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**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

November 5, 2003

Karen L. Boardman
Manager
Sandia Site Office/NNSA
U.S. Department of Energy
P.O. Box 5400, MS 0184
Albuquerque, NM 87185-5400

Peter B. Davies
Director, Geoscience and Environment
Center (6100)
Sandia National Laboratories
P.O. Box 5800, MS 0701
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**RE: NOTICE OF DEFICIENCY: MIXED WASTE LANDFILL CORRECTIVE
MEASURES STUDY REPORT, MAY 2003
SANDIA NATIONAL LABORATORIES
EPA ID# 5890110518
HWB-SNL-01-025**

Dear Ms. Boardman and Mr. Davies:

The New Mexico Environment Department (NMED) has reviewed the subject document. Enclosed are comments that must be addressed. Please submit your responses to this Notice of Deficiency within 60 days of receipt of this letter. If you have any questions, you may contact Mr. William Moats of my staff by telephone at (505) 284-5086.

Sincerely,

Sandra Martin
Acting Chief
Hazardous Waste Bureau

SM:wpm

Ms. Boardman and Mr. Davies
November 5, 2003
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cc: W. Moats, NMED HWB
F. Nimick, SNL, MS 1087
J. Gould, NNSA/DOE, MS 0184
L. King, EPA-Region 6 (6PD-N

File: Reading and SNL, MWL (OU 1289), 2003

New Mexico Environment Department Notice of Deficiency
October 2003
for
U. S. Department of Energy/Sandia National Laboratories
Mixed Waste Landfill Corrective Measures Study Final Report, May 2003

General Comments

The following general comments do not require a response. They are included herein to express the opinions of the New Mexico Environment Department (NMED, or Department) and for the benefit of the administrative record.

1. It is clear from the text of the Mixed Waste Landfill (MWL) Corrective Measures Study (CMS) Report that the U. S. Department of Energy (DOE)/Sandia National Laboratories (SNL) has the view that RCRA cover systems are inferior to evapotranspiration caps (ET caps). The NMED does not share this point of view. In the short term, there is ample evidence that RCRA covers will outperform ET caps. For the long term, there is no compelling evidence that a well-constructed RCRA cap made of modern materials is likely to fail simply because part of it would be constructed of man-made materials or fine-grain soil (clay). Additionally, not all RCRA cap variations contain fine-grain soil barriers.

Regardless, the NMED recognizes that ET caps are adequate for some sites, subject to certain geologic and climatological conditions. Modeling submitted with the ET cap design for the MWL, and modeling done for Kirtland Air Force Base's (KAFB's) Landfills 1, 2, and 8 indicate that ET caps should provide acceptable performance for landfills situated at both SNL and KAFB. The only reason not to install a RCRA cover system is that an ET cap is expected to provide acceptable performance at a lower cost.

2. Regarding the No Further Action (NFA) alternative, the NMED is unlikely to accept the operational cover because of the lack of documentation on its design, expected performance, the materials that it is constructed of, and the lack of construction quality data. Although there is some historical evidence that the operational cover meets corrective action objectives #1, 3, and 4, there are also uncertainties concerning whether this will remain true in the future. Additionally, the lack of construction and design documentation does not provide confidence to the NMED that corrective action objective #2 can be met in the future.

3. Actual monitoring and post-closure care requirements for the MWL will be negotiated later with the NMED, and will depend on the remedy selected by the Department.

4. The NMED reserves all rights with respect to any enforcement authority the Department may have with respect to radionuclides.

Specific Comments

Below are specific comments, most which require a response. Comments not requiring a response are included herein to express the opinions of the NMED and for the benefit of the administrative record.

1. Page 48, 2nd paragraph, Health and Safety -- This paragraph says that excavation and characterization present moderate health and safety concerns, and the risk to site workers is ranked medium. This seems to be inconsistent with the language in the first paragraph of Section 3.2.11.1 (page 47), which states "This alternative poses little exposure risk to site workers, the public, and wildlife". The latter suggests that the risk to site workers should be changed from "medium" to "low". Provide an explanation as to which risk level is correct in the DOE/SNL's opinion.

