laboratory, prescribes the primary requirements for the Los Alamos National Laboratory Environmental Restoration Project, and establishes an enforceable schedule and milestones for corrective actions in the form of watershed closure milestones.

Other drivers affecting the cleanup projects are: *Federal Facilities Compliance Agreement, Public Law 105–119, 10 CFR Part 830 Nuclear Safety Management, a hazardous waste facility permit for storage and treatment, Federal Facility Compliance Order, Waste Isolation Pilot Plant Hazardous Waste Facility Permit, the Atomic Energy Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Toxic Substances Control Act, and the Clean Air Act.*

Critical Site Uncertainties and Assumptions

The following assumptions create uncertainties and programmatic risks:

- Given the current lack of a completed and validated revised baseline for LANL, it is uncertain if the requirements of the negotiated Consent Order will be met in a timely manner. The new site contractor is expected to improve performance.
- The recently negotiated Consent Order with the State of New Mexico has numerous highly prescriptive characterization and reporting requirements that will impact the site's ability to meet compliance milestones.
- The remedies selected by the New Mexico Environment Department could add significant scope and cost above the presumptive remedies.
- LANL, DOE, and the New Mexico Environment Department have not come to agreement on points for compliance for contaminants in groundwater. If large-scale remediation is required, the cleanup cost and schedule may increase.
- Regulators will approve cleanup levels for individual sites that correspond to the intended land use therefore leaving in place contaminants where presence does not pose unacceptable health and environmental risk.

- The approval process allowed under the Consent Order gives New Mexico Environment Department discretion to modify DOE work plans and expand work scope. For example, since 2004, all work plans submitted by DOE and Los Alamos National Laboratory have been modified by New Mexico Environment Department to increase both the number of boreholes and samples collected/analyzed for characterization of legacy waste sites.
- Waste Isolation Pilot Plant Permit, Section 311 modification requests will be approved before October 1, 2007. This approval is critical to the schedule assumptions made for the Legacy Waste Disposition Project.
- The condition of the waste stored below grade will be no worse than that experienced in the previous Transuranic Waste Inspectable Storage Project (TWISP) retrieval project. Adverse conditions could have negative impacts on the cost and schedule.
- Los Alamos has about 100 m^3 of remote handled waste in shafts in several different configurations. A small volume is readily retrievable, and this will be retrieved and made ready for shipment to WIPP in FY 2007. Other configurations will be more difficult to disposition because of the high radiation fields and method of emplacement and could have negative impacts on cost and schedule.

Interdependencies

There are 10 Nuclear Environmental Sites at Los Alamos National Laboratory that must comply with safety basis requirements promulgated by 10 CFR 830. All planning and execution of Environmental Management activities at these Nuclear Environmental Sites requires integration and approvals from the National Nuclear Security Administration Site Safety Basis Office. The Government has assumed responsibility for several environmental restoration projects including well drilling and cleanup of the Los Alamos County Airport. These direct Government procurements require integration between several government offices as well as the M&O.

For the Legacy Waste Disposition Project, Los Alamos National Laboratory is dependent on Government Furnished Services and Items support from the Carlsbad Field Office in the area of characterization, packaging, and transportation of transuranic waste to Waste Isolation Pilot Plant.

Contract Synopsis

In December 2005 a new management and operating contractor was selected to run the Laboratory. The Los Alamos National Security LLC (LANS) was the successful offeror and is a combination of academic (University of California) and industrial partners (Bechtel, BWXT, and Washington Group). LANS is presently responsible for transitioning towards operations at LANL. Formal transition occurs on June 1, 2006. The first full year of LANS performance will begin in FY2007, and at that time incentive fees can be put into place to address programmatic priorities.

The Legacy Waste Disposition Project is a partnership between Los Alamos Site Office and the Carlsbad Field Office. Specifically, Carlsbad Field Office is providing Central Characterization Project staff and equipment to characterize and certify Los Alamos

National Laboratory transuranic waste for shipment to Waste Isolation Pilot Plant. This arrangement is expected to continue under the new LANS contract.

Cleanup Benefits

The Environmental Management Program at Los Alamos National Laboratory supports the DOE's mission by addressing legacy waste, legacy waste sites, decontamination and decommissioning, and groundwater protection. When the Environmental Management program is completed, more than 2,100 sites will have been assessed and remedies implemented where warranted. Hazards attributable to residual legacy waste will be eliminated or reduced to acceptable levels. The benefit of this Program is the increase to the operational efficiency and effectiveness of the Laboratory and reduction of human health and environmental risks.

Near Term Cleanup Benefits

- Closure of material disposal area H, a historical material disposition area used for disposal of security-classified solid-form waste including depleted uranium.
- Technical Area 73 (Los Alamos County Airport) Remediation - Corrective actions at the former Airport Landfill and incinerator are on-going and are scheduled for completion in FY 2007. Redesign of the main landfill cover began on March 21, 2005. A remedy completion report is due to New Mexico Environment Department by March 30, 2007.
- Completion of Cañon de Valle/260 Outfall and the140 potential release sites located within Technical Area-14, -15, and –16 ensures protection of intermediate and regional ground water supplies. These sites will be remediated to industrial standards.

Longer-Term Cleanup Benefits

- Technical Area-21 - project will characterize and remediate, if necessary, all Solid Waste Management Units in the vicinity of Technical Area-21, including completion of five, high-risk material disposition areas. This project is scheduled for FY 2007 – 2012.
- Corrective Actions - project includes all investigations and subsequent remediation of potential release sites intermixed with active Los Alamos National Laboratory operations. The investigation and cleanup activities for these Solid Waste Management Units (numbering approximately 550) will be coordinated with managers for active mission projects to ensure no disruption of operations. This project includes Solid Waste Management Units in eight watersheds and 20 aggregates. The New Mexico Environment Department Consent Order requires completion of corrective action at material disposition area C by October 31, 2009, and investigation and remediation of all other Solid Waste Management Units in the aggregate by 2012.
- Watershed Integration - work includes the activities of the Canyons Aggregates, the Facility-Wide Groundwater Monitoring Project, and the Federal Facilities Compliance Agreement and Order. The integration of these work components is intended to facilitate efficiencies in the collection, management and reporting of environmental data, and the utilization of combined data in support of site

decisions, not only for ground and surface water, but for other projects such as corrective measures at material disposition areas. The New Mexico Environment Department Consent Order drives work conducted for the canyons and site-wide monitoring aggregates, whereas the Federal Facilities Compliance Agreement/Federal Facilities Compliance Order requirements (pending issuance of an individual permit) are separate from the Consent Order. This project is scheduled for FY 2007 – FY 2015.

- Technical Area-54 Closure - area includes evaluation and implementation of corrective measures for material disposition areas G, H, and L. The corrective measures are presumed to be the installation and monitoring of engineered covers and installation and operation of a soil vacuum extraction system at material disposition area L. This area also includes the demolition of the waste staging and characterization buildings at Area L and Area G to facilitate the implementation of the final covers. This work includes the closure of former and active radioactive waste disposal areas for Los Alamos National Laboratory.

Target Level Accomplishments

FY2007

- Retrieve and Ship 1st 16 Remote Handled Canisters to WIPP
- Completion of cleanup at airport SWMUs
- CMS/CMI at 260 Outfall
- EM Completion of 5 sites (SWMUs)
- Submittal of 7 deliverables on stipulated penalties list to New Mexico Environment Department
- D&D of 10,000 sq ft at TA-21

FY2008

- CMP, and Pit 9Retrieval Planning
- Completion of remedy for MDA H
- Submittal of 4 deliverables on stipulated penalties list to New Mexico Environment Department
- EM Completion of25 sites (SWMUs)

FY2009

- CMP Waste Retrieval Completed
- Pit 9 Waste Retrieval Completed
- Remote Handled TRU and Trenches A-D Retrieval Planning
- Completion of remedy for MDA L

- CMS/CMI activities at MDAs V, C, T
- Submittal of 15 deliverables on stipulated penalties list to New Mexico Environment Department
- EM Completion of 65 sites (SWMUs)
- D&D of TSTA (start)

FY2010

- Completion of remedy for MDA B
- Submittal of 15 deliverables on stipulated penalties list to New Mexico Environment Department
- EM Completion of 116 sites (SWMUs)
- D&D of TSTA (continue)
- Trenches A-D Retrieval complete

FY2011

- Completion of remedy for MDA T
- Completion of remedy for MDA C
- Submittal of 15 deliverables on stipulated penalties list to New Mexico Environment Department
- EM Completion of 117 sites (SWMUs)
- Complete D&D of TSTA
- Groundwater monitoring, reporting and implementation of remedies
- Completion of MDA B and MDA V remedies

Nevada

Site Overview

Nevada Site Office was established to conduct tests of both nuclear and conventional explosives in connection with the research and development of nuclear weapons. Field-testing was primarily conducted at the Nevada Test Site; however, some storage and transportation experiments were conducted on the Nevada Test and Training Range, formerly known as the Nellis Air Force Range.

Atmospheric nuclear weapons tests were initiated in 1951. Portions of the Nevada Test Site and the Nevada Test and Training Range, including the Tonopah Test Range, were used for chemical explosion tests of plutonium- and uranium-bearing materials. Nuclear tests at the Nevada Test Site after July 1962 were conducted underground.
Although the Nevada Test Site was the primary location for conducting nuclear tests, other locations (known as "Nevada Offsites") within the continental United States were used based on the purpose of the test or geologic formation. These Offsites are being proposed for transfer to the Office of Legacy Management beginning in FY 2007.

Site(s) Description

The Nevada Test Site is located 65 miles northwest of Las Vegas, Nevada, and occupies approximately 1,375 square miles. The Nevada Test Site is surrounded by approximately 4,500 square miles of federally owned and Department of Defense controlled land. The Nevada Test Site is surrounded by the Nevada Test and Training Range on the north, east, and west, and land managed by the U.S. Department of the Interior, Bureau of Land Management on the south and southwest. The Nevada Test and Training Range, which includes Tonopah Test Range, is used for military training; the Bureau of Land Management lands are used for grazing, mining, and recreation. The Nevada Test Site is in a remote and arid region with approximately 75 percent of its perimeter surrounded by federal installations with strictly controlled access, and 25 percent adjacent to public lands that are open to public entry.

There are also nine former nuclear testing sites in Alaska (2), Colorado (2), Mississippi (1), Nevada (2), and New Mexico (2). Responsibility for these sites, including the completion of remaining remediation activities, closure, and long-term stewardship, is planned for transition to the Office of Legacy Management in FY 2007. All of the 67 surface release sites (47 currently closed), and at least 1 of the 13 subsurface release sites are projected to be closed prior to transition.

