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ENTERED



PETER MAGGIORE
SECRETARY



August 20, 1999

Ines Triay, Manager
Department of Energy
Carlsbad Area Office
Post Office Box 3090
Carlsbad, New Mexico 88221

RE: REVIEW OF REVISION 2 OF INEEL NONHAZARDOUS WASTE
DETERMINATION FOR IDC 300 WASTE STREAM

Dear Dr. Triay:

The New Mexico Environment Department (NMED) has conducted a review of the aforementioned document dated July 8, 1999. Attached are NMED's comments concerning: 1) the general completeness of the information provided for review; 2) technical comments regarding the nonhazardous waste characterization; and 3) our evaluation of INEEL's compliance with the WIPP Waste Analysis Plan, in light of proposed final Permit condition IV.B.2.b.

NMED underscores three areas of particular concern:

- The report does not fully support DOE's conclusion that the TCLP sampling was representative of the entire population of 1,100 IDC 300 drums. The report states that fifty drums were "carefully chosen," and of those, only five were sampled. As this is not random selection, one cannot consider the selected population as representative of the whole.
- Appendix A of the subject document states that totals analysis is "...to determine whether the graphite molds contain potentially "listed" VOCs and SVOCs." NMED agrees with DOE's statement, in that totals analysis will give all parties a better sense that the shipped waste is *not* hazardous.
- The origins of VOCs detected in the headspace gas samples raise concerns about the potentially hazardous nature of the waste. Specifically, insufficient

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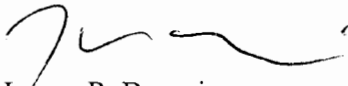
documentation of the origin of 1,1,1-trichloroethane has been provided to rule out the possibility that Raycohesive is not the sole source.

NMED is further concerned that Revision 2 did not directly or indirectly address our Revision 1 comments 4, 7, and 9 in a substantive manner. Specifically:

- Comment 4 -- DOE did not adequately describe processing variances to account for the elevated VOC concentrations in IDC 310 and 312 wastes compared to those in IDC 300 wastes.
- Comments 7 & 9 – DOE has not provided VOC or SVOC totals data for any samples associated with IDC 300, as discussed above.

In conclusion, NMED reiterates its position that failure to resolve these recurring issues surrounding DOE's waste characterization and compliance with the proposed WAP put DOE at risk with respect to the compliance status of waste stored at WIPP prior to issuance of a final permit. Should you have any questions, please do not hesitate to contact Steve Zappe at (505) 827-1560 x1013, or me at (505) 827-1567.

c Sincerely,



James P. Bearzi
Chief

Hazardous & Radioactive Materials Bureau

cc: Greg Lewis, Director, Water & Waste Management Division
Steve Zappe, NMED WIPP Project Leader
John Tymkowych, Manager, HRMB Enforcement & Inspection Program
Susan McMichael, NMED Office of General Counsel
David Neleigh, EPA Region 6
Connie Walker, Techlaw

ATTACHMENT 1

Review of "Nonhazardous Waste Determination for IDC 300 (Graphite Molds) Waste Stream", July, 1999 (Revision 2)

A. General Completeness Analysis

The Idaho National Engineering and Environmental Laboratory (INEEL) document titled "Nonhazardous Waste Determination for IDC 300 (Graphite Molds) Waste Stream", July, 1999 (Revision 2) (IDC 300 Waste Determination Report, Rev. 2) was examined to determine whether all of the necessary referenced material was included in the supplemental information package. Almost all information referenced within the IDC 300 Waste Determination Report, Rev. 2 that the U.S. Department of Energy, Carlsbad Area Office (DOE CAO) indicated had been provided were included in the information package. However, the following missing information should be provided to facilitate technical review of the document:

1. Reference 26, a letter from E. Kent Hunter to Lori Fritz, Supplementary Approval of INEEL Waste Stream IW-W276, dated June 23, 1999. This letter is needed because it reportedly substantiates INEEL's contention that the sampling and analysis conducted on the original 50 drums were representative of the entire waste stream.
2. Headspace gas sampling results for individual samples and raw data for the additional 151 drums that were sampled for volatile organic compounds (VOCs) subsequent to the submission of Revision 1 of the Waste Determination Report. This data is necessary to verify VOC headspace gas upper confidence limit (UCL) calculations and to ensure that log transformation of data did not change the hazardous waste determination.
3. Visual examination tapes for the additional 35 drums (including a repeat visual examination on two drums) that the IDC 300 Waste Determination Report, Rev. 2 states (pages 7 and 10) were visually examined between 1983 and 1999.
4. A statement indicating how many of the INEEL IDC 300 graphite molds waste drums have undergone radiography and the radiography data forms for all IDC 300 waste containers for which radiography has been completed.
5. A list of all drums subject to visual examination and headspace gas analysis. This information would be used to verify that the number of samples collected and sample identification is consistent with headspace gas and visual examination data.

