

Responses to Comments on Draft WVDP Vitrification Melter WIR Evaluation

To provide greater transparency to the Department of Energy's (DOE) cleanup of nuclear legacy waste, DOE made the "West Valley Demonstration Project Draft Waste Incidental to Reprocessing Evaluation for the Vitrification Melter" (Draft WIR Evaluation) available for public and state review and comment and Nuclear Regulatory Commission (NRC) consultation review. The public comments on the Draft WIR Evaluation were submitted to DOE by one individual and two organizations:

- Raymond C. Vaughan, PhD.,
- The West Valley Citizen Task Force, and
- The Coalition on West Valley Nuclear Wastes.

No states submitted comments.

To address comments and/or concerns raised by public stakeholders, DOE has grouped the comments and responses to comments as follows:

- Legal Basis and Authority
- Waste Management (WM) Environmental Impact Statement (EIS)
- Concentration Averaging
- Melter Flushing Solutions

Legal Basis and Authority

DOE received comments from the public questioning DOE's authority to apply the DOE Manual 435.1-1, *Radioactive Waste Management Manual*, Waste Incidental to Reprocessing (WIR) criteria to the vitrification melter, asserting that the melter is high-level waste (HLW) in accordance with the West Valley Demonstration Project Act (WVDPA) and questioning the basis for changing the definition for waste to be disposed offsite.

DOE disagrees that the vitrification melter is HLW within the definition of the WVDPA, and that its responsibilities and authorities under the WVDPA or other applicable law are misapplied in regard to its plans for disposal of the melter. DOE has planned for disposal of the melter at an offsite location, as part of its responsibilities for disposal of low-level waste (LLW) resulting from the demonstration project. Waste that is targeted for offsite disposal must meet the Waste Acceptance Criteria (WAC) of the offsite disposal site or facility, in this case the WAC at either Area 5 at the Nevada National Security Site or the Waste Control Specialists Federal Facility Waste Disposal Facility. Although not applicable here, any wastes which are incidental to reprocessing that remain on site must meet the criteria prescribed by NRC in its "Decommissioning Criteria for the West Valley Demonstration Project; Final Policy Statement."

DOE is following applicable legal and procedural requirements to carry out its responsibilities under the WVDPA and dispose of the melter. The WIR Evaluation is predicated on the criteria for determining whether waste is incidental to reprocessing (evaluation method), as set forth in Chapter II.B.(2)(a) of DOE Manual 435.1-1,

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Radioactive Waste Management Manual, which accompanies DOE Order 435.1, *Radioactive Waste Management*. Both DOE Manual 435.1-1 and DOE Order 435.1 were issued pursuant to DOE's authority under the Atomic Energy Act of 1954, as amended, after consideration of public comments. As explained in Chapter II.B. of DOE Manual 435.1-1, waste which is determined to be incidental to reprocessing is not HLW.

WM EIS

The Final West Valley Demonstration Project WM EIS evaluated waste management and disposal alternatives for WVDP wastes, including the vitrification melter. The Record of Decision (ROD) for the WM EIS was issued in 2005.

In 2006, DOE issued the WVDP WM EIS Supplement Analysis, and it included a specific review of the impacts of transporting for disposal the Vitrification Melter and two other vessels used in vitrification processing. The Supplement Analysis concluded that the impacts for transporting these processing components were only a small part of the total impacts evaluated in the EIS and did not represent a substantial change to the proposed action evaluated in the WM EIS relevant to environmental concerns. Further, based upon the Supplement Analysis, DOE determined that there were no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

