

West Valley Demonstration Project Update-10396

Craig Rieman
Deputy Director
West Valley Demonstration Project
US Dept of Energy, Environmental Management

ABSTRACT

The West Valley Demonstration Project (WVDP) Act of 1980 authorized the Department of Energy (DOE) to conduct a high-level radioactive waste management demonstration project on New York State owned property at the site of the former spent fuel reprocessing plant in West Valley, New York. The Project demonstrated safe solidification of the site's residual high-level radioactive waste through vitrification, which was completed in 2002. Wide-scale decontamination and dismantlement activities are underway at the Project as the two lead agencies – the DOE and the New York State Energy Research and Development Authority – prepare for the release of a Final Environmental Impact Statement (EIS) for Decommissioning and/or Long-term Stewardship of the WVDP and Western New York Nuclear Service Center. This paper will discuss the project status including the Decommissioning Environmental Impact Statement and Record of Decision, the Decommissioning Plan, ongoing cleanup and waste management activities, future decommissioning activities and anticipated acquisition efforts.

INTRODUCTION

The West Valley Demonstration Project (WVDP) is a U.S. Department of Energy (DOE) managed, contractor-operated, environmental remediation project located on the site of the Western New York Nuclear Service Center (Center), owned by the state of New York and administered by the New York State Energy Research and Development Authority (NYSERDA). The site is located on approximately 200 acres, in rural Cattaraugus County, about 40 miles south of Buffalo, in West Valley and the town of Ashford, New York. The WVDP is the site of the only commercial nuclear fuel reprocessing facility to have operated in the United States. The WVDP maintains a Property Protection Area surrounding the project premises.

The Center operated under a license issued by the Atomic Energy Commission (now the Nuclear Regulatory Commission [NRC]) in 1966 to Nuclear Fuel Services, Inc. (NFS) and the New York State Atomic and Space Development Authority, now known as NYSERDA (AEC 1966). Under the Energy Reorganization Act of 1974, the regulatory functions of the Atomic Energy Commission were given to the NRC, which became the licensing authority for the Center's operation.

During reprocessing, spent nuclear fuel was chopped, dissolved, and processed by a solvent extraction system to recover uranium and plutonium. Fuel reprocessing ended in 1972 when the plant was shut down for modifications to increase its capacity, reduce occupational radiation

exposure, and reduce radioactive effluents. At the time, NFS, the operator of the reprocessing plant, expected that the modifications would take 2 years and \$15 million to complete. However, between 1972 and 1976, there were major changes in regulatory requirements, including more stringent seismic and tornado citing criteria for nuclear facilities and more extensive regulations for radioactive waste management, radiation protection, and nuclear material safeguards.

As a result of these changes, in 1976, NFS estimated that over \$600 million would be required to modify the facility to increase its capacity and to comply with the new regulatory standards. The company subsequently announced its decision to withdraw from the nuclear fuel reprocessing business to exercise its contractual right to yield responsibility for the Center to NYSERDA. NYSERDA now holds title to and manages the Center on behalf of the people of the state of New York.

In 1978, Congress passed the Department of Energy Organization Act which, among other things, directed DOE to conduct a study to evaluate possible federal operation or permanent federal ownership of the Center and use the Center for other purposes. Congress subsequently passed the West Valley Demonstration Project Act in 1980 (Public Law 96-368), which directed DOE to conduct five specific activities at the West Valley site: solidify the liquid HLW, develop of canisters for permanent disposal, transport HLW canisters off-site to a Federal repository, dispose of low-level and transuranic radioactive waste produced during solidification and decontaminate and decommission the tanks and facilities used during the Project.

In 1981, the NRC license for the facility was modified, giving DOE exclusive use and possession of the facility. In the following year, the NRC license was once again modified to terminate NFS' responsibilities under the license coincident with NYSERDA's acceptance of surrender of the facility from NFS and DOE's assumption of exclusive possession. In 1982, the DOE selected West Valley Nuclear Services (WVNS), a Westinghouse subsidiary, to manage and operate the site under contract DE-AC-24-81NE44130. WVNS contracted with Pinkerton Government Services to provide Protective-Force Personnel for the WVDP. Subsequent WVNS activities through 2007 included the development of canisters for permanent disposal and solidification of HLW.

