U-004-305.27

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O.U. 2 REMEDIAL INVESTIGATION REPORT (OHIO EPA COMMENTS)

12/17/92

OEPA/DOE-FN
10
COMMENTS

OhioEPA
State of Ohio Environmental Protection Agency

Southwest District Office
40 South Main Street
Dayton, Ohio 45402-2086
(513) 285-6357
FAX (513) 285-6404

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AR

George V. Voinovich
Governor

December 17, 1992

DEC 31 1992
RECEIVED

Mr. Jack R. Craig
Project Manager
U.S. DOE FEMP
P.O. Box 398705
Cincinnati, Ohio 45239

Dear Mr. Craig:

Attached are Ohio EPA comments (hard copy as well as disk) on the O.U. 2 Remedial Investigation Report. We have made an effort to use the suggested DOE comment format. Some comments are in this format and some in the format we have used in the past.

If you have any questions about these comments, please contact Tom Schneider or me.

Sincerely,

Graham E. Mitchell
Project Manager

GEM/acp

Enclosure

cc: Jenifer Kwasniewski, DERR
Tom Schneider, DERR, SWDO
James Saric, U.S. EPA
Dennis Carr, FERMCO
Lisa August, GeoTrans
Tom Hahne, PRC
Robert Owen, ODH

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OHIO EPA COMMENTS - OU2 REMEDIAL INVESTIGATION REPORT

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Detailed below are Ohio EPA's comments on the above referenced document.

General Comments

1. The RI report should be revised to incorporate any additional data gained to date. These data must include samples from monitoring well 1433, leachate samples for the solid waste landfill trenches, and logs for the trenches within the solid waste landfill. These data are essential to assessing completeness of data for the operable unit investigation.

2. As stated in previous Ohio EPA comments, the use of a number of background groundwater sampling locations is unacceptable. Ohio EPA's previous comments were aimed at avoiding a situation such as this. DOE is now in a position which requires immediate attention to developing an acceptable background groundwater data base.

3. The document references GPR and magnetometer studies of the waste units, yet fails to provide any figures or data from these studies. This information should be included within the report to add to the overall insight into each waste unit. Additionally, the text states that areas of magnetic readings were avoided during sampling activities. Such biased sampling may have prevented DOE from investigating concentrated source areas (i.e. buried drums).

4. The RI report fails to determine whether any of the waste units are contributing to groundwater contamination presently. Significant groundwater contamination does occur near a number of the waste units. The resolution of the waste units as groundwater contamination sources can not be put off until the OU5 RI, since the OU2 ROD should be complete before the issuance of the that RI.

Specific Comments

1. Sections 1.3.1.2 & 1.3.1.2, pg. 1-16: DOE should include in these sections information relevant to the fact that the lime sludge ponds are RCRA units. This information will be necessary during the evaluation of remedial alternatives for these waste units. RCRA will be an ARAR for these waste

units.

2. Section 1.3.3.2, pg. 1-21: The information gained from the walkover surveys during the removal action should be included within the RI to supplement existing surface soil sampling data. The survey data can be used for a qualitative view of the waste unit.

3. Section 1.3.3.3, pg. 1-21: Some of the surface soil sampling locations from this removal action may have been placed within the operable unit 2 waste unit boundaries. These data should be reviewed to determine if any additional surface soil data is available for the OU2 units.

4. Section 1.3.3.4, pg. 1-22: It is unclear from this paragraph if all information gained from the firing range investigation is included in the RI. If additional data are available (e.g. organic, inorganic and radiological contaminants), they should be included in this report.

5. P2-21,line 7; DOE does not verify that monitoring wells 2014, 3014, and 3016 meet the QA/QC requirements of the RI work plan. If not, the data must be evaluated to determine its usability.

6. P2-22, line 17; How long were the sampling events?

7. Section 2.1.3.4, pg. 2-22, line 19: Table 2-3 is incorrectly referenced here. The correct reference is most likely Table 2-4.

