



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

October 14, 2009

Mr. Bryan Bower
Project Director
Department of Energy
West Valley Demonstration Project
10282 Rock Springs Road
P.O. Box 191
West Valley, NY 14171-9799

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION WEST VALLEY
DEMONSTRATION PROJECT MONITORING VISIT 2009-002

Dear Mr. Bower:

On September 15-17, 2009, Mark Roberts of this office conducted a routine monitoring visit at the Department of Energy's (DOE) West Valley Demonstration Project (WVDP) site to review ongoing decommissioning activities at the site. These activities are conducted and coordinated by DOE and their site contractor, West Valley Environmental Services (WVES). The purpose of the monitoring visits was to review activities associated with the solidification of main plant process building liquid wastes; the WVDP tank and vault drying system; and performance of high-hazard work activities. The results of this visit were discussed with you, members of your staff, WVES representatives, and a representative from the New York State Energy Research and Development Authority at the conclusion of the monitoring visit on September 17, 2009. Details of the NRC review are provided in the enclosed report.

Current NRC regulations are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Medical, Academic, and Industrial Uses of Nuclear Material**; then **Regulations, Guidance, and Communications**. You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 7:00 a.m. to 6:30 p.m. EST, Monday through Friday (except Federal holidays).

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and the enclosed report will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS) accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Please contact Mark Roberts at (610) 337-5094 if you have any questions about this report.

B. Bower

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Thank you for your cooperation.

Sincerely,

/RA/

Judith Joustra, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure:
Monitoring Report No. 2009-002

cc:
Paul Bembia, Program Director, NYSERDA
State of New York
Christopher Eckert, Lead Physical Scientist, DOE, WVDP

B. Bower

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Thank you for your cooperation.

Sincerely,

/RA/

Judith Joustra, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure:
Monitoring Report No. 2009-002

cc:
Paul Bembia, Program Director, NYSERDA
State of New York
Christopher Eckert, Lead Physical Scientist, DOE, WVDP

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**U.S. NUCLEAR REGULATORY COMMISSION
REGION I**

MONITORING REPORT

Monitoring Visit Number: POOM-032/2009002

Project Number: POOM-032

Location: West Valley Demonstration Project
10282 West Spring Road
West Valley, NY 14171-9799

Monitoring Visit Dates: September 15-17, 2009

Monitor: Mark Roberts, Senior Health Physicist
Decommissioning Branch
Division of Nuclear Materials Safety

Approved by: Judith Joustra, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

U. S. Department of Energy (DOE)
West Valley Demonstration Project (WVDP)

NRC Monitoring Report No. 09-002

In accordance with the WVDP Act of 1980 and as implemented by a Memorandum of Understanding between the DOE and the NRC, NRC Region I staff conduct technical monitoring visits at the WVDP site to review WVDP facilities and operations. NRC technical monitors use NRC Inspection Manual Chapter 0111, "Region I Monitoring Activities for the DOE West Valley Demonstration Project" as guidance for the monitoring visits. This report summarizes the monitoring visit conducted during the period of September 15-17, 2009 at the WVDP. The purpose of the visit was to review activities associated with the solidification of main plant process building liquid wastes; the WVDP tank and vault drying system; and performance of high-hazard work activities.

The NRC monitor interviewed cognizant personnel, performed field observations, and examined documentation during the visit. Based on this review, the monitor noted the following:

- Liquid wastes in a tank within the main plant process building will be stabilized in a concrete matrix for offsite disposal. The stabilization equipment has been located to take advantage of the current plant configuration and should be capable of processing additional wastes outside the current scope of activities. Waste characterization for both radiological and non-radiological components is in process to ensure that the wastes can be handled in this manner. (Section II)
- Liquid wastes from past operations are stored in four tanks at the west end of the WVDP site. A tank and vault drying system is being installed to eliminate the residual liquid within the tanks and tank vaults, eliminate the risk of a tank leak, and eliminate the intrusion of groundwater into the tank vaults. The first phase of the installation has commenced and is expected to be completed later in 2010. A special treatment system, located in a heavily shielded area and making use of remote handling equipment, has been designed to collect the large inventory of Cesium-137 (Cs-137) (14,000 curies) in the liquid waste. (Section III)
- Work activities are conducted in a manner that uses a graded approach to consider the types and levels of hazards that may be present for the assigned tasks. Work in high hazard areas involves significantly more safety reviews and appears well-planned and identifies industrial and radiological safety measures and equipment necessary to safely conduct the activities. The DOE and WVES staffs make use of industrial experience from other facilities to assess and confirm safety operations at the WVDP site. (Section IV)

REPORT DETAILS

I. Introduction

This report documents the NRC monitoring visit to the West Valley Demonstration Project (WVDP) site on September 15-17, 2009. The purpose of the visit was to review activities associated with the solidification of main plant process building liquid wastes; the WVDP tank and vault drying system; and performance of high-hazard work activities.