PROJECT STATUS

The DOE awarded an Interim End State Completion contract to West Valley Environmental Services LLC (WVES), headquartered in Aiken, South Carolina, on June 29, 2007, to conduct the next phase of cleanup at the WVDP. WVES is a limited liability company comprised of Washington Group International, Inc. (subsequently the Washington Division of URS); Jacobs Engineering Group, Inc.; Environmental Chemical Corporation; and Parallax, Inc.

WVES is providing waste disposition, decontamination, deactivation, and disposition of facilities, and infrastructure/landlord activities under the cost-plus-award fee contract. The current value of the contract is approximately \$264.6 million with a period of performance through June 30, 2011.

The “WVDP Interim End State” is an interim step for final decommissioning of the tanks and facilities consistent with the West Valley Demonstration Act. DOE will proceed toward Interim End State completion by performing waste disposition, decontamination, deactivation, and disposition of facilities, and infrastructure/landlord activities. The decommissioning of the site will be accelerated by the obligation of nearly 74 million dollars in Environmental Management Recovery Act funding.

WVDP is moving forward with facility decontamination, and eventual decommissioning, as required by the WVDP Act. Until DOE completes its 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 in FY 2012. The West Valley Demonstration Project Interim End State includes D&D of all DOE-managed facilities (foundations remain), with the exception of the former spent nuclear fuel reprocessing facility and any other support facilities required for the interim storage of the high-level waste canisters, the Remote Handled Waste Processing Facility (RHWF); and the Vitrification Facility. A primary focus for the project has been the decontamination of areas within the Main Process Plant Building (MPPB), specifically the Process Mechanical Cell, the General Purpose Cell, and Extraction Cell-2 and 3 and the disposal of legacy waste.

In addition the DOE expects to issue the Final Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center (DOE/EIS-0226) (“Final EIS”) in January 2010. The EIS analyzes three alternatives for decommissioning and/or long-term stewardship of the Western New York Nuclear Service Center (WNYNSC), and a No Action Alternative as required by NEPA and SEQR. The three action alternatives evaluated for the Proposed Action are: sitewide removal, sitewide close-in-place, and phased decisionmaking.

The Preferred Alternative is the phased decisionmaking alternative. Under this alternative, decommissioning would be completed in two phases. This alternative involves substantial removal actions in the first phase. In addition, during the first phase, this alternative provides for additional site characterization and scientific studies to facilitate consensus decisionmaking for the remaining facilities or areas.

Phase 1 would include removal of the MPPB and the source area of the North Plateau Groundwater Plume. In addition, the lagoons and all facilities in Waste Management Area (WMA) 2 (except the permeable treatment wall) would be removed. The Vitrification Facility, the Remote Handled Waste Facility, and a number of facilities in WMAs 5, 6, 9, and 10 would also be removed. Foundations, slabs or pads from these facilities, as well as those from previously demolished facilities would also be removed. During Phase 1, a few facilities would continue under active management. These facilities include the Waste Tank Farm and its support facilities, the Construction and Demolition Debris Landfill, the non-source area of the North Plateau Groundwater Plume, the NRC regulated Disposal Area (NDA), and the State Disposal Area (SDA). Activities undertaken in Phase 1 would make use of proven technologies and available waste disposal sites to reduce the potential short-term health and safety risks from residual radioactivity and hazardous contaminants at the site.

Phase 1 activities are expected to take 8 to 10 years to complete. During this 8 to 10 year period, DOE and NYSERDA would conduct a number of activities to ensure the best technical approach to complete decommissioning of the remaining facilities and to facilitate interagency consensus, and to further public involvement. These activities would include further characterization of site contamination and additional scientific studies. These additional studies would be conducted to possibly reduce technical uncertainties related to the decision on final decommissioning and long-term management of the balance of WNYNSC. In particular, these studies may address uncertainties associated with the long-term performance models, the viability and cost of exhuming buried waste and tanks, the availability of waste disposal sites, and technologies for in-place containment.

While Phase 1 activities are being conducted, DOE and NYSERDA would assess the results of site-specific studies as they become available, along with other emerging information such as applicable technology development. In consultation with NYSERDA and cooperating and involved agencies on the EIS, DOE would determine whether new information would warrant preparation of a Supplemental EIS. NYSERDA also would assess the results of site-specific studies and other information during Phase 1. NYSERDA expects to prepare and issue for public comment an EIS, or to supplement the existing EIS, to evaluate Phase 2 decisions for the SDA and the balance of WNYNSC for which NYSERDA has responsibility.