Site Cleanup Strategy/Scope of Cleanup

The EM Program at the Nevada Test Site (including the Nevada Test and Training Range) consists of two primary projects, Environmental Restoration and Waste Management. The Environmental Restoration Project is to assess and perform appropriate corrective actions at 878 former underground test locations, 100 atmospheric test locations, and more than 1,000 other industrial-type sites. This Project consists of three subprojects--the Underground Test Area, Soils, and Industrial Sites subprojects. The Waste Management Project is to support the closure of DOE sites across the United States by maintaining the capability to dispose low-level waste and mixed low-level

waste. The Nevada Test Site is designated as a primary regional disposal site for low-level waste and a secondary disposal site for mixed low-level waste generated as the result of cleanup activities across the DOE Complex. Additionally, the Waste Management Project is responsible for the storage, treatment, and disposition of legacy on-site transuranic and mixed transuranic waste.

The scope for the Underground Test Area subproject addresses subsurface radioactive groundwater contamination resulting from past underground nuclear testing. Closure-in-place with monitoring is considered to be the only feasible corrective action because cost-effective groundwater technologies have not been developed to effectively remove or stabilize these subsurface contaminants. The former test locations are categorized into 878 separate corrective action sites.

The scope of the Soils subproject addresses surface and shallow subsurface radiological soil contamination on the Nevada Test Site and Nevada Test and Training Range (87 corrective action sites grouped into 18 Corrective Action Units). Contamination at these sites is the result of historic nuclear detonations, safety related tests, and hydronuclear experiments.

The Industrial Sites subproject includes sites and facilities created in support of nuclear testing and reactor research and development. The sites include sewage lagoons, septic systems, disposal wells, spill sites, disposal sites, ordnance sites, bunkers, and various other contaminated areas which have been organized into Corrective Action Units based on geography, technical similarity, or other appropriate reasons, for purposes of determining corrective actions.

The Waste Management Project provides indispensable, efficient, cost-effective low-level waste and mixed low-level waste disposal capability to meet the needs of other DOE sites. Also under the Nevada Site Office Waste Management Project, the scope for legacy on-site transuranic and mixed transuranic waste and material includes storage, treatment (as needed), and disposal/disposition.

Site Completion and End State

The long-term end state vision for the Nevada Test Site is to restore the environment to an extent that will allow the maximum continuation of the national security mission. This vision includes the removal of the contamination that poses an unacceptable risk to workers conducting planned site operations in support of the Nevada Site Office mission and characterizing/stabilizing the remainder of contamination to ensure effluent levels do not spread to the surrounding environment and pose an unacceptable risk.

The end state for the subsurface contamination at the Underground Test Area subproject will be achieved with the completion of a modeled contaminant boundary, a negotiated compliance boundary, monitoring well network(s), and successful five year "proof of concept" monitoring.

The end state for surface and shallow subsurface radiological contamination associated with the Soils subproject at the Nevada Test Site and Nevada Test and Training Range includes the completion of safety basis documentation and the isolation, containment,

and/or removal of contamination as necessary to close the release sites based on risk assessments and agreed upon remediation requirements. Engineered barriers/institutional controls will be enhanced or established, as applicable, for all sites. Remaining close-in-place sites will be inspected and monitored as necessary.

The end state for the Industrial Sites subproject envisions applicable corrective actions completed for all 1,000 plus sites. Most sites will be available for unrestricted surface use while others will be stabilized for restricted use appropriate to the risk posed by residual contamination. For those sites where contamination remains in place, appropriate long-term remedial action activities will be in place, such as monitoring, cap inspections, and use restrictions as applicable. Closure of the Industrial Sites subproject is expected to be completed in FY 2018.

The end state for the transuranic/mixed transuranic waste activities will be the elimination of the legacy transuranic/mixed transuranic waste and material from the Nevada Test Site. Disposition of the transuranic/mixed transuranic waste and material will reduce the risk to the Nevada Test Site workers and the environment resulting from continued storage. The Nevada Test Site transuranic/mixed transuranic waste related facilities will be decontaminated and decommissioned, or will be transitioned to other uses.

The end state for the waste management operations is closure of all filled disposal cells with a final approved closure cap and transition of any remaining disposal operations to the Nevada Test Site landlord if the capability is needed for on-site operations. Future disposal operations (after the end state) beyond that being performed by EM would be conducted by NNSA as a part of continuing NNSA or other program missions.

Short Term Projects

The primary short-term project will be the completion of disposition of all legacy transuranic/mixed transuranic waste and material by the end of FY 2007.

Longer Term Projects

The majority of the remediation scope within the Environmental Restoration and Waste Management Projects are long-term (earliest completion of significant cleanup scope other than transuranic/mixed transuranic waste is not planned until FY 2018). Surface remedial activities at the approximate 1,000 Industrial Sites subproject release sites are planned for completion in FY 2018. Completion of the current 87 Soils subproject contamination sites are planned for completion by FY 2021. Completion of the disposal operations under EM is planned for FY 2021 (corresponding to the completion of the Soils subproject). Completion of the characterization, modeling, proof-of-concept, and monitoring network development efforts under the Underground Test Area subproject are planned for completion in FY 2027.

Regulatory Framework

EM work at the Nevada Test Site and Nevada Test and Training Range follows all applicable federal level regulations including the Resource Conservation and Recovery

Act, Clean Air Act, Clean Water Act, Atomic Energy Act, DOE Orders, and applicable State of Nevada specific laws, codes and acts relating to these regulations. Below are some specific regulatory instruments associated with agreements and consent orders between the National Nuclear Security Administration Nevada Site Office and the State of Nevada.

For the Environmental Restoration Project, the primary regulatory process for addressing contaminants on the Nevada Test Site and surrounding areas (Nevada Test and Training Range) is the *Federal Facility Agreement and Consent Order (1996),* which is the primary regulatory instrument for the Nevada Site Office Environmental Restoration and Defense Threat Reduction Agency projects within the State of Nevada. The purpose of the agreement is to identify sites of potential historic contamination and implement proposed corrective actions based on public health and environmental considerations. The objective is to ensure that the impacts and potential impacts at applicable facilities, associated with the releases or threatened releases of hazardous substances, pollutants, solid wastes, and/or hazardous wastes into the environment and discharges of pollutants into the waters of the State are thoroughly investigated by Nevada Site Office and/or the Defense Threat Reduction Agency under the regulatory authority and oversight of Nevada Division of Environmental Protection. Regulatory milestones under the agreement are established on a rolling wave concept where specific characterization and remediation activity completion dates are agreed upon between the Nevada Site Office (or the Defense Threat Reduction Agency) and State of Nevada. Semi-annual meetings are conducted to discuss and establish milestone dates for the upcoming year. Milestone dates typically correspond to the completion and submittal of documents that record and detail plans, activities, and outcomes. Much of the Environmental Restoration work is captured under this milestone development process; although a relatively small portion of the total future scope is established as regulatory milestones at any given time. For the Waste Management Project, the primary regulatory process is the *Federal Facility Compliance Act and Consent Order*, signed in 1996, which required the Nevada Site Office to develop and submit Site Treatment Plans for the development of treatment capacity and technologies for treating mixed wastes. Additionally, *the June 1992 Settlement Agreement for Mixed Transuranic Waste* requires the Nevada Site Office to operate the Area 5 Radioactive Waste Management Site Transuranic Pad in accordance with *40 C.F.R. Subpart I.*

Critical Site Uncertainties and Assumptions

Programmatic to the Nevada Test Site (including Nevada Test and Training Range)

- Federal directed changes to the mission of the Nevada Test Site that alter the current baseline plans for environmental management activities.

Programmatic Assumptions

- Changes to the current Nevada Site Office regulatory framework, including consent agreements, state and federal regulations, and/or DOE orders will not impact the implementation of the baselines for the EM activities.

Environmental Restoration Project Uncertainties

- Federal policies on the process utilized to implement the environmental restoration mission change. These changes include, contracting and procurement

requirements, addition of new requirements, and initiatives for Environmental Health and Safety, Price Anderson Amendment Act, etc., that must be addressed by the site office.
- A change in plans from limited to complete remediation (i.e., from "close in place" to "clean close") of contaminated areas on the Nevada Test Site.

Environmental Restoration Project Assumptions

- A change to the corrective action level in the planning criteria for the Soils subproject baseline will represent a corresponding exponential cost impact. For example, if the negotiated corrective action level is below 800 picocuries per gram versus the projected approximation of 1,000 picocuries per gram, the cost impact could exceed a $200 million increase.
- Failure of the Underground Test Area five-year proof of concept will require a partial restart of the subproject activities.
- Contaminated soils areas that are on the Nevada Test Site will be closed in place with institutional controls.

Waste Management Project Uncertainties

- Political or state regulatory decision to terminate the receipt of waste at the Nevada Test Site.
- An extension of the transuranic/mixed transuranic waste activities as a result of an unforeseen delay in characterization, construction/modification of facilities to support treatment, or an incident during treatment, such as a radioactive release.

Waste Management Project Assumptions

- Low-level waste will continue to be accepted from approved on-site and off-site generators for disposal at the Nevada Test Site through 2021.
- The transuranic waste activities will be completed in FY 2007.
- Mixed low-level waste will be accepted from approved off-site generators for disposal at Nevada Test Site through 2010.

Interdependencies

Environmental Restoration Project

- The completion of Soils subproject remediation and closure work on the Nevada Test and Training Range and the Nevada Test Site is dependant on successful negotiations with the U.S. Air Force and the State of Nevada to establish a final soils corrective action level.
- Additionally there is a dependency on the State of Nevada for approval of investigation, characterization, closure, and long-term stewardship plans as stipulated in the Federal Facility Agreement and Consent Order.
- The transition of the remaining Offsites remediation activities and long-term maintenance to DOE's Office of Legacy Management is to occur in FY 2007.

Waste Management Project

- Waste Management operations are dependant on the State of Nevada for acceptance of mixed low-level waste for disposal at the Nevada Test Site.

- Additionally, TRUPACT IIs and approved shipping corridors are required to meet the goal of completing the transuranic waste project by the end of FY 2007.

Contract Synopsis

There are two primary contractors working on EM activities at the Nevada Test Site and Nevada Test and Training Range. One is Bechtel Nevada (the Management and Operating Contractor for the Nevada Test Site), who is contracted to perform environmental restoration field remediation activities and all waste management scope on the Nevada Test Site (including Nevada Test and Training Range). The other contractor is Stoller-Navarro Joint Venture (the architect engineer for Nevada Site Office EM), who is contracted to perform site investigation and characterization activities on the Nevada Test Site (including Nevada Test and Training Range).

Cleanup Benefits

- The near and long-term benefit for Nevada Site Office environmental restoration efforts are varied and include the overall reduction in potential risk to human health and the environment; and the restoration of the environment to an extent that will allow the maximum continuation of the national security mission conducted by the Nevada Site Office.
- The near term benefit of the legacy transuranic/mixed transuranic waste cleanup at the Nevada Test Site is to eliminate the need for maintaining storage configurations, thereby eliminating human health risk from continued compliance inspections, and to properly disposition the waste at an appropriate disposal location.
- The near term and long-term benefit for maintaining sufficient low-level and mixed low-level radioactive waste disposal capabilities is to support accelerated cleanup across the DOE complex. Safe and compliant disposal of radioactive waste at the Nevada Test Site from across the DOE complex eliminates/reduces risk at other DOE sites.

