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DISAPPROVAL OF THE OU 5 REMEDIAL INVESTIGATION REPORT

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COMMENTS

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 0 9 1994

REPLY TO THE ATTENTION OF:

HRE-8J

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

RE: Disapproval of the OU 5
Remedial Investigation Report

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the Operable Unit (OU) 5 Remedial Investigation (RI) Report. Although the OU 5 RI Report demonstrates the United States Department of Energy's (U.S. DOE) commitment to provide an improved RI report that was prepared in accordance with U.S. EPA guidance, there are numerous deficiencies that must be addressed. Several major concerns are discussed below.

First, the United States Department of Energy's (U.S. DOE) description of the nature and extent of contamination is accurate and, in most cases, sufficient to support the baseline risk assessment. However, the extent of contamination requires either additional investigation at several specific locations for certain contaminants, or further justification regarding these assumptions. These locations and contaminants are highlighted in the specific comments.

Second, in several instances U.S. DOE concludes that certain media at certain depth intervals are free of contamination. However, a review of the relevant data often reveals that these conclusions are based on insufficient data, or in some cases no data. Examples are cited in specific comments.

Third, two issues exist concerning contaminant fate and transport modeling. The groundwater fate and transport modeling indicates that future areas of high uranium concentrations in the Great Miami Aquifer (GMA) will be located beneath the storm sewer outfall ditch (SSOD) and Paddys Run. However, the SSOD and Paddys Run source terms used as model input parameters do not account for the high GMA uranium concentrations generated by the model. Because the existing uranium concentrations in the SSOD and Paddys Run cannot account for the future GMA uranium concentrations, an apparent error exists in the development of source terms for the groundwater fate and transport model.

Also, numerous conclusions regarding source input, source depletion, retardation, and transportation are cited throughout the RI. However, in most cases, it is not clear whether reactions heading toward equilibrium require days, decades, or centuries. The RI should more clearly summarize the amount of time that affects these fate and transport processes.

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Finally, the basic approach of the baseline risk assessment appears to be technically valid and appropriately conservative. However, numerous errors and omissions in text, calculations, and references prevented a complete and thorough review of the document.

Therefore, U.S. EPA hereby disapproves the OU 5 RI report pending incorporation of responses to the attached comments into the document. Considering U.S. EPA's extensive comments, and the fact that this Report is a primary document as defined in the 1991 Amended Consent Agreement, U.S. EPA recommends a meeting to discuss the comments as soon as possible.

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
Jack Baublitz, U.S. DOE-HDQ
Don Ofte, FERMCO
Jim Theising, FERMCO
Paul Clay, FERMCO

TECHNICAL REVIEW COMMENTS ON THE OPERABLE UNIT 5 DRAFT REMEDIAL INVESTIGATION REPORT

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.0 Page #: NA Line #: NA
Original General Comment #: 1
Comment: Generally the description of the nature and extent of contamination presented in Section 4 is accurate. In most cases, information on major areas of contamination is sufficient to support the baseline risk assessment and feasibility study. The general comments for Section 4.0 highlight areas where additional investigation may be necessary. Specific comments relate to specific geographical locations or to specific chemicals as described in the appendixes. The specific comments regarding the appendixes should be addressed, and corresponding changes should be made to the main text of the remedial investigation report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.0 Page #: 4-1 Line #: 1
Original General Comment #: 2
Comment: In several instances, the text concludes that certain media at certain depth intervals are free of contamination. However, some of these conclusions are based on insufficient data, or in some cases no data at all. Specific examples are cited in specific comments. Conclusions regarding the extent of contamination should be reevaluated, and more accurate conclusions should be drawn from the available data.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: All Line #: All
Original General Comment #: 3
Comment: In Appendix A, several similar but slightly different terms can be easily confused by the reader. One example is the term "chemical of potential concern" (CPC) and the term "chemical of concern" (COC). Another example is the term "preliminary remediation goal" (PRG) and the term "risk-based concentration" (RBC). Throughout the appendix, these similar and easily confused terms should be clearly defined and differentiated, and used consistently.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: All Line #: All
Original General Comment #: 4
Comment: The procedure used to select CPCs for Operable Unit 5 (OU5) is not clear. In one section, it appears that CPCs are selected OU-wide, and in another section it appears that

CPCs are selected for different areas within OU5. The text should be revised to clearly present the process used to select CPCs for OU5.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: NA Line #: NA
Original General Comment #: 5
Comment: About 10 percent of the detailed intake tables (Tables A.VI-1a through A.VI-38g) were reviewed. Most of the calculations were found to be correct. However, a small but significant number of errors was identified. Some examples of these errors are summarized in the following paragraphs.

In Table A.VI-9d, reviewers calculated intakes of radionuclides that were about 55 percent less than the values presented. For example, the intake for cesium-137 is presented as 3.3E+03; reviewers calculated a value of 1.8E+03. Similarly, the intake for strontium-90 is presented as 1.6E+04; reviewers calculated a value of 8.8E+03.