Phase 2 decisions would be made within no more than 30 years of the DOE Record of Decision and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected. However, both DOE and NYSERDA are considering if this timeframe can be reduced. NYSERDA and DOE would strive to make a comprehensive Phase 2 decision for the entire site that is protective of public health and safety and the environment. For WVDP, Phase 2 actions would complete decommissioning or long-term management decisionmaking according to the approach determined most appropriate considering existing information and any new knowledge gained during the additional Phase 1 evaluations. For the SDA, alternatives that would be considered for Phase 2 actions would include at least: complete exhumation, close in place, and continued active management consistent with SDA permit and license requirements.

In December 2008, the DOE submitted a decommissioning plan to the US Nuclear Regulatory Commission (NRC) pursuant to its statutory obligation for decontaminating and decommissioning of the WVDP under the WVDP Act. The plan addresses Phase 1 of the two phases of the WVDP decommissioning. As stated previously, Phase 1 activities are expected to take 8 to 10 years to complete. The overall objective of the Phase 1 of the decommissioning is to remove certain facilities and remediate portions of the project premises to criteria for unrestricted release in the License Termination Rule in 10 CFR 20.1402, thereby fulfilling part of DOE's responsibilities under the WVDP Act for decontaminating and decommissioning the tanks, facilities, materials, and hardware used in the WVDP in accordance with requirements prescribed by the NRC. Phase 1 decommissioning activities are designed to support license termination for remediated portions of the project premises if license termination for all or part of the Center were to become an objective in Phase 2 of the decommissioning. The scope of the plan is limited to certain facilities on the north plateau area of the project premises and to removal of one major facility on the south plateau, the Radwaste Treatment System (RTS) Drum Cell. It is

anticipated that NRC will issue its technical evaluation report on the decommissioning plan in February 2010.

Currently the DOE-WVDP is taking steps to acquire contracts for future project activities including soliciting an acquisition for Environmental Characterization Support Services (ECSS) to be performed at the West Valley site. The ECSS contractor shall perform environmental characterization support services including, but not limited to, soil, sediment & groundwater characterization, environmental monitoring and associated regulatory documentation supporting decommissioning activities at the WVDP site in support to the DOE in satisfying regulatory requirements in the West Valley Demonstration Project Act and the New York State Energy and Research Development Authority (NYSERDA)/DOE Cooperative Agreements.

The ECSS scope includes comprehensive environmental task-based characterization services, including, but not limited to, the following:

- Work plan development and documentation, field data collection and sample analyses, civil survey support, non-intrusive geophysical data collection, buried infrastructure identification and mapping, data management, data validation, data reduction, interpretation, and presentation, statistics, geographic information system products, field summary reports, data summary reports (i.e., summary of data verification, validation, and assessment), and technical oversight of field investigation activities.
- Onsite activities will include subsurface field services (e.g., well drilling, soil borings, cone penetrometer testing, and related services) as well as surface soil, groundwater, surface water, and stream sediment characterization.
- Non-intrusive and field screening capabilities may be required (e.g., gamma walkover surveys, down-hole gamma surveys, non-intrusive geophysical surveys, etc.).
- As part of characterization activities, the contractor should be prepared to deploy and support in-field laboratory capabilities (radiological and chemical) as required and appropriate. Investigation-derived waste (IDW) management and disposition will also be included.

In addition to the ECSS, the DOE through the DOE Environmental Management Consolidated Business Center has begun contract acquisition actions for the follow-on contract to the present Interim End State contract that ends on June 30, 2011. On November 23, 2009 DOE released a Sources Sought announcement for small businesses and received numerous capabilities statements that are currently under review. A request for proposal for a scope of work, commensurate with the Preferred Alternative and Record of Decision of the Final EIS, is expected to be released in mid-2010.

THE AMERICAN RECOVERY AND REINVESTMENT ACT AT THE WVDP

The WVDP project has received approximately \$74 million in funding from the American Recovery and Reinvestment Act of 2009 (ARRA). This funding has two equally important purposes. The first is to accelerate cleanup of excess nuclear and contaminated facilities at the

site. In addition, this investment will create jobs, replacing a small portion of the jobs lost since 1996. The Western New York area has high levels of unemployment in many skilled trades that are needed at the WVDP. In addition, legacy radioactive waste will be dispositioned sooner to permanent disposal facilities, improving the long-term safety of the site and Western New York.

