



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



JUL 12 2004

OFFICE OF
AIR AND RADIATION

R. Paul Detwiler, Acting Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090



Dear Dr. Detwiler:

The U.S. Environmental Protection Agency (EPA) received the U.S. Department of Energy's (DOE) Compliance Recertification Application (CRA) for the Waste Isolation Pilot Plant (WIPP) on March 26, 2004. On May 20, 2004, we provided you with our first comments related to completeness of the CRA documentation. In our ongoing review, we have identified additional documentation needed to constitute a complete application.

Since the original certification decision, DOE has conducted a number of activities related to waste chemistry, such as the Source-Term Waste Test Program, gas generation experiments, and magnesium oxide (MgO) effectiveness studies. In addition, changes have been made to the treatment of waste chemistry in performance assessment calculations – notably, the introduction of organic ligands into the calculation of actinide solubilities. These activities and changes are incorporated by reference but not fully described in the CRA. Furthermore, a number of the relevant references were not provided to us with the application. Waste chemistry is central to the solubility (and, by extension, the transport) of radionuclides, and a thorough explanation of the changes is necessary to support and justify DOE's conclusions and revised performance assessment. We find that key references are needed to allow a full review of changes in the consideration of waste chemistry; a list of these documents is provided in the enclosure. In addition, our review of information related to waste characterization and quality assurance has identified additional information that must be provided; these items are also described in the enclosure.

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If you have any questions, please contact Betsy Forinash at 202-343-9233.

Sincerely,

A handwritten signature in cursive script that reads "Elizabeth Cotsworth".

Elizabeth Cotsworth, Director
Office of Radiation and Indoor Air

Enclosure

cc: Russ Patterson, DOE/CBFO
Lynne Smith, DOE/EM
Steve Casey, DOE/CBFO
Steve Zappe, NMED
EPA WIPP Team
EPA Docket

Enclosure

CRA Comments – July 2004

Waste Chemistry

R-23-1 Waste Chemistry References

DOE must provide copies of the following references related to waste chemistry and referenced in SOTERM and other appendices:

Brush, L.H., and Y. Xiong. 2003b. Calculation of Organic Ligand Concentrations for the WIPP Compliance Recertification Application. Unpublished analysis report. Carlsbad, NM: Sandia National Laboratories. ERMS 527567.

Choppin, G.R., A.H. Bond, M. Borkowski, M.G. Bronikowski, J.F. Chen, S. Lis, J. Mizera, O. Pokrovsky, N.A. Wall, Y.X. Xia, and R.C. Moore. 2001. Waste Isolation Pilot Plant Actinide Source Term Test Program: Solubility Studies and Development of Modeling Parameters. SAND99-0943. Albuquerque, NM: Sandia National Laboratories.

Giambalvo, E.R. 2002a. Recommended Parameter Values for Modeling An(III) Solubility in WIPP Brines. Unpublished memorandum to L.H. Brush, July 25, 2002. Carlsbad, NM: Sandia National Laboratories. ERMS 522982.

Giambalvo, E.R. 2002b. Recommended Parameter Values for Modeling Organic Ligands in WIPP Brines. Unpublished memorandum to L.H. Brush, July 25, 2002. Carlsbad, NM: Sandia National Laboratories. ERMS 522981.

Giambalvo, E.R. 2002c. Recommended Parameter Values for Modeling An(IV) Solubility in WIPP Brines. Unpublished memorandum to L.H. Brush, July 26, 2002. Carlsbad, NM: Sandia National Laboratories. ERMS 522986.

Giambalvo, E.R. 2002d. Recommended Parameter Values for Modeling An(V) Solubility in WIPP Brines.. Unpublished memorandum to L.H. Brush, July 26, 2002. Carlsbad, NM: Sandia National Laboratories. ERMS 522990.

Giambalvo, E.R. 2002e. Recommended μ_0/RT Values for Modeling the Solubility of Oxalate Solids in WIPP Brines. Unpublished memorandum to L.H. Brush, July 31, 2002. Carlsbad, NM: Sandia National Laboratories. ERMS 523057.

Giambalvo, E.R. 2003. Release of FMT Database FMT_021120.CHEMDAT.. Unpublished memorandum to L.H. Brush, March 10, 2003. Carlsbad, NM: Sandia National Laboratories. ERMS 526372.

Gillow, J., and A.J. Francis. 2003. Microbial Gas Generation Under Expected Waste Isolation Pilot Plant Repository Conditions. Final Report, Revision 0, October 6 Draft. ERMS 532877.

Papenguth, H.W. 1999. Evaluation of Candidate MgO Materials for Use as Backfill at WIPP. Unpublished memorandum to M.G. Marietta, November 12, 1999. Sandia National Laboratories. Albuquerque, NM. ERMS 520314.