- Continue as the primary regional low-level waste (LLW) disposal site and initiate closure of the mixed low-level waste (MLLW) disposal facilities on the NTS.

Target Level Accomplishments

FY2007

- TRU/MTRU Sub-project End

- Complete Frenchman Flat Phase 2 Transport Model

- Complete the closure of disposal wells, ordnance sites, D&D sites, housekeeping waste sites, storage bunkers, waste disposal sites, septic systems and discharge points, and landfills

- Complete the characterization and corrective action decision for Clean Slate III, and enhance engineered barriers/institutional controls at Clean Slate II

- Continue as the primary regional low-level waste (LLW) disposal site and as a secondary regional disposal site for mixed low-level waste (MLLW) for approved generators across the DOE complex

FY2008

- Submit Pahute Mesa Corrective Action Investigation Plan Addendum to State
- Complete the closure of Clean Slate II
- Complete the closure of disposal wells, D&D sites, muck piles, storage bunkers, waste disposal sites, septic systems and discharge points
- Continue as the primary regional low-level waste (LLW) disposal site and as a secondary regional disposal site for mixed low-level waste (MLLW) for approved generators across the DOE complex

FY2009

- Complete Yucca Flat Phase 1 Flow Model and begin drilling 5 wells in Western Pahute Mesa
- Submit Frenchman Flat Corrective Action Decision Document to State
- Enhance engineered barriers/institutional controls at Clean Slate III
- Complete the closure of storage tanks, D&D sites, waste disposal sites, unexploded ordnance site, injection wells, and mud pits
- Continue as the primary regional low-level waste (LLW) disposal site and as a secondary regional disposal site for mixed low-level waste (MLLW) for approved generators across the DOE complex

FY2010

- Complete Yucca Flat Phase 1 Transport Model, complete 5 wells in Western Pahute Mesa, and start drilling 5 wells in Central Pahute Mesa
- Complete the closure of the Clean Slate 3 Soils site
- Complete the closure of waste sites and spill sites
- Continue as the primary regional low-level waste (LLW) disposal site and as a secondary regional disposal site for mixed low-level waste (MLLW) for approved generators across the DOE complex

FY2011

- Submit Frenchman Flat Corrective Action Plan to State
- Complete the corrective action investigation plan for Project 57 Soils site
- Complete the closure of contaminated bunker, mud pits, injection wells, and landfills

- Continue as the primary regional low-level waste (LLW) disposal site and initiate closure of the mixed low-level waste (MLLW) disposal facilities on the NTS

Pantex Plant

Site Overview

Pantex has a continuing mission to support nuclear weapons in the stockpile program. The primary mission of the Pantex Plant is to: 1) evaluate, retrofit, and repair nuclear weapons in support of life extension programs and certification of weapon safety and reliability programs, 2) dismantle nuclear weapons surplus to the stockpile, 3) sanitize components from dismantled weapons, 4) develop, test, and fabricate chemical and explosive components, and 5) provide interim storage and surveillance of the plutonium components.

Historical waste management activities at the Pantex Plant have resulted in contamination of the soils and the upper Perched Aquifer. High explosives, metals, and solvents exist in the soils located in the Pantex Plant. The Perched Aquifer contaminant plume has migrated past the Plant boundaries and onto adjacent landowners' properties to the southeast. The lower Ogallala Aquifer is the primary water supply for Pantex and the area landowners. Immediately north of the Pantex property boundary is a well field in the Ogallala Aquifer that supplies a portion of the water supply to the city of Amarillo. Contamination in the Perched Aquifer has the potential to leach deeper if appropriate corrective measures are not implemented to mitigate the risk.

When the end state is achieved in FY 2008, it is assumed that corrective measures will be effective in mitigating contaminants of potential concern from legacy plant operations. Regulator requirements for long-term surveillance and maintenance will require the site landlord to continue environmental monitoring and maintenance of corrective measures. This is expected to take the form of Monitored Natural Attenuation of the contaminants in the perched groundwater at some point in the Life Cycle of the project. Based on the projected plant mission, Pantex will remain in use as an active industrial site under the National Nuclear Security Administration after completion of environmental cleanup activities. Potential release sites will be closed and deed recorded as appropriate, except for 15 active sites necessary for continued plant operations. Some environmental hazards from active Pantex industrial operations will remain after achieving the end state. These hazards are known and controlled per existing regulations.

Site(s) Description

The Pantex Plant is located in the Texas Panhandle, approximately 17 miles northeast of Amarillo, Texas. Pantex was deactivated in 1945 and sold to Texas Technical University as excess government property. In 1951 the Atomic Energy Commission reclaimed approximately 10,000 acres for the manufacturing of high explosives for the nuclear weapons program. During the mid-1960s, the plant was expanded to assume weapons maintenance and modifications. The Pantex Plant is composed of more than 400 buildings and several functional areas to carry out the nuclear mission.

The primary subsurface geologic units in the vicinity of the Pantex Plant are the Blackwater Draw Formation (clayey silts), the Ogallala Formation (sand to silty sand), and the Triassic Dockum Group (sand to clay). The first of two water-bearing units below the Pantex Plant in the Ogallala Formation is the perched aquifer located at

approximately 200 to 300 feet. This aquifer is formed by a relatively low permeability zone, referred to as the 'Fine-Grain Zone', that consists of silt and clay that retards the downward migration of the perched groundwater to the second water bearing zone, the Ogallala Aquifer. The perched aquifer flows initially outward in a radial manner away from a playa lake designated as Playa 1, located near the eastern boundary of the Plant, but then is quickly influenced by the regional south-southeast gradient. The perched aquifer ranges in saturated thickness from less than a foot to over 75 feet.

The second water-bearing zone below the Fine-Grain Zone is the Ogallala Aquifer. The Ogallala Aquifer is a primary drinking and irrigation water source for most of the High Plains. The groundwater surface is approximately 400 feet below ground surface and is approximately 1 to 100 feet thick in the southern regions of the Plant and approximately 250 to 400 feet thick in the northern regions. The base of the Ogallala in the southeastern area is deposited directly on the Permian rocks (Dockum Group). The primary flow direction in the Ogallala Aquifer is north to northeast.

The major emphasis of environmental work and long-term monitoring at Pantex is the protection of the Ogallala Aquifer from the overlying perched groundwater. The long-term environmental management at Pantex will involve the continued operation of the pump and treat system to treat the perched groundwater with potential corrective measures to remediate the perched aquifer. In addition, long-term monitoring of the perched groundwater and Ogallala aquifer will ensure that the Ogallala is being protected.

Site Cleanup Strategy/Scope of Cleanup

The Pantex environmental cleanup strategy consists of three main objectives:

- Focus on Risk Reduction/Minimization
- Implement Source Abatement
- Implement Long-term Surveillance and Maintenance and Landlord Turnover

The vision and priorities agreed upon between the DOE and its regulatory agencies to meet these objectives consist of four strategic initiatives being implemented to eliminate or reduce risk at the Pantex Plant.

Soils Project Closure

The strategy for soil closure involves the removal of some surface contamination, source control of larger contaminated areas, and remediation by in situ treatment.

Zones 11 and 12: The removal of several small areas of contaminated surface soils in Zones 11 and 12 will complete in FY 2006. The construction of the Zone 11 Soil Vapor Extraction system and Zone 12 Ozone Injection System is complete. The operation and maintenance of these systems is scheduled to be completed the end of FY 2008. The soils cleanup will be complete at that time. Only maintenance of engineered soil covers will remain for long-term stewardship.

Cleanup of the Perched Aquifer: The approach for remediation and closure of the perched aquifer is the pump and treat system, a permeable reactive barrier, and in situ bioremediation; combined with Monitored Natural Attenuation. The long-term

objective is to obtain approval for Monitored Natural Attenuation as part of the preferred alternative for the final corrective measures to be implemented at Pantex. It is anticipated that three objectives will be achieved: source removal/source control, contaminant reduction, and static or decreasing plume. Source removal and control will be achieved through the permeable reactive barrier in the center of the perched groundwater plume. Contaminant reduction will be achieved by the pump and treat system in the southeast portion of the perched groundwater plume and by in situ bioremediation at the edge of the perched. Static or decreasing plume will be achieved by the operation of the perched pump and treat system.

The pump and treat system was constructed in 1995 with more than 421 million gallons of perched groundwater treated to date. The pump and treat system will continue operation as part of long-term environmental stewardship. The permeable reactive barrier and in situ bioremediation pilot scale studies are underway with positive results. These remedial actions are scheduled to go into full-scale operations in FY 2007 and will be monitored through long-term environmental stewardship.

Continued Monitoring of Ogallala Aquifer: The Compliance Plan specifies the wells, contaminants, methods and frequency for monitoring the perched groundwater and Ogallala Aquifer. Ogallala Aquifer monitoring will continue into long-term environmental stewardship.

Facility Cleanup and Footprint Reduction: The decontamination and decommissioning scope includes facilities representing approximately 1 million square feet and that are 50 to 60 years old. This consists of Building 8-008 (completed FY 2001), Building 11-44 (completed FY 2004), Zone 10 Ruins (completed FY 2005), and Building 12-24 Complex which was comprised of structures 12-024 North, 12-024 South, 12-024A, 12-024SS, 12-25, 12-R-25 and 12-43 (to be completed in FY 2006).

Site Completion and End State

Environmental Restoration Project

FY 2007

- Continue operation and maintenance of Interim Stabilization Measures and Interim Corrective Measures.
- Regulators approve Corrective Measures Design.
- Commence Corrective Measures Construction (incorporates Interim Stabilization Measures and Interim Corrective Measures).

FY 2008

- Complete Corrective Measures Construction.
- Regulators approve Corrective Measures Report.
- Regulators issue Final Compliance Plan and Comprehensive Environmental Restoration, Compensation, and Liability Act Record of Decision.
- Environmental Remediation Program completion (CD-4).

Decontamination and Decommissioning Project

All decontamination and decommissioning activities will be completed by FY 2007.

Regulatory Framework

The environmental work is identified and conducted under the requirements of the current solid and hazardous waste permit issued by the State of Texas to Pantex. Also, the Environmental Protection Agency has listed the Pantex Plant on the National Priority List as a Superfund Site. Through a Memorandum of Agreement between the Environmental Protection Agency and the State of Texas, the Texas Commission for Environmental Quality has authority for investigations conducted under the Resource Conservation and Recovery Act process; however, the Environmental Protection Agency has retained the authority to manage radionuclides. There are no regulatory drivers associated with the decontamination and decommissioning activities at the Pantex Plant.

Critical Site Uncertainties and Assumptions

- Timely regulator approval is a key factor for environmental restoration program completion; therefore, there is some uncertainty associated with timely regulator approval of the final corrective measures and Final Compliance Plan. Senior BWXT Pantex and Pantex Site Office management coordinate with Environmental Protection Agency/Texas Commission for Environmental Quality senior management to assure that the program remains on track for FY 2008 completion.

