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OU#3 ISA
FERNALD, OHIO
OH6 890 008

10-24-90

USEPA/DOE-FMPC
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LETTER

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

OCT 24 1990

REPLY TO ATTENTION OF:

5HR-12

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

RE: OU#3 ISA
Fernald, Ohio
OH6 890 008

Dear Mr. Davis:

On September 24, 1990, the United States Department of Energy (U.S. DOE) submitted the Initial Screening of Alternatives (ISA) report for Operable Unit #3. The ISA report was reviewed for completeness, technical adequacy, and compliance with the National Contingency Plan (NCP) and U.S. EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive No. 9355.3-01).

Based on deficiencies identified below, U.S. EPA is disapproving the first draft of the ISA for OU#3.

GENERAL COMMENTS

1. The ISA states that there currently U.S. DOE lacks sufficient remedial investigation (RI) information to adequately screen alternatives due to the schedule established in the Consent Agreement. U.S. DOE committed to the deadlines imposed by the 1990 Consent Agreement. The lack of information exists because U.S. DOE has not yet performed enough field work. Preparing a document to meet a milestone date, when the site has not been sufficiently characterized to sufficiently develop alternatives, is not consistent with the RI/FS process and does not fulfill the purpose of the ISA document or the Consent Agreement.

2. The number of alternatives retained for detailed analysis is too limited. Excluding the no action alternative, only two alternatives are carried forward to the detailed analysis of alternatives for 4 of the 6 suboperable units. The only difference between the two alternatives carried forward to the detailed analysis of alternatives for these 4 suboperable units is the location of the disposal facility. The total volume of contaminated soil for these 4

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suboperable units represents over 65 percent of the contaminated soils in Operable Unit 3. The two alternatives for these 4 suboperable units consist of removal, treatment, and disposal. Additional alternatives could have been developed if various treatment, stabilization, and non-treatment technologies were considered.

3. RI information is still being collected that could significantly impact the development of alternatives. This data includes the results of the structural analysis of buildings, contamination of the buildings themselves, engineering properties of soils, characterization of material in containers, analysis for non-radiological contaminants, and treatability study investigations. The results of these investigations must be considered and reported in the detailed analysis of alternatives report.

4. The report is not consistent with the alternatives presented. For example, Alternative pairs 3/4, 5/6, 7/8, and 13/14 are identical except one alternative considers on-site disposal where the other considers off-site disposal. However, Alternatives 9, 10, and 12 considers both on- and off-site disposal within each alternative. This inconsistency should be reconciled.

5. All alternatives described in Chapter 4 that include treating excavated soils consider either soil washing, chemical extraction, or hydrocyclonic separation. However, other treatment technologies applicable to contaminated soils (i.e., thermal treatment and stabilization) were not screened from further consideration in Chapter 3 and must be considered.

6. The rating of 5 for constructability, reliability, maintainability, and special engineering under the no action alternatives for each suboperable unit is extremely misleading. These categories should receive a not applicable or zero rating. For example, the rating of 5 for reliability associated with no action is inappropriate, if no action was at all reliable there would be no need for any further action.

7. U.S. EPA is establishing a guideline that treatment as part of CERCLA remedies should generally achieve reductions of 90 to 99 percent in contaminant concentration or mobility of individual contaminants of concern. This guideline does recognize that a reduction of mobility or toxicity below 90 percent may achieve health based or other site specific remediation goals. The analysis of the reduction in mobility, toxicity, or volume is typically completed during treatability studies prior to the detailed analysis of alternatives. The results of the treatability studies and the analysis on significant reduction in mobility, toxicity,

or volume should be considered and reported in the detailed analysis of alternatives report.