II. Solidification of Main Plant Process Building Liquid Wastes

A. Inspection Scope

The NRC monitor reviewed the activities being conducted and planned to install a solidification system for certain liquid radioactive wastes within the main plant process building. Monitoring activities consisted of interviews with cognizant personnel and field observations.

B. Observations

Project engineers have developed plans to process approximately 7500 gallons of liquid radioactive waste from a tank in the main plant process building. The liquid wastes will be stabilized as a concrete matrix in containers, that when filled, will meet the U. S. Department of Transportation regulations. The mixing equipment and containers will be set up in an existing pit adjacent to the spent fuel storage pit. Both pits have been emptied of their prior contents. The area was selected because hoisting equipment is already present in the building and a rail spur runs into the building. A conveyor system will be set up adjacent to the pit, but outside of the building, to bring in dry ingredients. A line will be run from the existing tank A1 to the pit area to bring in the liquid waste. The containers will be staged in the pit and the ingredients mixed in the containers. Each final package will weigh approximately 20,000 pounds. The liquid waste is currently being characterized for both radiological and non-radiological, hazardous components. Initial characterization of the liquids found a much lower pH than expected. Discussions with the project engineers indicate that adjusting the pH to a more neutral pH should not be a problem and the solidification process should not be affected. Additional plant liquid waste, not currently within the current scope of this activity, will likely be stabilized in a similar manner.

C. Conclusions

Liquid wastes in a tank within the main plant process building will be stabilized in a concrete matrix for offsite disposal. The stabilization equipment has been located to take advantage of the current plant configuration and should be capable of processing additional wastes outside the current scope of activities. Waste characterization for both radiological and non-radiological components is in process to ensure that the wastes can be handled in this manner.

III. WVDP Tank and Vault Drying System

A. Inspection Scope

The monitor reviewed the current plans for installation of a system to eliminate residual liquids in the four underground tanks in the WVDP tank farm and the treatment plans for handling and disposing of high concentrations of Cesium-137 (Cs-137) in the liquid in one of the tanks. The lead project engineer discussed the current plans for the project and accompanied the monitor

during a walk-down of the specific work areas. Monitoring activities consisted of reviews of documents, discussions with cognizant personnel, and field observations.

B. Observations

Liquid radioactive wastes from past operations are currently stored in four underground tanks at the west end of the WVDP site. Two large carbon steel tanks, 8D1 and 8D2, (each tank has a capacity > 500,000 gallons) are each located in their own tank vaults and are no longer in active service. The two smaller stainless steel tanks, 8D3 and 8D4 (14,000 gallon capacity) are located in a common tank vault and can still receive liquid wastes from certain processes. The tanks are not scheduled for removal during the current phase of decommissioning; however, plans have been formulated to address the residual liquid wastes in the tanks and in-leakage of groundwater into the tank vaults. The liquid radioactive waste in tank 8D4 contains approximately 14,000 curies of Cs-137 and will be handled through a special cleanup system to be installed in 2010.

The current tank ventilation system consists of above ground and underground components. Certain underground components appear to be the source of the groundwater in leakage. The remediation plans for the tank and vault drying system for the remainder of calendar year 2009 involve excavating a portion of the underground system; repairing and replacing selected components; and backfilling the excavated areas. During calendar year 2010, equipment will be installed that will flow warm air into the tanks to gradually evaporate the liquid contents and condense the evaporated water. The tanks will retain their radioactivity inventory as a damp or dried sludge at the bottom of each of the tanks.