6. Results and supporting documentation for VOC and semivolatile organic compound (SVOC) totals analyses. This data would be used to verify that the presence of listed wastes in the headspace gas is not attributable to a listed waste contained in the graphite molds. This request is specifically supported by the *Special Characterization Sampling and Analysis of Graphite Mold Waste* (Appendix A of the IDC 300 Waste Determination Report, Rev. 2) which states (page A-2) that the intent of the totals analysis is "to determine whether the graphite molds contain potentially "listed" VOCs and SVOCs." Note that although DOE included a disclaimer on the cover page of the Sampling and Analysis Plan stating that the totals analysis was included in the original sampling plan to address contingencies which, as it turns out, do not require addressing to demonstrate a nonmixed determination for the graphite waste, NMED believes that provision of the totals analysis data would be useful further assess the hazardous nature of the waste, particularly since numerous organic compounds are present in headspace gas whose presence require more explanation.

B. Technical Evaluation of the Nonhazardous Waste Determination for IDC 300 (Graphite Molds) Waste Stream, July, 1999 (Revision 2)

1. It is apparent that the IDC 300 Waste Determination Report, Rev. 2 is to apply to a much larger population of IDC 300 graphite molds waste drums than Revision 1. However, the actual magnitude of the expanded scope of the IDC 300 Waste Determination Report, Rev. 2, as described on page 1, is unclear. The following require clarification:
 - Clarify whether the IDC 300 Waste Determination Report, Rev. 2 applies only to IDC 300 graphite molds waste in containers that are currently stored at INEEL, and
 - Clarify whether the IDC 300 Waste Determination Report, Rev. 2 applies to waste containers that contain only IDC 300 graphite molds waste (i.e., not other IDCs).
2. The IDC 300 Waste Determination Report, Rev. 2 (page 4), indicates that 1,1,1-trichloroethane was used to clean gloveboxes, also stating (page 4) that no known contact with F listed wastes (including 1,1,1-trichloroethane) has been documented. The elevated concentrations of 1,1,1-trichloroethane detected in the headspace gas samples are attributed (page 8) to the use of the glue called "Raycohesive" to affix the polyliner lids to the polyliner. NMED acknowledges that headspace gas analysis data is not used for making hazardous waste determinations. However, questions regarding the origin of the VOCs detected in

the IDC 300 headspace gas samples do raise suspicions about the overall hazardous nature of the waste. The IDC 300 Waste Determination Report, Rev. 2 did not adequately document that Raycohesive is the sole or primary source of 1,1,1-trichloroethane detected in the headspace gas as it did not assess potential contributions from radiolysis. In addition, the origin of other organics (i.e., acetone) was not assessed. The document should include a more thorough and complete discussion regarding the origin of organics in headspace gas, which could include, for example, material balance calculations since INEEL asserts that the complete origin of these organics is from Raycohesive. Alternatively, the missing totals analyses could be provided to support INEEL's conclusion regarding the origin of the VOCs in headspace gas.

3. The IDC 300 Waste Determination Report, Rev. 2 (pages 1 and 7) indicates that the available documentation and chemical characterization performed to date show that the processes generating graphite molds waste changed very little over the production years and concludes that the IDC 300 graphite mold waste is homogeneous with respect to chemical properties. The IDC 300 Waste Determination Report, Rev. 2 (page 7) then uses this conclusion to support their argument that INEEL performed toxicity characteristic leaching procedure (TCLP) sampling and analysis on a representative sample of the IDC 300 graphite molds waste drums. However, the information provided in the IDC 300 Waste Determination Report, Rev. 2 does not fully support the argument that the TCLP sampling were actually representative of the entire population of approximately 1100 drums of INEEL retrievably stored IDC 300 graphite molds waste. Revise the IDC 300 Waste Determination Report, Rev. 2 to address the following issue:
 - The IDC 300 Waste Determination Report, Rev. 2 (section 3.4.3, page 10) indicates that the TCLP sample results for the five drums of graphite wastes, obtained during characterization of the initial 50 drums selected for shipment to WIPP, are representative of the entire IDC 300 waste stream and states (section 3.4.3.2, page 11) that "No further toxic characteristic analysis of this waste stream will be performed." As noted in the comment above, NMED is concerned whether the original 50 drums selected for shipment to the WIPP were actually representative of the entire IDC 300 waste stream. In addition, section 3.4.3 (page 10) states that only the original 50 drums of IDC 300 waste were considered during the INEEL random sampling process, and therefore the INEEL TCLP and totals sampling and analysis program cannot be considered a random sampling of the "total" IDC 300 waste population. Specifically, the INEEL sample selection process was not random, as only 50 hand selected drums out of the 1100 IDC 300 graphite molds waste drums were considered for the random sample selection performed by INEEL.

