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**OHIO EPA COMMENTS CONCERNING: THE
TREATABILITY STUDY WORK PLAN FOR
OPERABLE UNIT 4**

08-22-91

**OEPA
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COMMENTS**

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THE TREATABILITY STUDY WORK PLAN FOR OPERABLE UNIT 4**

General Comments

1. The work plan should indicate that the treatability study will be conducted to comply with 40 CFR 261.4(e) and (f) and Ohio Administrative Code 3745-51-04(E) and (F).
2. Following the EPA's "Guide for Conducting Treatability Studies under CERCLA", the following sections are missing or omitted:
 - a) Goals - Goals for the treatability study should be clearly defined within the first chapter. Goals should be measurable aspects of the treatability study. As stated in the "Guide for Conducting Treatability Studies under CERCLA" (Section 2.1.3), "Setting goals for the treatability study is critical to the ultimate usefulness of the data generated." Goals should include disposal requirements, potential cleanup levels, and the reduction of toxicity, mobility and volume.
 - b) Schedule - Since schedules were recently negotiated with USEPA, a detailed schedule for the treatability study should be available and incorporated into the document.
3. Contamination within the berms and silo walls is likely, but is not specifically addressed in any of the removal alternatives. How will the treatment/disposal of these soils/structures be addressed?
4. A primary contaminant of concern for the silos is radon, yet radon emissions are not confronted within this work plan. The work plan should address how radon emissions will be affected by the proposed treatment options. The following, at a minimum should be addressed: What level of radon would be released during actual remediation via the specific treatment option? How much radon will be emitted by the waste form following treatment? If this can not be directly measured, then can it be estimated via some other measure (i.e., pore size)?
5. A number of analytical methods have been proposed within this work plan (MTCLP, Bulking Factor, etc.). Few if any of these refer to approved QAPP SOPs or ASTM methods: All new analytical methods should be incorporated into the revised site-wide QAPP to be submitted in September, 1991. Approved analytical methods are essential to using the data in risk

assessments as well as assuring the quality of data in choosing remedial actions.

Specific Comments

1. Section 1.1, p. 1, line 14: This sentence seems to indicate that waste is stored in the silo berms. Clarify this sentence.
2. Section 1.1, p. 2, line 4: Other radionuclides have been identified in the waste, including isotopes of uranium and thorium, radium 226, lead 210, and polonium 210. These are also nuclides of concern.
3. Section 1.2: As has been pointed out to DOE in Ohio EPA comments on several previous documents, remedial action goals must meet a site-wide risk range of 10^{-6} to 10^{-4} excess lifetime cancer risk. Action levels are not determined by simply using by twenty-five percent of standards (Table 1-1 & 1-2). This section should reference the methodology recently negotiated in the Amended Consent Decree between USEPA and DOE for ensuring the attainment of site-wide risk levels. The reasoning for inclusion of this section are unclear. If it is to be included in this work plan, it should be tied into setting goals for the treatability study (See general comment #2).
4. 1.3.1, p. 6, line 11 reads: "The purpose of treatment is to render the material nonleachable so that it is not hazardous by characteristics under the Resource Conservation and Recovery Act." The purpose of the treatment should just not only be to render the material not hazardous, but also to permanently and significantly reduce the volume, toxicity, and mobility of the hazardous substances, pollutants and contaminants of the site (including the elimination of radionuclide leachability).
5. Section 1.3.1, p. 6, line 14: It is inappropriate to cite a reference unavailable to the public or the reviewer. Either eliminate this reference or release the report, "Characteristics of Fernald's Silos 1 and 2 Residue Before, During and After Vitrification."
6. Section 1.3.1, p. 6, lines 20-21: DOE should more clearly state what this sentence is suggesting. Are silo 3 wastes candidates for solvent extraction? Will the high concentrations of Th-230 and other radionuclides (i.e., Ac-

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- 227, Ra-228, Pa-231, U-235/236) in silo 3 affect the effectiveness of this process.
7. Section 1.3.2, p. 7, lines 11-13: There is a mention of "original interpretation" of the U.S. EPA "Guide for Conducting Treatability Studies Under CERCLA." There is no explanation for another interpretation.
 8. Section 1.3.2, p. 9, Figure 1-3: Is the source for Figure 1-3 different from that used for Figure 1-2? Please clarify this.
 9. Section 1.3.3, pg. 11, 1st full paragraph: Unless testing of this solid residual reveals that contaminants are below detectable limits, this material will be considered a solid waste under Ohio law.
 10. Section 1.3.4, pg. 11, lines 29-30: When will the vitrification studies of untreated silo material be addressed, and in what document?
 11. Section 1.3.3., pg. 12, Figure 1-4: Justification for the 5 pCi/g limit for the radionuclides should be provided. This would preferably be defined in a goals section.
 12. Section 2.0, pg. 1, lines 13-15. Unless testing of this solid residual reveals that contaminants are below detectable limits, this material will be considered a solid waste under Ohio law.
 13. Section 2.1, p. 2, line 2: The date of the Seely reference (1977) does not agree with the date in the reference list (1976). Please correct this discrepancy.
 14. Figure 2-4, pg. 6: The last block in the flow chart should read "off-property disposal".
 15. Section 3.1, p. 1, Objective bullets: An additional objective of the treatability testing should be to determine the leachability of all radionuclide and HSL constituents from the final waste form. This information will be important in evaluating the long term effectiveness as well as the reduction in mobility for each treatment option.
 16. Section 3.1, p. 1, line 14: This section refers to the "laboratory treatability testing program." This program is not mentioned elsewhere in the test. The titles of the various phases of the treatability study need to be consistent.