8. P2-35, sec 2.2.5; Why were monitoring wells installed in the landfill instead of downgradient of the unit?

9. Section 2.3.1, pg. 2-40: This section must reference the fact that these waste units have been designated as RCRA units.

10. Section 2.5.2, pg. 2-55, line 41: Figure 2-14 is incorrectly referenced. The correct reference is Figure 2-15.

11. Section 2.6.2, pg. 2-64: The section fails to discuss surface soil samples collected within and adjacent to the South Field boundary (e.g., 1046, 1516, 1517, 05001, See Figure 2-65). These samples should be discussed within the section.

12. P3-69, lines 13-15; The detailed description of the slug tests should be discussed here in the RI, not simply referenced.

13. P3-69, lines 13-15; DOE should discuss what measures were taken to determine if the permeable zones in the till are

interconnected.

14. P4-1, lines 17-19; All data used in the RI/FS must be validated and meet all criteria set in the RI/FS work plan. It is not possible for Ohio EPA to review each item of data to determine its usability; that is why the RI/FS work plan was created.

15. Table 4-1, pg. 4-3: a) As stated in the general comments above, the use of the inorganic background values defined in this table is unacceptable to Ohio EPA. The fact that a number of the "background" inorganic concentrations exceed their respective MCLs calls into question the database.
b) Footnote "g" states that the value is assumed based upon the lowest background value from other groundwater units. If this is true then the lowest value was probably a non-detect for some constituents and thus non-detect should be the background value.
c) The use of regional values for the determination of background inorganic soil concentrations is not warranted in light of the substantial sampling program implemented by DOE. DOE should use site specific data for the determination of background values.

16. Table 4-5, pg. 4-21, Tetrachloroethene: It is unclear how a range of 0.030-0.097 was obtain when the contaminant was detected in only one sample. The table needs to be corrected.

17. P4-6, lines 9-15; This is an oversimplification of a potentially complex system. Simply because a contaminant is found above background in ground water and not above background in the overlying soil does not in any way indicate that it had to come from an upgradient source. It is quite possible that the contaminant may be originating from a different part of the same unit.

    DOE cannot simply ignore the presence of the ground water contaminant and waive further investigation to the OU5 RI. It is DOE's responsibility to fully investigate and define any ground water contamination in regards to OU2. If additional investigation gives technical justification for assigning an upgradient source other than OU2, then the source must be identified and investigated in the OU5 RI/FS.

18. Table 4-11, pg. 4-42: Locations 23-012 and 23-013 are footnoted with an "a", yet both locations lie within the south lime sludge pond (See Figure 4-7). Please correct the table.

19. P4-29, lines 5-6; What is DOE's assessment of the presence of secondary permeability due to the weathering of clay till?

What evidence shows that secondary permeability does not provide a pathway to the underlying sand and gravel aquifer?

20. P4-29, lines 15-18; Why were not all monitoring wells sampled for the same parameters? One of the purposes of an RI/FS is to provide a broad data base for comparison. Although radionucleides are a prevalent contaminant at Fernald, the RI/FS is designed to look at all contaminants. As a result, it is not desirable to pick and choose certain wells which are to be sampled for select parameters.

21. P4-29, line 22; DOE switches between the use of Picocurries per liter and parts per billion. A single unit should be used throughout the document.

22. P4-29, lines 21-27; DOE has not included figures illustrating ground water flow based upon the quarterly RI sampling events. Additionally, the text does not include a technical discussion of ground water flow gradients or directions. As a result, it is impossible to evaluate MW 2052's adequacy as an upgradient monitoring well.

23. P4-29, lines 26-27; DOE will have to include a thorough technical justification for this hypothesis. The limited discussion in this section is not adequate.

24. P4-29, lines 34-36; Why was the RI work plan not followed for these samples?

25. P4-29, lines 21-27; Figures with: Unit delineation, ground water flow, and monitoring well placement should be included for all monitored units in OU2.

