



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

December 9, 2004

T. J. Jackson  
Acting Director  
Department of Energy  
West Valley Demonstration Project  
10282 Rock Springs Road  
P.O. Box 191  
West Valley, NY 14171-0191

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION MONITORING VISIT 2004-002

Dear Dr. Jackson:

This report summarizes the results of the monitoring visits of October 19-21 and November 17-19, 2004, at the Department of Energy's (DOE) West Valley Demonstration Project. The purpose of these monitoring visits was to evaluate activities associated with the preparation for packaging and eventual offsite disposal of three vitrification process components. These routine monitoring visits were conducted by Robert Prince and Chad Glenn (for the October visit). The results of these monitoring visits were discussed with you and other members of your staff on October 21 and November 19, 2004. Details of this review are provided in the enclosed report.

As a result of this review, the monitors determined that the three components were appropriately characterized, packaged, and prepared for offsite disposal in accordance with regulatory requirements.

Please contact me at (610) 337-5200 if you have any questions about this report.

Thank you for your cooperation.

*/RA/*

Ronald R. Bellamy, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

Enclosure:  
Monitoring Report No. 2004-002

cc:  
Paul Piciulo, Ph.D., Program Director, NYSERDA  
State of New York

T. Jackson  
Department of Energy

2

Distribution:

D. Screnci, RI  
D. White, RI  
R. Bores, RI  
C. Glenn, NMSS/DWM  
A. Bradford, NMSS/DWM

DOCUMENT NAME: E:\Filenet\ML043440043.wpd

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI	NNMS/		
NAME	RPrince		Rbellamy JJK	C. Glenn RJP4		
DATE	12/09/04		12/09/04	12/09/04		

OFFICIAL RECORD COPY

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

MONITORING REPORT

Monitoring Visit Number: P00M-032/2004002

Project Number: P00M-032

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

Visit Dates: October 19-21, 2004  
November 17-19, 2004

Monitors: Robert Prince  
Health Physicist

Chad Glenn  
Senior Project Manager

Approved by: Ronald Bellamy, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

## EXECUTIVE SUMMARY

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

NRC Monitoring Report No. 04-02

This report summarizes the monitoring visits conducted over the periods of October 19-21, and November 17-19, 2004, at the West Valley Demonstration Project. The purpose of these monitoring visits was to evaluate the efforts associated with the preparation for packaging and disposal of three vitrification process components. These components required specially designed and fabricated packaging. The monitoring visits evaluated the characterization and waste profile methodologies, the design and fabrication of the packages, and verification that packages were prepared for shipment and disposal in accordance with applicable regulatory requirements.

Characterization of the three components by DOE and their contractors was appropriate. Methodologies used to determine waste profiles were in accordance with acceptable industry practices and were sufficiently documented to support the characterization determination.

DOE and responsible contractors established appropriate design specifications for the construction and fabrication of the three containers. The containers were adequately designed, fabricated and inspected in accordance with scope of work documents. Adequate controls were implemented to monitor the procurement and fabrication of the containers

Proper controls have been established by DOE and responsible contractors to ensure the safe storage of the melter, melter feed hold tank (MFHT), and concentrator feed makeup tank (CFMT) containers while awaiting shipment for offsite disposal. DOE procedures specify adequate controls to ensure that onsite storage, control and monitoring of radioactive material is performed in a safe manner.

Packaging, handling and onsite storage activities were conducted in a safe manner in accordance with the scope of work documents. Adequate controls were established to ensure proper certification of hoisting and rigging equipment used for lifting and movement of heavy loads. A movement of a heavy load was observed to be performed in a safe and controlled manner. Personnel were adequately trained and qualified in the handling and movement of heavy loads.

Pre-job preparations and as low as reasonably achievable (ALARA) related measures were adequate in maintaining exposures ALARA for the removal and packaging of the melter. The use of mock-up training sessions and a temporary shielded enclosure were effectively utilized to maintain worker exposures ALARA. Radiological safety measures were adequately addressed in work instructions and the associated Radiation Work Permit (RWP).