Chapter 9 of SW-846 indicates that sampling accuracy is achieved through the collection of random samples and that each unit (drum) of the waste must have an equal chance of being sampled and measured (EPA, pg NINE-6). Revision 1 of the Waste Determination Report was only intended for 50 of the IDC 300 graphite molds waste containers stored at INEEL. As such, the INEEL sampling plan is not directly applicable to any other IDC 300 wastes from INEEL or elsewhere because it does not take the entire population of IDC 300 containers into consideration. INEEL must provide adequate justification for this deviation from statistical guidance found in Chapter 9 of SW-846, or consider collecting additional random samples from the entire population of INEEL retrievably stored IDC 300 graphite molds waste.

4. The INEEL IDC 300 waste sampling plan, *Special Characterization Sampling and Analysis of Graphite Mold Waste* (Appendix A, Page A-2 of the IDC 300 Waste Determination Report, Rev. 2), indicated that extraneous listed hazardous waste (i.e., rags, blotter paper, and lab equipment) could be co-mingled with the graphite waste and not be identified by radiography; as such, INEEL determined that intrusive visual examination would be necessary to verify the contents and the absence of co-mingled extraneous items in the graphite waste. The IDC 300 Waste Determination Report, Rev. 2 indicated that evidence of blotter paper in IDC 300 graphite molds waste drums could be an indication of the presence of carbon tetrachloride and thus cause the waste to be listed as F001. Thus, INEEL focused their initial characterization efforts to ensure that the 50 drums did not contain blotter paper and performed confirmatory visual examination on all 50 drums in INEEL's IDC 300 graphite molds waste because radiography does not consistently detect blotter paper. Subsequent characterization activities appear to consist of radiography of all waste containers and INEEL apparently intends to continue to perform radiography with no further confirmatory visual examination on the remainder of the 1100 IDC 300 waste containers. INEEL must reconcile this apparent discrepancy in proposed and actual procedures, as it appears that the sampling plan indicates that it is necessary to visually examine all IDC 300 waste containers to ensure exclusion of potential listed waste, while the IDC 300 Waste Determination Report, Rev. 2 indicates that only radiography will be used to ensure that potential listed wastes are not co-mingled with the graphite molds.
5. The acceptable knowledge information provided indicates that it was standard practice to keep liquids away from the molds, as liquids degraded the graphite molds integrity. However, it is unclear why liquids would be kept from the molds after the molds were deemed unusable and discarded. In addition, it appears likely that molds inadvertently degraded by liquids (1,1,1-trichloroethane or carbon tetrachloride) would be subject to disposal. There is limited discussion on

how other waste streams generated where the molds were generated were managed. Since solvents were used within the ingot production process, it is possible that solvent-soaked rags or other solvent wastes could have been disposed of with the graphite molds. The process for managing other wastes generated in the process should be identified as well as the mechanism or procedures followed to prevent addition of hazardous waste.

6. The IDC 300 Waste Determination Report, Rev. 2 does not include any discussion of potential effects of radiolysis of the waste with respect to the generation of hazardous waste. Stakeholders have questioned the generation of reactive, corrosive, and ignitable waste, as well as TC wastes due to radiolysis. Sections of the IDC 300 Waste Determination Report, Rev. 2 should be revised to specifically discuss the potential effects of radiolysis with respect to generation of hazardous waste. Note that the presence of plastic in the graphite waste is very likely based on information provided in Section 3.4.2.3 (page 9) of the IDC 300 Waste Determination Report, Rev. 2 and the potential for radiolysis of plastic materials is one of the stakeholders primary concerns. Also refer to Comment No. B.2.