26. P4-35, lines 2-8; Specifically, where were these contaminants found? What is the rate and extent of the ground water contamination?

27. P4-52, lines 9-13; See comment 20.

28. P4-52, lines 16-23; This section completely lacks any discussion of hydrogeology. Technical hydrogeologic justification must be provided to support an upgradient source.

29. P4-52, lines 26-29; To what are these contaminants attributable?

30. Section 4.3.5.3, pg. 4-52, line 32: It is unclear whether chromium was "not consistently detected above background" or "not detected" (See 4.3.7) in groundwater. DOE needs to be

more concise in its discussion of sampling results. Statements such as "not consistently detected above background" need to be eliminated and replaced with more specific summaries.

31. P4-56, lines 2-4; This statement cannot be made if all ground water samples were not analyzed for the complete list of parameters.

32. P4-56, lines 9-11; The fate of contamination in these wells cannot be determined at this time. DOE has not presented any technical data addressing the vertical or horizontal migration of ground water in the till.

33. P4-69, lines 25-27; DOE must present technical evidence that shows that the Active Flyash Pile is influenced by the South Field.

34. Table 4-24, pg. 4-72: The table should state whether the concentrations are in wet weight or dry weight of organism.

35. Section 4.5.4.3, pg. 4-90: List all waste-related metals detected and their respective concentrations within this section.

36. P4-90, lines 28-32; Why weren't all wells sampled for the complete list of parameters?

37. P4-93, lines 12-15; This sentence is phrased such that it implies that 4016 is an example of more that one well with elevated metals concentrations. If more than one well showed elevated metals concentrations, then they should all be listed.

38. P4-93, lines 36-37; If there is insufficient data to determine if the inactive flyash landfill is a source of ground water contamination, then a phase II investigation should be implemented.

39. Section 4.5.5.3, pg. 4-93: The section states, "Waste-related metals consistently detected in one or more wells above their applicable background concentration include cadmium in well 4016." This statement leaves the reader asking, What other waste-related metals are "included"?, Which waste-related metals were inconsistently detected? and In what other wells were these metals detected?. DOE should clarify the text to answer questions not raise additional concerns.

40. P4-90, lines 28-32; Why weren't all wells sampled for the

complete list of parameters?

41. P4-93, lines 12-15; This sentence is phrased such that it implies that 4016 is an example of more that one well with elevated metals concentrations. If more than one well showed elevated metals concentrations, then they should all be listed.

42. P4-93, lines 36-37; If there is insufficient data to determine if the inactive flyash landfill is a source of ground water contamination, then a phase II investigation should be implemented.

43. Section 4.5.7, pg. 4-96, line 9: Clarify what DOE considers "consistently detected".

44. P4-96, line 11; Change Great Miami Aquifer to Inactive Flyash Landfill.

45. Table 4-37, pg. 4-127, Beryllium: The frequency above background should be 17/26 since the range all exceed background. Please correct the table.

46. Section 4.6.5.1, pg. 4-140, line 20: Correct "Rum" to "Run."

47. Section 4.6.5.3, pg. 4-140: DOE should clarify whether cadmium was the only waste-related metal detected or which other metals are "included."

48. P4-144, lines 1-5; A technical discussion of fate and transport of contaminants based upon existing data should be included prior to any fate and transport modeling.

49. Figures 5-1 thru 5-3: Correct "Moss" to "Mass".

50. Figure 5-3: Include an arrow between Pb-212 and Bi-212.

51. P5-16, lines 6-22; Is DOE implying that surface water obtained from the lime sludge pond is capable of representing leachate for all of OU2? The wastes disposed of throughout OU2 are too variable to use this one sample as a representative example.

52. P5-19, lines 4-14; This method replaces actual measurement with modeling. This is a process which Ohio EPA has been encouraging DOE to discard. If there is not enough existing data to determine site specific leachate compositions, then phase II activities are warranted.