## REPORT DETAILS

### **I. Introduction**

This report documents the monitoring visits to the West Valley Demonstration Project (WVDP) on October 19-21, and on November 17-19, 2004. The purpose of these monitoring visits was to provide an independent assessment of the characterization, packaging, onsite storage, and preparation for shipment and disposal of three vitrification process components in specially designed containers. Specifically, the evaluation included the concentrator feed makeup tank (CFMT), the melter feed hold tank (MFHT), and the melter used in the vitrification process.

### **II. Waste Profile and Characterization**

#### a. Inspection Scope

The inspector reviewed the waste characterization data, method used to determine activity amounts, and the development and application of waste stream scaling factors. The evaluation consisted of reviews of DOE and contractor reports, data packages and associated relevant information and interviews with cognizant personnel.

#### b. Observations

The inspector reviewed the characterization data developed by the primary contractor and applicable portions of the WVDP submittal of Nevada Test Site Waste Profile for Vitrification Process Components (letter DW:02004:0310, dated August 30, 2004). Additionally the inspector evaluated the calculation methodology used to determine the curie content of each component, and the sample analysis documentation associated with the development of nuclide-specific scaling factors. The inspector noted that a dose to curie conversion factor (DCF) was determined for each of the three packages. Based on measured dose rates and utilizing the specific DCF for each component, the curie content for Cs-137 was determined. Using appropriate sample data, the activity of other nuclides present, relative to calculated cesium levels, was used to calculate nuclide-specific scaling factors. Utilizing the DCF for Cs-137 and the appropriate scaling factors, the curie amounts for other radionuclides were determined. The methodology employed and supporting calculations were adequate to support proper characterization of the vitrification process components.

West Valley has established a formalized process to determine if a waste is or contains a residue in a form that could be high level waste. This program is detailed in West Valley Procedure WV-929, Waste Incidental to Reprocessing Determination. The inspector reviewed this procedure and discussed specific details with cognizant personnel. DOE representatives stated that a Waste Incidental to Reprocessing (WIR) determination had been performed for the CFMT and MFHT components. This determination concluded that neither component contained high-level waste. It was noted that the WIR determination for the melter was undergoing internal reviews.

#### c. Conclusions

Characterization of the three components by DOE and their responsible contractors was appropriate. Methodologies used to determine waste profiles were in accordance with

acceptable industry practices and were sufficiently documented to support the characterization determination.

### **III. Container Design and Fabrication**

#### **a. Inspection Scope**

A review of the design and fabrication of the three specially designed containers was performed. The evaluation included interviews with cognizant DOE and contractor personnel, review of associated design documentation, and field inspections of the fabricated containers.

#### **b. Observations**

The inspector reviewed the DOE Scope of Work package (PO#19-104320-C-LH), the contractor's Design Interface Document (4005-DI-001), the Data Package for the MFHT, and other documentation associated with the design and fabrication of the three containers. In addition, the inspector reviewed a DOE Material Receiving Inspection and Release Report (MRIR-04-0936) associated with the procurement of the CFMT container to ensure it met the requirements of a Type 2 Industrial Package (IP-2).

The inspector discussed contractor controls with cognizant DOE personnel, including the DOE project manager. The inspector noted that DOE had established adequate controls and processes to ensure contractor performance met the requirements specified under the Scope of Work. The inspector noted that the Design Interface Document had a concurrence review performed by DOE's primary contractor - West Valley Nuclear Services Company (WVNSCO). The inspector noted that DOE personnel performed independent surveillances of contractor work activities. The inspector reviewed a Supplier Surveillance Report (SR-04-091) performed onsite at the fabricator premises. The fabricator was responsible for the construction of the containers to be used for packaging the three vitrification components. This surveillance report evaluated the contractor welding program and included a review of contractor records and field observations. The surveillance report was comprehensive and adequately documented the scope and results of the surveillance. No safety concerns were identified.

