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**CONDITIONAL APPROVAL OF THE OU 1
REMEDIAL INVESTIGATION FINAL REPORT**

04/01/94

**USEPA/DOE-FN
18
COMMENTS
OU1**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

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REPLY TO THE ATTENTION OF:

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

HRE-8J

RE: Conditional Approval of the
OU 1 Remedial Investigation
Final Report

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the revised Operable Unit (OU) 1 Remedial Investigation (RI) Final Report. The United States Department of Energy (U.S. DOE) has adequately addressed the majority of U.S. EPA's comments with appropriate responses and incorporated them into the text of the RI report. However, there are further changes required to the document.

Representatives of U.S. EPA and the United States Department of Energy (U.S. DOE) met on March 31, 1994, to discuss U.S. DOE's responses to U.S. EPA's draft comments on the OU 1 RI final report. At that meeting it was agreed that all issues could be resolved with text revisions. Therefore, U.S. EPA hereby approves the revised OU 1 RI final report pending incorporation of the attached comments into the RI Report.

U.S. DOE must incorporate the attached changes into the OU 1 RI Report within thirty (30) days receipt of this letter. The comment responses and changed pages should be clearly marked or shaded to expedite review of the revisions.

Please contact me at (312) 886-0992 if you have any questions.

Sincerely,

James A. Saric, Remedial Project Manager
Technical Enforcement Section #1
RCRA Enforcement Branch

Enclosure

cc: Tom Schneider, OEPA-SWDO
Pat Whitfield, U.S. DOE-HDQ
Don Ofte, FERMCO
Jim Theising, FERMCO
Paul Clay, FERMCO

TECHNICAL REVIEW COMMENTS ON OPERABLE UNIT 1 (OU1)
DRAFT REMEDIAL INVESTIGATION (RI) REPORT, REVISION 1

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.4.2.1 Page #: 3-24 Line #: 24

Original Comment #66 (OSC #13)

Comment: The original comment states that the characterization of the till should address secondary permeabilities. The U.S. Department of Energy (U.S. DOE) discusses horizontal and vertical hydraulic conductivities (K_h and K_v) and uses a 10:1 ratio for K_h and K_v for the fate and transport modeling. Based on slug test data, K_h ranges from 3.1×10^{-3} to 2.5×10^{-6} centimeters per second (cm/s). Using a ratio of 10:1, these values for K_h would give K_v values that range from 3.1×10^{-4} to 2.5×10^{-7} cm/s. However, in the fate and transport modeling, U.S. DOE uses a K_v value that ranges from 4×10^{-6} to 6.6×10^{-6} cm/s. U.S. DOE should explain this discrepancy.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.4.2.3 Page #: 3-26 to 3-28 Line #: NA

Original Comment #69 (OSC #16)

Comment: The original comment states that basic hydrogeologic information, including vertical and horizontal permeabilities, should be discussed. U.S. DOE does not fully discuss K_h and K_v values for the Great Miami Aquifer (GMA). U.S. DOE cites literature values (Spieker 1968a) for the GMA (Type III aquifer); however, it should also discuss if K_h and K_v values were determined from pump or slug tests performed on site wells installed in the GMA.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.0 Page #: 3-41 to 3-45 Line #: Figure 3-2 to 3-6
Original Comment #70 (OSC #17)

Comment: The original comments states that waste pit cross-sections should indicate how media elevations were determined, specifically for the pit liners. U.S. DOE addressed this comment by stating that at least one boring in each waste pit extended to the clay liner below each pit. Figures 3-2 through 3-6 also illustrate this point. However, U.S. DOE's response to Original Comment #74 (OC #58) states that all borings in the pits were stopped above the liner to avoid damage. U.S. DOE should resolve this discrepancy.

Commenting Organization: U.S. EPA
Section #: 3.0 Page #: 3-86 and 3-87 Line #: Figure 3-47 and Figure 3-48
Commentor: Saric

Original Comment #72 (OSC #19)

Comment: The original comment states that groundwater flow directions indicated on perched water level maps may be inaccurate because wells may not be screened in the same geologic units. U.S. DOE partially addressed this comment by stating that coarse-grained (sand and gravel) lenses were correlated in cross-sections A-A', B-B', E-E', and G-G'. The correlation of the lenses is not apparent in cross-sections A-A' and B-B'. U.S. DOE should address this issue.

Commenting Organization: U.S. EPA
Section #: 4.0 Page #: 4-12 Line #: 27 and 28
Commentor: Saric
Original Comment #93 (OSC #22)

Comment: The original comment discusses thorium concentrations in the waste pits. U.S. DOE apparently references the incorrect pages. As described in the Action, Page 4-19 is incorrectly referenced twice. Apparently, the first reference to Page 4-19 should actually be to Page 4-16 and the second reference to Page 4-19 should actually reference Page 4-15. U.S. DOE should resolve this discrepancy.

