



**Department of Energy**  
Carlsbad Field Office  
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**MAY 11 2005**

Ms. Elizabeth Cotsworth, Director  
Office of Radiation and Indoor Air  
U. S. Environmental Protection Agency  
Ariel Rios Building, 6601J  
1200 Pennsylvania Ave., N.W.  
Washington, DC 20460

Subject: Hanford Tank and K-Basin Wastes

Dear Ms. Cotsworth:

In a telephone conversation in early April 2005 Environmental Protection Agency (EPA) staff asked some additional questions concerning the Hanford Tank and K-Basin transuranic (TRU) waste inventories included in the Waste Isolation Pilot Plant (WIPP) Compliance Recertification Application (CRA). These questions were based on their review of information previously provided in my letter dated March 18, 2005 in responding to your December 17, 2004 letter concerning this subject. Some of these informal verbal questions were addressed in a teleconference between Department of Energy (DOE) staff, EPA staff and Hanford site personnel on April 13, 2005. Three questions remain to be answered from this exchange as listed below. For your convenience, a brief answer is provided and additional responsive information is enclosed with this response, as indicated.

- 1) It is stated that the mechanical removal of cladding creates waste that is not high level waste. How does DOE make the connection that chemical removal of cladding is also not high level waste?

**Brief Answer:** The NRC has not distinguished between chemical and mechanical means to separate radioactive hulls (i.e., cladding) from irradiated reactor fuel. Further, the NRC, denying a petition for rulemaking by the States of Washington and Oregon, stated that

“the [AEC] specifically noted that the term HLW [high-level waste] did not include ‘incidental’ waste resulting from reprocessing plant operations, such as ion exchange beds, sludges, and contaminated laboratory items such as clothing, tools, and equipment. Neither were radioactive hulls and other irradiated and contaminated fuel structural hardware encompassed by the Appendix F definition.”

See 58 FR 12342 (March 4, 1993). Thus, the Department has concluded that radioactive cladding is excluded from the definition of high-level waste.

- 2) Does the K-Basin sludge contain chunks of spent nuclear fuel, or has all of the residue been dissolved?

Brief Answer: K-Basin sludge designated for disposal at WIPP and included in the CRA TRU waste inventory contains no "chunks" of spent nuclear fuel. Wastes generated from spent fuel cleaning activities are distinguishable from other K-Basin wastes. Cleaning activities associated with the removal of N-Reactor fuel from the K-Basin involved a sequence of washing, straining and collection through a system that included Knock-Out Pots and Settler Tanks. These are closed systems which did not mingle with sludge in other locations of the K-Basins. Because these treatment systems are closed, materials derived from these systems contain very little sand, dirt, silt or other foreign, material making them distinguishable from other K-Basin wastes.

- 3) Why is the knock out pot sludge so similar to N – reactor fuel?

Brief Answer: See brief answer to question 2, above. Large chunks of spent N-Reactor fuel and corrosion products were removed and packaged into multi-canister overpacks and managed as spent nuclear fuel scrap or debris. The resulting wastes were washed through a piping system, using the same water used to wash the spent fuel, to a series of strainers and collection containers; the Knock-Out-Pots and Settler Tanks. Wastes leaving the Knock-Out-Pots contained particulate matter less than 500 microns in size. This waste was sent to the Settler Tanks to allow particulate matter to settle further. Materials collected from this process will be managed as either debris or spent fuel.

In response to question 1, enclosure 1 and its attachments provide additional historical regulatory information regarding the Department's assertion that cladding hulls from the Hanford tank wastes are not high-level waste. In response to questions 2 and 3, enclosure 2 provides additional technical information regarding the various Hanford K-Basin wastes, their generation, and their relation to N-Reactor spent fuel.

EPA transmitted on April 22, 2005 via e-mail an additional question regarding "high-level liquid radioactive waste". As noted the solid wastes resulting from the treatment of such wastes are prohibited from disposal at WIPP by the WIPP Land Withdrawal Act, however the wastes from the plutonium decontamination cycles in the Bismuth Phosphate process are not HLW because these wastes originated from plutonium processing activities and are not aqueous waste from the reprocessing of irradiated reactor fuel or subsequent extraction cycles. The complete EPA question and the DOE response are provided in enclosure 3.

Elizabeth Cotsworth

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The above enclosures are being provided both in hard copy and in the attached compact disc (enclosure 4). If you have any additional questions regarding this issue, please contact me at (505) 234-7457.

Sincerely,



Russell Patterson  
Certification Compliance Manager

Enclosures

cc: w/enclosure

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