DOE took many opportunities to keep the public informed regarding the disposition of the vitrification melter and these vessels as part of its public outreach process on the Supplement Analysis, such as discussions at Quarterly Public Meetings and West Valley Citizen Task Force (CTF) meetings. The CTF was briefed on the intended packaging and disposition of the components (including the melter) on September 27, 2004. In response to the CTF's request for more specific information regarding the safety of moving the Vitrification Melter and vessels to outside storage, DOE provided that information at the October 20, 2004, CTF meeting. DOE also requested NRC to review and respond to public concerns regarding safe storage of these components. To this end, NRC staff performed two monitoring visits at the site in 2004 and concluded that the vitrification melter had been characterized, classified, and packaged in accordance with the applicable regulatory requirements. As explained in the "Waste-Incidental-to-Reprocessing Evaluation for the West Valley Demonstration Project Vitrification Melter" (Final WIR Evaluation), NRC confirmed these conclusions in its "Technical Evaluation Report for the Draft Waste Incidental to Reprocessing Evaluation for the Vitrification Melter" (Technical Evaluation Report), issued September 30, 2011.

In summary, DOE conducted appropriate environmental analyses in 2005 with the WM EIS and in 2006 with the Supplement Analysis, informed the public of its activities, was responsive to public concerns concerning the melter and the WIR process in general, and consulted with the NRC and obtained NRC's Technical Evaluation Report for the Vitrification Melter.

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Concentration Averaging

As discussed in the Draft and Final WIR Evaluations, the total waste concentration of the vitrification melter (after removal of key radionuclides to the maximum extent technically and economically practical) was determined by the sum of fractions rule in accordance with NRC's regulations at 10 CFR 61.55 (and parallel requirements in § 336.362(a)(7) of the Texas Administrative Code), using radiological characteristics of the vitrification melter waste package before grouting. Using the sum of the fractions rule specified in NRC (and State of Texas) regulations, the vitrification melter waste package meets the concentration limits for Class C low level waste. Furthermore, the melter will be grouted for enhanced stability during transportation to the disposal site and disposal at the selected location. As explained in Section 6 of the Final WIR Evaluation, the Class C calculation results were conservative because (1) the mass of the stabilizing grout was not used in the calculation (which would have been acceptable under NRC guidance), (2) radioactive decay that has reduced the amounts of shorter-lived radionuclides in the melter was not taken into account, and (3) the inherent conservatism in the melter total radioactivity estimate.

Melter Flushing Solutions

Key radionuclides were removed to the maximum extent technically and economically practical from the vitrification melter using processing vitrification system decontamination (flush) solutions and the Evacuated Canister System. The flushing solutions were mixed with glass formers and resulted in Vitrification Batches 76 and 77 as part of the final effort to remove key radionuclides to the maximum extent technically and economically practical from the Vitrification System. The flush solutions consisted of nitric acid, increasingly dilute radioactive waste solutions, non-radioactive simulated waste and glass formers. Two evacuated canisters were used to remove as much of the remaining glass as technically and economically practical from the melter upon shut down. The canisters generated from Batches 76 and 77 and the two evacuated waste canisters are in storage in the HLW Interim Storage Facility with the HLW canisters.

Consideration of Comments and Resulting Changes to the Draft Evaluation

DOE considered all public comments received along with the comments and the Technical Evaluation Report received from NRC before finalizing the Final WIR Evaluation, as discussed in Section 1.3 of the Final WIR Evaluation. Among the resulting changes were changes regarding concentration averaging and melter flushing solutions.

The changes regarding concentration averaging including adding a footnote explaining that it would have been acceptable under NRC guidance to account for the mass of the stabilizing grout to be used to encapsulate the vitrification melter within its waste package, which would have resulted in a smaller Class C sum of fractions (footnote 58 on page 71). Information was also included on page 71 to describe other conservatism in the sum-of-fraction calculations, used to demonstrate that the vitrification melter waste package does not exceed concentration limits for Class C LLW.

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The changes regarding the flushing solutions involved revising Section 4 of the Final WIR Evaluation to more clearly describe vitrification system flushing and how processing the decontamination flush solutions in the vitrification melter effectively removed key radionuclides from the melter before use of the evacuated canisters. Information on the disposition of the flush solutions was also included in the Final WIR Evaluation.