The inspector reviewed the Data Package for the procurement and fabrication of the MFHT container. This review included such items as certification documentation associated with the procurement and fabrication of steel plating used in the construction of the container, in-process inspection data sheets for visual and magnetic particle inspections, material receipt and inspection reports, and welder qualification records. The inspector noted that individual welder qualifications and training certificates were available and current, and that welders were appropriately qualified to perform welding. The data package was noted to be comprehensive and adequately addressed appropriate aspects to ensure that the container was fabricated in accordance with the established design specifications. Similar data packages, though not specifically reviewed by the inspector, were also developed for the construction and fabrication of the CFMT and melter containers. No safety concerns were identified.

Prior to the October 19-21 monitoring visit, the CFMT and MFHT containers had been staged adjacent to the railcar loading station. The containers were visually inspected for the presence of any visible defects by the inspector. The containers were in good material condition with no

defects noted. An epoxy coating that is resistant to exposure from the elements was applied to the outer surfaces of the containers to further protect the integrity of the containers while awaiting offsite disposal. DOE representatives stated that these containers would be shipped for disposal in approximately 6 to 8 months. The inspector noted that caulking was applied to the seam of the container closure plates for the CFMT and MFHT to prevent intrusion of water and moisture.

The melter container was staged in the load-out facility during the October visit. On November 17, 2004 the loaded melter container was placed in the railcar loading station adjacent to the previously staged CFMT and MFHT containers (refer to Section V of this report). The melter container was inspected for the presence of any visible defects. This container also had an epoxy coating. The container was in good physical condition with no defects noted.

No safety concerns regarding the material condition of these containers were noted.

#### c. Conclusions

DOE and responsible contractors established appropriate design specifications for the construction and fabrication of the three containers. The containers were adequately designed, fabricated and inspected in accordance with scope of work documents. Adequate controls were implemented to monitor the procurement and fabrication of the containers.

### **IV. Monitoring and Surveillance Controls**

#### a. Inspection Scope

The inspector reviewed the administrative controls established to monitor the physical condition of the containers while staged onsite prior to transportation. Access controls to the storage area were also reviewed. The evaluation included interviews with cognizant personnel, review of applicable documentation, and field observations.

#### b. Observations

The inspector reviewed applicable sections of procedure SOP 09-24, Chemical Process Cell Waste Storage Area and Lag Storage Inspection. Section 5.2.1 of this procedure specifies the inspection criteria when conducting periodic inspections of radioactive material storage areas. These inspections are performed on a routine basis and address such items as inspecting for leaks, material condition of packaging, container integrity, and the presence of proper labeling among others. Procedure SOP 09-21, Lag Storage Operations, was also reviewed. This procedure describes the controls associated with the management and storage of radioactive material. The procedure specifies the established precautions and controls, including dose rate limits, associated with the onsite movement and storage of radioactive material at West Valley.

The inspector observed the storage location where the CFMT and MFHT are currently stored. Appropriate radiological postings were present. The inspector observed while DOE personnel performed surveys to confirm that radiation levels were appropriate based on measured dose rates at the boundary of the posted areas. Additional surveys were performed to confirm that

localized areas, measured on contact to the surface of the containers, were accurate. The inspector reviewed these survey results and previous surveys made by DOE contractor personnel on October 4, 2004. These surveys (number 126313 of the MFHT container #TC-472 and number 126320 of the CFMT container #TC-471) indicated that the highest contact dose rate readings were 41 mR/hr and 165 mR/hr to the MFHT and CFMT containers, respectively. The inspector reviewed radiological surveys for the melter container (TC-474). Survey number 127046 indicated that the highest contact dose rate reading for the melter container was 75 mR/hr, located on the top surface of the container. No safety concerns were identified.

c. Conclusions

Proper controls have been established by DOE and responsible contractors to ensure the safe storage of the melter, MFHT, and CFMT containers while waiting shipment for offsite disposal. DOE procedures specify adequate controls to ensure that onsite storage, control, and monitoring of radioactive material is performed in a safe manner.

**V. Packaging, Handling and Onsite Storage**

a. Inspection Scope

The inspector reviewed DOE and contractor preparation activities to support shipment and disposal of the three containers to ensure compliance with regulatory requirements. The inspection included review of records, interviews with cognizant personnel, and field observations.

b. Observations

The inspector reviewed DOE and contractor documentation, including calculations to determine the quantity of radioactive material and type package required for each of the three components.