53. P5-19, lines 21-36; If there is not enough existing data to determine site specific leachate compositions, then phase II

activities are warranted.

54. P5-21, lines 1-19; Is the HELP model able to interpret complex geology like that which is found in the till?

55. P5-21, lines 31-36; Ohio EPA has identified many problems with the SWIFT II model as it has been used by DOE. DOE is currently taking action to fix some of these problems. As such, it is not suitable for use for the OU2 RI fate and transport modeling. Once the model input is corrected, then it can be used for this process.

56. Section 6.1.1, pg. 6-3, line 6: What basis did DOE specifically use for eliminating a contaminant based upon infrequency of detection? Was elimination based upon detections per media, sample location, well etc.? It would seem that based upon the limited number of samples available for each waste unit, that few if any contaminants could be eliminated based upon this criteria.

57. Table 6-1, pg. 6-6: The text should briefly clarify why no pathways are assessed on this page.

58. Tables 6-3,5,7,9,&11: DOE must add the risks by scenario.

59. Tables 6-4,6,8,10,&12: Hazard Indices must be added by target organ.

60. Section 7.1.3, pg. 7-3, lines 20-21: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with the scenarios. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

61. Section 7.2.3, pg. 7-5, lines 1-2: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with Scenario 3. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

62. Section 7.3.3, pg. 7-6, lines 10-11: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with Scenario 3. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

63. Section 7.4.3, pg. 7-7, lines 30-31: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with the scenarios. Additionally,

the risks from the pathways were not summed to reflect each total risk associated with the scenario.

64. Section 7.5.3, pg. 7-9, lines 13-14: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with the scenarios and other contaminants. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

65. Section A.2.1.1.2, pg. A-2-3, line 25-27: The use of regional values for the determination of background inorganic soil concentrations is unacceptable. DOE should use site specific data for the determination of background values. The fact that these chemicals were not detected during the sampling does not justify the use of regional data. Additionally, the detection limits from the site specific sampling were significantly less than the regional values chosen. The site specific background for these chemicals is obviously less than the detection limit of the samples, and thus any detections during waste characterization are above background.

66. Section A.2.1.3.1, pg. A-2-14, lines 11-14: It is unclear whether the third sentence(lines 11-13) in the paragraph is describing a criteria separate from the fourth sentence (lines 13-14). Please clarify and provide an example.

67. Table A.2-4, pg. A-2-23: a) Why are no organics, such as dioxins included in the table?
b) The footnotes are not referenced within the table. Please correct.

68. Table A.3-1, pg. A-3-2, Pu-238: This seems to be the only contaminant for which the mean exceeds the range. Is this an error or the effect of high detection limits?

69. Table A.3-1, pg. A-3-5, Nickel: Screening based upon the UCL<UTL is only acceptable if there is only one detection above the UTL (See Manganese). Please clarify justification for screening. Was only one detection above background UTL?

70. Table A.3-1, pg. A-3-6, Zinc: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

71. Table A.3-1, pg. A-3-7, footnote "g": The UTL for these chemicals should be calculated with one-half the detection limit and the detected result. Why is DOE using the detection as the UTL? It is possible that the detection is an outlier.

Additionally, footnote "g" is not referenced within the table. Please clarify.

72. Table A.3-1, pg. A-3-7, footnote "j": The use of this footnote is not justified. Since no contaminant was analyzed for more than 20 times, it is not possible to have a less than 5% frequency of detection (1/20). The use of this screening criteria is inappropriate and should be deleted.

73. Table A.3-1, pg. A-3-7, footnote "o": The detection limits for these chemicals were not elevated and were significantly less than the regional values chosen as background UTLs. Positive detections of these contaminants should result in their being selected as constituents of concern.