8. The ISA report does not identify volumes or areas of media for which general response actions may apply until late in the ISA report (i.e, step 6). This approach is not consistent with U.S. EPA guidance (OSWER Directive No. 9355.3-01). This apparently caused the technology types and process options to be screened without considering site specific information. Insufficient screening resulted in alternatives with nonspecific remedial actions. For example, most alternatives carried through to the detailed analysis of alternatives consist of removal, treatment, and disposal. This type of remedial alternative could have been selected for detailed analysis without the screening process. Additional screening will need to take place prior to initiating the detailed analysis of alternatives.

SPECIFIC COMMENTS

9. Page ES-6: The ISA states that decontamination of buildings is not to be considered a remedial action under Operable Unit 3. This issue was discussed on U.S. EPA's September 10, 1990, letter. U.S. DOE can not arbitrarily exclude portions of the site from the remedial response action. This issue is raised again on page 1-11. Other regulatory programs such as RCRA closures, waste characterization, overpacking of drums, UST, and SPCC are Applicable or Relevant and Appropriate Requirements (ARARs) for the CERCLA response actions. All areas within this Operable Unit must be addressed in the revision of the ISA and all other documents for this operable unit.

10. Section 1.3.1, Page 1-10, para 1: All process buildings that were involved in handling, storage and process of pitchblende ore and yellowcake should be identified as suspect for radium contamination. All hazardous substances suspected to have contaminated buildings and other facilities within the production area must be identified.

11. Section 1.4.1, Page 1-11, Paragraph 3: The assumption of the Operable Unit #3 study is that compliance with other environmental programs will be adequate to address all the environmental concerns within the OU is incorrect. As previously stated, other regulatory programs are ARARs in the CERCLA remedial and removal process. See U.S. EPA's letter dated September 10, 1990.

12. Section 1.4.1, Page 1-12: Suboperable Unit E must include drummed materials. Suboperable Units C and D should include loose (removable) surface contamination on or within

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facilities, or else should justify why this is not a potential release point.

13. Section 1.4.1, Page 1-12, Paragraph 3: Additional description of the suboperable units is needed. This description should include the location of each area, nature of contamination in each area, volume of contaminated materials, and potential risk to human and environmental receptors. This additional detail is necessary to allow for an independent evaluation of the adequacy and accuracy of the screening presented in the report. This information can be presented as a summary of the RI findings and attached as an appendix.

14. Table 1-2, Page 1-19: Plant 2/3 may have potential radium contamination based upon past pitchblende and yellowcake operations. This should be included or else justification provided why radium is not a contaminant.

15. Tables 1-1, 1-2, 1-3, 1-4: Technetium 99 is not listed as a "potential" contaminant in any of the facilities. Tc-99 is a common contaminant associated with UF6 feed materials from recycled uranium. Because of high mobility, Tc-99 could affect soils and groundwater.

16. Section 1.4.4, Page 1-24, para 3: Radon and other hazardous substances must be measured in the K-65 slurry lines.

17. Section 1.4.4: The discussion concerning the nature and extent of contamination associated with the suspect areas is not supported with specific information from the field investigations.

18. Section 1.4.5, Page 1-27, Paragraph 1: The results of the non-radiological contamination investigation is necessary before conducting the detailed analysis of alternatives.

19. Table 5-1, Page 1-29: General categorization of all levels below 50 ppm uranium makes it impossible to consider cleanup at a lower level, or to estimate the extent of contamination or waste volumes for ALARA purposes, and is thus premature at this point.

20. Table 1-6, Page 1-30: Levels of 150-200 ppm radium identified in the drum area appear to be in the wrong units since this would correspond to .15-.2 millicuries per gram of radium. Also, the use of the term "no radioactive elements identified" should be explained giving sensitivities of measurements, etc.

21. Table 1-7, Page 1-32: The use of the category "less than 10,000 micrograms per liter" (uranium) should be clarified.

since this is several orders of magnitude greater than the proposed cleanup level for water.

22. Section 2.1.1, Page 2-4, Paragraph 3: The point of compliance for each medium occurring in each suboperable unit should be explicitly stated. For ground water, remedial action objectives should be met throughout the contaminant plume; or where waste is left in place, the point of compliance is the edge of the waste management unit.