- The Pantex Environmental Restoration Program investigation phase has been completed. Therefore, there are no uncertainties associated with cleanup levels, waste and material disposition paths, litigation, efficiency improvements, and work sequencing.

- There are uncertainties in the technology development and anticipated results of some of the treatment options for the perched groundwater. The permeable reactive barrier pilot study has shown promising results in the treatment of high explosives. The major uncertainties with the permeable reactive barrier involve the longevity of the barrier. The pilot study of in situ bioremediation at the edge of the perched groundwater plume is still underway. The results will be monitored to evaluate the technology for full-scale implementation. However, the technology has not yet been proved at Pantex.

Interdependencies

Pantex is currently subject to Compliance Plan, CP-50284, June 2003, issued by the Texas Commission on Environmental Quality. The Compliance Plan requires Pantex to conduct corrective measures and groundwater monitoring programs, with specific environmental sampling and reporting requirements. The Compliance Plan also requires that approved Pantex Baseline Risk Assessments (site-wide or for specific areas) be evaluated and/or calibrated every five years to determine if assumptions and exposure scenarios remain valid. The Compliance Plan process assures that Risk Based End State environmental goals will continue to be met during long-term surveillance and

maintenance. Texas Commission on Environmental Quality approval of the Corrective Measures and Final Compliance Plan is required for program completion.

Contract Synopsis

BWXT Pantex, LLC, under a Cost Plus Award Fee, Management and Operating Contract, operates the Pantex Plant. No additional contract activities will occur through the completion of the Environmental Restoration Project. The Pantex Site Office is developing annual incentives for baseline acceleration and critical milestone accomplishment for the remainder of the project.

Cleanup Benefits

Groundwater cleanup at Pantex will ensure that the Ogallala Aquifer, the primary source of drinking water for this region, will remain a clean and viable natural resource for generations to come. Soils cleanup will ensure the appropriate future land use and is protective of human health and the environment.

Target Level Accomplishments

FY2007

- Commence Corrective Measures Construction (incorporates ISMs and ICMs)

FY2008

- Complete Corrective Measures Construction
- Regulators issue Final Compliance Plan and CERCLA Record of Decision
- Environmental Remediation Program completion (CD-4)

Separations Process Research Unit

Site Overview

The Separations Process Research Unit is an inactive Atomic Energy Commission chemical processing pilot plant that supported nuclear weapons activities from 1949-1953. The plant was used to research the process of separating plutonium from irradiated uranium. Operations contaminated the four non-reactor nuclear facilities comprising the processing plant, auxiliary structures used to manage waste, and approximately thirty acres of surrounding land including the groundwater. Knolls Atomic Power laboratory is a continuing mission site. Consistent with the EM policy on risk based end states, project planning is proceeding on the basis that the land and facilities disposition would be consistent with the sites continuing industrial use.

Site(s) Description

The Separations Process Research Unit is located within the currently operating 170-acre Schenectady Naval Reactors' Knolls Atomic Power Laboratory near Schenectady, New York. The Mohawk River forms the northern boundary of the site. Both industrial and residential areas also bound the site. There are six solid waste management units identified within the Separations Process Research Unit land areas. These areas comprise about 30 acres of the 170-acre Knolls Atomic Power Laboratory site. The non-reactor nuclear facilities include Building H2, the chemical processing building G2, the pipe tunnel connecting G2 and H2, and support structures. The auxiliary structures include seven tanks and tank enclosures containing process residues. The soil in the lower level parking lot, rail bed, north field, and associated groundwater in the vicinity of Building H2 (the waste handling facility) are contaminated.

Site Cleanup Strategy/Scope of Cleanup

The cleanup strategy for the Separations Process Research Unit EM Project is to disposition the facilities and remediate the identified land areas by 2014. This will eliminate a DOE legacy facility that has been inactive for fifty years and allow DOE to close an inactive small site, stabilize and consolidate transuranic waste, meet site Resource Conservation and Recovery Act Permit investigation and cleanup requirements, eliminate surveillance and maintenance costs of the nuclear facilities, and allow DOE-EM to closeout an agreement with Naval Reactors for the disposition of the Separations Process Research Unit facilities. In order to implement this strategy, there is waste (Transuranic, low-level, mixed and hazardous) associated with the Separations Process Research Unit Project that needs to be characterized and disposed prior to completing the decontamination and decommissioning of the nuclear facilities and cleanup or stabilization of the associated soil areas as planned. Plans are to cleanup soils in other Separations Process Research Unit related areas and address any groundwater issues encountered.

To date those soil areas not proximate to the nuclear facilities, as well as Separations Process Research Unit related groundwater, have been characterized. Data from this characterization are currently being evaluated to identify any appropriate response. In addition, one ancillary Separations Process Research Unit structure, the K-6 storage facility, has been decontaminated and decommissioned.

Site Completion and End State

Short Term Projects

To complete the Separations Process Research Unit Project in the short term, the soil and groundwater characterization data collected to date must be evaluated and appropriate remedies and responses for any contaminated soil and/or groundwater areas must be developed in concert with DOE management and state regulators. In addition, the remaining ancillary non-nuclear facilities structures, i.e. the Cooling Tower/Pump House and K5 retention basins must be decontaminated, decommissioned, and removed.

Long Term Projects

In the longer term, contaminated soil and groundwater from the land areas (North Field, Lower Level Parking Lot, and Railbed Area) and non-nuclear facilities will be remediated, if required. In addition, the nuclear facilities (H2, G2, Tunnels, and Tanks) must be decontaminated, decommissioned, and removed and associated soil and groundwater remediated. These activities are planned for completion of the DOE EM mission by FY2014.

Regulatory Framework

The Naval Reactors Knolls Site Resource Conservation and Recovery Act Part B permit currently covers the Separations Process Research Unit facilities. The site's permit involves storage treatment and cleanup activities. Since Separations Process Research Unit only involves short-term storage and cleanup, the State of New York agreed to a simplified approach for the Separations Process Research Unit project. An application for a separate simplified Resource Conservation and Recovery Act permit for Separations Process Research Unit project related work was submitted to the State of New York.

Critical Site Uncertainties and Assumptions

The end state for the SPRU site needed to be agreed upon between EM and Naval Reactors. This cleanup plan assumes the "worst case" (i.e., "green fields"). This project is only in the "pre-CD-0" stage of baseline development.

Interdependencies

The major interdependency related to Separations Process Research Unit is the ongoing relationship with the Naval Reactors, the Schenectady Naval Reactors Office and Knolls Atomic Power Laboratory. Separations Process Research Unit is located on the Knolls Atomic Power Laboratory site and Separations Process Research Unit characterization and remediation activities are closely coordinated with Schenectady Naval Reactors and Knolls Atomic Power Laboratory in order to minimize impact on ongoing Knolls Atomic Power Laboratory operations. The relationship between the Separations Process Research Unit Project and the Naval Reactors is formally documented in a Memorandum of Agreement.

Other interdependencies are associated with waste disposition and will include the Waste Isolation Pilot Plant, Nevada Test Site, and Hanford. Separations Process Research Unit

will work with these sites to ensure the expeditious transportation of waste and compliance with site waste acceptance criteria.

Contract Synopsis

There is currently no Management and Operating contractor at the Separations Process Research Unit site. EM activities are accomplished through direct contracts issued by the Separations Process Research Unit Project. These include a site characterization contract that is nearing completion. An existing EM Indefinite Delivery/Indefinite Quantity contract is currently being used to install a security fence to segregate the Separations Process Research Unit facilities from Knolls Atomic Power Laboratory operations.

A new EM Indefinite Delivery/Indefinite Quantity contract has been awarded for decontamination and decommissioning of the Cooling Tower & Pump House and the Structure K5 retention basins. Subject to Acquisition Executive approval, a prime contract will be initiated to complete the nuclear facilities' decontamination and decommissioning, soil and groundwater remediation, and project closeout and transition of these areas back to the Knolls Atomic Power Laboratory.

Cleanup Benefits

The benefits of completing the Separations Process Research Unit Project and relationship to the EM Strategic Plan are accelerating the closure of inactive small site related to the cold war legacy, removal of transuranic wastes and consolidating them at the DOE Waste Isolation Pilot Plant (WIPP), and eliminating the surveillance and maintenance costs related to the nuclear facilities. In addition, remediation and removal of Separations Process Research Unit facilities and contaminated areas will allow Separations Process Research Unit to comply with Resource Conservation and Recovery Act requirements. A pending permit for the project will require the investigation and remediation of chemical contaminants that have been spilled or leached into soils and groundwater surrounding the Separations Process Research Unit facilities and areas where waste was formerly managed. Naval Reactors' Knolls Atomic Power Laboratory will also benefit in that risk to site workers from potential exposure to Separations Process Research Unit contaminants will be eliminated, and the land areas made available for future productive use.

Target Level Accomplishments

FY2007

- Remove 5,000 cubic meters of contaminated soil

FY2008

- Complete Authorization Basis for Nuclear Facility
- Complete Soil Remediation of Lower Level Rail Bed

FY2009

- Complete Deactivation of Building G2

- Complete Characterization of Tunnel

FY2010

- Complete Characterization of Building H2
- Complete Characterization and Deactivation of Tanks
- Complete Deactivation of Tunnel

FY2011

- Complete Deactivation of Building H2
- Ship Transuranic Waste to the WIPP

All Other Sites

Argonne National Laboratory- East

Site Overview

Argonne National Laboratory is a DOE Office of Science research and development laboratory with a broad program of research in the basic energy and related sciences (such as physical, chemical, material, computer, biomedical and environmental sciences) including operation of several large scientific user facilities. The Laboratory is located about 27 miles southwest of downtown Chicago.

Contamination of soil and groundwater occurred as a result of accidental spills, past materials management practices, and former waste disposal practices. Contaminants of concern for soil and groundwater include volatile organic compounds, semi-volatile organic compounds, metals, polychlorinated biphenyl compounds, and a variety of radioisotopes. A number of buildings and research reactors were contaminated with low levels of radioactive materials as a result of normal past operations. Resource Conservation and Recovery Act Corrective Actions were completed in September 2003 with minor ongoing long term stewardship activities. Eleven (11) of thirteen (13) nuclear cleanups are complete, one is in progress, and one is expected to start in FY 2006.

Site Description

The Argonne National Laboratory cleanup involves two key areas. Cleanup of residual contamination that still remains at several areas of the Argonne National Laboratory site, which requires continued monitoring and/or remediation system operation. Decontamination and decommissioning will be completed at the Zero Power 6 reactor and continue at Building 301.

The Illinois Environmental Protection Agency has formally issued all "No Further Actions" as appropriate and has signed the Land Use Control Memorandum of Agreement; the remediation systems are operational; and maintenance activities have been integrated into the site monitoring and surveillance program conducted by the site landlord (Office of Science) at Argonne National Laboratory. Transfer of monitoring and surveillance responsibilities to the Office of Science is planned to occur when all EM work at the site is completed.