2. Page 48, Section 3.2.11.3, Cost -- The cost for disposal has not been included as it should be. Given that costs are given as present value, the cost today for disposal of waste should have been included. For simplicity, the NMED suggests using the cost for disposal included in the landfill excavation scenario presented in Appendix H, which is in the range of \$122,000,000. Provide a disposal cost for this remedial alternative.

3. Page 51, Section 4.1, first bullet below 1st paragraph -- Clarify whether institutional controls (ICs) will include monitoring for durations as much as 100 years, given that 30 and 70 year time periods are used elsewhere in the document.

4. Page 61, Section 4.3.4, first paragraph -- see specific comment #2.

5. Page 62, Section 4.3.4.2, first sentence -- Note that mixed and hazardous waste may require treatment before disposal to meet the land disposal restrictions in 20.4.1.800 NMAC incorporating 40 CFR Part 268. No response is required.

6. Page 63, Section 4.3.4.4 -- Although excavation may take only an estimated two years, the design and construction of support facilities, which must precede excavation, will likely take several additional years. This is demonstrated in Appendix H for the excavation scenario described in that appendix. Please provide an estimate of the total project duration for the future excavation scenario.

7. Page 63, Section 4.3.4.5, 2nd sentence -- The language in this sentence is poor and implies that there will be no costs for waste disposal for future excavation. Provide clarification.

8. Page 65, Section 5, first paragraph following the four bullets -- See general comment #2. No response is required.

9. Page 65, Section 5, 2nd paragraph following the four bullets -- The text states "This selection is based on years of dialogue with the NMED and the public in determining the best approach for closure of the site". Clarify whether the CMS added value to this conclusion.

10. Figures 1-3 and 1-4. There is a dashed line in both figures separating the northern and southern halves of the unclassified area. In Figure 1-3, the dashed line presumably represents part of the MWL perimeter according to the legend. In Figure 1-4, it represents a fence. Provide clarification.
11. Figures 3-1 through 3-7. All of these figures do not include a scale. Resubmit the figures with the appropriate scales included. The addition of an arrow to indicate the north direction on each figure should also be included for the benefit of the public.
12. Table 2-1, "NFA" corrective measure, "Comments" block at bottom of table -- See general comment #2. No response is required.
13. Table 2-1, "ICs" corrective measure, "Long-term Surveillance and Maintenance" technology description, column on "Responsiveness to Corrective Action Objectives" -- For reasons explained in general comment #2 above, the NMED's opinion is that this column should contain the ranking of "no" instead of "yes". No response is required.
14. Table 2-1, "Containment" corrective measure, "Structural Barriers" technology description, column on "Performance" -- the NMED agrees that the long-term performance of this technology can be poor if proper maintenance is not being conducted. The NMED disagrees with the first sentence in the "Comments" block in that structural barriers such as concrete and asphalt can easily meet corrective action objectives #2 and #3, provided that such barriers are well maintained. However, in the case of the MWL, the Department would prefer a remedial alternative that will require as little maintenance as possible. Thus, no response is required.
15. Table 2-1, "Containment" corrective measure, "RCRA Subtitle C Cap" technology description, column on "Performance" -- For reasons stated in general comment # 1 above, the NMED believes strongly that the performance of a RCRA cap should be ranked as least as high as an ET cap. Thus, DOE/SNL should consider changing the performance ranking from "Fair" to "Good", and resubmitting this page of Table 2-1.
16. Table 2-1, "Containment" corrective measure, "Bio-Intrusion Barrier" technology description -- A bio-intrusion barrier alone would not likely be accepted by the NMED as a remedial alternative. It may be accepted in combination with another technology. No response is required.
17. Tables 2-1, technology descriptions for "Complete Excavation" and "Partial Excavation" with either "Above-Ground Retrievable Storage" or "Offsite Disposal", "Comments" blocks for all four cases -- NMED agrees that these technologies are problematic with regard to meeting corrective action objective #1 in the short term. However, these technologies, in the long term, are responsive to corrective action objective #1 (assuming in the cases for partial excavation that this is also true for a technology applied to the unclassified portion of the landfill). Resubmit these pages of Table 2-1 with language stating that objective # 1 will be met in the long term; include

also language that corrective objective #1 will not be met in the short term as currently indicated.