23. Section 2.1.4.1, Page 2-8, para 1: The statement that an RAO which must be applied across all media is that total cancer risk from radionuclides not exceed 2.5E-5 is inconsistent with the individual RAO's listed in Table 2-2. In Table 2-2 the approximate risk level of 2.5E-5 is reached by radon, and by other radionuclides, is probably exceeded by 35 picocuries per gram soil residual uranium, and is probably not exceeded through the water pathway. In any case, the total cancer risk across all media, clearly would exceed 2.5E-5. This should be clarified.

24. Section 2.1.4.1, Page 2-8 (and elsewhere in the document): The residual level of 35 picocuries per gram (pci/g) of uranium in soil is presented as "the acceptable residual concentration" through reference to the USNRC Branch Technical Position. The introduction of a cleanup level (or defacto cleanup level) at this point is premature. It should be made very clear that this level is only used as a benchmark or reference level for the purpose of estimating potential waste volumes.

The NRC Branch Technical Position is not final but only proposed. While it derives residual levels based upon 1 millirad lung and 3 millirad bone annual doses due to inhalation, which is conservative as far as U.S. EPA is concerned, it does not deal extensively with other pathways, and in particular, there is relatively high uncertainty as to what external exposure doses may result from these residual levels.

In addition, the Branch Technical Position derives residuals for other contaminants than depleted uranium, some of which should be considered for the FMPC. Levels of 30 pci/g for natural or enriched uranium (which has been processed at FMPC), 10 pci/g for uranium in equilibrium with all daughters (such as pitchblende ore also refined at FMPC) and for natural thorium (also refined and stored at FMPC), are all put forth.

In addition, past work with pitchblende ore opens the possibility of radium contamination, some of which has been

identified in OU#3. U.S. EPA has specified standards for cleanup of radium in soil which are codified at 40 CFR 192, which are ARARs.

Finally, the cleanup levels for this Operable Unit should be derived using combined risk of all radionuclide contaminants and hazardous substances as part of the Risk Assessment process. Following this, and prior to finalizing the remedial work plan, a studied application of the ALARA principle should occur, using RI data to do a cost benefit analysis. Until that time, it is premature to use any number as an acceptable residual for uranium in soil.

25. Section 2.1.4.2, Page 2-9, para 5: The 4 mrem/yr dose limit cited as attributable to 40 CFR 141.16 actually limits the dose to the whole body or to any organ to less than 4 mrem/yr, and as such is often more restrictive than is portrayed.

26. Section 3.1.3, Page 3-4, Paragraph 4: The text states that temporary caps and sump repair and replacement will be retained for further evaluation. However, Figure 3-3 (Page 3 of 6) indicates it was not applicable for soils contamination; where as Figure 3-3 (Page 5 of 6) temporary caps are applicable to facility floors. The screening steps would be more clear if the text and Figure 3-3 were prepared for media within each suboperable unit.

27. Section 3.1.3, Page 3-4, Paragraph 4: Figure 3-3 also does not match the text for in-situ vitrification.

28. Section 3.5.10, Page 3-19, Paragraph 2: The report lists two types of adsorption processes (carbon and alumina); but only discusses carbon adsorption.

29. Section 3.12.1, Page 3-30, Paragraph 3: The anticipated date of completing the structural analysis and soils properties investigation should be stated. This information is pertinent to the feasibility study and should be included in the remedial investigation and feasibility study reports.

30. Section 4.2.7, Page 4-14, Paragraph 1: Covering facility floors with a temporary synthetic cap does not address the possibility of contaminant release from leaking underground pipes or sumps.

31. Section 6.0, Page 6-6, Paragraph 2: On- and off-site disposal can not be ranked equal in regards to long term effectiveness. On-site disposal is slightly less effective because it requires engineering controls to continue the proper and safe management of contaminated materials remaining on-site. Although disposal off-site results in a

permanent solution for the site (because the contaminants are eliminated from the immediate area), there are other balancing criteria which may make off-site disposal less acceptable.

