



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



10/21/03

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OFFICE OF  
AIR AND RADIATION

Dr. Inés R. Triay, Manager  
Carlsbad Field Office  
U.S. Department of Energy  
P.O. Box 3090  
Carlsbad, NM 88221



Dear Dr. Triay:

As part of our ongoing review of the proposed disposal of supercompacted waste processed by the Idaho National Engineering and Environmental Laboratory's (INEEL) Advanced Mixed Waste Treatment Project (AMWTP), DOE and EPA staff met on November 18 and 19, 2003 to exchange additional technical information, as you acknowledge in your letter of November 26, 2003. While some of our issues were resolved at this meeting, we have further comments based on the November meeting and reviewing references we received from you.

In our October 29, 2003, letter, we identified several issues, including the room porosity values calculated, in part, with the use of the computer code SANTOS. These room porosity values, presented as porosity surfaces, represent the impact, over time, of creep closure and gas generation on the porosity of the waste area that is used in the BRAGFLO computer code. This is important because DOE has used the SANTOS calculations to justify that there is no effect of heterogeneous waste emplacement (e.g., putting supercompacted wastes together with standard uncompact 55-gallon drums) on the performance of the Waste Isolation Pilot Plant (WIPP). In our October 29, 2003, letter we expressed the concern that "the porosity surfaces generated using the current computer code (SANTOS) may not properly represent the supercompacted waste and the pipe overpacks." We still have not received written documentation that discusses the SANTOS modeling. However, based on the presentation at the November 18 and 19, 2003, technical exchange, we understand that your staff made changes to the SANTOS modeling to address comments by EPA and that these changes affected the model results. Additional analysis is necessary to demonstrate whether the changes in the SANTOS results affect the overall performance of WIPP. Furthermore, we are concerned that the modeling does not fully capture the heterogeneity of the different waste forms. To address this issue, DOE needs to use more

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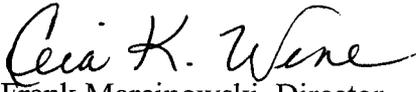
explicit modeling of waste types using material properties identified in smaller blocks instead of assuming large areas of similar properties in SANTOS. It is our understanding that the reports by Park and Hansen that discuss the SANTOS modeling should be sent to us soon. We look forward to reviewing the reports and discussing their results at the staff level.

We have enclosed a list of issues that require additional information based on our review of the October 17, 2003, AMWTP report and the associated references that were provided in early November 2003. We believe this information is necessary for us to understand and to properly evaluate the effect of the supercompacted wastes and the pipe overpack wastes. Our review is ongoing and we may identify additional issues in the future.

I appreciate the information exchange that has already occurred on this topic and I hope that we can continue to progress toward a decision on the AMWTP supercompacted waste. Until you are notified of a decision, supercompacted wastes processed at the AMWTP are not approved for disposal at WIPP.

We look forward to receiving this additional information and discussing with your staff what additional information exchanges are required. If you have any questions, please contact Tom Peake at (202) 343-9765.

Sincerely,

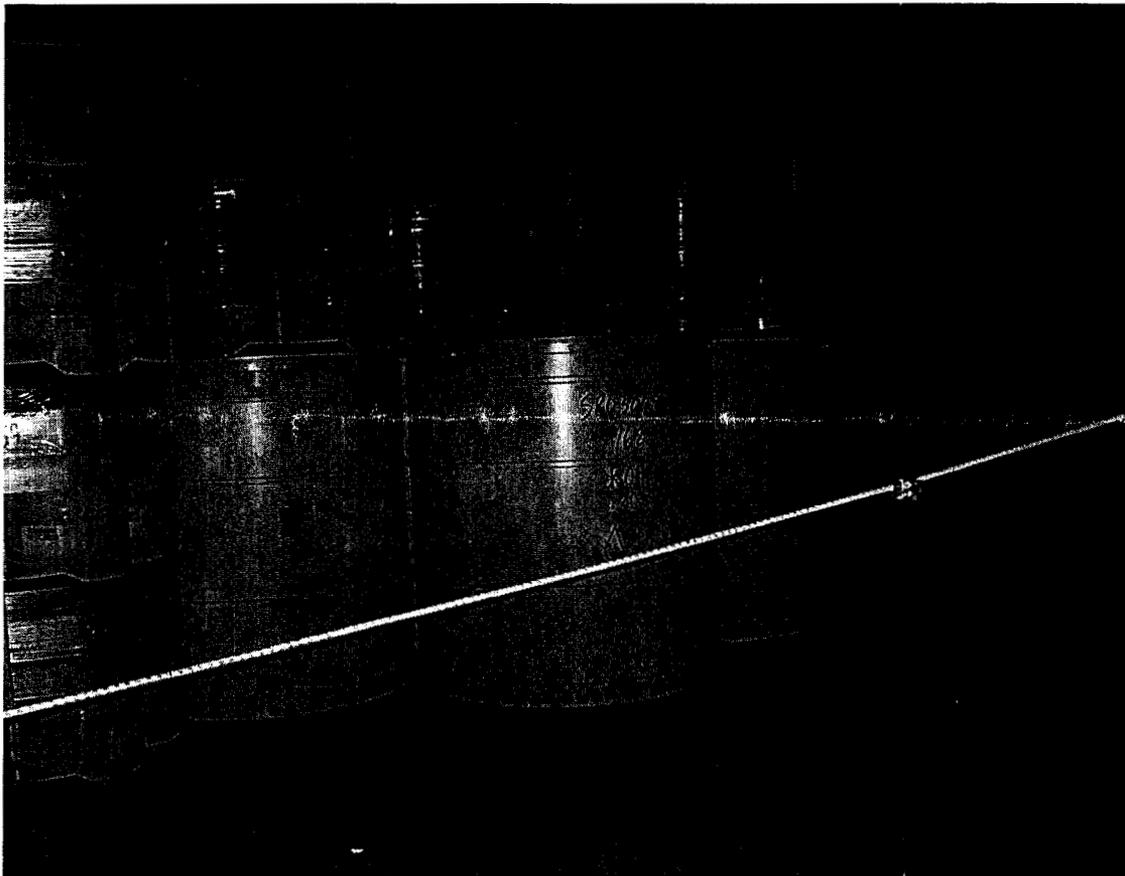
*for*   
Frank Marcinowski, Director  
Radiation Protection Division

