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**OU#1 - ALT SCREENING
U. S. DOE - FERNALD
OH6 890 008 976**

11/13/90



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

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REPLY TO ATTENTION OF:

Mr. Andrew P. Avel
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

5HR-12

RE: OU#1 - Alt Screening
U.S. DOE - Fernald
OH6 890 008 976

Dear Mr. Avel:

On October 12, 1990, the United States Department of Energy (U.S. DOE) submitted a revised proposed Initial Screening of Alternatives (ISA) report for Operable Unit #1 to the United States Environmental Protection Agency (U.S. EPA) for review and approval.

U.S. EPA has reviewed this revised document and again finds it unacceptable because of inconsistencies with U.S. EPA guidance and technical deficiencies. Most of the deficiencies fall into the first category where the report does not follow or adequately follow U.S. EPA Guidance on Conducting Remedial Investigations and Feasibility Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Fewer (but perhaps more significant) comments relate to the second category where technical deficiencies result in an incomplete range of remedial alternatives.

1. Section 1.2.1 was revised in response to deficiencies concerning the inaccurate volume of contaminated materials that may require remediation. The report was revised in this section to include 550,000 cubic yards of contaminated soils surrounding the waste pits. This generalized response to U.S. EPA's comments is not adequate to fulfill the requirement to accurately characterize the types and volumes of contaminated materials to be able to modify the response action to achieve greater cost effectiveness. It appears that no attempt was made to revise the report to consider both an increased volume and two distinct types of contaminated materials (i.e., waste pit contents and contaminated soils). An example of this appears in Section

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4.3.5.1, where the volume of materials to be transported off-site did not change from the original report.

2. Section 1.2.1: It appears that the report proposes to handle waste pit material and contaminated soils in the same manner. This does not seem to be a suitable approach considering the significant difference in the characteristics between the two contaminated materials. Furthermore, the waste pit material contains bulk waste, drummed waste, and scrap metal. Additional discussion (other than the few brief statements provided) concerning how these materials affected the screening of process options or assembly of alternatives should be provided.
3. Section 4.2 presents description and screening of process options for ground water, soils/sediment, and air. This section should also present remedial technologies and process options specific to the waste pit materials. Simply including the waste pit materials in the soils/sediment media is not appropriate because of the significant difference in their physical and chemical characteristics.
4. Process options were developed in Section 4, screened in Section 5, and assembled into alternatives in Section 6. However, there is no explanation given for any of the process options selected to represent the remedial technology in the assembled alternatives. Section 5 presents the absolute minimum screening that could have been presented. Section 5 does little to justify the selection of representative process options and does not present sufficient information concerning the screening factors. Section 4.2.5 of U.S. EPA guidance on Conducting Remedial Investigations and Feasibility Studies Under CERCLA suggests that more information than a simple ranking of high, moderate, or low be provided.
5. Because the ISA report considers soil/sediment and the materials in the waste pits as a single medium, it seems that several alternatives were not developed. Two examples of remedial alternatives not developed include:
 - Excavate and treat waste pit materials prior to disposal (on- or off-site), leave contaminated soils in-place, and backfill and cap with low permeability materials;
 - Excavate and treat waste pit materials prior to disposal (on- or off-site), stabilize the remaining contaminated soils in-place (shallow soil mixing or vitrification), and backfill and cap with low permeability materials;

Each of the above potential remedial alternatives would also have to consider the other contaminated media to be

remediated (i.e, ground water, and air) as well as support technologies such as surface water control.

6. It seems that chemical extraction of radionuclides is a viable process option to reduce the volume of radiologically contaminated materials. The materials in the waste pits are sufficiently similar those in the K-65 silos where chemical extraction is considered a viable process option. In an October 5, 1990, teleconference, U.S. DOE (Dennis Carr) acknowledged that Waste Pits 3 and 5 contain the same material as the K-65 silos. The average U-238 concentration in the K-65 materials (Silos 1 and 2) is approximately 700 Pci/gm. The U-238 concentrations in the waste pits are listed below:

<u>Waste Pit No.</u>	<u>Range of U-238 (Pci/gm)</u>	<u>Total U (Kg)</u>
1	360 - 6,980	52,000
2	53 - 17,900	1,206,000
3	134 - 1,380	129,000
4	509 - 15,800	3,048,087
5	387 - 1,230	50,309
6	350 - 1,740	1,740