74. Table A.3-7, pg. A-3-22: See previous comments on Table A.3-1

75. Table A.3-14, pg. A-3-37: a) See previous comments on Table A.3-1
b) Silver, Vanadium: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

76. Table A.3-19, pg. A-3-49: a) See previous comments on Table A.3-1
b) Silver: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

77. Table A.3-26, pg. A-3-63: a) See previous comments on Table A.3-1
b) Barium, Cobalt, Copper, Cyanide, Nickel: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

78. Table A.I.1, pg. A-I-1, footnote "e": The UTL for these chemicals should be calculated with one-half the detection limit for non-detect samples and the detected result. Why is DOE using the detection as the UTL? It is possible that the detection is an outlier.

79. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 2.2.5 Pg. #: 2-35 Line #: 23
Code: C
Original Comment #
Comment: These analytical results will help fulfill the objectives of the groundwater sampling. Will these results be available for incorporation in the next OU-2 RI report revision?

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Response:
Action:

80. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 3.6.2 Pg. #: 3-63 & 3-69 Line #: 41 & 1
Code: C
Original Comment #
Comment: The extent of the area lacking overburden deposits along Paddys run is not adequately described here.

81. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.1.2 Pg. #: 4-2 Line #:
Code: C
Original Comment #
Comment: Can DOE provide documentation of the sample locations and analytical results relied upon to calculate the UTLs and statistics provided in Table 4-1 and Appendix A, respectively, either as an appendix to this report or in a separate submission? Can the data (sample station coordinates and analytical results) also be provided on disk?
Response:
Action:

82. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.1.2, Table 4-1 Pg. #: 4-3, 4, 5 Line #:
Code: C
Original Comment #
Comment: Can sample quantification limits (SQLs) be included in Table 4-1?
Response:
Action:

83. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.3.1 Pg. #: 4-10 Line #:
Code: C
Original Comment #
Comment: Results from test pit #8 should be included in this section.
Response:
Action:

84. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.5.1 Pg. #: 4-29 Line #: 26
Code: C
Original Comment #
Comment: Figure 3-11 on page 3-21 does not support this conclusion (note U concentrations shown). A groundwater elevation map for the solid waste landfill area should be provided to support this statement.

Response:
Action:

85. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.5.3 Pg. #: 4-35 Line #: 7
Code: C
Original Comment #
Comment: The range of concentrations of molybdenum detection should be included here.
Response:
Action:

86. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.7 Pg. #: 4-35 Line #: 35
Code: C
Original Comment #
Comment: This sentence is somewhat inconsistent with Section 4.2.5.1, line 26. A groundwater elevation map for the solid waste landfill should be provided to clarify this statement.
Response:
Action:

87. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.3.3.1 Pg. #: 4-40 Line #: 26
Code: C
Original Comment #
Comment: With the exception of uranium results at 46-187, it appears from Figure 4-7, Table 4-10, and Table 4-11 that surface media immediately adjacent to the K-65 slurry line contains more uranium than media sampled elsewhere in the lime sludge ponds. Sample 46-187 may be related to another source other than the lime sludge ponds; note its proximity to the access road to the waste storage area.
Response:
Action:

88. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.3.3.1 Pg. #: 4-40 Line #: 31
Code: C
Original Comment #
Comment: Figure 4-7 depicts four thorium analyses of surface media located in the lime sludge pond area not associated with the K-65 slurry line, not one as reported. While the areal distribution of data may be insufficient to completely demonstrate that surface media along the slurry line are more contaminated with thorium than surface media elsewhere in the lime sludge ponds, the

thorium data collected do suggest that this is the case.
Response: Action:

89. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.3.3.1 Pg. #: 4-46 Line #: 1
Code: C
Original Comment #
Comment: The statement that minimal or no vertical migration of radionuclides has occurred should be qualified as the subsurface soil sample locations were not collected at locations of maximum surface media concentrations.
Response:
Action:

90. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.4.3.3 Pg. #: 4-66 Line #: 20
Code: E
Original Comment #
Comment: This sentence should read: "Concentrations of antimony in three..."
Response:
Action:

91. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.5.5 Pg. #: 4-90 Line #: 21
Code: C
Original Comment #
Comment: This section should state that based on the data presented, a definite conclusion can not be drawn as to whether the perched groundwater is in contact with the fill. This comment also applies to Section 4.6.5.

