



**Department of Energy**  
Savannah River Operations Office  
P.O. Box A  
Aiken, South Carolina 29802

**DEC 20 1996**

Dr. Carl J. Paperiello  
Director  
Office of Nuclear Materials and Safeguards  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Dr. Paperiello:

**SUBJECT: Savannah River Site (SRS) High Level Waste (HLW) Tank Closure; Classification of Residual Waste as Incidental**

I appreciated the opportunity to meet with you and your staff this past September 17, 1996, to discuss the U.S. Department of Energy (DOE) Savannah River Operations Office (SR) plans for closure of the 51 HLW storage tanks on SRS and the classification of the residual waste as "incidental".

SR has determined that all 51 tanks can be closed under existing Nuclear Regulatory Commission (NRC) criteria for "incidental" waste as specified in the Bernero (NRC) to Lytle (DOE) letter of March 1993; some will require use of concentration averaging and others will require additional cleaning and the likely use of concentration averaging. DOE will assure that the waste: (1) has been processed (or will be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical; (2) will be incorporated in a solid physical form at a concentration that does not exceed the applicable concentration limits for Class C low-level waste as set out in 10 CFR Part 61; and (3) will be managed pursuant to the Atomic Energy Act, so that safety requirements comparable to the performance objectives set out in 10 CFR Part 61 are satisfied to assure safety to the public. In order to meet all the above criteria we plan to proceed forward with two separate approaches as follows:

- The first approach would close 14 tanks that meet the criteria stated in the Bernero to Lytle letter. However, for most if not all of the 14 tanks, guidelines found in the NRC Branch Technical Position (BTP) of January 17, 1995, "Issuance of Final BTP on Concentration Averaging and Encapsulation, Revision in Part to Waste Classification Technical Position" have been used to support meeting the Class C limits. Assuming the NRC takes "no objection" to this methodology, these tanks will not require additional cleaning. These 14 tanks will be addressed as Category I tanks.
- The second approach would address the 37, Category II, tanks that will require additional cleaning, which could include an oxalic acid wash, and the likely use of concentration averaging to meet the above criteria. The cost for the additional cleaning is approximately \$800,000 per tank.

Concurrently with Category I tank closure activities, SR is requesting the NRC to review the SR general methodology and application of the Bernero to Lytle letter, particularly Criteria 2 to high level waste tank closure. With regards to Criteria 2, SR specifically requests under 10 CFR 61.58, consideration of an alternative to the Class C limits of 10 CFR 61.55 for tank closure as the intruder scenarios for Class C determination may not be appropriate; the residual waste will be

immobilized and the tank will be filled with a stable medium; and the performance objectives of 10 CFR Part 61 will be met. These points are discussed further in the below paragraphs. SR recognizes that consideration of 10 CFR 61.58 for Criteria 2 may also require NRC evaluation of SR application of Criteria 1 and 3. SR recognizes that this will require further discussion and evaluation by the NRC which SR will fund.

SR understands that Criteria 2 is based on protection of individuals from inadvertent intrusion. However, with regards to SRS high level waste tank closure, access to and ultimate contact with the waste from inadvertent intrusion is highly unlikely. The small amount of residual waste on the bottom of the tanks will be located under approximately 40 feet of cement. Additionally, as documented in the *SRS Future Use Project Report of January 1996*, DOE intends to maintain control of the site in-perpetuity. Therefore, the possibility of inadvertent intrusion into the closed high level waste tanks and the areas surrounding the tanks will be remote. Consequently, the intruder exposure scenarios used to establish Class C limits of 10 CFR 61.55 may not be appropriate for tank closure. Re-evaluation and reconsideration of the appropriateness of the Class C limits for tank closure would result in substantial cost savings as additional cleaning of 37 tanks may not be required. This approach will not affect meeting the performance objectives of 10 CFR Part 61 and human health and the environment will still be protected.

10 CFR 61.58, states that the Commission, on request, may authorize other provisions for the classification and characteristics of waste on a specific basis if, after evaluation of the specific characteristics of the waste, disposal site and method of disposal, it finds reasonable assurance of compliance with the performance objectives in Subpart C of 10 CFR Part 61. Section 3.9 of the above referenced BTP further states that alternatives to the determination of radionuclide concentrations for waste classification purposes, other than those defined in the BTP, may be considered acceptable. Additionally, the referenced BTP states that the physical form of certain discrete wastes may be such that intruder exposure scenarios, other than those used to establish the values in Tables 1 and 2 of 10 CFR 61.55, may be appropriate. The referenced BTP specifically mentions the disposal of a large intact activated component filled with a structurally stable medium (e.g., cement). Subsequent to removal of waste from a tank, reducing grout will be placed in the tank to bind up and immobilize any residual waste. The grout is formulated to bind up the residual waste. The height of the reducing grout is dependent on the amount and characteristics of the residual waste. A low-strength cement, Controlled Low-Strength Material (CLSM), forms the next layer (approximately 7500 cubic yards) on top of the reducing grout. The final layer consists of a high-strength cement at the top of the tank (approximately 1500 cubic yards of cement, 5 feet high). The attached figure provides a typical tank closure configuration.

The first four tanks that will be closed at SRS in order are Tanks 20, 17, 19 and 18. The following provides the amount of reducing grout required in the first four tanks to meet Class C limits using concentration averaging based on the guidelines of the aforementioned NRC BTP: Tank 20 - 2.2 inches; Tank 17 - 12.5 inches; Tank 19 - 2.2 inches; and Tank 18 - 13.2 inches. Qualitative tests conducted by Construction Technology Laboratories (CTL), Inc. indicate that mixing occurs between the residual waste and the reducing grout. Based on the preliminary qualitative CTL test results, for SRS to proceed forward with closure activities for those tanks would involve only minimal risks. A copy of the CTL report, "Development of Reducing Grout for Closure of Savannah River Site Tank 20" of October 1996, has been provided to the NRC staff. At SR request, CTL is conducting additional quantitative tests to verify the performance of the reducing grout. Results from these quantitative CTL tests will also be provided to the NRC. This information can be used to support evaluation of SR tank closure methodology. With quantitative CTL test results, SR will proceed with closure activities for Tanks 20 and 17 concurrently with the NRC review of our methodology and the application of the Bernero to Lytle letter. SR plans to commence closure activities for Tank 20 in early February 1997.

Dr. Carl J. Paperiello

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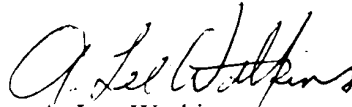
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We recognize that an Interagency Agreement (IA) is necessary to support the NRC involvement in our tank closure activities. I will ensure that SR actions required to finalize the IA on an expedited basis are performed.

As we discussed in a telephone conference call with your staff on December 16, 1996, NRC plans to visit SRS to evaluate our tank closure activities in January 1997. I fully support this effort and will provide any assistance your staff may require for this visit.

I am prepared to further brief you and your staff on our plans for tank closure at your convenience. Please contact me or Larry Ling of my staff at (803) 208-8248 if you have any questions or would like to schedule a briefing.

Sincerely,



A. Lee Watkins  
Assistant Manager for  
High Level Waste

PB-97-0011

Enclosure  
Tank Closure Diagram

cc:  
S. Cowan, EM-30, HQ  
R. Erickson, EM-32, HQ