Commenting Organization: U.S. EPA
Section #: 4.2.0.5 Page #: 4-14 Line #: 9
Commentor: Saric
Original Comment #99 (OSC #26)

Comment: The original comment discussed the concentration of various metals in the waste pits. In the Response and Action section to this comment, U.S. DOE discusses "major" and "minor" inorganic contaminants. U.S. DOE should discuss which contaminants are considered "major" and "minor" and why.

Commenting Organization: U.S. EPA
Section #: 4.2.1.3 Page #: 4-18 Line #: 2, 3, and 4
Commentor: Saric
Original Comment #104 (OSC #31)

Comment: The original comment discusses elevated electromagnetic (EM) readings indicated on Figure 4-10. U.S. DOE addressed this comment by revising Figure 4-10. U.S. DOE should indicate in the table included in Figure 4-10 that Area C is an area of elevated EM readings.

Commenting Organization: U.S. EPA
Section #: 4.2.1.3 Page #: 4-18 Line #: 5 and 6
Commentor: Saric
Original Comment #105 (OSC #32)

Comment: The original comment states that a high density of buried objects is discussed in the text for Area D, but this area is not indicated on Figure 4-10. U.S. DOE addressed this comment by revising Figure 4-10.

Commenting Organization: U.S. EPA
Section #: 4.2.4.6 Page #: 4-52
Original Comment #127 (OSC #51)

Commentor: Saric
Line #: 3 and 4

Comment: The original comment discusses metals that were detected above background but were not discussed in the text. U.S. DOE addressed this comment by discussing the metals that were detected above background levels. However, in the original comment, it was noted that cobalt and zinc appeared to be elevated when compared to background levels. Because U.S. DOE did not address these constituents in its discussion, it should discuss these constituents.

Commenting Organization: U.S. EPA
Section #: 4.2.7.6 Page #: 4-68
Original Comment #140 (OSC #61)

Commentor: Saric
Line #: 20 and 21

Comment: The original comment states that there are metals that exceed "normal abundance levels" that are not discussed in the text and that the term "normal abundance levels" should be defined. U.S. DOE addressed this comment by revising the list of metals that exceeded normal abundance levels and by revising the term "normal abundance levels" to mean above background levels. However, in the revised list of metals, arsenic, lead, and magnesium are deleted. U.S. DOE should state why these constituents were deleted.

Commenting Organization: U.S. EPA
Section #: 4.3.1.1 Page #: 4-75
Original Comment #146 (OSC #66)

Commentor: Saric
Line #: NA

Comment: The original comment states that background field instrument for detection of low energy radiation (FIDLER) readings and locations should be provided. U.S. DOE's response states that descriptions of the background FIDLER measurements are presented in Table 4-25; however, Table 4-25 contains RI/FS groundwater data. U.S. DOE should reference the correct table. Also, according to Figure 3-7, there is a significant portion of time when background FIDLER locations 14 and 15 are downwind. This would appear to invalidate these locations as background locations. U.S. DOE should address this discrepancy.

Commenting Organization: U.S. EPA
Section #: 4.3.2.1 Page #: 4-81
Original Comment #154 (OSC #74)

Commentor: Saric
Line #: 22 and 23

Comment: The original comment states that the amount of uranium detected in each zone is a result of the limited number of samples collected from the zones. U.S. DOE has not adequately addressed this comment. According to Figure 2-12A, there were nine borings drilled through the Upper Sand and Gravel Layer, three were drilled through

Comments on the Draft Final "Remedial Investigation Report for Operable Unit 1"

U.S. EPA Region 5 Radiation Section

March 18, 1994

Commenting Organization: U.S. EPA - Region 5, Radiation Section

Section #: 4.2.2.4

Page #: 4-28

Line #: 37

Code: C

Original Comment #: 113 (OC #6)

Comment: It is stated that the concentration value for Th-228 listed in Table 4-5 is considered to be an anomalous analytical result, since Th-228 should be in secular equilibrium with its Th-232 and Ra-228 parents. Nonetheless, both the CIS and RI/FS radiological data indicate an excess average concentration of Th-228, with Th-228/Th-232 concentrations ratios of 1.5 (CIS) and 3 (RI/FS); radium data is not available from the CIS, so a Th-228/Ra-228 ratio comparison is not possible. This is a consistent indication that within Waste Pit 2, Th-228 is present in higher concentrations than its Th-232 "parent," for whatever reason. While viewed as an anomaly, this data should still be accepted as true and usable, provided it's validated data.