92. Commenting Organization:OEPA Commentor:
Section #:4.5.5.1 Pg. #:4-93 Line #:1 Code:E
Original Comment #
Comment:At the top of the page in line 1, well 2046 has a concentration of 575 ug/l and at the bottom of the page well 2046 has a concentration of 576 ug/l. Response:
Action:

93. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.6.5.1 Pg. #: 4-140 Line #: 10
Code: C
Original Comment #
Comment: Figure 4-20 or 3-71 should adequately demonstrate the 2000 series well groundwater elevation contours in order to support the statements in this section.
Response:
Action:

94. Commenting Organization:OEPA Commentor:
Section #:4.6.7 Pg. #:4-142
Line #:19 Code: C
Original Comment #
Comment:Why was well 2385 sampled only once? Are additional data now available?
Response:
Action:

95. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.0 Pg. #: 5-3 Line #: 26
Code: C
Original Comment #
Comment: What about mention of tritium? Although this is not one of the transuranics, has this been considered? Also technicium-99.
Response:
Action:

96. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.3.3.4 Pg. #: 5-20 Line #: 17
Code: E
Original Comment #
Comment: Change "mover of" to "mechanism by which"
Response:
Action:

97. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.4.1.3 Pg. #: Line #:
Code: C
Original Comment #
Comment: Is it possible that vertical mixing is only on the order of a few feet or less thus questioning the vertical discretization used in the groundwater transport model. If the size of the grid blocks is significantly greater than the vertical mixing of the plume, the model will result in geometric mixing and underprediction of the level of the concentration. In other words, by applying relatively coarse vertical grids, the model will undercalculate the concentration level. Has this been sufficiently explored? In the regional model this was less of an issue as the scale of the transport plume was greater.
Response:
Action:

98. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.4.1.3 Pg. #: 5-26 Line #: 31
Code: E
Original Comment #

Comment: What uranium is presented in the contour plot? Is it U-238 or all isotopes added together. This should be more clear both in the text and the figures. Also what model layer is this? It appears to be the topmost layer.
Response:
Action:

99. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 6 and Appendix A Pg. #: Line #:
Code: M
Original Comment #:
Comment: The estimated cancer risks were not summed by pathway for evaluating the risks from a chemical mixture throughout the report. The endpoint for potential cancer risks is the probability of contracting cancer; therefore, the individual probability estimates should be summed. In addition, hazard quotients were not summed for each exposure pathway. According to guidance, the hazard quotients should be summed by pathway(s) or target organ (which is more accurate) for evaluating the total noncarcinogenic hazard associated with exposure to a chemical mixture (USEPA, 1989).
Response:
Action:

100. Commenting Organization: OEPA Commentor:
Section #: 7.0 Pg. #:7-3/7-9 Line #: Code: C
Original Comment #
Comment:At the end of each O.U. 2 area the conclusion is made that,"in summary, no elevated risks are associated with the scenarios which assume access controls are maintained". However, this is only part of the assessment of risk and a sentance should be added that mentions the elevated risks associated with the potential loss of access controls.
Response:
Action:

101. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.1.4 Pg. #: A-1-9 Line #: 3-5
Code: M
Original Comment #
Comment: The use of the 95th upper confidence limit (UCL) on the geometric mean as the exposure point concentration (EPC) for small sample sizes does not appear to be appropriate and is not a method recommended in USEPA (1989) guidance. The use of the 95th UCL on the arithmetic mean as the EPC is based on general assumptions regarding the pathway (e.g., children may randomly contact different locations across the site over the duration of the exposure period)

and not the distribution of the chemical. If it is not reasonable to estimate the 95th UCL on the arithmetic mean given the available data (i.e., high likelihood that the estimate will greatly exceed the maximum concentration), then the maximum concentration should be used as the EPC. In several cases, the maximum concentration exceeded the 95th UCL on the geometric mean by as an order of magnitude. Therefore, use of the maximum concentration in these cases may impact the ultimate risk estimates.