The inspector noted that the material was classified based on the specific activity of the radioactive material present in the three components. Based on these calculations the CFMT and MFHT were classified as LSA (low specific activity) group II material while the melter was classified as LSA group III material (LSA-II and LSA-III respectively). The inspector noted that the characterization and waste profile data supported these designations based on LSA group specific activity limits specified in 10CFR49.

As of November 17, 2004, all three containers were staged adjacent to the railcar loading area located within the owner controlled property. The inspector observed the activities on November 17<sup>th</sup>, associated with the lifting of the melter container off the transport vehicle and the placement of the container onto the storage pad, adjacent to the CFMT and HFMT containers. This evolution involved the use of a 4-point gantry crane with a 500 ton capacity, to lift the melter container (161 tons) from the transport vehicle. After the container was raised from the vehicle, the transport vehicle was moved and the melter container lowered onto the storage pad. A 4-point lift was utilized with each lifting sling rated at 60 tons. Work was performed in a controlled and deliberate manner. The person in charge conducted a pre-lift briefing to ensure that workers were knowledgeable of their responsibilities. Good coordination

and communication was observed among all individuals, with the melter container safely placed onto the storage pad.

The inspector reviewed DOE's Scope of Work document (19-104539-C-LH) for removing the three containers from the vitrification facility. This document addressed hoisting and rigging controls, certification of hoisting and rigging equipment, training and certification requirements of crane operators, and additional requirements. The inspector reviewed selected certification reports supplied by contractors and equipment suppliers. Certification records for shackles, lifting clamps, and slings were reviewed. DOE Action Reports 12 and 12A were also reviewed. These Action Reports were associated with DOE's review of suppliers' certification records of slings and shackles used during the contract period. The reviews were adequately performed by WVNSCO and Quality Assurance personnel. The inspector noted that one Action Report contained a deviation stating the need for a supplier to specify the specific serial numbers for each sling contained in the certification package. This issue was addressed by the supplier and the inspector noted that certification reports included specific serial numbers for each piece of hoisting and lifting equipment.

DOE required contractor personnel to complete DOE's Hoisting and Rigging classroom and practical training courses. The inspector reviewed training attendance rosters to verify that appropriate contractor personnel attended the required training. The inspector noted that the contractor selected by DOE to perform the work had extensive experience in the handling and movement of heavy loads. No safety concerns were identified.

During the packaging of the melter into its container it was necessary to lift the container lid, which weighed approximately 18 tons, with a 15 ton rated-capacity crane (crane number 63-W-021). ASME code B 30.2-2001 specifies that under such conditions, a planned "engineered" lift may be performed provided that the load does not exceed 125% of the rated capacity, an evaluation is completed, and that certain measures are implemented. The inspector reviewed the evaluation performed to support the engineered lift and the pre-operational surveillance that was performed on the crane prior to the lift. The inspector determined that the requirements contained in the ASME code were adequately addressed to support the engineered lift.

While moving the melter from the vitrification facility to the equipment decontamination room (EDR) the melter became dislodged from the transfer rails. Rails were utilized to move the melter from the vitrification facility to the EDR, and into the shielded transport container. DOE personnel effectively evaluated the situation and subsequently, successfully repositioned the melter onto the rails.

### c. Conclusions

Packaging, handling and onsite storage activities were conducted in a safe manner in accordance with scope of work documents. Adequate controls were established to ensure proper certification of hoisting and rigging equipment used for lifting and movement of heavy loads. A movement of a heavy load was observed to be performed in a safe and controlled manner. Personnel were adequately trained and qualified in the handling and movement of heavy loads.

## **VI. Occupational Exposure Controls**

### **a. Inspection Scope**

The inspector reviewed DOE's program for the monitoring and control of radiation exposure associated with the preparation and packaging of the vitrification process components for shipment. The inspection consisted of field observations, review of ALARA work packages and radiological survey records, and interviews with cognizant personnel.