2nd Comment: U.S. DOE states in its response that the Th-228 results in fact are not anomalous, but their stated modifications to text were not made. The modifications for this comment involved deletion of the reference to the anomalous results, requiring most of the original paragraph to be deleted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: March 21, 1994

SUBJECT: Review of the Draft Final Remedial Investigation Report
for Operable Unit 1, Fernald Environmental Management
Project (FEMP), Fernald, OH, February 1994

FROM: Pat Van Leeuwen, Toxicologist *PVL*
Technical Support Unit

TO: Jim Saric
Project Manager

I have reviewed the revised Remedial Investigation Report for Operable Unit 1 of the Fernald Environmental Management Project (FEMP), dated February 1994, focussing on my prior comments on the risk assessment portion (Appendix E) of the document and other stated changes. I was disappointed to see that some whole sections (such as E.2.3.1.2/ Toxicological Screening) were revised completely, and no notation of the text changes was indicated either in the text, by shading, or in the Response Manual. I did not reread the entire document and am afraid that there may be other changes which will escape review - at least in this round - only to surface next time around. This is not in the best interest of either agency.

My comments on the changes and response comments follow. If you have any questions on these comments or any section of the risk assessment, please contact me at 886-4904.

180/NEW I was surprised to see DOE again include the Upper Threshold Limits (UTL) approach. We have discussed this approach several times and commented that the UTL value might be very unstable, and even exceed the maximum background level, as the UTL calculation is sensitive to even a single elevated sample. I do not recall EPA ever agreeing to the use of the UTL approach. For radionuclides, the use of the UTL is a moot point. If the comparison of the radionuclide concentration including background with the background concentration is the basis of the assessment, then no prior elimination of radionuclides based on a comparison with any background concentration level, either means or the UTL, is acceptable.

261/OC1 My comment on the issue of the proper approach for radionuclides (subtract natural background levels

and calculate the risk for the residual) is consistent with my comment # 22 in the Response to Comments - Risk Assessment Workplan Addendum, February 1992 referred to in the response. DOE continues to prefer to do two sets of risks calculations for radionuclides - one which includes the background component and a second for the background levels only. What is missing in the assessment is the risk above background; the latter is used in the risk management step.

DOE should probably rethink their approach, as it will make it more difficult for them to apply the evolving cleanup standards when they are available. The DOE approach also means that exclusion of radionuclides as CPCs using a comparison with background is not valid, and this step should be removed from the screening process outlined on pages E-2-14 and E-2-15.

270/OC2 The response is acceptable.

308/OC3 The response is acceptable.

309/OC4 The May 1993 DRAFT "Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure", while draft, represents Regional consensus as well as "best professional judgement" at present. As such, it is a relevant document. It is fine to include it in the reference section, but this should not be done unless it was used in the report. I did not see any reference to this document in the text. Please explain how it fits into the report.

310/OC5 Action is incomplete. Please add to the text: "Some contaminant exposures (childhood exposure to lead, dermal exposure to PAHs, etc.) might be better addressed using a qualitative or semi-qualitative approach."

314/OC6 The response is acceptable.

315/OC7 The response is acceptable.

318/OC8 The response is acceptable.

319/OC9 The response is acceptable.

323/OC10 The response is acceptable.

325/OC11 The response is acceptable.

327/OC12 Table E.2-3 The reporting is still unconventional - soil metals are usually reported in mq/kg. I am now further confused as some metals previously reported have been eliminated (an example is arsenic), although the previously listed concentration in soil was toxic even if one assumes that the value should have been mg/kg instead of g/kg. Please explain the removal of these contaminants.

346/OC13 The response is acceptable.

351/OC14 The response is acceptable.

352/OC15 The response is acceptable.

363/OC16 The response is acceptable.

373/OC17 The response is acceptable.

374/OC18 The response is incomplete. I/the reader does not have any idea why the exposure is limited to a 30-year period if the resident lives in the area for 70 years? Please provide an explanation of your assumptions for this scenario.

375/OC19 The new explanation is interesting; however I believe that the NRC value represents an average (read CT) exposure, not an RME exposure as required by RAGS. In any case, it is less than the time usually considered in EPA risk assessments, which is more on the order of 175 eight-hour days. It might be longer if the contractor/builder puts up the barns, garage, etc. in addition to the house. I am concerned that the risk to this receptor is seriously underestimated.

An additional problem is raised by the use of 10 hour workdays, as the soil Incidental Ingestion and Dermal Absorption pathways use 8 hour days in the calculation. (Actually, the gamma radiation exposure is the only exposure for which the total hours input will work.) A further confounder in the the construction/builder scenario is the use of 365 days as the averaging time for non-carcinogens. The time frames must be consistent; the risk stops when the exposure stops.

376/OSC52; 377/OC20 Some additional explanation is still needed in the scenario description of the onsite farmer. It is not readily apparent that the gamma radiation exposure is based on the total time spent outdoors (total hours/year), while the Incidental Ingestion of soil pathway uses the number of days

exposed (in the explanation, either 100 or 48 days) at the elevated ingestion rate.