32. Section 6.0, Page 6-6, Paragraph 3: Containment is not a treatment technology by definition and cannot be considered as such. In addition, the last sentence appears to contradict the earlier discussion in this paragraph which states capping does not provide for sufficient reduction in contaminant mobility. U.S. EPA is establishing a guideline that a reduction of 90 to 99 percent in the concentration or mobility of an individual contaminant of concern should be achieved to qualify as a significant reduction in toxicity or mobility. This guideline does recognize that a reduction of less than 90 percent may achieve health based or other site specific remediation objectives. The analysis of the extent to which mobility or toxicity is reduced is required to be considered and reported in the detailed analysis of alternatives.

33. Section 6.0, Page 6-6, Paragraph 3: Thermal treatment and stabilization technologies were not screened from further consideration in Chapter 3. These technologies or process options should then also be included in the assembled alternatives. The statement that all excavated materials will be subject to treatment seems too narrow in scope and should also include the other treatment or solidification technologies.

34. Section 6.0, Page 6-6, Paragraph 4: Further clarification is needed on what is meant by the statement; "a loss of efficiency has been considered in the ranking."

35. Section 6.1, Page 6-8, Paragraph 2: The rationale for dividing the levels of contamination into two groups (i.e, 50 to 200 ppm and >200 ppm) should be provided. If there are special handling considerations for materials contaminated with >200 ppm total uranium, then it will be necessary to determine the quantity of materials in various contaminant ranges; specifically, soils in the Plant 6 area with uranium concentrations >15,000 ppm.

36. Section 6.1, Page 6-8, Paragraph 3: The amount of uncontaminated soil present in the interval between 5.5 to 10 feet below grade should also be included in the screening of alternatives. As the alternatives are described, it will be necessary to excavate and handle this material as part of excavating contaminated soils at deeper intervals. Therefore, the excavation and handling of all soils should be included in the alternative evaluation.

37. Section 6.4.2.6.2, Page 6-57, Paragraph 5: The constructability of this alternative should be no more difficult than either alternatives 7 or 8 which both include removing facilities.

38. Section 6.6, Page 6-71, Paragraph 7: The extent of uranium contaminated ground water above 30 µg/l should be discussed. This may significantly effect the location and magnitude of the ground-water collection system considered.

39. Section 6.6.2.2.2, Page 6-77, Paragraph 6: The text describes a well point system as the ground-water extraction process option; however, the screening of ground-water extraction process options did not select a representative ground-water extraction process option. The text should consistently report the results of the process option screening.

40. Section 6.6.2.5.3, Page 6-81, Paragraph 2: The reported estimated cost of over $250 million appears excessive. A relative cost of medium seems more appropriate for this alternative.

41. Section 7.1, Page 7-1, para 3: Portrayal of the 35 pci/g uranium residual in soil as a criteria for cleanup and source control is clearly premature and incorrect. It should not be portrayed as such.

42. Section 7.1, Page 7-3, Paragraph 1: Table 7-2 shows alternatives and associated technology types not process options.

43. Section 7.2.2, Page 7-7, Paragraph 1: A description of the extent of uranium contamination exceeding the remedial action objective of 30 µg/l would also be appropriate in this section.

44. Section 7.5, Page 7-11, Paragraph 4: The results of the treatability studies will have a significant impact on the detailed analysis of alternatives. The results of the treatability studies should be considered and presented in the detailed analysis of alternatives report.

U.S. DOE must submit a revised ISA for OU#3 within thirty (30) days of the date of this letter. In accordance with the 1990 Consent Agreement, the revision must be modified to correct all deficiencies identified by U.S. EPA in this letter.

If there are any questions regarding this matter, I may be contacted at (312/FTS) 886-4436.

Sincerely,

Catherine A. McCord
Remedial Project Manger

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