C. General Compliance With the Waste Analysis Plan of the November 13, 1998 WIPP Revised Draft Hazardous Waste Permit

The information provided in the IDC 300 Waste Determination Report, Rev. 2 was evaluated to determine whether there were significant deviations from the Waste Analysis Plan (WAP) of the November 13, 1998 WIPP Revised Draft Hazardous Waste Permit (RCRA Part B permit). This evaluation did not include a detailed review of whether all of the specific WAP requirements have been met. The requirements of the RCRA Part B permit WAP are specified primarily in Permit Condition II.B and Permit Attachments B, and B1 through B6. As noted above, it appears that INEEL intends for the IDC 300 Waste Determination Report, Rev. 2 to apply to all of the approximately 1100 drums of retrievably stored IDC 300 graphite molds waste. The IDC 300 Waste Determination Report, Rev. 2 provides the general waste characterization information required by the WAP for only a portion of the approximately 1100 drums.

In general, the Waste Determination for the IDC 300 graphite molds debris waste that has already been conducted by INEEL incorporates the appropriate major elements of the parameter characterization methods for retrievably stored S5000-Debris Waste specified in section B-3 and Table B-6 of the RCRA Part B Permit. The IDC 300 Waste Determination Report, Rev. 2 provided statements (pages 1, 8 and 9) that 432 of approximately 1100 drums of IDC 300 graphite mold debris waste covered in the report underwent 100 percent real-time radiography (RTR) inspection, a minimum of 50 of the drums underwent visual examination for verification of the RTR results, and 201 of the drums underwent headspace gas sampling and analysis. It is assumed, although not specified, that all remaining containers shall undergo RTR and headspace

gas analysis (See Comment No. C.1 for questions regarding WAP compliance of visual examination).

In the IDC 300 Waste Determination Report, Rev. 2 (pages iii and 2) INEEL commits to, but does not provide data for, continued characterization of the IDC 300 graphite molds waste in accordance with the requirements of the QAPP (the Transuranic Waste Characterization Quality Assurance Program Plan, Interim Change, CAO-94-1010, November 15, 1996, is referenced). The referenced version of the QAPP requires that the basic methods for parameter characterization specified in the WAP be performed for S5000-Debris wastes. For example: Section 4.2.2.1 of the QAPP (page 8 of 18) states that all retrievably stored waste must be categorized using radiography; Section 4.2.2.2 (page 8 of 18) states that headspace gas sampling and analysis must be conducted on all TRU waste to be sent to the WIPP facility; and Section 5.4.2 (page 18 of 27) states that as a QC check on radiography, a statistically selected portion of the certified waste containers must be opened and visually examined. Thus, if INEEL actually conducts future IDC 300 waste characterization activities in accordance with the referenced QAPP, this characterization is likely to also incorporate the appropriate major elements of the characterization parameter methods for retrievably stored S5000-Debris Waste specified in section B-3 and Table B-6 of the RCRA Part B Permit. Note that TechLaw's evaluation of the QAPP did not include a detailed evaluation of whether waste characterization activities conducted in accordance with the QAPP will address all of the specific WAP requirements.

While the IDC 300 Waste Determination Report, Rev. 2 information indicated that INEEL has characterized, or commits to characterizing, the IDC 300 waste in general compliance with the major requirements of the WAP, several major deviations were noted in how the characterization methods were conducted. These deviations are noted in the following comments.

1. Sections 3.3.2 (page 7) and 3.4.2.4 (page 10) of the IDC 300 Waste Determination Report, Rev. 2 indicate that a total of 87 of the INEEL IDC 300 graphite molds waste drums have undergone visual examination to verify the results of RTR. These include the visual examination of the 50 drums selected for the initial shipment to WIPP, 35 additional visual examinations performed between 1983 and 1989, and two drums that were re-inspected to confirm whether the drums actually contained blotter paper. Section 3.3.2 (page 7) further states that visual inspections has been performed on approximately 7 percent of the INEEL's total IDC 300 waste inventory. While the percentage of IDC 300 drums visually examined by INEEL actually exceeds the visual examination rate of 2 percent specified in Attachment B2 (page B2-1) of the WAP, the IDC 300 Waste Determination Report, Rev. 2 does not provide adequate information to demonstrate that a random selection process was employed to select IDC 300 waste drums for visual examination. Permit Attachment B, Section B2-1 (page B2-2) of the WAP specifies that drums chosen for visual examination be randomly selected. The following support this observation:

- The INEEL IDC 300 waste sampling plan, *Special Characterization Sampling and Analysis of Graphite Mold Waste* (Appendix A of the IDC 300 Waste Determination Report, Rev. 2) includes specific statements which imply that the 50 drums of IDC 300 waste drums that were visually examined were carefully selected, rather than randomly selected. These statements included: page A-1, "From the estimated 1100 IDC 300 drums, the INEEL has segregated 50 drums that real-time-radiography (RTR) indicates contains only graphite mold waste." and page A-2, "Based on the Stored Waste Examination Pilot Plan (SWEPP) RTR results, the 50 drums that make up the initial shipment population were carefully chosen to be as similar as possible in physical form, and free from any prohibited items."
- The data provided in Section 3.4.1.2 and Appendix C of the IDC 300 Waste Determination Report, Rev. 2 indicate that 90% upper confidence limit headspace gas concentration of 1,1,1-trichloroethane increased from 2.755 parts per million by volume (ppmv) (as reported for 50 drums in Appendix C of Revision 1 of the Waste Determination Report) to 6.716 ppmv when calculated using the data obtained from the VOC headspace gas analyses of an additional 151 drums. None of the other VOCs analyzed in the headspace gas samples exhibited this large increase in mean and 90% upper confidence level concentrations. While the IDC 300 Waste Determination Report, Rev. 2 discussed the origin of this compound, it did not identify or discuss this upward concentration trend for 1,1,1-trichloroethane or provide a reasonable explanation for the increase. This significant difference between the concentration of 1,1,1-trichloroethane in the headspace gas of the two sets of drums is an indication that the original 50 drums selected for visual examination may not have actually been representative of the entire IDC 300 waste stream because the headspace gas data between the two groupings is so different, implying different waste material could be present.

In conclusion, it does not appear that the 50 drums selected for the initial shipment (and visually examined) were randomly selected from the entire population of approximately 1100 drums of IDC 300 waste. In addition, the IDC 300 Waste Determination Report, Rev. 2 did not provide any information to indicate that the 35 drums that were visually examined between 1983 and 1989 were randomly selected, as specified in section B2-1 of Attachment B2 of the RCRA Part B Permit, and did not describe the methods used for random sample selection of the confirmatory samples.

2. Section 3.4.1.2 (page 8) of the IDC 300 Waste Determination Report, Rev. 2

discusses the analytical results of the headspace gas analyses performed for 201 drums of the IDC 300 graphite molds waste. The text indicates that INEEL decided to evaluate the source of 1,1,1-trichloroethane even though the 90% upper confidence limit concentration for 1,1,1-trichloroethane (6.716 ppmv) was below the Program Required Quantitation Limit (PRQL) of 10 ppmv. While the IDC 300 Waste Determination Report, Rev. 2 provided information regarding the likely source of the 1,1,1-trichloroethane even though the WAP (Attachment B4, section B4-3d) only requires initiation of the evaluation of the likely source of a constituent if the 90% upper confidence limit concentration is above the PRQL, the IDC 300 Waste Determination Report, Rev. 2 did not address the following concern related to the presence of 1,1,1-trichloroethane in the headspace gas samples.

As noted in the Comment C.1 above, the data provided in Section 3.4.1.2 and Appendix C of the IDC 300 Waste Determination Report, Rev. 2 indicates that 90% upper confidence limit headspace gas concentration of 1,1,1-trichloroethane increased from 2.755 ppmv to 6.716 ppmv when the data from VOC headspace gas analyses of an additional 151 drums was incorporated. The IDC 300 Waste Determination Report, Rev. 2 should have evaluated whether the increase in concentration is a function of the drum age prior to sampling or some other reason. Additionally, since the upward trend in the 90 percent upper confidence limit for 1,1,1-trichloroethane may eventually result in an exceedance of the PRQL, the IDC 300 Waste Determination Report, Rev. 2 should have provided a specific commitment to closely monitor the concentrations of 1,1,1-trichloroethane concentrations detected in the headspace gas samples for the remainder of the INEEL IDC 300 graphite molds waste drums.

3. The IDC 300 Waste Determination Report, Rev. 2 (Table 4 of Appendix C) provides a list of analytes for the headspace gas sampling performed on the 201 drums of IDC 300 graphite molds debris waste. The list of analytes does not include all of the VOC analytes specified in Tables B-1 and B-3 of Attachment B of the RCRA Part B Permit. The VOCs that were not included are: bromoform, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, 1,1,2,2-tetrachloroethane and methyl isobutyl ketone.
4. The IDC 300 Waste Determination Report, Rev. 2 did not include any discussion of the data quality objectives (DQOs) or DQO levels for the IDC 300 graphite molds debris waste stream as specified in Sections B3-1 through B3-8 of Attachment B3 of the RCRA Part B permit. The IDC 300 Waste Determination Report, Rev. 2 also did not indicate how DQOs were evaluated or whether the DQOs were met for IDC 300.