18. Table 2-2, "Long-Term Surveillance and Maintenance" technology column -- the column for "Responsiveness to Corrective Action Objectives" -- For reasons stated in general comment #2, the NMED believes that this column should be changed from "yes" to "no". No response is required.

19. Table 2-2, "RCRA Subtitle C Cap" technology column -- the column for "Performance" -- see specific comment #15.

20. Table 3-1, alternatives V.a and V.b -- State the reasons why long-term monitoring, maintenance, and access controls will be required for these complete excavation scenarios.

21. Table 3-4, alternatives III.d and III.e -- See general comment #1 above. For the limit migration of contaminants to ground water column, NMED believes that the rankings of "No" should be changed to "Yes", and that the text should explain that the RCRA cap alternatives were not given further evaluation in Chapter 4 because they cost more than ET caps. No response is required.

22. Table 3-4, alternatives V.a to V.d -- SNL/DOE should indicate in a footnote in the table that their failure in meeting the corrective action objective of "minimize exposure to workers, the public, and wildlife" is limited to the short-term because of the increased exposure during the excavation phases. In the long-term, these alternatives can meet this corrective action objective. Make this change and resubmit the table.

23. Table 3-4, alternative V.e, column for "Worker Health and Safety Risk" -- See specific comment # 1.

24. Table 4-1, extent of long-term monitoring -- Clarify whether DOE/SNL really intend to monitor ground water for 70 years, or whether this duration of monitoring is just being assumed for the purpose of calculating costs and for suggested post-closure activities. See also general comment #3.

25. Table 4-1, Short term reduction in existing risks, future excavation alternative -- The risk assessments assume that the levels of radiological and chemical constituents will be similar to those detected during the RCRA Facility Investigation (RFI). Although the nonradiological risk would be difficult to estimate without further information, the health risk due to chemicals could be much higher than that corresponding to the levels of contaminants detected at the landfill during the RFI. The same applies to radiological constituents, which already show a high level of risk in the future excavation scenario. No response is required.

26. Table 4-1, "Cost", "Future Excavation" alternative -- change the table to include disposal costs and resubmit. See specific comment #2.

27. Table 4-2, "Ecological (Rad) and Transportation and Remediation Injuries and Fatalities" -- include the units of measure and resubmit the table.
28. Table 4-3, alternative V.e, under direct costs, include the cost of disposal and correct accordingly the total cost (last column). See specific comment #2.
29. Appendix B -- For the category of monitoring, for each cost summary report, it is not clear what the costs are for each type of monitoring. Provide clarification.
30. With regard to the information presented in Chapter 4 (and associated appendices), please provide the following information in table format:
- A. For each remedial alternative, indicate the type, frequency, and duration of monitoring assumed for the purposes of calculating costs.
 - B. Using total costs (directs plus markups), breakout the costs of monitoring, surveillance, and maintenance for each remedial alternative. Escalate the costs for each type of monitoring/surveillance/maintenance for a period of 30 years (or 70 or 100 years) using an average inflation rate of 4% per year (or justify and use another rate). Report also the difference between the escalated costs and their present value.
 - C. Using total costs (directs plus markups), calculate the cost per square foot (in $\$/\text{ft}^2$) of each warehouse and support building for each remedial alternative in today's dollars. Show your calculations separately.
 - D. Using total costs (directs plus markups), calculate the cost per mile (in $\$/\text{mile}$) of all roads that would need to be constructed for each remedial alternative in today's dollars. Show your calculations separately.
31. Appendix H, Page J-2, Section 2.1, 1st paragraph, 5th sentence, which starts "Because of the continued on-site warehouse storage..." -- The language in this sentence is unclear. Provide clarification.
32. Appendix H, Page J-2, Section 2.2, 1st sentence -- the statement that excavation of the trenches and pits would reduce toxicity and volume contradicts that of the main text for the excavation scenarios (see Table 4.1). Clarify which is correct.
33. Appendix H, Page J-3, Section 2.2, last sentence -- The language in this sentence is unclear. Provide clarification.
34. Appendix H, Page J-4, Section 2.3.1, 2nd paragraph, last sentence -- The language in this sentence is unclear. Provide clarification.