Enclosure

cc: Russ Patterson, DOE/CBFO  
Steve Casey, DOE/CBFO  
Matthew Silva, EEG  
Larry Allen, EEG  
Steve Zappe, NMED  
EPA Docket

## Additional Issues

1. In our October 29, 2003, letter, we requested the report that discusses the 3100 project and the reconciliation of the acceptable knowledge, but we have not received a copy of it yet. Your November 26, 2003, letter identifies the report as being prepared for transmittal and we look forward to reviewing it. We have been told that a similar but more comprehensive and perhaps highly relevant analysis of the waste from multiple sites has been conducted (title unknown) and we request a copy of that analysis also.
2. Several documents (ERMS 531332, 531324 and 531328, for example page 8 of ERMS 531324) state that 1 ten-drum over pack (TDOP) is equivalent to three seven-packs of standard drums. It has been our observation, however, that one TDOP takes up the equivalent space of two seven-packs of standard drums (see Figure 1 below which shows Savannah River TDOPs from shipments SR030086 and SR030087 adjacent to seven packs but below one level of seven packs.). Please discuss these apparent differences and the effect, if any, on the inventory calculations and subsequent performance assessment calculations, and possibly the CH emplacement procedure (WP 05-WH1011 revision 20) cited as a reference.



**Figure 1** Ten drum overpacks adjacent to seven-packs in the WIPP underground

3. As discussed with your staff at the November 2003 meeting, you need to provide a reasonably concise discussion in one document on the current inventory and how it has changed since the Compliance Certification Application (CCA), including, but not limited to, the process of "blending" "alpha" radioactive waste with the TRU waste with the emphasis on INEEL waste but other wastes where applicable, relevant calculations and assumptions, the different types of container expected to be used, volumes and how these different topics have changed. For example, the estimated supercompacted volume of supercompacted waste in the report that accompanied your December 10, 2002, letter requesting the disposal of the AMWTP waste was 11,635 m<sup>3</sup> and in the October 17, 2003, report, is estimated to be 19,875 m<sup>3</sup>. We have also been reviewing the draft report on "The Disturbed Rock Zone at the Waste Isolation Pilot Plant" by Francis D. Hansen and believe a document with a similar style for the inventory would be helpful for us and the public. The outline provided in the November 26, 2003, letter is appropriate if it can be used to address the issues as discussed above.
4. In the preliminary draft document, "Annex C to Attachment F Crosswalk of Transuranic Waste Baseline Inventory Report Revision 2/3 and 2003 Waste Streams Update," there is a reference (p. 29, Data-F-C-1.13.6 Volumes) to waste volume reduction at Oak Ridge National Laboratory that includes compaction among other processes. DOE needs to identify to EPA what the potential for future compacted WIPP-destined waste is across the DOE complex and the confidence in that estimate. In other words, will there be additional compacted waste or pipe overpack waste that should be factored into this analysis?
5. In the AMWTP report that DOE provided on October 17, 2003, much of the permeability discussion focuses on permeability of the standard waste; there was very little discussion on the potential effects of the rigid wastes on waste permeability and the potential effect on releases. Please provide additional information that more thoroughly discusses the effect of compacted and pipe overpack waste effect on the waste permeability on the room scale, including the applicability of the random waste model (p. 48 of the AMWTP report) that was based upon only standard (uncompacted) waste.
6. At the November 18 and 19 technical exchange, there was discussion that some of the wastes may act as a "rigid pillar" in a mine. Please provide a discussion of the rigid pillar as it relates to the compacted waste and pipe overpacks and creep closure.
7. The discussion on methanogenesis in the October 17, 2003 supercompacted and heterogenous waste report indicates that methanogenesis will be the predominant reaction due to the lack of sulfates and nitrates in the waste. However, there is sulfate available in the anhydrite and repository fluids. Please provide information on how this sulfate would or would not be expected to confound the methanogenesis reaction.
8. The mobility of the gas and the sensitivity of the results to the type of gas needs to be more fully discussed. Please provide a discussion that integrates the information in the

CCA Appendix MASS gas viscosity discussion with the information presented at the November 18 and 19, 2003 technical exchange, both of which indicate that the hydrogen-methane gas mixture expected from methanogenesis would increase gas pressure in the repository.

9. We have requested, but not received, a table showing results of the AMWTP analysis and the PAVT at the compliance probabilities of 0.1 and 0.001 as was done in the comparison of the results of the original compliance certification application and the performance assessment verification test. Your November 26, 2003 letter identifies the table as being prepared for transmittal and we look forward to seeing it.
10. At the November 18 and 19, 2003 technical exchange you identified that there was limited transport of radionuclides into the anhydrites. Please provide information to support this position.