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April 14, 1995
Contract No. NRC-02-93-005
Project No. 20-5706-002

U.S. NUCLEAR REGULATORY COMMISSION
ATTN: Mrs. Barbara D. Meehan
Contracting Officer
Division of Contracts
Mail Stop T7-12
Washington, DC 20555

SUBJECT: Waste Solidification Systems, Major Milestone 20-5706-002-550, Draft Safety Evaluation Report (SER) on the Vitrification Process and High-Level Waste Interim Storage (Review of WVNS-SAR-003, Revision 2, Draft D)

Dear Mrs. Meehan:

Enclosed is the Draft Safety Evaluation Report (SER) on the Vitrification Process and High-Level Waste Interim Storage (Review of WVNS-SAR-003, Revision 2, Draft D). With this transmittal, the requirement of the referenced milestone is complete.

The SER reflects the resolution status of the comments raised by the NRC/CNWRA team on the Draft SAR-003, Revisions C and D and the subsequent interactions with the WVNS staff during the DOE-NRC Joint Review Meeting. The nuclear criticality issues identified by Kim Hardin (NRC) and Gary Comfort (NRC) were addressed satisfactorily at the final review meeting with WVNS on February 14-16, 1994, and the SER identifies criticality as important to future monitoring activities. The seismic and off-gas issues have been reviewed in detail by the CNWRA staff, and they have concluded that the technical approach used is appropriate and there is adequate safety in the design of the vitrification facility.

The SER finds no areas of concern or question about the radiological safety resulting from the planned operation of the vitrification facility. This conclusion is reached by reviewing the WVNS-SAR-003 and supporting documents. It is to be noted that the WVNS-SAR-003, by itself, does not provide the details necessary to obtain a good understanding of all the safety systems that exist at the facility.

The format for this SER is adapted from DOE-SER preparation guidelines. The modifications to the format reflect the NRC role at West Valley that limits discussion of nonradiological issues.

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Please call me at (210) 522-5158 or Narasi Sridhar at (210) 522-5538 if you need any additional information.

Sincerely yours,

Wesley C. Patrick
President

NS/blg

cc: J. Linehan
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DRAFT SAFETY EVALUATION REPORT ON THE VITRIFICATION PROCESS AND HIGH-LEVEL WASTE INTERIM STORAGE

REVIEW OF WVNS-SAR-003, REVISION 2, DRAFT D

Prepared for

Nuclear Regulatory Commission
Contract NRC-02-93-005

Prepared by

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Center for Nuclear Waste Regulatory Analyses
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April 1995

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ABSTRACT

This safety evaluation report (SER) reviews the radiological safety aspects of design and operation of the Vitrification Process (VP) and High-Level Waste Interim Storage (HLWIS) at the West Valley Demonstration Project (WVDP) in West Valley, New York, as documented in the Safety Analysis Report WVNS-SAR-003, Revision 2, Draft D. The VP is being undertaken to transform the liquid inventory of radioactive high-level waste into a more stable and less hazardous waste form—canistered borosilicate glass.

The SER provides background information on the WVDP facilities with respect to modifications made for the VP and HLWIS. Radiological hazards are discussed, and those factors governing design are identified as seismic loads and tornadoes and tornado-generated missiles, for most radiologically important structures, systems, and components. The design philosophy at the WVDP is reviewed as it relates to multiple barriers for control of radiological contamination, use of ventilation zones for direction of airborne contamination away from occupied areas, defense-in-depth, and as-low-as-is-reasonably-achievable (ALARA). Individual systems and components within the scope of WVNS-SAR-003 are reviewed with respect to margins of safety and incorporation of key design concepts. Radiological doses for normal operations, design basis events, and beyond design basis events are reviewed with respect to WVDP evaluation guidelines and NRC-established permissible levels. Administrative features of VP operations and programmatic considerations are also reviewed. Conclusions from the review indicate that no comments remain open that are critical to the safe operation of the facility.