Snider, A.C. 2003a. Verification of the Definition of Generic Weep Brine and the Development of a Recipe for This Brine. Unpublished report. Carlsbad, NM: Sandia National Laboratories. ERMS 527505.

Wang, Y. 2000. Methanogenesis and Carbon Dioxide Generation in the Waste Isolation Pilot Plant (WIPP). Unpublished memorandum to B.A. Howard, January 5, 2000. Sandia National Laboratories. Carlsbad, NM. ERMS 519362.

Drez, P.E. 1991. Preliminary Nonradionuclide Inventory of CH-TRU Waste, Preliminary Comparison with 40 CFR Part 191, Subpart B for the Waste Isolation Pilot Plant, December 1991. Volume 3: Reference Data. WIPP Performance Assessment Division Eds. R.P. Rechar, A.C. Peterson, J.D. Schreiber, H.J. Iuzzolino, M.S. Tierney, and J.S. Sandha. SAND91-0893/3. Albuquerque, NM: Sandia National Laboratories, A-43 through A-53.

Krumhansl, J.L., Kelly, J.W., Papenguth, H.W., and R.V. Bynum. 1997. MgO Acceptance Criteria. Unpublished memorandum to E.J. Nowak, December 10, 1997. Sandia National Laboratories. Albuquerque, NM. ERMS 248997.

Popielak, R.S., R.L. Beauheim, S.R. Black, W.E. Coons, C.T. Ellingson and R.L. Olsen. 1983. Brine Reservoirs in the Castile Formation, Waste Isolation Pilot Plant Project, Southeastern New Mexico. TME 3153. Carlsbad, NM: U.S. Department of Energy WIPP Project Office.

194.24 - Waste Characterization

C-24-1 Appendix DATA Attachment F, Preface

The Preface of Appendix DATA, Attachment F, indicates that there are still inconsistencies in the Waste Stream Profiles. However, the Preface does not clearly indicate the nature of these inconsistencies. This information is necessary to verify DOE's conclusion that the inconsistencies were not significant to PA.

DOE must provide a summary list of identified inconsistencies in the Waste Stream Profiles as referred to in the Preface of Appendix DATA, Attachment F.

C-24-2

Appendix DATA Attachment F-2.3.1

DOE indicated that data obtained from individual generator sites and entered into the Transuranic Waste Baseline Information Database (TWBID) were subsequently exported to, and decay-corrected through the use of, the Oak Ridge Isotope Generation code (ORIGEN), version 2.2. The decay-corrected data were then imported back into TWBID. As part of our §194.24(a) technical review of the inventory, the function of ORIGEN for the purposes of decay-correcting the data will be verified through recalculation of a randomly selected subset of the data.

To support these calculations, DOE must provide electronically the TWBID. If any modifications have been made to the off-the-shelf ORIGEN code for decay correction, DOE must also describe the changes and provide an electronic version of the modified ORIGEN code. Finally, DOE must provide all relevant quality assurance (QA) documents listed in Table DATA-F-4 and applicable to codes used in performance assessment. These documents include the Access Control Memorandum, Requirements Document, Code Classification of ORIGEN (version 2.2), Verification and Validation Plan, and Validation Document. The documents are necessary to demonstrate proper review, verification, and implementation of the ORIGEN 2.2 software.

C-24-3

Section 4.4.1

Quality assurance objectives (QAOs) previously identified in the 1998 Compliance Certification Application have been removed from the CRA with respect to acceptable knowledge and non-destructive examination. Although these requirements are included in the Contact-Handled Waste Acceptance Plan (CH WAP) the WAP is a RCRA-based document and does not deal with QAOs related to radiological components. The absence of radiological QAOs in the CRA documentation is troubling since it may imply that sites are not applying consistent criteria in implementing waste characterization. DOE must explain why the CRA does not include QAOs for acceptable knowledge and non-destructive examination, describe what criteria are being applied at sites, and explain how these criteria ensure that appropriate data is being collected.

C-24-4

Section 4.3.2

The CRA indicates that the WIPP Waste Information System (WWIS) is an important component of the waste inventory system of controls mandated by §194.24. EPA found that some WWIS data fields included in the original application have been deleted from the CRA (see Docket No. A-93-02, V-B-15, Chapter 6). Data fields such as transuranic (TRU) alpha activity, TRU alpha uncertainty, waste matrix parameters with weights, and waste matrix code are important for inventory calculations. Similarly, an assay-method field tells whether approved equipment has been used to characterize a transuranic waste drum. DOE must provide a justification for the addition or removal of WWIS data fields.