UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

September 15, 2023

OFFICE OF
AIR AND
RADIATION

Mr. Mark Bollinger
Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221

Re: Addition of Four New Shielded Containers

Dear Mr. Bollinger:

The U.S. Environmental Protection Agency (EPA or Agency) has received and reviewed the Planned Change Notice (PCN) submitted by the Department of Energy (DOE) on April 25, 2023, under 40 CFR § 194.4(b)(3)(i). The PCN addresses the addition of four new lead shielded container variants (SC-30G2, SC-30G3, SC-55G1 and SC-55G2) that will reduce the dose rate of remote handled (RH) transuranic waste to below the 200 millirem per hour (mrem/hr) limit prescribed by the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act so that they can be handled and emplaced in the WIPP like contact handled (CH) waste. EPA has completed review of the PCN and finds that it is consistent with the terms of existing certifications.

On November 15, 2007, DOE submitted a planned change request (PCR) for SC-30G1, the original shielded container that would allow for RH waste to be handled as CH waste.[1] In the 2007 PCR, DOE provided several analyses, including a performance assessment (PA) that indicated that impacts to repository long-term performance would be minimal. EPA reviewed the documentation, agreed with the assessment, and accepted the PCR.[2] The four new shielded containers in the 2023 PCN (SC-30G2, SC-30G3, SC-55G1 and SC-55G2) are variations on the shielded container SC-30G1 because they are thicker and heavier. The table below provides a comparison of the shielded containers.

During its review of the 2023 PCN, EPA had additional questions on the new shielded containers, which were conveyed through several email correspondences with DOE. These questions and responses are summarized in the Enclosure.

The Agency will continue to use its regular waste characterization and site inspections to verify the emplacement of containers in the repository as well as DOE's measurements of the external dose of all containers. As with our previous approval, we expect DOE to maintain a consistent measurement approach complex-wide to ensure the surface dose rate of these RH waste containers remains below the limit of 200 mrem/hr for CH waste.

[1]Letter from David C. Moody, DOE/CBFO to Juan Reyes, Director, Radiation Protection Division, EPA, titled: Transmittal of Planned Change Request for Shielded Containers (November 15, 2007).
[2]Letter from Jonathan Edwards, Director, Radiation Protection Division, EPA to Edward Ziemianski, Acting Manager, DOE/CBFO (August 8, 2011).

Comparison of Shielded Container Variants					
	Outer Diameter (in.)	Height (in.)	Total Thickness (in.)		Weight (lbs)
			Steel	Lead	
SC-30G1 (original)	23	35.75	0.313	1.0	1851
SC-30G2	24.5	36.375	0.625	1.25	2610
SC-30G3	28	42.25	1	2.75	5750
SC-55G1	29.375	40.5	2.25	-	2810
SC-55G2	31	45.75	1	2	5900

EPA also notes that use of these shielded containers rather than boreholes to emplace RH waste will increase both the steel and lead inventories of the repository. In future PAs, EPA expects DOE to assess both lead and steel surface areas to determine their effects on anoxic corrosion and repository gas generation. These issues were previously raised in EPA's review of the 2019 Compliance Recertification Application (CRA-2019, issues 47 and 26).[3] In future PAs, the Agency, through its review of DOE's Performance Assessment Inventory Report, will verify how these containers impact the volumetric disposal limit for transuranic waste and the facility design. If you have any questions, please contact Tom Peake at (202) 343-9765.

Sincerely,

Lee Veal Digitally signed by Lee Veal Date: 2023.09.15 10:52:51 -04'00'

Lee Ann B. Veal
Director
Radiation Protection Division

Enclosure (1)

cc: Tom Peake, EPA ORIA
Dan Schultheisz, EPA ORIA
Jay Santillan, EPA ORIA
Ray Lee, EPA ORIA
Harry Shah, EPA Region 6
EPA WIPP Team
Betsy Forinash, DOE CBFO
Michael Gerle, DOE CBFO
Anderson Ward, DOE CBFO

[3]Letter from Tom Peake, Radiation Protection Division, Director, Center for Waste Management and Regulations, EPA, to Michael Gerle, Director, Environmental Regulatory Compliance Division, DOE/CBFO (June 30, 2022).

Enclosure

EPA questions on shielded containers provided to DOE via email. DOE Responses are in *italics.*

1. What is the maximum dose rate that can be placed in each of the new shielded container variants?
   Remote handled (RH) waste is limited to 1,000 R/hr in accordance with the Land Withdrawal Act. This is the limit on the surface of a drum placed inside a shielded container. The shielded container surface dose rate is limited to 200 mrem/hr.

2. What are the general plans for each of the containers (i.e., which wastes are being put in which container)?
   The RH waste that will be emplaced in shielded containers is included in the current inventory for the WIPP. Candidate RH waste streams for shipment and disposal in shielded containers have been selected based on the requirement to keep the radiation surface dose rate below 200 millirems per hour (mrem/h). These waste streams and containers will remain designated as RH waste in the WIPP Waste Information System (WWIS). In other words, RH-TRU waste (compliant with TRAMPAC/WAC requirements) will be shielded down to CH level dose rates when loaded in the shielded containers. Some of this inventory would have originally been destined for RH-TRU 72-B shipments.

3. Is DOE actually planning to put 1,000 R/hr waste in a shielded drum or is DOE wanting to keep its options open with the statement you made quoting the LWA?
   The shielded containers are capable of handling levels much greater than 1,000 R/hr depending on the energy and distribution of the source, however the LWA limits what can come to WIPP to 1,000 R/hr.

4. Is there a procedure or set of guidelines for a site to use that governs the decision of the R/hr level that can go into a particular container? Please provide it/those if it/they exist.
   No, there is no written procedure or guideline that is specifically used. Historical knowledge based on containers that have passed and failed previously, is used in choosing which drums to place in SCAs. Ultimately, it is ensuring that the dose rate on contact is less than 200 mrem/hr that drives loading.

5. Is there documentation that shows a correlation between internal waste dose rate and external dose for the different shielded containers? If so, please provide it.
   No, there is not documentation that shows a correlation. The shielded containers were designed considering two predominant radionuclides, Cs-137 with relatively low gamma energies and Co-60 with relatively high gamma energies. These were chosen as the basis for the shielded container designs to ensure that radial and axial shielding configurations were balanced. Dose rates at the surface of the payload drum were not calculated because the maximum payload drum surface dose rate is highly dependent on:
      1. *the gamma energy of the contents.*
      2. *the source location(s) within the drum*
      3. *the payload drum contents material(s) and density(ies).*