Response:
Action:

102. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.2.4 Pg. #: A-2-31 Line #:
Code: M
Original Comment #
Comment: The fraction ingested (FI) exposure parameter value used for ingestion of soil under current land-use conditions and future land-use conditions with passive access controls was only 0.1. The Risk Assessment Work Plan calls for a FI value of 1 (DOE, 1992). Using the higher FI would ultimately increase the risks for this pathway by an order of magnitude.

Response:
Action:

103. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.2.4 Pg. #: A-2-33 Line #:
Code: C
Original Comment #
Comment: The USEPA (1992) reference for the chemical-specific adsorption factors is not presented in the reference section. Is the reference "Dermal Exposure Assessment: Principles and Applications" (USEPA, 1992)?

Response:
Action:

104. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.3.2 Pg. #: A-2-46 Line #:
Code: C
Original Comment #
Comment: Toxicity criteria are not presented in IRIS or HEAST for lead. Why was the Integrated Uptake/Biokinetic Model not used for properly evaluating the potential risk from exposure to lead?

Response:
Action:

105. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.3.2 Pg. #: A-2-47 Line #:
Code: M
Original Comment #
Comment: A few errors were found in Table 1.2-10. IRIS reports a chronic oral RfD of 0.02 mg/kg/day for chlorobenzene and 0.1 mg/kg/day for ethylbenzene.
Response:
Action:

106. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.3.3.5 Pg. #: A-2-66 Line #:
Code: M
Original Comment #
Comment: TEFs have been derived for other potentially carcinogenic PAHs which were not listed in Table A.2-11 including anthanthrene, benzo(e)pyrene, benzo(j)fluoranthene, benzo(g,h,i)perylene, cyclopentadieno(c,d)pyrene, and pyrene (ICF-Clement, 1988). Although some of these PAHs may not have been detected, pyrene was selected as a chemical of concern. Why were pyrene and potentially other carcinogenic PAHs not included in the carcinogenic assessment of PAHs as those listed in Table A.2-11.
Response:
Action:

107. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.4.2.1 Pg. #: A-2-68 Line #:
Code: M
Original Comment #
Comment: In several instances, chemical-specific carcinogenic risks exceeded 10^{-2}. According to USEPA (1989) guidance, a modified cancer risk equation should be used when estimating cancer risks in excess of 10^{-2}.

$$\text{Cancer Risk} = 1 - e^{(-CDI \cdot SF)}$$

Response:
Action:

108. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1 Pg. #: A-5-1 Line #: 13
Code: C
Original Comment #
Comment: The chemical-specific risk to off-property residents/trespassing child under passive access control conditions exceeded 10^{-4} for Ra-226 at the South Field site. In addition, the total carcinogenic risk for the same pathway at the Inactive Flyash Pile approached 10^{-4}. Therefore, the sentence presented on line 13 should be changed. Insert the work "active" between "...assuming

access..."; and insert "under current land-use conditions" between "...controls are...".
Response:
Action:

109. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1.2 Pg. #: A-5-2 Line #: 10-11
Code: C
Original Comment #
Comment: This statement is not accurate. The chemical-specific risk level for Ra-226 exceeded 10^{-6}, as well as the total risk for the chemical mixture.
Response:
Action:

110. Commenting Organization: OEPA Commentor: Geotrans
Section #: A.5.1.3 Pg. #: A-5-2 Line #: 23-24
Code: C
Original Comment #
Comment: This statement is not accurate The estimated carcinogenic risks for several radionuclides exceeded 10^{-4} for future land-use pathways (see Table 6-7).
Response:
Action:

111. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1.5 Pg. #: A-5-3 Line #: 17
Code: E
Original Comment #
Comment: Replace the phrase "with access controls" with "without access controls."
Response:
Action:

112. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1.4 Pg. #: A-5-3 Line #: 3
Code: C
Original Comment #
Comment: It may be important to note that the total carcinogenic risk for the future land-use exposure pathway assuming passive access controls is slightly below 10^{-4} (i.e., 9.3×10^{-5}).
Response:
Action:

113. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.2 Pg. #: A-5-4 Line #: 7
Code: C
Original Comment #

Comment: Provide a reference and more information on the 10^{-2} background cancer risk estimate mentioned in the text.
Response:
Action:

114. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.2 Pg. #: Line #:
Code: M
Original Comment #
Comment: It would very useful to provide summary tables or plots of the mass in place. It is difficult to understand just how much of the material actually leaches, how much is in the vadose zone (sorbed and dissolved) and how much is within the groundwater flow system (sorbed and dissolved) and how much actually decayed. A semi-log plot might be useful here.
Response:
Action:

115. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.2 Pg. #: Line #:
Code: M
Original Comment #
Comment: There should be some discussion or displays of the concentration level at different depths. It is difficult to understand and accept the areal contours without some indication of the vertical mixing. A vertical plot would be extremely useful.
Response:
Action:

116. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.2.2 Pg. #: B-49 Line #: 20-31
Code: M
Original Comment #
Comment: While the discussion regarding the possibility of transport through fractured media is appropriate, the validity of using equivalent porous media is understated. The modeling lacks supporting evidence, either direct or indirect, that EPM assumptions can be used for the till. This simplifying assumption is critical to all of the modeling. The subject deserve greater emphasis.
Response:
Action:

117. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.1 Pg. #: B-104 Line #: 19
Code: M
Original Comment #

Comment: How were the parameters varied? What determined acceptable recalibration? What were the final values? How did these vary from the regional model? What is the importance of these changes? Does this say something regarding the calibration efforts of the regional model? It seems that the local model was recalibrated with greater emphasis on matching the local monitor wells. Why not provide the statistics as was provided in the regional model calibration?

Response:
Action:

118. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.1 Pg. #: B-104 Line #: 9-30
Code: M
Original Comment #
Comment: There is no discussion of the perimeter boundary conditions. It must be assumed that the calibrated heads from the regional model were interpolated to for Dirichlet (prescribed heads value) boundary conditions. This should be more clearly stated as this has definite implications regarding the limitations of mesh refinement. For example, the local area model must be used with caution in modeling any additional sources/sinks at wells. Furthermore, the model can not be easily used to simulate transient groundwater flow.

Response:
Action:

119. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.2 Pg. #: B-105 Line #: 33-35
Code: M
Original Comment #
Comment: How were the loading rates defined? Was the interpolation performed using the log of the concentration? Was there a check on the preservation of, i.e. the area under the curves? Could the approximation of the "spikes" to a uniform value for a specified period of time result in an additional numerical mixing and loss of artificial reduction in the calculated peak concentration?

Response:
Action:

REFERENCES

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ICF-Clement International Corporation, 1988. Comparative potency approach for estimating the cancer risk associated with exposure to mixtures of polycyclic aromatic hydrocarbons, interim final report.

U.S. Department of Energy, 1992. Remedial investigation and feasibility study, Fernald Environmental Management Project, Fernald, Ohio, Risk Assessment Work Plan Addendum, U.S. Department of Energy, Fernald Office, Fernald, Ohio.

H.S. Environmental protection Agency, 1992. Dermal exposure assessment: Principles and applications, Office of Health and Environmental Assessment, EPA/600-8-91/011B.