7. The use of surcharging in Alternative 2 is an effective means of physical waste stabilization; however, it is not effective in stabilizing the liquid materials potentially present in drums disposed in the waste pits. This process option may generate free liquids released from drums and diminish the effectiveness this process option and the overall remedial action.
8. The "Action Levels" listed in Tables 2-3, 2-4, and 2-5 only consider four components of risk (e.g. only four chemicals in one exposure pathway or one chemical from four exposure pathways); this does not follow standard risk assessment procedures. Remedial action levels are typically derived by summing the risks of all contaminants of concern and calculating the concentration for each contaminant in which the sum of the resultant concentrations is equal to the 10^{-6} excess cancer risk.
9. Several references to Appendix A are incorrect and need to be changed to properly reference additional information. Examples of incorrect citations appear on page 6-15. All references to Appendix A should be checked throughout the report and corrected.
10. Appendix C accurately reports that the concentration of chemicals in many classes of contaminants are below the analytical method quantification limit. However, it should

be noted that many compounds are present at concentrations above the analytical method detection limit. The results of the additional waste pit sampling should be considered in the detailed analysis of alternatives.

11. References to 10 CFR Part 61 is deleted from the list of Applicable or Relevant and Appropriate Requirements (ARARs) for material in the waste pits.
12. Pages 1-15 and 1-16: The pathway analysis and baseline risk assessment for OU#1 must include doses from radon-222.
13. Section 1.2.1, Page 1-7, Paragraph 1: The report should explicitly state that perched ground water within the waste pit area is also in the scope of Operable Unit 1.
14. Section 1.2.3, Page 1-14, Paragraph 2: The total uranium concentrations listed for the "2000-and 3000-series" wells are not accurately reported. Concentrations up to 218 ug/l (well 3084) have been detected in the "3000-series" wells located in the waste pit area. In addition, four other "3000-series" wells in the waste pit area have above background concentrations of total uranium.
15. Section 1.2.5, Page 1-16, Paragraph 1: Comments on the risk assessment will be presented after the RI/Risk Assessment report is submitted.
16. Section 2.0, Page 2-1, Paragraph 2: The ISA report must acknowledge that remediation goals may be set below ARARs, if multiple contaminants or pathways of exposure exist.
17. Section 2.1, Page 2-2, Paragraph 2: The point of compliance for future use scenarios is within, not at the boundary of the waste management unit.
18. Section 2.2, Page 2-2, Paragraph 3: An appendix should be provided support the conclusion that uranium is the only contaminant of concern for the air and soil media.
19. Section 2.3, Page 2-2: Radium-226 and radon-222 must also be considered contaminants of concern for OU#1.
20. Page 2-6, Table 2-3: The drinking water standards for Tc-99 (900 Pci/l), Sr-90 (30 Pci/l), and Cs-137 (200 Pci/l) are potential ARARs for OU#1. Concentrations calculated from U.S. DOE Order 5500.4 are only To Be Considered (TBC) requirements and are less protective, so should be referenced.

21. Section 2.6, Page 2-11: The media goals set forth in Figure 2-1 must be consistent with the goals set forth in the National Contingency Plan (NCP) of $10E-4$ to $10E-6$.
22. Section 2.6, Page 2-11, Paragraph 3: The report should calculate risk based remediation goals using the 10^{-6} increased cancer risk as the point of departure. This change should also be consistently made in Table 2-1.
23. Section 3.3, Page 3-1, Paragraph 4: The report should be revised to state that containment does not reduce the mobility of the contaminants; but rather, the containment reduces or eliminates the exposure pathway where contaminant migration may take place.
24. Section 4.0, Page 4-1, Paragraph 1: The volumes of contaminated media have not been sufficiently characterized. This is illustrated in this section, and subsequent sections, where process options are evaluated for effectiveness and implementability for all contaminated materials. It is not likely that process options would have similar results on materials with greatly different characteristics such as the waste pit materials and contaminated soils.
25. Section 4.2.1.4, Page 4-8, Paragraph 2: There is no groundwater removal technology listed in Table 4-1 and no justification is provided for selecting pumping wells over other groundwater removal processes options.
26. Section 4.2.1.4, Page 4-8, Paragraph 2: This section does not address the removal (collection) of contaminated ground water in the perched water table aquifer outside each waste pit. This section should be revised to include the removal of contaminated ground water from the perched water table aquifer.
27. Section 4.2.1.5, Page 4-8, Paragraph 5: The process options listed in this section do not match the process options listed in Table 4-1.
28. Section 4.2.1.6, Page 4-9, Paragraph 1: Process options for discharge of treated groundwater was not, and should be considered in Table 4-1.
29. Section 4.2.2.4, Page 4-11, Paragraph 5: Pneumatic/dozer and airlift dredging were screened out from further consideration in Table 4-1 and should not be considered further.