Site Cleanup Strategy/Scope of Cleanup

Corrective actions to address contaminated soils and groundwater were conducted under the site Resource Conservation and Recovery Act permit. All corrective actions were completed at the end of FY 2003, with the exception of such ongoing activities as operation and maintenance of groundwater pumping systems; routine environmental monitoring; and periodic inspection of engineered barriers. Focus of site cleanup is now on completing the remaining decontamination and decommissioning projects. At the end of FY 2005, eleven nuclear facilities were decontaminated and decommissioned, with two facilities remaining for completion.

Site Completion and End State

Two facilities await cleanup, Zero Power Reactor 6 and Building 301 Hot Cells. There are also approximately 50 drums of remote-handled transuranic wastes to be disposed at the Waste Isolation Pilot Plant, in Carlsbad, New Mexico, prior to geographic site completion of the Argonne National Laboratory site. The End State includes decontamination of one facility for unrestricted research and development reuse (Zero Power Reactor) and decontamination and demolition of Building 301, a former Hot Cell facility. The land occupied by Building 301 will be available for unrestricted research and development reuse. Zero Power Reactor 6 will be complete in FY 2007. Building 301 decontamination and decommissioning will be complete in FY 2009.

Regulatory Framework

Corrective actions to address contaminated soils and groundwater were conducted under the Argonne site Resource Conservation and Recovery Act permit with the Illinois Environmental Protection Agency.

Critical Site Uncertainties and Assumptions

One potentially critical project uncertainty has to do with the volume and disposal location of certain wastes anticipated to come from the Building 301 project. The DOE Argonne Site Office is actively working with stakeholders to assess the feasibility of implementing DOE's exemption policy for disposing some project wastes to a local landfill. No decision has been made but Argonne Site Office intends to proceed with a quantitative risk and cost study to support future decision making.

Interdependencies

Argonne Site Office and Argonne National Laboratory expect to work with various State of Illinois agencies such as Illinois Environmental Protection Agency, Illinois Emergency Management Agency, and the State Historic Preservation agency to execute the remaining EM scope. In addition, Department of Housing and Urban Development determinations are sometimes required when buildings are to be demolished. Wastes are typically disposed to local landfills or to Envirocare or the Nevada Test Site for radioactive wastes. Most shipments are economical via truck. Final disposal of the remote-handled transuranic waste will require that the Waste Isolation Pilot Plant facility be open to accept remote-handled transuranic waste, and will require that a shipping corridor be open from Argonne National Laboratory to the Waste Isolation Pilot Plant. In order to execute remote-handled transuranic waste shipments, coordination with various State agencies will be required.

Contract Synopsis

The current major contract in place to support the balance of the EM mission at Argonne National Laboratory is the Management and Operating contract for Argonne National Laboratory, currently held by the University of Chicago. Activity is underway to compete the contract, which expires September 30, 2006. The Argonne Site Office also uses specialty contractors to support aspects of EM work such as the existing contracts for National Environmental Policy Act scope and for Independent Verification scope.

The only upcoming major contract anticipated is the new contract, beginning FY 2007, to operate Argonne National Laboratory.

Cleanup Benefits

In FY 2007, Argonne Site Office expects that the Zero Power Reactor 6 project will be complete and will return valuable research and development space to the Management and Operating contractor for future research use. Projects completed prior to FY 2007 yielded substantial risk reduction, and reductions in surveillance and maintenance costs. Valuable space was returned to Argonne National Laboratory for research and development purposes. Stakeholder relations were improved as a result of EM completions.

Through FY 2009, Argonne Site Office expects that the last two EM scope projects will be finished (Building 301 and remote-handled transuranic waste). These two projects will likewise reduce risk, cut surveillance and maintenance costs, and return valuable space to Argonne National Laboratory for research and development purposes. All EM remediation and facility cleanup scope is expected to be complete by FY 2009. Only minor long term stewardship scope is expected to continue post FY 2009.

Target Level Accomplishments

FY 2007

- Zero Power Reactor 6 D&D Complete
- Initiate D&D of Building 301

FY 2008

- Continue long-term response actions for implemented soil and groundwater remedies
- Offsite disposal of Bldg. 301demolition wastes under current technical strategy and disposal costs

FY 2009

- Project end (all EM D&D Complete)

Brookhaven National Laboratory

Site Overview

The Brookhaven National Laboratory is a U.S. Department of Energy (DOE) owned multi-disciplinary scientific research center located in the center of Suffolk County on Long Island, about 60 miles east of New York City. The Atomic Energy Commission established Brookhaven National Laboratory on the site of the U.S. Army's former Camp Upton in 1947. The Atomic Energy Commission's objective was to build a regional laboratory that could provide researchers with powerful tools too costly for their home institutions to build and maintain.

The Brookhaven Environmental Management Completion Project addresses the cleanup of the Brookhaven National Laboratory Superfund site as well as the decontamination and decommissioning of two former research reactors: the High Flux Beam Reactor and Brookhaven Graphite Research Reactor. Cleanup is required by a 1992 Interagency Agreement among DOE, the U.S. Environmental Protection Agency and the New York State Department of Environmental Conservation. The Brookhaven Environmental Management Completion Project is considered complete when all required groundwater treatment plants are built and operating; cleanup of soil and the Peconic River are complete; decontamination and decommissioning of the Brookhaven Graphite Research Reactor and High Flux Beam Reactor is complete; all cleanup, decontamination and decommissioning and legacy wastes are disposed of off-site; and an effective Long Term Environmental Operations, Safety and Security program is underway.

Brookhaven Science Associates has operated Brookhaven National Laboratory for DOE since 1997 and also performs the cleanup work for the DOE Office of Environmental Management (EM).

Site Description

Groundwater cleanup is Brookhaven National Laboratory's highest priority because Long Island's Sole Source aquifer provides the only source of drinking water for local residents. Off-site groundwater is contaminated with volatile organic compounds above State standards and onsite groundwater is contaminated with volatile organic compounds and the radionuclides tritium and strontium-90 above the drinking water standard. Some soils at Brookhaven National Laboratory are contaminated with radionuclides (primarily cesium-137 and strontium-90) and chemicals (primarily mercury) due to historical practices and spills. Three landfills have been capped and 55 waste disposal pits have been excavated and disposed of off-site. Historical discharges from Brookhaven National Laboratory's Sewage Treatment Plant have resulted in elevated levels of metals, primarily mercury, and radionuclides (e.g. cesium-137) in the Peconic River sediments both on and just off-site. Cleanup requirements are outlined in Records of Decision for the various areas.

Brookhaven Graphite Research Reactor: The Brookhaven Graphite Research Reactor was the first reactor built solely to provide neutrons for research and was operated from August 1950 to June 1968. This reactor is of concern because releases to the environment have occurred and have caused soil and groundwater contamination with

cesium-137 and strontium-90 and it is listed as an Area of Concern in the Interagency Agreement. Numerous interim actions have been performed to address high priority environmental releases. A Record of Decision was signed by the United States Environmental Protection Agency in March 2005 that adopts the interim actions as final and requires removal and off-site disposal of the pile and biosheild.

High Flux Beam Reactor: The High Flux Beam Reactor, constructed for basic experimental research in physics, chemistry and biology, was permanently shut down in 1999. Extensive stabilization activities were conducted during FY 2000 – FY 2001 including the removal of experimental equipment, installation of a stainless steel liner for the spent fuel pool and the installation of leak prevention alarms and double-walled piping to mitigate potential releases to the environment. All systems have been drained and the reactor vessel and primary and secondary cooling systems are in dry lay-up. The reactor fuel was sent to the DOE Savannah River Site in 1996-97. Decision making with the regulatory agencies and the community is currently underway for the High Flux Beam Reactor.

Site Cleanup Strategy/Scope of Cleanup

In summary, Brookhaven National Laboratory's highest cleanup priorities involve the cleanup of environmental releases to groundwater, soils and the Peconic River. These activities make up the CH-BRNL-0030/Soil and Water Remediation and were completed in FY 2005. The budget for FY 2006 and beyond is for Long Term Environmental Operations, Safety and Security activities.

High priority activities at the Brookhaven Graphite Research Reactor (CH-BRNL-0040 Nuclear Facility decontamination and decommissioning – Brookhaven Graphite Research Reactor) related to addressing environmental releases were also completed in FY 2005. Removal of the internal pile and bioshield planned for completion in FY 2008. These high priority activities include the removal and off-site disposal of contaminated soil and materials (e.g. concrete) associated with the Pile Fan Sump, Fan House, the Above Grade Ducts, Coolers and Filters, the Canal and Water Treatment House, and portions of the Below Ground Ducts.

Decontamination and decommissioning of the High Flux Beam Reactor is considered the lowest risk and is scheduled for completion last.

Site Completion and End State

Completion of the Brookhaven National Laboratory Soil and Water activities in FY 2005 is followed by continuing Long Term Environmental Operations, Safety and Security. These activities will continue while the Brookhaven Graphite Research Reactor and High Flux Beam Reactor decontamination and decommissioning is completed. Site completion is scheduled for FY 2009. After this, the Long-Term Environmental Operations, Safety and Security program will be transferred to the DOE Office of Science, which is the Brookhaven National Laboratory site landlord.

Regulatory Framework

Brookhaven National Laboratory was added to New York State's list of Inactive Hazardous Waste sites in 1980 and to the federal National Priorities List in 1989. A tri-

party Federal Facilities Compliance Agreement, also known as the Interagency Agreement, was subsequently negotiated between the DOE, the U. S. Environmental Protection Agency Region II, and the New York State Department of Environmental Conservation. The Interagency Agreement integrates the requirements of Comprehensive Environmental Response, Compensation, and Liability Act, the corrective action requirements of the Resource Conservation and Recovery Act, DOE cleanup authorities under the Atomic Energy Act, and any corresponding New York State regulations.

The Interagency Agreement became effective in 1992 and provides the overall framework for conducting the Brookhaven environmental restoration program, using Comprehensive Environmental Response, Compensation, and Liability Act processes. Furthermore, the Interagency Agreement defines authorities between the three parties, and includes procedures for resolving disputes, assessing stipulated penalties by Environmental Protection Agency, reviewing documents, reporting and notifications, extending schedules, complying with State and Federal regulations and requirements, and reimbursing the costs of oversight performed by the New York State Department of Environmental Conservation. While not a formal Interagency Agreement partner, the Suffolk County Department of Health Services is also actively involved with the Brookhaven National Laboratory cleanup. Examples of Suffolk County Department of Health Services activities include reviewing proposed work plans, overseeing field work to ensure that it is performed properly and splitting Brookhaven National Laboratory samples for analysis.

Critical Site Uncertainties and Assumptions

The most significant project uncertainty involves the resolution of the High Flux Beam Reactor end state with the regulatory agencies and the public. The current assumption involves removing accessible source terms and shrinking the footprint of the facility to reduce long term surveillance, maintenance and security requirements and to defer removal of the reactor vessel for 40 to 75 years which will allow the high source terms to radiological decay thus reducing radiation exposures to workers during removal and packaging. Deferral of the vessel removal will also greatly simplify the dismantlement, segmentation and packaging of the vessel and will reduce the need for specialized shipping casks and containers to transport the highly radioactive components; reducing the generation of secondary waste streams. DOE is using the Core Team process with the regulatory agencies to facilitate this decision.