17. Table 3-2, "Stabilization Test DQOs": Each test should reference the method to be used, or should reference a detailed explanation of the method in the appendix.
18. Table 3-2, "Stabilization Test DQOs", 5-Day Static Leach Test: There is no explanation for this test being used. This test should also have a description of its procedures located preferably in the appendix.
19. Table 3-2: Any DQO Level V should have a justification for its use and a description of its procedures located in the appendix.
20. Section 3.2.1, p. 6, line 2: Provide a copy of the MTCLP method. Discuss how the changes in the method would still provide for valid results for use in the treatability study.
21. Section 3.2.2, p. 6, line 16: Define "adequate waste form."
22. 3.2.2, pg.6, line 22: DOE should provide a reference for the bulking factor equation.
23. Section 3.2.2, pg. 7, line 3: The title of this document should be provided and it must be included in the References Section.
24. Section 3.2.3, p. 7, line 11: Explain the rationale for using composite samples in the advanced screening tests for silo 3. How many samples will be tested?
25. Section 3.3, pg. 7, Objective Bullets: An additional objective of the treatability testing should be to determine the leachability of all radionuclide and HSL constituents from the final waste forms. This information will be important in evaluating the long term effectiveness as well as the reduction in mobility for each treatment option.
26. Section 3.3, pg. 7, line 22-23: Provide further discussion and justification for this objective.
27. Section 3.4, pg. 8, line 23: Define what makes the leaching process "successful."
28. Section 3.4, pg. 11, line 2: The stabilized precipitate should be subject to full TCLP. All final waste forms should be subject to full TCLP if the treatment option is being carried forth.

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29. Section 3.4, p. 11, line 3:
 - a) The vitrified leachate should be subject to full TCLP. All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.
 - b) Provide a method for the PCT, preferably in the appendix.
 - c) Explain how the leachate will be vitrified.
30. Table 3-3, "Metals Extractions Tests DQOs", PCT: There is no explained reason for this test being used. This test should also have a description of its procedures, preferably in the appendix.
31. Table 3-3, "Metals Extractions Tests DQOs": Each test should reference the method to be used, or should reference a detailed explanation of the method in the appendix.
32. Section 4.1, p. 1, line 1: Explain the rationale for using a 3/8 inch mesh screen. Define "obvious debris."
33. Section 4.1.2.1, p. 1, line 17: What kind(s) of acid will be used?
34. Section 4.2, p. 3, line 2: Explain the rationale for using a percent weight/weight composite for soil types.
35. Section 4.2, p. 3, line 8: Explain the rationale for the analytes in Table 4-2.
36. Section 4.3.2, p. 10, line 28: This sentence is not clear in designating what silos will be used for the tests.
37. Section 4.3.2, pg. 10, lines 28-31: Top, middle and bottom layers should be defined, to reference an actual location in the silos.
38. Section 4.3.2, p. 10, line 28: Recent sampling in the silos indicates that there may be cavities within the waste extending to lower levels in the silos. When bentonite is added to the silos, it may enter these lower cavities. The stabilization tests should therefore be conducted on additional strata of the waste, not just the top stratum.
39. Section 4.3.3, p. 11, line 2: Explain the rationale for using composite samples in the advance screening. How many samples will be tested?
40. Section 4.4.1, p. 11, line 24: Identify acids in the text.

41. Section 4.4.1, pg. 11, line 29: Target compounds should not be chosen on concentration alone. If the least soluble compound is chosen as the target compound, then when screening suggests a solution works it is likely the more soluble compounds would have also leached successfully.
42. Section 4.4.1.3, p. 13, lines 24-25:
 - a) Define the source of the limits suggested in this sentence.
 - b) Justify defining only uranium limits by risk. Final cleanup levels for the site will be risk based levels.
43. Section 4.4.2, p. 17, line 2: Describe the location and composition of the site soil and the locally available soil that will be used.
44. Section 4.4.2, p. 17, line 8: In Figure 4-4 there is a step to evaporate leachate to dry solids. Explain in the text how this step will be accomplished.
45. Section 4.4.3, p. 17: Are the 0.45 micron filters and the centrifuge operation representative of how the wastes would be treated in large scale operations?
46. Section 4.4.4, p. 17, line 28: Section 4.4.2 is about vitrification. Explain where the precipitated material is generated.
47. Figure 4-4, pg. 18: The vitrified leachate should be subject to full TCLP. All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.
48. Section 4.4.5.1 and 4.4.5.2, p. 22: Each of the sections begins with, "If necessary,...". Define the criteria to determine if these tests need to be conducted.
49. Section 4.4.8, pg. 24, line 6: See comment #41.
50. Section 4.4.8, pg. 24, line 13:
 - a) See general comment #4.
 - b) All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.
51. Section 4.4.8, pg. 24, line 23: All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.
52. Table 5-1, "Equipment and Materials": This table should include the manufacturer and manufacturing number.

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53. Section 7, p. 1, line 14: This discussion of laboratory protocol for testing in the laboratory seems to indicate that the laboratory will not follow the RI/FS QAPP. Please clarify this.
54. Section 8.1, p. 1, line 4: State which leachate results will be used in the risk assessment. This is important to know because of the data quality requirements for risk assessments.
55. Section 8.4: Please give a reference for these formulas.
56. Section 10.4: Does DOE intend to archive any products of the treatability study? These could be useful for assessing the effects of radiation on vitrified and solidified material over a period of time.