35. Appendix H, Page J-8, Section 2.4.1, last paragraph, 1st sentence -- It seems likely that the planning phase of the project could be reduced to no more than 3 years at most, as many planning tasks can be done simultaneously. Provide justification why this phase should take 5 years.
36. Appendix H, Pages J-9 (Section 2.4.2, last paragraph) and J-11 (Section 2.4.3, last paragraph) -- The information on these pages suggest that full excavation of the landfill will take nearly 6 years to complete. Under the future excavation scenario presented in the main text, full excavation is estimated to take only two years to complete. Explain this difference in time.
37. Appendix H, Page J-11, Section 2.4.4, Waste Management -- The Department is unlikely to accept a remediation proposal which would include provisions that would allow treatment and disposal to be delayed until the landfill was completely excavated (six years later). Should the Department select an excavation alternative for the landfill, treatment and disposal would be required to commence immediately upon implementation of the corrective measure. No response is required.
38. Appendix H, Page J-12, 4th paragraph, Treatment -- Be advised that shredding and mixing, and other forms of treatment, require a RCRA permit. No response is required.
39. Appendix H, Page J-13, Backfill -- Be advised that an engineered cap may be required for the MWL even if it is excavated, depending on the final state of the landfill. The alternative described in Appendix H assumes that any residual contamination would meet acceptable risk levels without the need for a cap. No response is required.
40. Appendix H, Page J-16, Table J-5, "Long-term Reliability and Effectiveness", "Extent of Long-Term Monitoring" -- This part of the table indicates that ground water monitoring was assumed to continue for 30 years. Under the future excavation alternative in the main text, ground water monitoring is not going to be conducted. Explain this difference.
41. Appendix H, Page J-16, Table J-5, "Reduction in Toxicity, Mobility, and Volume" -- See specific comment #32, and if necessary, correct the table accordingly.
42. Appendix H, Page J-16, Table J-5, "Short-Term Effectiveness" -- See specific comment #25.
43. Appendix H, Appendix J-3, Page J.3-9 (and elsewhere) -- justify the purchase of major construction equipment, rather than renting such equipment as some contractors might do. Additionally, because the equipment is purchased, clarify whether the equipment will have resale value after the project is completed, what any such resale value may be, and whether this is taken into account in the cost estimates.
44. Appendix H, Appendix J-3, Page J.3-10, assumption #9 -- justify the cost to bring backfill as far as 20 miles from the site when information in the main text states that

suitable backfill is readily available next to the landfill. How much does this influence the cost (provide an answer in estimated dollars) when the haul realistically should not exceed perhaps 0.5 mile?

45. Appendix H, Appendix J-3, Page J.3-15, assumption #3 -- justify why (2) 235 excavators, as many as (3) 950 loaders, and as many as (5) dump trucks are needed for the waste management phase when the landfill would already be excavated under this hypothetical scenario? How much does this influence the cost (provide an answer in estimated dollars)?

46. Appendix H, Appendix J-3, Page J.3-17, assumption #5 -- Justify why 8,000 CY of scraped soil is assumed to be disposed of off-site rather than be placed back into the excavation as replaceable soil. How much does this influence the cost (provide an answer in estimated dollars)?

47. Appendix H, Appendix J-3, Page J.3-19, bullet #1 -- See specific comment #40.

48. Appendix I, Section IV, Page I-12, last paragraph of section, third sentence stating "However, due to remedial options, the COC's may vary." -- This statement and the rest of the paragraph would be more clear with some additional explanatory text. Provide further explanation on how constituents of concern were selected.

49. Appendix I, Page I-42, Section VI.6.2.2 -- Provide an explanation as to what ICs are implemented for this alternative. Make it clear how these ICs would then cause less risk than that calculated for the "NFA without ICs" alternative (compare Tables 16 and 17). Explain why the list of COC's is different in Tables 16 and 17 (see specific comment #48).