Interdependencies

The most significant dependency with other external agencies involves the resolution of the High Flux Beam Reactor end-state with the U. S. Environmental Protection Agency and New York State Department of Environmental Conservation, as well as the public. Waste transportation and disposal constitute the most significant inter-site dependencies. It is envisioned that decontamination and decommissioning wastes will be disposed of at Envirocare, Inc. Brookhaven Science Associates is currently seeking certification for disposal at the Nevada Test Site which will serve as a substitute or supplement to Envirocare to allow for the most rapid, cost effective waste disposal pathway.

Contract Synopsis

DOE's cost-plus performance fee contract with Brookhaven Science Associates, as the managing and operating contractor, to perform the DOE science mission at Brookhaven National Laboratory extends through January 4, 2008. EM funded cleanup activities involving the completion of the Brookhaven National Laboratory Soil and Water activities, high priority removals at the Brookhaven Graphite Research Reactor, and surveillance and maintenance activities at the High Flux Beam Reactor are included in this contract through September 30, 2008.

Current plans for work in FY 2006 and beyond involve extending Brookhaven Science Associate's contract to perform the Brookhaven Graphite Research Reactor and High Flux Beam Reactor decontamination and decommissioning as an integrating contractor.

Cleanup Benefits

Near term benefits of cleanup include the completion of Brookhaven's highest priority environmental releases in the Soil and Water project in FY 2005 and continuation of groundwater treatment and operations through FY 2007. Also, numerous removals of contaminated structures and soil addressed high-priority environmental releases at the Brookhaven Graphite Research Reactor facility. Starting in FY 2006, the focus will be on the planning and decontamination and decommissioning of two former research reactors, the High Flux Beam Reactor and Brookhaven Graphite Research Reactor. Community expectations are that DOE will also complete these cleanups as planned. Long term benefits include completion of the Brookhaven Graphite Research Reactor and High Flux Beam Reactor, and thus the EM cleanup, at the Brookhaven National Laboratory site in FY 2009. This will be a geographic completion for the EM program and will also allow Brookhaven National Laboratory to focus on its main mission of performing world class science for DOE's Office of Science.

Target Level Accomplishments

FY 2007

- Continue Long Term Environmental Operations, Safety and Security involving the operations, maintenance and monitoring of 16 groundwater treatment systems, three capped landfills, the Peconic River and numerous soil cleanup areas.

- Complete Decontamination and Decommissioning of the Brookhaven Graphite Research Reactor.

FY 2008

- Continue Long Term Environmental Operations, Safety and Security involving the operations, maintenance and monitoring of 16 groundwater treatment systems, three capped landfills, the Peconic River and numerous soil cleanup areas.

FY 2009

- Continue Long Term Environmental Operations, Safety and Security involving the operations, maintenance and monitoring of 16 groundwater treatment

systems, three capped landfills, the Peconic River and numerous soil cleanup areas.

- Completion all contractor project closeout and transition activities and achieve site completion.
- Complete Decontamination and Decommissioning of the High Flux Beam Reactor.

Energy Technology Engineering Center

Site Overview

The Santa Susana Field Laboratory, owned by the Boeing Company, is located atop a range of hills between the populous Simi and San Fernando Valleys, north of Los Angeles. Area IV (the western-most 290 acres of the site), was primarily used for DOE research and development activities. The Energy Technology Engineering Center, which was DOE's laboratory at the Santa Susana Field Laboratory, consists of government-owned facilities located on 90 acres within Area IV.

When opened in the late 1950s, the site was ideally remote from population centers to enable development of security sensitive projects. These projects supported nuclear research and energy development for DOE and its predecessor agencies. The site includes buildings which house test apparatus for large-scale heat transfer and fluid mechanics experiments, mechanical and chemical test facilities, office buildings, and auxiliary support facilities.

Energy Technology Engineering Center is surplus to DOE's current mission and is operated by EM solely to complete site cleanup and closure. As such, the current use of the site involves diminishing use of facilities through deactivation, decommissioning, and dismantlement. As a result of past operations, radioactive and chemical contamination exists in several structures (including the Radioactive Materials Handling Facility) and soil, surface and groundwater.

Site(s) Description

Two radiological facilities (comprising a total of 11 buildings) and one sodium facility remain. In addition, fifty industrial facilities (for example, office and storage buildings, warehouses, parking lots, electrical substations) will be demolished. The two radiological facilities remaining at Energy Technology Engineering Center are the Radioactive Materials Handling Facility complex and Building 4024. The Sodium Pump Test Facility is the remaining sodium facility. (Sodium facilities are those installations where research and development related to sodium cooled reactors were performed. The facility is not radiologically contaminated.)

Site Cleanup Strategy/Scope of Cleanup

DOE is responsible for nine areas of soil contamination that require investigation and potential remediation at Energy Technology Engineering Center. Corrective actions are based on a residential land-use assumption. It is anticipated that three of the nine units will be excavated to meet projected media cleanup standards.

Three small plumes, contaminated with low levels of trichloroethylene, trichloroacetic acid and tetrachloroethylene, require groundwater remediation. These units are included in the site wide Resource Conservation and Recovery Act Corrective Action Program. While the three contaminated groundwater plumes of concern to DOE are small, the groundwater contamination resulting from Boeing and National Aeronautics and Space Administration operations at the rest of Santa Susana Field Laboratory is substantial. The long-term response actions for the DOE groundwater contamination was transferred to

Boeing as part of the 1998 Closure Contract. The three plumes already have interim remedial measures in place for containment of the plumes.

Site Completion and End State

Following is a list of remaining activities that are needed to achieve completion by FY 2009:

- Decontamination and demolition of two remaining radiologically contaminated facilities
- Resource Conservation and Recovery Act Corrective Action
- Resource Conservation and Recovery Act permitted facilities (two)
- The completion date has been revised to FY 2008, due to regulatory delay in closure of RCRA regulated unit and new work scope.

Regulatory Framework

Regulation of the Energy Technology Engineering Center Closure project is segmented into different regulatory authorities. The decontamination and demolition of the radiologically contaminated facilities at the Energy Technology Engineering Center site is being conducted under Atomic Energy Act authority. A comprehensive Environmental Assessment was released in March 2003 for the final decommissioning activities and release of the site. The Resource Conservation and Recovery Act chemical cleanup is regulated by the State Department of Toxics Substance Control. Decontamination and demolition of the State licensed facilities is regulated by the State Department of Health Services. The Department of Health Services does not have direct regulatory authority over DOE, however, if they determine that the site has not been adequately cleaned up to State standards they would license the site and require additional survey and remediation before it could be released. Therefore, as a risk mitigation measure DOE obtains Department of Health Services concurrence on decontamination and demolition activities. The Energy Technology Engineering Center site is not on the National Priority List and therefore the Environmental Protection Agency has no regulatory authority.

Critical Site Uncertainties and Assumptions

- Potential delays in State environmental reviews (since DOE work will be completed ahead of Boeing/National Aeronautics and Space Administration scope), and final acceptance by the regulators of DOE's zone approach to groundwater characterization and containment.
- Ongoing litigation by outside parties on the adequacy of the NEPA analysis to support the level of cleanup

Interdependencies

There are no significant dependencies with other DOE sites.

Contract Synopsis

The current cleanup contract is held by Boeing. The three year option to extend the contract has been exercised.

Cleanup Benefits

The cleanup plan has been developed to achieve rapid, cost effective results.

Contaminated soil units will be remediated to meet the risk associated with industrial land use. Groundwater remedial systems have been constructed to prevent off-site migration and discharge to surface water. Where necessary, additional systems will be constructed to address the goal of meeting Maximum Contaminant Levels for drinking water.

EM will complete construction of remedial systems identified in the Resource Conservation and Recovery Act Corrective Measures Study Report, dispose of all remediation derived waste and complete business closure activities by the end of FY 2009.

Target Level Accomplishments

FY 2007

- Complete demolition of Sodium Pump Test Facility
- Complete demolition of the Space Nuclear Auxiliary Power Reactor, and the B4024 radiological facility

FY 2008

- Complete RMHF demolition (radiological)

FY 2009

- Completion of EM cleanup and transition to Boeing

Inhalation Toxicology Laboratory

Site Overview

The Inhalation Toxicology Laboratory is a research facility operated by the non-profit Lovelace Biomedical and Environmental Research Institute. It is located in Albuquerque, New Mexico, on Kirtland Air Force Base. It was built by the Office of Science in 1960 to conduct research on the health effects of inhaling radioactive and other energy related pollutants. From 1960 to 1996 Inhalation Toxicology Laboratory was operated under a traditional Management and Operating contract. In 1996 the facility was privatized and continues to operate as a private facility, which conducts research for DOE and other entities on a reimbursable basis.

As a result of operations conducted for DOE, groundwater and soil areas were contaminated, laboratories and buildings were contaminated and legacy waste has accumulated.

Site Description

Inhalation Toxicology Laboratory is located in Albuquerque, New Mexico on Kirtland Air Force Base. It has approximately 240,000 square feet of building space on 144 acres of land, which has been withdrawn from the Bureau of Land Management by the Air Force and permitted to DOE.

Site Cleanup Strategy/Scope of Cleanup

Remedial activities for contaminated soil and groundwater at the site were completed in 1997. Currently, the environmental management mission at the Inhalation Toxicology Laboratory is comprised of two projects: (a) groundwater monitoring and reporting and (b) waste collection and disposal--surface decontamination.

Site Completion and End State

Groundwater monitoring and reporting is ongoing and will continue until state regulatory standards are met or an alternative abatement standard is granted by the state. Legacy waste from about 30 laboratories and other contaminated areas is being collected and disposed of. Once the legacy waste is collected and disposed and the laboratories and other contaminated areas decontaminated, the EM mission at Inhalation Toxicology Laboratory will be complete. EM completion is scheduled for 2008. Remaining projects for FY 2006-FY 2008 include the Radioactive Source Collection and Disposal, and cleanup of the Beta Gamma Wing, Castle Area and Miscellaneous Laboratory Areas.

Long-Term Stewardship objectives include continued groundwater monitoring and reporting under Monitored Natural Attenuation until either state standards are met or alternative abatement standards are granted by the state. Institutional controls to preserve industrial land use will be required until approximately the year 2030 when residual radioactivity will decay sufficiently to allow for unrestricted land use.

Regulatory Framework

The Inhalation Toxicology Laboratory cleanup is being conducted under DOE Orders, Resource Conservation and Recovery Act, and State of New Mexico Groundwater Standards. The Sewage Lagoon Site is regulated under a State Discharge Permit. Hazardous waste is managed by the State of New Mexico pursuant to Resource Conservation and Recovery Act and radioactive waste is managed under DOE Orders and Nevada Test Site Waste Acceptance criteria. There are no compliance milestones other than those related to groundwater monitoring and reporting contained in the Discharge Permit and New Mexico State regulations.

Critical Site Uncertainties and Assumptions

None.