The second question, whether the US Conservation Services data represents an average (read CT) exposure or an RME exposure, was not addressed. What if the farmer choses to plant more that 10% of his land in hay/spent more time in the field - is he at greater risk? What is a realistic upper bound (RME) exposure value? Maybe this is a moot point, as even the average exposure presents an unacceptable risk for any on-site farming activities at this OU. However, it would be nice to be able to use a consistent site-wide exposure scenario, as it might make a difference in another on-site location, and it will be difficult to explain the modification of the farmer's activities, based on location. By the way, 4.2 hrs x 275 days = 1155 hrs.

380/OC21 The response is acceptable.

384/OC22 The response is acceptable.

386/OC23 Lead Profile There still appear to be a number of problems with statements in this profile.

Page E-4-45, lines 19-24: The NAAQS for lead is useful in assessing the adverse health impacts on the general public from inhalation of lead; however the NAAQS is not useful in deterring the impact of lead on children under the age of seven, the population of concern. The text revision states that the NAAQS was not used, but gives the impression that it could be used for children, as the previous sentence discusses these health impacts.

Page E-4-46, lines 20-24: The limitations on the use of the UBK Model for Lead are the FEMP data, not the UBK Model. Versions 0.5 and 0.6 of the Model have been widely applied at CERCLA sites in both this Region and other Regions. The use of interim versions of the Model represent the best science at present.

Page 4-47, lines 1-2: The Science Advisory Board review took place more than a year ago. Version 0.99D of the IEUBK Model and the guidance manual have been completed and are in the process of being distributed.

394/OC24 I did not see the updates/ dermal discussion for PAHs used in the OU#4 reports included in this update, although other OU#4 guidance was incorporated. EPA has revised the guidance for PAHs to allow the use of Relative Potency Factors (RPFs) in the risk calculation. Please comment.

466/DERR 158 I was surprised to see that I had suggested the use of Roy Smith's tables for chosing CPCs in a 6/28/93 teleconference. (1) My calendar shows that I was

engaged on another site on 6/28/93; I do have notation of a 6/8/93 teleconference with FERMC0. (2) I am not a big advocate of Roy Smith's tables, except as a quick screening device. I prefer the of EPA guidance - i.e., do the calculations in RAGS, Part B. (3) Roy's table should only be used for preliminary (pre-RI) screening of a site; they should never be used as part of the process to select CPCs. The tables have not been approved by Headquarters; therefore they remain Region III guidance.

NEW01 Page E-2-14, bullets. This section has been revised to include some points which were eliminated in previous review comments.

Bullet 4: I have previously commented that the use of a 5% frequency of detection limit to eliminate contaminants as CPCs is an example in RAGS, not a rule. When a large number of samples are collected, detection in 5% of the samples might result in a large number of detects which cannot be dismissed so frivolously. A frequency of detection rule should not be used unless the limit value has been specifically agreed upon by the project manager, toxicologist and health physicist for the site.

Bullet 5: The first sentence seems to be incomplete - include "at concentrations found" where?

Bullet 7: Why? The decomposition products of some contaminants, such as chlorinated hydrocarbons and PAHs, are the more toxic entities, and these products are toxic at concentrations in the parts per billion range!

Bullet 8: Why? VOCs with vapor pressures less than 10 mm Hg would still be a problem under certain exposure scenarios. Please explain.

Bullet 9: Roy Smith's/Region III Tables may never be used to eliminate contaminants as CPCs; this is a screening guidance. See above comments.

Bullet 10: Add "These chemicals were discussed qualitatively or semi-qualitatively."

Bullet 12: All radionuclides might be present at levels that do not "significantly" exceed background levels, given the high natural background for some radionuclides, and still present an unacceptable risk above background. This is not a valid comparison given the methodology employed in this assessment. See above comments.

NEW02 In Table E.3-18, there are two columns listed for the Expanded Trespasser, Age 7-18. The two lists of parameter values contain different values. What was used in this scenario?

NEW03 Table E.3-18. If the on-property Home Builder is only on site for 3 months, the AT-noncancer value should be 90 days (or 175 days, as suggested), not 365 days. The risk stops when the exposure stops.

NEW04 The Table headers in Section E.3 have not been revised to be consistent with the new scenario labels. The reader does not know which parameter values were used in which scenarios.

NEW05 Page E-6-6: Under uncertainties associated with the calculation of the exposure point concentration, I did not see any discussion of the underestimation of the risk due to the use of surface soil data from 0-24 inches. For ingestion and dermal absorption pathways for soil, surface soil is usually considered to be six inches. This greater dilution of the surface soil contaminant concentrations will likewise reduce the risk. A discussion of this point should be included in Section E.6.2.2.1.