In order to handle the high activity Cs-137 waste in tank 8D4 (approximately 740 microcuries/milliliter), a special treatment system will be installed in a heavily shielded area of a building adjacent to the tanks. The treatment system will consist of a series of process vessels containing a special zeolite material to collect the high concentration of Cs-137 in the liquid waste. Remote manipulator devices will be used to make and break the quick disconnections to the vessels and assist in maneuvering the vessels for hoisting into a shielded transport cask. The first process vessel in the series is expected to collect the majority of the Cs-137 activity and is expected to have a contact dose rate of approximately 7000 Roentgens/hour (R/hr). Plans have also been developed for hoisting the process vessels from the shielded collection area, moving the vessels on a rail system to the building exit, and loading the vessels into a cask located on the bed of a transport vehicle. This work is expected to commence and be completed in 2010.

C. Conclusions

Liquid wastes from past operations are stored in four tanks at the west end of the WVDP site. A tank and vault drying system is being installed to eliminate the residual liquid within the tanks and tank vaults, eliminate the risk of a tank leak, and eliminate the intrusion of groundwater into the tank vaults. The first phase of the installation has commenced and is expected to be completed later in 2010. A special treatment system, located in a heavily shielded area and making use of remote handling equipment, has been designed to collect the large inventory of Cs-137 (14,000 curies) in the liquid waste.

IV. Performance of High-Hazard Work Activities

A. Inspection Scope

The monitor reviewed selected high-hazard work activities and work documents and discussed the process for planning and authorizing remediation activities underway in the main plant process building. Monitoring activities consisted of discussions with cognizant personnel, review of documentation, attendance of work briefing meetings, and field observations.

B. Observations

In order to support the eventual decommissioning of the main plant process building, remediation activities are being conducted to remove the highly contaminated equipment, piping, and tanks from various rooms and cells in the building. Because these components were used in the reprocessing of spent nuclear fuel, high levels of contamination and significantly elevated radiation exposure rates are present in the areas being remediated. In addition to the radiological hazards associated with the contaminated components, many of the job tasks are made more difficult because of chemical hazards (e.g., waste acid) and the physical arrangement of certain work areas, i.e., some cells are over five-stories high, with access only from the top or bottom of the cell. Work in the five-story cells must be done on scaffolds or by suspending workers in "spider baskets" from the upper access points of the cells. Planning for these high hazard activities must include not only radiation protection concerns, but also consider industrial hazards such as confined space entries, fall protection, chemical protection, and the safe use of thermal cutting equipment.

The monitor discussed the process of identifying and planning work activities to account for multiple significant hazards with DOE and West Valley Environmental Services (WVES) representatives. The representatives discussed how a graduated approach is used to plan activities to account for the different hazards that may be present. Less involved tasks may be safely done using lower tiered preventive maintenance instructions or standard operating procedures. Jobs with more significant hazards involve the creation of a work instruction package (WIP). The creation of a WIP for a particular job involves answering a series of screening questions that are intended to identify the magnitude of potential hazards, hazard mitigation measures and controls, boundary conditions, applicable procedures, and training requirements. The final WIP lists general information and pre-requisites; lists materials, special tools, and equipment; specifies precautions and limitations; provides a sequence of instructions that identify any hold points; and specifies the post-completion configuration of the work area. The WIP generation process also involves the generation of specific Radiation Work Permits (RWP) and Industrial Work Permits (IWP) that specify required radiological and industrial safety measures and equipment that are required for the job. The approval of a WIP involves multiple approvals to ensure that all involved disciplines have been represented in the review process.

The monitor attended the pre-job, RWP, and IWP briefings for the task of obtaining radiological characterization smears and conducting an integrity test of the concrete floor in a highly contaminated room in the main plant process building. During these briefings, cognizant individuals provided an overview of the steps required for each of the major tasks to be completed and outlined the radiological and industrial safety measures that would be employed. Specific work assignments were confirmed with individual work crew members. The project lead engineer emphasized the "stop work" culture of the facility, i.e., any worker can stop work if the

worker believes that unsafe or unknown conditions are encountered. During the briefings, crew members were given the opportunity to ask questions and all questions were answered satisfactorily. Workers acknowledged their attendance at the briefings by signing the pre-job briefing, RWP, and IWP documents.

The DOE and WVES representatives emphasized their use of current industry experience and events for identifying potential hazards at the WVDP. Industrial events at other facilities are reviewed for their applicability to work activities at the WVDP site. Also emphasized were the pre-work safety discussions held by supervisory personnel during daily planning meetings and pre-job safety discussions held by each work crew. The DOE and WVES staffs have worked over 1.7 million hours without a lost-time work accident or illness.