### **b. Observations**

The inspector reviewed the pre-job preparations and ALARA evaluations performed by DOE and DOE contractor personnel. The inspector discussed details associated with the packaging of the melter with the cognizant Radiation Protection Engineer responsible for the activity. Pre-job preparations included the review of contractor procedures, mock-up training sessions conducted at the manufacturer's facility, meetings with contractor personnel, and the development of task-specific dose estimates. ALARA reviews resulted in the use of fewer persons during various stages of the evolution, enhancements to contractor procedures, the design of a temporary shielding enclosure, improved tooling, and other dose reduction measures.

The inspector reviewed the Work Instruction Package (WIP) for the removal of the melter from the vitrification facility. This WIP document (VFS-112008-WIP) contained the ALARA-related and detailed work instructions associated with the movement of the melter. The instructions were comprehensive and adequately addressed ALARA-related measures and precautions. The inspector reviewed selected "Detailed Radiation Dose Estimate Forms" for the activity. Task-specific steps were adequately detailed together with estimated dose values for the various tasks. The RWP for this activity was RWP 2004-0288, Remove and Package the VIT Melter. The inspector reviewed selected signature sheets for this RWP to verify that individuals were aware of the RWP requirements. A dose estimate of approximately 4.2 rem was established for the job. Preliminary dose totals indicated that the actual exposure received for the task was approximately 1 rem. No safety concerns were identified.

### **c. Conclusions**

Pre-job preparations and ALARA-related measures were adequate in maintaining exposures ALARA for the removal and packaging of the melter. The use of mock-up training sessions and various ALARA initiatives were effectively utilized to maintain worker exposures ALARA. Radiological safety measures were adequately addressed in work instructions and the associated RWP.

## **VII. Management Meetings**

### **Exit Meeting Summary**

The inspector presented the monitoring visit results during out-briefing meetings with yourself and members of your staff, New York State Energy Research and Development Authority

(NYSERDA) representatives and others on October 21 and November 19, 2004. DOE and DOE contractor personnel acknowledged the observations presented by the inspector.

### Other Meetings

The inspector, together with the NRC Project Manager, attended a West Valley Citizens Task Force (CTF) meeting on the evening of October 20, 2004. Approximately 30 members of the public and the Committee and West Valley representatives were in attendance. The inspectors answered questions from members of the Committee and others in attendance.

### **Partial List of Persons Contacted**

#### Department of Energy

Ahmad Al-Daouk, General Engineer  
 \*\*\*Bryan Bower, Team Leader  
 \*David Cook, Facility Representative  
 \*\*\*T. J. Jackson, Acting Director  
 \*\*\*Herman Moore, Team Leader  
 \*Tom Vero, General Engineer

#### NYSERDA

T. Attridge, Senior Project Manager  
 Paul Bembia, Program Manager  
 Colleen Gerwitz, Program Manager  
 \*\*Paul Piciulo, Director  
 \*\*\*Ted Sonntag, Program Manager

#### WVNSCO

Dave Biela  
 \*M.J. Cain  
 \*Lettie Chilson  
 \*\*John Garcia  
 \*\*\*Jack Gerber  
 Jerry Liu  
 \*\*Larry Mryska  
 Harold Payne  
 David Ploetz  
 \*\*Laurene Rowell  
 Dan Smith  
 \*\*Doug Steffen, EVP/SAFSTOR Projects Manager  
 \*Joe Wolniewicz

\* Denotes attendance at the October 12, 2004 out-briefing.

\*\* Denotes attendance at the November 19, 2004 out-briefing.

\*\*\* Denotes attendance at both the October 12<sup>th</sup> and November 19<sup>th</sup> out-briefings.

**List of Acronyms**

ALARA	As Low As Reasonably Achievable
AR	Action Report
ASME	American Society of Mechanical Engineers
CFMT	Concentrator Feed Makeup Tank
CTF	Citizens Task Force
DCF	Dose-to-curie Conversion Factor
DOE	Department of Energy
EDR	Equipment Decontamination Room
IP	Industrial Package
LSA	Low Specific Activity
MFHT	Melter Feed Hold Tank
NYSERDA	New York State Energy Research and Development Authority
RWP	Radiation Work Permit
WIP	Work Instruction Package
WIR	Waste Incidental to Reprocessing
WVNSCO	West Valley Nuclear Services Company