Specific ARRA work activities include:

- Main Process Plant Building (MPPB) Acceleration- This scope combines decontamination and decommissioning related removal tasks from the existing project baseline into an overall project to decontaminate and dismantle the MPPB so that it is demolition ready. Except for High Level Waste (HLW) canister storage and active systems needed for on-going safe operations and subsequent demolition, most areas in the MPPB will be in a “cold and dark” end state as a result of completing these activities. The decommissioning of the approximately 3250 m² (13,000 m² actual area of the five story structure) MPPB is on the critical path in the baseline schedule. To keep this scope on schedule, ARRA funding will recover the FY 2008 work as well accelerate future decommissioning by removing additional vessels and process piping from the MPPB.
- Tank & Vault Drying System- The scope of this task is to dry out and maintain the four Waste Tank Farm (WTF) tanks in a safe configuration until a final decommissioning decision is made by reducing the risk of liquid releases associated with HLW Tank heels presently contained in tank bottoms. It is expected that the tank and vault drying system will reduce corrosion and extend the life of the tanks. This activity will also provide additional decontamination of the Tank 8D-4 liquid and solidify and ship for disposal the decontaminated 8D-4 and 8D-3 liquid. This work supports EIS Decision making to safely manage the tanks in the near-term (up to 30 years) and defer final decision making. Following tank drying and storage period (up to 30 years), final closure decisions are anticipated. Isolations of the WTF and ventilation installation began in FY09 and are continuing.
- Process CH-TRU, mixed and legacy low-level waste- The scope of this task is to accelerate the processing of approximately 1,500 m³ of legacy Contact Handled-Transuranic (CH-TRU), Mixed and Low-Level Waste (MLLW) for off site disposal.
- Main Process Plant Building (MPPB) Liquids- The scope of this task is to install a MPPB liquids solidification system and process and remove approximately 68,000 liters of liquids to support the MPPB decontamination and eventual demolition. Installation of a solidification system to manage MPPB liquids would facilitate source removal from the MPPB and facilitate shipment of the solidified liquids offsite for disposal as low level waste.
- Demolition of O1-14 Building - The scope of this task is to decontaminate, dismantle, and demolish the O1-14 building and dispose of all generated waste. Historically this building contained the Acid Fractionator Cell, Off-Gas Treatment Cell, and iodine removal equipment. Later the building was retrofitted to support stabilization of supernatant into cement drums. Most recently the building held sodium bearing waste process equipment. The footprint of the O1-14 building is approximately 1,400 sq. ft.

This task does not include disposal of soil beneath the footprint of the building which should be addressed in the future. Isolations began in FY09 and are continuing as well as piping removal so that demolition can begin in FY 2010.

- North Plateau Groundwater Plume Mitigation- The scope of this task is to design and install a passive, permeable reactive barrier (PRB) to control the forward expansion of the Sr-90 groundwater plume at approximately the 10,000 pCi/L line and reduce Sr-90 release off the WVDP premises to no more than the DOE Derived Concentration Guideline (DCG) of 1,000 pCi/L at the project premises fence line and mitigate the expansion of the leading edge of the ground water contamination. This effort has reached the 30% design milestone with final design and construction expected in FY10.

The Office of Environmental Management (EM) Office of Project Management Oversight conducted a Project Review (PR) in September 2009 of the ARRA projects at the West Valley Project Office. The Independent Project review team was comprised of members from EM Headquarters and Consolidated Business Center. This review was conducted for the Assistant Secretary for Environmental Management, as Acquisition Executive, in consideration of approval for ready to proceed for construction. The review team has found the West Valley Recovery Act project documentation to be in order and in accordance with the “EM Recovery Act Portfolio Management Framework” and the “Independent Project Reviews for American Recovery Reinvestment Act of 2009 Projects Standard Operating Policies and Procedures” and ready to proceed for construction approval by the EM Acquisition Executive.

CONCLUSION

The WVDP is expected to undergo a significant source reduction during the execution of the Interim End State Contract by the decontamination of various nuclear facilities as well as the transportation and disposal of legacy and newly generated wastes. In addition tremendous progress has been made towards the goal of determining the decommissioning the WVDP with the issuance of the FEIS and Decommissioning Plan. Ongoing contract acquisition actions will prepare the WVDP to conduct future work commensurate with the Preferred Alternative and Record of Decision of the Final EIS.