Interdependencies

Low-level waste is packaged and shipped by Inhalation Toxicology Laboratory to the Nevada Test Site. The small volume of transuranic waste resulting from Inhalation Toxicology Laboratory operations has been transported to Sandia National Laboratory for ultimate disposition at the Waste Isolation Pilot Plant. There are no major Government Furnished Services and Items related to materials or services. There are no other interdependencies associated with the Inhalation Toxicology Laboratory EM Project.

Contract Synopsis

The Inhalation Toxicology Laboratory has been managed under a Cooperative Agreement with DOE since 1996; the Cooperative Agreement expires at the end of FY 2006. The Cooperative Agreement is the mechanism currently used for funding the EM Project as well as other DOE projects and initiatives. It is administered by the National Nuclear Security Administration Service Center.

Cleanup Benefits

In FY 2006, groundwater monitoring and reporting will continue, as will chemical waste collection and disposal. Cleanup of the Beta Gamma Wing, the largest remaining subproject will begin. In FY 2007, cleanup of the Beta Gamma Wing will be nearly completed. Most of the remaining Inhalation Toxicology Laboratory EM activities such as the Castle area cleanup and disposal of mixed waste and radioactive sources will be completed.

In FY 2008 the Beta Gamma Wing will be completed and all remaining legacy waste will be collected and disposed. The Inhalation Toxicology Laboratory EM mission will then be completed and will be transferred to LM where Long-Term Stewardship will begin.

Target Level Accomplishments

FY 2007

- Conduct Groundwater Monitoring and Reporting

FY 2008

- Conduct Groundwater Monitoring and Reporting
- Complete Beta Gamma Wing
- Complete EM cleanup

Moab, Utah, UMTRA Project

Site Overview

The project mission is to remediate uranium mill tailings from the former Atlas Minerals Corporation (Atlas) uranium-ore processing and mill site, contaminated vicinity properties, and contaminated groundwater. DOE became responsible for this mission upon the enactment of the Floyd D. Spence National Defense Authorization Act of 2001.

Site Description

The DOE Moab project site is approximately 3 miles northwest of the city of Moab, Utah on the west bank of the Colorado River. The site encompasses approximately 400 acres, of which approximately 130 acres is covered by an 8.9 million cubic yards uranium mill tailings pile.

Site Cleanup Strategy/Scope of Cleanup

DOE's Record of Decision (issued on September 14, 2005) made the decision for the relocation of the mill tailings pile away from the Colorado River to a DOE-constructed disposal facility near Crescent Junction, Utah via rail transportation. DOE will assess the extent of radiological contamination at the mill site and vicinity properties, characterize the proposed disposal site and construct a disposal cell, excavate and remove the tailings pile to the disposal cell, and remediate local ground water. The remainder of the mill site will be verified to meet radiological standards and then restored to an acceptable condition. Demobilization from the site will complete the on-site activities, except in the case of active ground water restoration. DOE also will investigate unidentified vicinity properties to assess the presence of contamination.

Site Completion and End State

The end state for the Moab Site Project will be achieved after contaminated soil, tailings, vicinity properties, and surface and groundwater are remediated. DOE may place some restrictions on reutilization of the site, depending on how a proposed land use could impact the selected ground water remedy. The site will then be transferred to the Office of Legacy Management for monitoring and required stewardship.

Regulatory Framework

In October 2000, the Floyd D. Spence National Defense Authorization Act for FY 2001 assigned DOE responsibility to establish a remedial action program and stabilize, dispose of, and control uranium mill tailings and other contaminated material at the Moab uranium-ore processing site and associated vicinity properties.

Critical Site and Project Uncertainties and Assumptions

- Acquisition strategy to implement remediation consistent with the Record of Decision is still undefined.
- Full cost of remediation will not be known until a remedial action contract(s) is awarded.

- Potential rail upgrades (to transverse the terrain incline at the tailings pile and disposal cell) will be accomplished within expected project cost and schedule.
- Vicinity Properties characterization will minimize the number of sites requiring remediation.

Interdependencies

Past surveys by the Environmental Protection Agency indicate contaminated vicinity properties may exist and consequently will have to be remediated to Environmental Protection Agency standards. Contaminated materials will be excavated and transported to the disposal cell location.

Contract Synopsis

The existing technical assistance contract expires in June 2007. DOE is developing an acquisition strategy for remediation per the Record of Decision.

Cleanup Benefits

Continued maintenance and surveillance of the groundwater and mill tailings pile will ensure no further contamination of surrounding areas. Removal of the nearly 9 million cubic years of uranium tailings away from the Colorado River will significantly reduce danger to human health and the environment.

Target Level Accomplishments

FY 2007

- Implement acquisition strategy and award cleanup contract
- Complete final design of disposal cell

FY 2008

- NRC approves remedial action plan and final design

FY 2009

- Start tailings haul
- Initiate disposal cell excavation/construction

FY 2010

- Ongoing tailings haul

FY 2011

- Ongoing tailings haul

Stanford Linear Accelerator Center

Site Overview

The mission of the EM Stanford Linear Accelerator Center Project is to conduct necessary response actions at 21 remaining release sites, implement necessary long-term groundwater remediation remedies, and transfer responsibility for long-term operation and maintenance of necessary groundwater treatment systems to the Office of Science for continued mission use at the end of FY 2009. Meeting this mission will allow DOE-EM to meet ongoing obligations as defined in the DOE lease with Stanford University (April 26, 1962), comply with the California Regional Water Quality Control Board Site Cleanup Requirement Order (issued May 2005), and achieve EM completion for the Stanford Linear Accelerator Center Environmental Remediation Project. In addition, meeting this mission in the shortest time feasible results in mortgage reduction as annual site monitoring costs are reduced and most of the support staff can be reassigned or eliminated.

Site Description

The Stanford Linear Accelerator Center is a national research facility operated by Stanford University under contract with DOE. The term of Stanford University's current contract with DOE (then the Atomic Energy Commission) began in 1962 and extends to 2007. The current lease expires in 2012.

Stanford Linear Accelerator Center is located in an unincorporated area of southeast San Mateo County, California, about 2 miles west of the Stanford University campus. Constructed on land owned by Stanford University, Stanford Linear Accelerator Center is devoted to theoretical and experimental research in elementary particle physics, developing new accelerator and particle detection techniques, and the utilization of synchrotron radiation in biology, chemistry, physics, materials science, medical science, and other disciplines.

As a result of Stanford Linear Accelerator Center's mission as a research facility, certain chemicals have been used or produced as wastes over its 40+ year history. These chemicals include volatile organic compounds, polychlorinated biphenyls, and metals, most notably lead. Additionally, radionuclides, notably tritium, have also been generated as a result of Stanford Linear Accelerator Center experiments. Some of these chemicals have been released to the environment, including site soil, groundwater, sediment, and storm water. In May 2005, the California Regional Water Quality Control Board issued a Site Cleanup Requirements Order.

Site Cleanup Strategy/Scope of Cleanup

The Office of Environmental Management will complete construction of remedial measures by the end of FY 2009 and transition these facilities to the Office of Science for the implementation of long-term stewardship. This objective will be achieved by:

- Identifying and defining the risks associated with existing areas of contamination that may require remediation;
- Prioritizing remediation projects;

- Developing remedial alternatives for areas of identified contamination;
- Seeking regulatory approval, where appropriate, for the proposed remedial alternatives; and
- Remediating areas using approved methodologies to reduce risk to workers, the public, and the environment in accordance with applicable regulatory requirements

The primary chemicals of concern detected in soils at Stanford Linear Accelerator Center include polychlorinated biphenyls, lead, volatile organic compounds, and petroleum hydrocarbons. Remediation activities are planned for the Lower Salvage Yard, the Clean Landfill, the Bone Yard, and several other smaller sites.

A network of wells has been installed at Stanford Linear Accelerator Center to investigate past operational areas. As a result of groundwater investigation and monitoring performed since the 1980s, four areas of Stanford Linear Accelerator Center have been identified where volatile organic compounds are present in groundwater. Additionally, results of storm water and sediment sampling and testing indicate that polychlorinated biphenyls and lead have entered Stanford Linear Accelerator Center's storm water system.

Site Completion and End State

Site completion end date is FY 2009. It is anticipated that Stanford Linear Accelerator Center will continue to operate as an Office of Science DOE sponsored laboratory, and responsibility for operation and maintenance of remedial systems will be transferred from the Office of Environmental Management to the Office of Science in FY 2010. EM will complete construction of remedial systems, dispose of all remediation derived waste, complete business closure activities and enter into an agreement with the Office of Science defining EM Completion, the end state, and transferring the long-term response action responsibility.

Regulatory Framework

The California Regional Water Quality Control Board is the lead regulatory agency for the groundwater, sediment, and storm water portions of the Stanford Linear Accelerator Center Environmental Restoration Program. Stanford Linear Accelerator Center is now under a California Regional Water Quality Control Board Site Cleanup Requirements Order, which has increased the cleanup work scope and extended the planned completion date to 2009. This Order requires the investigation and remediation of impacted soil and groundwater resulting from the historical spills and leaks that have occurred during the operation of the Stanford Linear Accelerator Center site. The U.S. Environmental Protection Agency also provides oversight regarding soil remedial actions involving polychlorinated biphenyls. The San Mateo County Department of Environmental Health Services has provided field confirmation sampling oversight for Interim Remedial Actions.

Critical Site Uncertainties and Assumptions

Potential beneficial uses of groundwater at Stanford Linear Accelerator Center are limited. As summarized in Demonstration that Natural Groundwater Conditions at Stanford Linear Accelerator Center Meet Exemption Criteria for Potential Sources of Drinking Water (Stanford Linear Accelerator Center, 2001), Stanford Linear Accelerator Center demonstrated that the groundwater is not suitable for use as drinking water due to naturally poor water quality and low well yields. Stanford Linear Accelerator Center in conjunction with the landowner, Stanford University, has proposed that the California Regional Water Quality Control Board exempt groundwater at Stanford Linear Accelerator Center from all potential uses except freshwater replenishment, agricultural supply, industrial supply and industrial process supply.

Interdependencies

Transition to Office of Science

The intent is to transfer responsibility for environmental management of Stanford Linear Accelerator Center to the Office of Science. It is expected that EM completion will achieve protection of groundwater and industrial land use standards. DOE's lease with Stanford requires final end-state of "leaving the premises in safe, clean and neat condition".

Contract Synopsis

The Stanford Linear Accelerator Center is a national research facility operated by Stanford University under contract with DOE. The term of Stanford University's contract with DOE (then the Atomic Energy Commission) began in 1962 and extends to 2012.

Cleanup Benefits

Although the scope of the Stanford Linear Accelerator Center environmental remediation may be less substantial than that of the large EM cleanup sites, its location on the densely populated San Francisco peninsula with Stanford University as the Stanford Linear Accelerator Center property owner produces significant visibility and public awareness of EM's cleanup performance. In addition, the land on which Stanford Linear Accelerator Center is built is zoned residential, and property values in the area are among the highest in the nation.