30. Section 4.2.2.6, Page 4-13, Paragraph 4: Briefly summarize the major Federal and State requirements must be met in designing an on-site disposal facility.
31. Section 4.2.2.6, Page 4-13, Paragraph 5: Lined/unlined pits and trenches were screened out in Figure 4-1 and should not be considered further.
32. Section 4.3.1.2, Page 4-18, Figure 4-2: The vertical drain showing perched ground water discharge to the underlying aquifer should be eliminated or modified. Although the conceptual design was described in the response to an Ohio EPA comment, the text should also include this information.
33. Section 4.3.5.1, Page 4-21, Paragraph 3: The reference to 2,000,000 cubic yards of materials to be transported is not consistent with the estimated amount of contaminated materials stated in Section 1.2.1. The text should be revised to be consistent. In addition, cost, mileage, and risk figures should be revised to be consistent with the amount of estimated materials to be transported.
34. Section 5.1, Page 5-2, Table 5-1: The subsurface drain process option should be added to the Subsurface Flow Control remedial technology branch of this figure. This is required to be consistent with Table 4-1.
35. Section 5.1, Page 5-3, Table 5-1: The subsurface drain process option should be added to the Subsurface Flow Control remedial technology branch of this figure. This is required to be consistent with Table 4-1.
36. Section 5.1, Page 5-4, Table 5-1: The pneumatic/dozer dredging process option was screened from further consideration in Table 4-1 and should not be presented in Table 5-1.
37. Section 5.1, Page 5-4, Table 5-1: The truck transport process option was screened from further consideration in Section 4.3.5 and should not be presented in Table 5-1.
38. Section 5.1.3, Page 5-6, Paragraph 1: Cost information is required to be estimated for both capital and operation and maintenance cost.
39. Section 6.2.1, Page 6-7, Paragraph 4: The placement of vertical drains upgradient of the slurry wall to allow the perched ground water to drain into the underlying Great Miami Aquifer may result in further contaminant migration. Considerations and operations necessary to make this process option a necessary and safe remedial action should be presented.

40. Section 6.3.1, Page 6-10, Paragraph 5: The placement of pore water collection trenches should also be located in Waste Pit 4 (as previously suggested in an Ohio EPA comment).
41. Section 6.3.3, Page 6-11, Paragraph 5: Explain why the cap in Alternative 2 covers approximately 16 acres and the cap in Alternative 3 covers approximately 44 acres.
42. Section 6.5.1, Page 6-15, Paragraph 6: The report states that a water treatment plant constructed specifically for use during Operable Unit 1 remediation will be constructed. This statement is not consistent with other information presented by U.S. DOE concerning the treatment of all contaminated water in a centralized advanced waste water treatment facility. Furthermore, the reference in the ISA report to an Operable Unit 1 specific water treatment facility is not in agreement with U.S. DOE's response to Ohio EPA comment No.16.
43. Section 6.5.4, Page 6-17, Paragraph 1: The report states that "if either vitrification or physical stabilization is used. . ." it will require approximately 6 years to complete this alternative. The statement regarding the possible use of a treatment technology is not consistent with the earlier description of this alternative which required treatment as an integral part of this alternative.
44. Section 6.5.5, Page 6-17, Paragraph 2: The report should state where on the FMPC property the proposed 150 acre above grade tumulus will be built.
45. Section 7.1.5, Page 7-4, Paragraph 1: State which innovative technologies have been carried forward to the detailed analysis of alternatives
46. Section 7.4.4, Page 7-10, Paragraph 4: An additional disadvantage of surcharging is that the compaction of the waste materials may cause drums containing liquids to rupture and result in additional contaminant migration. In addition, surcharging will allow drummed waste to remain in place and allow for potential future release of contamination.
47. Section 8.1, Page 8-1, Paragraph 1: State which hybrid alternatives are to be developed prior to the detailed analysis of alternatives. When will U.S. DOE put forth these alternatives?
48. References: Most of the cited references in the ISA report are not listed in the reference section. This should be corrected throughout the report.

U.S. DOE is required to submit primary documents prepared in accordance with applicable U.S. EPA regulations and guidance.

In accordance with the terms of the 1990 Consent Agreement, U.S. EPA is invoking dispute resolution as provided for in Paragraph B of Section XII. U.S. EPA is suggesting a first dispute resolution meeting on November 20, 1990, at 10:00 am in Chicago. Please confirm your availability for this meeting, or suggest an alternative date to which all necessary participants can agree, within five (5) days of the date of this letter. If U.S. DOE does not respond, I will assume that the proposed meeting is acceptable.

Please contact me at (312/FTS) 886-4436, if you have any questions.

Sincerely,



Catherine A. McCord
Remedial Project Manger

cc: Richard Shank, OEPA
Graham Mitchell, OEPA-SWDO
Leo Duffy, U.S. DOE
Joe LaGrone, U.S. DOE