UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 15 2008

OFFICE OF
AIR AND RADIATION

Dave Moody, Ph.D., Manager
Carlsbad Field Office
P.O. Box 3090
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Dear Dr. Moody:

We have been reviewing the Department of Energy's (DOE) submittal for its remote-handled (RH) shielded container planned change request (EPA Docket: II-B2-31). In this request, DOE is proposing to emplace lead-lined waste containers (steel drums) with RH waste in disposal rooms in addition to placing RH waste in room walls as is presently approved. In our review we have identified documents that we need for our technical review. The attachment contains a list of documents that we request you provide to us.

We have also listed in the attachment a few issues that need additional development or documentation. For example, in DOE's 1995 RH TRU Study (DOE/CAO 95-1095) developed for the original certification, DOE took credit for the emplacement of RH canisters in the wall of the disposal room. In that study credit was applied to the solubilities (discussed on page 27 of the report) and intrusion probability (discussed on page 40 of the report; see comment 9). EPA believes it is prudent for DOE to assure that the introduction of RH waste into the rooms does not negatively influence these credits in performance assessment (PA), in the lines of reasoning used for the credit, or even assumptions related to repository performance. Thus, DOE needs to examine documents in which DOE may have taken credit for RH in the walls and explain how they affect the current PA. EPA will also continue to look for areas affected as well.

If you have any questions on this topic, please contact Tom Peake at (202) 343-9765.

Sincerely,

Juan Reyes, Director
Radiation Protection Division

Enclosure

cc: Electronic Distribution
Frank Marcinowski, DOE/EM
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Bev Crawford, LANL
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EPA Docket

ATTACHMENT
April 2008

First Completeness Comments on the Department of Energy's (DOE) submittal for its remote-handled (RH) shielded container planned change request

1. Burns 2005 is cited in Crawford and Taggart 2007 as the source of information on masses of some CPR materials. We were not able to locate this document on the CREL system and would like a copy for review. The same comment applies to Donner 2007.

2. Footnote 1, page 5 of Crawford and Taggart 2007 indicates that there are "87 RH waste streams" while Section 2.2.1 of Dunagan et al. 2007 states that there are "77 RH waste streams." The 2004 Baseline Inventory Report (DOE/TRU-2006-3344) also lists 77 waste streams in Table E-2. Please clarify the reason for this difference.

3. Section 5.1 of Crawford and Taggart 2007 state that activity concentrations were multiplied by gamma factors from Shleien 1992 to identify dominant gamma emitters. Can DOE provide spreadsheets or other documentation that describe the procedures used?

4. Section 5.1 of Crawford and Taggart also notes that Microshield 6.02 was used to determine the maximum activity loadings for shielded containers to establish the maximum activity that would result in a dose rate of < 200 mrem/hr. Can DOE supply spreadsheets or other documentation that present details of the procedures used? How was conversion from exposure (mR/hr) to dose (mrem/hr) accomplished?

5. Section 6.2 of Crawford and Taggart 2007 states that the masses of lead and steel in the shielded containers were obtained from "Shielded Container Project Guidance." Please provide this documentation.

6. Where are the input/output files for the Microshield calculations located? How do we obtain copies of selected calculations? We note that the example calculations used in Attachment 2 of Crawford and Taggart 2007 does not include any signoff that the calculations have been checked. Provide information that Microshield has been qualified for its intended use and documentation verifying that these calculations were performed adequately.

7. Section 5.1 of Crawford and Taggart 2007 provides no reference to the data source used to determine the dominant gamma emitters. Please provide us with a reference and a copy of the cited document.

8. Sections 6.3 and 6.4 of Crawford and Taggart 2007 provides no reference as to the source of data in Tables 9 and 10. Please provide us with a reference and a

copy of the cited document. We note that the waste stream volumes in Table 10 are different from the waste stream volumes in DOE 2006. Please explain the source of the differences.

9. From 1995 RH TRU Study (DOE/CAO 95-1095)

   - Solubilities discussed on page 27 (RH Study 1995), Item 1 takes credit for RH emplacement canisters placed in the walls, "provide a barrier to the transport of radionuclides". In the conclusions on page 27 it states; "...(2) the RH-TRU waste package and configuration, which will limit brine accessibility to waste during the period when RH radionuclides are present in high concentrations." It would seem appropriate that using the new emplacement configuration this reasoning needs to be revisited. Does any of the new documentation provided sufficient information to deal with this adequately?