Target Level Accomplishments

FY 2007

- Complete Characterization at Lower Salvage Yard
- Complete Site Wide Remedial Investigation and Risk Assessment
- Complete construction of a groundwater treatment system at the Plating Shop

FY 2008

- Complete Removal Action at Lower Salvage Yard

- Complete Dual Phase Extraction System Installation at Plating Shop
- Complete Sitewide Remedial Action Plan

F Y 2009

- Project Completion
- Transfer Project to Office of Science

FY 2010

- Transfer to Office of Science for Long Term Surveillance and Maintenance

West Valley Demonstration Project

Site Overview

The West Valley Demonstration Project is being executed at the site of the only commercial nuclear fuel reprocessing facility to have operated in the United States. The West Valley Demonstration Project is located on the site of the Western New York Nuclear Service Center whose title is held by the New York State Energy Research and Development Authority. The principal mission of DOE is to satisfy the mandates established by the West Valley Demonstration Project Act of 1980 (Public Law 96-368):

- Solidify, in a form suitable for transportation and disposal, the high-level waste;
- Develop containers suitable for permanent disposal of the solidified high-level waste;
- Transport, in accordance with applicable law, the solidified waste to an appropriate federal repository for permanent disposal;
- Dispose low-level waste and transuranic waste produced by high-level waste solidification activities; and
- Decontaminate and decommission tanks and facilities used for solidification of high-level waste, as well as any material and hardware used in connection with the Project, in accordance with such requirements as the Nuclear Regulatory Commission may prescribe.

Site Description

The West Valley Demonstration Project is located approximately 40 miles south of Buffalo, New York. For purposes of conducting the West Valley Demonstration Project, DOE has operational responsibility for approximately 165 acres located near the center of the larger 3,345 acre Western New York Nuclear Service Center owned by the state of New York.

Site Cleanup Strategy/Scope of Cleanup

DOE has completed the first two mandates of the West Valley Demonstration Project Act – solidification of the liquid high-level waste and development of containers suitable for permanent disposal of the high-level waste. There are currently 275 high-level waste canisters that have been produced in accordance with federal repository requirements that are in safe storage within the former spent fuel reprocessing plant. The remaining work to be completed by DOE per the West Valley Demonstration Project Act includes (1) shipment of the high-level waste canisters to a federal repository, (2) disposal of Project-generated low-level waste and transuranic waste, and (3) facility decontamination and decommissioning. Additionally, in accordance with the DOE and New York State Energy Research and Development Authority spent fuel agreement, DOE shipped 125 spent fuel assemblies to the Idaho National Environmental and Engineering Laboratory in July 2003.

The technical, schedule and cost considerations associated with decommissioning of the West Valley Demonstration Project are being considered during development of the Decommissioning and/or Long-term Management Environmental Impact Statement, a joint effort being supported by both DOE and New York State. A Record of Decision

determining the actions needed for final decommissioning is planned for issuance in 2008. As such, DOE will focus its near-term efforts on Project waste disposition, process building decontamination and removal of non-essential facilities can proceed in the near-term while the Decommissioning Environmental Impact Statement is developed.

Site Completion and End State

Until DOE completes evaluation and analysis of various closure alternatives in the Decommissioning Environmental Impact Statement and issues a Decommissioning Record of Decision, DOE plans to proceed toward Interim End State completion by the end of FY 2010. The West Valley Demonstration Project Interim End State is defined as:

- Shipment of all low-level waste and transuranic waste generated by DOE as a result of the high-level waste solidification project;
- Deactivation, demolishment and removal of all DOE-managed facilities (foundations remain), with the exception of the former spent nuclear fuel reprocessing facility (i.e. process building) and any other support facilities required for the interim storage of the high-level waste canisters;
- Removal of major components and decontamination of the process building; and
- Configuring utilities and infrastructure to achieve cost effective long-term storage and maintenance of the process building and other facilities, including the tank farm, until off-site transport of the high-level waste canisters can be facilitated.

Following publication of the Decommissioning Environmental Impact Statement Record of Decision, currently planned for 2008, DOE will proceed toward implementation of actions necessary to achieve EM Completion. The end state for EM Completion will be achieved when the following actions have been performed:

- Decommissioning of the tank farm;
- Remediation of lagoons, sludge ponds and water treatment systems, as applicable;
- Removal and disposal of facility foundations and contaminated soil, as applicable;
- Installation of erosion controls and environmental monitoring requirements;
- Multi-Agency Radiation Survey and Site Investigation Manual survey and sampling; and
- Implementation of other actions as required by the Decommissioning Environmental Impact Statement Record of Decision.

Activities to be implemented to achieve the Final End State for the West Valley Demonstration Project once transport of the high-level waste canisters to a federal repository can be facilitated include:

- Construction of load-out facility;
- Shipment of the high-level waste canisters off-site;
- Final decommissioning of the process building consistent with Decommissioning Environmental Impact Statement Record of Decision;
- Demolition and removal of any other interim storage support facilities; and
- Transition of the site back to the State of New York.

Regulatory Framework

Cooperative Agreement between DOE and New York State Energy Research and Development Authority: Signed in October 1980 with the New York State Energy Research and Development Authority and amended in September 1981, this agreement was entered into for implementation of the West Valley Demonstration Project Act of 1980. It allows DOE use and control of the 165 acre West Valley Demonstration Project premises and facilities thereon for the purposes and duration of the Project. In addition, this agreement sets forth specific definitions, roles, and responsibilities applicable to the Project, use of facilities and Project completion.

Memorandum of Understanding between DOE and Nuclear Regulatory Commission: Published in the Federal Register in September 1981, this memorandum identifies roles, responsibilities, terms and conditions agreed to by the DOE and Nuclear Regulatory Commission regarding Nuclear Regulatory Commission review and consultation during the course of the Project.

Agreement between New York State Energy Research and Development Authority and DOE on U.S. DOE Spent Nuclear Fuel located at the Western New York Nuclear Service Center: Signed in July 1986, this agreement relates to shipment of spent nuclear fuel from the Project site to Idaho.

Stipulation of Compromise Settlement: Reached in May 1987, this settlement represents the legal compromise reached between the Coalition on West Valley Nuclear Waste and Radioactive Waste Campaign and the DOE regarding development of a comprehensive Environmental Impact Statement for the Project and for on- and off-site disposal of low-level waste.

Supplemental Agreement to the Cooperative Agreement: Signed in February 1991, this supplemental agreement sets forth special provisions for the preparation of a joint Environmental Impact Statement between the DOE and New York State for facility decommissioning.

Resource Conservation and Recovery Act 3008(h) Administrative Order on Consent: Expanded and signed in March 1992, this four-party agreement is between the United States Environmental Protection Agency, the New York State Department of Environmental Conservation, DOE and New York State Energy Research and Development Authority. Among the requirements of this agreement, DOE is to complete Resource Conservation and Recovery Act facility investigations and perform corrective measures for Resource Conservation and Recovery Act-regulated solid waste management units on the Project premises.

Federal and State Facility Compliance Agreement and Addendum: Completed in 1993, this agreement defines requirements for preparing and submitting a site treatment plan for mixed low-level waste (radioactive waste mixed with hazardous chemicals) to the New York State Department of Environmental Conservation, including options and schedules for treatment of identified waste.

Cooperative Agreement between the Seneca Nation of Indians and Ohio/West Valley Demonstration Project: Signed in June 1996, this agreement establishes a framework for inter-governmental relationships between the Seneca Nation of Indians and the DOE with respect to Project activities.

Critical Site Uncertainties and Assumptions

The following assumptions support the planning basis for achieving Interim End State completion by the end of FY 2010:

- The Project will be able to disposition low-level waste off-site,
- Supplemental analyses and amendments to the Record of Decision, as necessary, will allow for off-site disposition of other Project waste.

The critical path to achieving Interim End State completion at the West Valley Demonstration Project is continued decontamination operations in the former spent nuclear fuel reprocessing facility and final off-site disposal of the resulting waste.

Implementation of closure for the tank farm and other facilities under DOE's responsibility will become critical path following publication of the Decommissioning Environmental Impact Statement Record of Decision in order to achieve EM completion. Efforts will include final site survey and possible transfer to another organization for oversight and maintenance for long-term surveillance and monitoring with the exception of process building oversight and maintenance, high-level waste canister transport, and final decommissioning of the process building consistent with the Decommissioning Environmental Impact Statement Record of Decision after the high-level waste canisters have been shipped off-site. Completion of West Valley Demonstration Project Act mandates will be satisfied once West Valley Demonstration Project facilities can be returned to the state of New York.

Interdependencies

Completing the West Valley Demonstration Project Act requires off-site disposal of low-level waste, mixed low-level waste, transuranic waste, and high-level waste. Thus, the project is dependent on other sites for these disposal services.

Contract Synopsis

The current prime contract at West Valley Demonstration Project will expire December, 2006. The acquisition process to competitively award a new contract for completion of the Interim End State at West Valley Demonstration Project. Additionally, a separate contract for shipment and disposal of the Radwaste Treatment System Drum Cell waste and the disposition of the Drum Cell will be competitively awarded in the FY 2007 timeframe.

Cleanup Benefits

Work planned for performance through FY 2007 includes significant progress toward off-site shipment of legacy low-level waste. Additionally, the former spent nuclear fuel

reprocessing facility will be in the process of being decontaminated, reducing overall risks.

West Valley Demonstration Project plans to achieve Interim End State completion in FY 2010. At that point, all of the work that can be accomplished with current regulatory authority will have been completed including off-site disposition of low-level waste, decontamination and demolishment of facilities and infrastructure no longer needed to support safe site operations, and decontamination of the former spent nuclear fuel reprocessing facility. The site will be ready for implementation of the Decommissioning Environmental Impact Statement Record of Decision planned for issuance in 2008 which will include final decommissioning for the high-level waste tanks. The high-level waste canisters will be safely stored on-site awaiting disposition to a federal repository.

Target Level Accomplishments

FY 2007

- Continue off-site disposition of Project wastes
- Continue decontamination operations in former spent nuclear fuel reprocessing facility
- Continue dismantlement and removal of ancillary facilities no longer needed to support safe site operations
- Issue draft Decommissioning EIS

FY 2008

- Continue off-site disposition of Project wastes
- Continue decontamination operations in former spent nuclear fuel reprocessing facility
- Continue dismantlement and removal of ancillary facilities no longer needed to support safe site operations
- Issue final Decommissioning EIS and ROD.

FY 2009

- Continue off-site disposition of Project wastes
- Continue decontamination operations in former spent nuclear fuel reprocessing facility
- Continue dismantlement and removal of ancillary facilities no longer needed to support safe site operations

FY 2010

- Continue off-site disposition of Project wastes

- Continue decontamination operations in former spent nuclear fuel reprocessing facility
- Continue dismantlement and removal of ancillary facilities no longer needed to support safe site operations

FY 2011

- Continue off-site disposition of Project wastes
- Continue decontamination operations in former spent nuclear fuel reprocessing facility
- Achieve Interim End State Completion