C. Conclusions

Work activities are conducted in a manner that uses a graded approach to consider the types and levels of hazards that may be present for the assigned tasks. Work in high hazard areas involves significantly more safety reviews and appears well-planned and identifies industrial and radiological safety measures and equipment necessary to safely conduct the activities. The DOE and WVES staffs make use of industrial experience from other facilities to assess and confirm safety operations at the WVDP site.

V. **Meetings**

NRC Public Meeting on the WVDP Decommissioning Plan

On the evening of September 16, 2009, representatives from the NRC's Office of Federal and State Materials and Environmental Management Programs (FSME) and the Region I monitor participated in an NRC open house to update members of the public on the status of the NRC's review of the WVDP Phase I Site Decommissioning Plan. Technical staff prepared poster presentations on the regulatory process, dose modeling, erosion modeling, groundwater modeling, radiological surveys, and the regional monitoring activities for the WVDP site. Approximately 25 members of the public viewed the poster presentations and discussed items of interest with individual representatives of the technical staff.

Meeting with the New York State Energy Research and Development Authority (NYSERDA) Representatives to Discuss the Release of a Portion of the WVDP Site for Unrestricted Use

The monitor met with NYSERDA representatives to answer questions regarding the potential release of an area of the WVDP site that is not adjacent to the DOE project area. At this time, neither DOE nor NYSERDA has requested release of any areas of the site and NRC staff has not reviewed any requests for release of areas of the WVDP site.

Exit Meeting

The monitor presented the results of the monitoring visit to representatives from DOE, WVES, and NYSERDA at the conclusion of the visit on September 17, 2009. Representatives from DOE, WVES, and NYSERDA acknowledged the observations presented by the monitor.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Department of Energy

*Bryan Bower, Project Director
Pat Casey, Work Integration Control Manager
Christopher Eckert, Safety and Site Programs Team Leader
Geoff Gorsuch, Industrial Hygienist
David Gray, General Engineer, Facility Representative
*Craig Rieman, Deputy Director

NYSERDA

Paul Bembia, Program Director
*John Kelly, Program Manager
Andrea Mellon, Project Manager
Paul Piciulo, Program Liaison

WVES

*Sonja Allen, Senior Communications Administrator
*Charles Biederman, Regulatory Affairs
Lettie Chilson, Project Engineer
John Chamberlain, Technical Advisor
*Cindy Dayton, Communications Administrator
Joseph Ebert, Engineer
*John Gerber, Manager, Environmental, Safety, Health & Quality
Mark Hackett, Manager, High-Hazard Facilities & Site Projects
*John McKibbin, President and Project Manager
Dan Meess, Chief Engineer
*Laurene Rowell, Project Integration, Strategic Planning, and Communications
*Steve Warren, Deputy Project Manager

*Denotes attendance at the onsite out-briefing held on September 17, 2009.

PARTIAL LIST OF DOCUMENTS REVIEWED

Weekly Status Reports of WVDP Projects and Support Activities (various)

Monthly West Valley Demonstration Project Progress Reports (various)

WVES Work Instruction Package (WIP) Form, Work Control Number PWH-155207, "Remove Tanks 7D-11 and 7D-12 from the Hot Acid Cell (HAC)", June 18, 2009 and WVES Work Instruction Package (WIP) Field Change Form, Work Control Number PWH-155207, "Remove Tanks 7D-11 and 7D-12 from the Hot Acid Cell (HAC)", June 22, 2009

WVES Work Instruction Package (WIP) Form, Work Control Number LWTS-156987, "Remove Vessels 71-D-009 and 71-D-011 from XC-3", September 10, 2009

WVES Work Instruction Package (WIP) Form, Work Control Number VOG-157671, "Obtain Smears and Test Integrity of Off Gas Cell Concrete Floor", September 10, 2009

Attachment A from WVDP-485, Decision Tree for Proper Work Authorization

Briefing packages for the tank and vault drying system and the decontamination of Tank 8D-4 liquids

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
Cs-137	Cesium-137
DOE	Department of Energy
FSME	Office of Federal and State Materials and Environmental Management Programs
IWP	Industrial Work Permit
NRC	Nuclear Regulatory Commission
NYSERDA	New York State Energy Research and Development Authority
R/hr	Roentgens/hour
RWP	Radiation Work Permit
WIP	Work Instruction Package
WVDP	West Valley Demonstration Project
WVES	West Valley Environmental Services, LLC