   - Intrusion Probability: It states on page 40 of DOE/CAO 95-1095 (RH Study 1995); "The probability for the RH-TRU activity level (5) is based on the relative area of RH-TRU waste emplacement to the total waste emplacement area." It also states; "the intrusions into the lower probability RH-TRU canister must be calculated and the release from this intrusion must be significant in comparison to intrusions calculated for the range of activity of [contact-handled] CH-TRU. The identical CCDFs indicate that there were no significant consequences from intrusions into RH-TRU canisters compared to the CH-TRU activity levels." When one considers the new RH waste configuration it seems like this analysis needs to be redone. Does any of the new documentation provided sufficient information to deal with this adequately?

   Are there other "historical" issues, such as assumptions, reasoning, or commitments previously made that may influence taking RH originally planned to be placed in the walls of rooms and placing this RH waste in shielded containers onto the floor of a disposal room?

10. Stakeholders have voiced concerns about the possibility of the shielded container lead melting and not being fully protective if subjected to high temperatures that may be encountered with a fire. EPA believes that DOE should respond to this issue. We understand that lead melts at 621.5°F (327.5 °C). Would a fire in the repository increase the shielded container internal temperature sufficiently to melt lead as postulated by stakeholders?

11. DOE has published an inventory update and that some of the inventory information has changed since the shielded container analysis was conducted. EPA believes it is appropriate to compare the new inventory data to the inventory data used in the calculations done to support the shielded container change request to determine the impact of these changes and their effect on the candidate waste calculation. Therefore, EPA expects DOE to compare the new inventory to the

inventory used in the shielded container change request calculations and determine the impact of these inventory changes.

12. EPA plans to visit DOE/SNL in the near future to evaluate the shielded container performance assessment calculations (SCPA) done to support the shielded container change request. EPA will examine all aspects of these calculations to confirm that they were performed properly. In addition, the Agency will verify that correct and qualified computer codes, parameter values, input files, and appropriate scripts were used to perform the SCPA calculations. Please provide the appropriate modeling (PA and Microshield) documents.

13. A key issue controlling the shipment of RH waste in shielded containers is the Land Withdrawal Act (LWA) requirement that the surface dose of CH waste be 200 mrem/hr or below. EPA has been observing the implementation of procedures used at waste generator sites to measure the surface doses of drums. EPA has observed that the characterization procedure is comparable but implemented slightly differently between the sites. We noted at Savannah River Site (SRS) that the bottom of the container is actually measured by tilting or lifting with equipment, but at Los Alamos National Laboratory (LANL) they do not measure the bottom of the container for safety reasons. From these visits we have developed some initial questions. For example, how will DOE assure that measurements of surface dose are adequately consistent from site to site? We are concerned that an errant drum may be disposed at WIPP and have to be removed at a later date.

    How will instrument and measurement error be incorporated into the measurement process? How is this handled in current procedures? How will hot spots (close to one side or the bottom of the shielded container) be handled at each site? For example, if a CH drum has a measurement of 190 mrem/hr, given the potential errors, how is it treated now? We understand that for CH waste these issues are part of the work every day, but it seems that the limit of 200 mrem/hr may be approached more often with RH waste. EPA believes that it is important that, for RH waste to be shipped and handled as CH waste at WIPP, a shielded container would have to be below the surface dose requirements of the LWA.

References:

Burns 2005. *Estimates of Cellulose, Plastic, and Rubber Based TWBID, Revision 2.1, Data Version D.4.1.6*, Los Alamos National Laboratory , Carlsbad NM, INV-0607-01-46-26.

Crawford and Taggart 2007. *Analysis of RH TRU Wastes for Containment in Lead Shielded Containers.* Los Alamos National Laboratory, Carlsbad Operations. INV-SAR-08, Revision 0.

DOE 2006. *Transuranic Waste Baseline Inventory Report-2004*. DOE/TRU-2006-3344.

Donner 2007. *Specification for the RH-TRU Drum Handling Bag*. Washington TRU Solutions. Carlsbad NM, Specification E-1-473.

Dunegan et al. 2007. *Analysis Report for the Shielded Container Performance Assessment, Revision 1.0*. Sandia National Laboratories.

RH Study 1995. *Remote-Handled Transuranic Waste Study*. DOE/CAO 95-1095. October 1995

Sellmer T. 2007. *Final Container Design, Shielded Container*. Washington TRU Solutions. Carlsbad NM. ERMS 547052.

Shleien, Bernard 1992. *The Health Physics and Radiological Handbook*, Scinta, Inc.