Reviewers consistently had difficulty reproducing the intakes calculated for inorganic toxicants from dermal exposure while bathing. For example, the intakes associated with dermal exposure to groundwater presented in Table A.VI-12f could not be reproduced. The difficulty may lie in the fact that the equations presented in Section A.3.4.2.4 for calculating the absorbed dose per event (DA_{event}) are intended to be used only for organic compounds. Nonetheless, reviewers could not duplicate the results even using the recommended equation for inorganic compounds presented in U.S. Environmental Protection Agency's (U.S. EPA) most recent dermal guidance. Section A.3.4.2.4 should be revised to present the equations or methods used to calculate DA_{event} for inorganic contaminants.

Each of the intake tables for recreational receptors under future land use conditions (for example, Table A.VI-17a) presents a single set of intake results. For carcinogenic intakes, the results represent the summation of the exposures for each of the age groups evaluated. For noncarcinogens (referred to in the report as "toxicants"), the tables present only the results for a single age group. The tables need to be footnoted to clearly indicate what the results represent. Specifically, the carcinogenic tables should indicate that the results represent summed exposures from all age groups evaluated, and noncarcinogenic tables should clearly indicate for which age group results are presented.

For some of the tables presenting toxicant intakes for recreational receptors under future land use conditions, the results could only be duplicated if carcinogenic parameters were used. For example, the intakes presented in Table A.VI-20b for toxicants in the northwest area are identical to the intakes presented in Table A.VI-19b for carcinogens in the northwest area.

Appendix A should be closely reviewed, and the calculations should be revised as necessary. The text of the risk assessment and any summary tables should also be revised as necessary to incorporate any changes made to the tables.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.4 Page #: NA Line #: NA
Original General Comment #: 6
Comment: All tables should be paginated, either within each table or, more desirably, within the entire section. This is especially necessary for tables such as Table A.4-3, which is 18 pages long. As presented, it is difficult to tell if pages have been omitted or incorrectly sequenced.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.5 Page #: All Line #: All
Original General Comment #: 7
Comment: The objective of the risk characterization is not clear. The summary presented in Section A.5 should clearly present (1) all CPCs in OU5 contributing significant risk, (2) all pathways and exposures leading to significant risk, (3) all current and potential future receptors at significant risk, and (4) the CPCs, pathways, routes, and receptors driving the OU-wide risk. This section should be revised to clearly present this data.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7 Page #: NA Line #: NA
Original General Comment #: 8
Comment: The summary section of the risk assessment adequately summarizes the exposure pathways and contaminants driving the risk for the exposure areas posing the greatest risk for different receptors. However, the summary does not adequately discuss any differences in exposure pathways and contaminants driving the risk across the various exposure areas for each receptor. For example, under the current land use scenario, the greatest carcinogenic risks for the exploring youth is associated with the former production area. The majority of the risk is due to exposure to surface soils, with radium-228 and thorium-228 being the primary contaminants. However, the discussion does not specify whether the risks for the exploring youth are driven by other media and contaminants in other exposure areas. Differences in media and contaminants driving the risks in

different parts of the site will directly impact the selection of remedial technologies across the site. The summary should be revised to more thoroughly characterize differences in media and contaminants driving the risks for various receptors across the site. This revision can be accomplished through a summary table that highlights differences in media and contaminants driving the risks for various receptors.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7 Page #: NA Line #: NA
Original General Comment #: 9
Comment: The summary section mentions that central tendency risks were calculated and indicates that central tendency risks for the on-property resident farmer are summarized in Table A.7-6. However, the summary does not discuss or draw any conclusions about the central tendency results. The summary should be revised to discuss the central tendency results, including the degree and significance of any differences between the central tendency risks and the reasonable maximum exposure risks.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.VIII Page #: All Line #: All
Original General Comment #: 10
Comment: Attachment A.VIII presents and discusses the model used to estimate indoor airborne radon-222 levels from known soil radium-226 levels. However, validation of the model is not discussed. Granted, the model predicts indoor concentrations for hypothetical future residences, for which validation would require building an actual house on the facility. However, the model also predicts a soil gas concentration that could be measured and used to evaluate the accuracy of the model. The text should be revised to discuss how the model will be validated or why it cannot be validated, as well as the impact of any validation (or lack of validation) on the expected accuracy of the model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: All Line #: NA
Original General Comment #: 11
Comment: The page numbering format is inconsistent between the sections of Appendix B. The page numbers of the executive summary (ES), the reference list, and Section B.4 incorporate section numbers (for example, B-ES-1, B-R-1, and B.4-1); however, Sections B.1, B.2, and B.3 do not incorporate section numbers (for example, page B-1). As a result, several pages within Appendix B have the same page numbers, which could cause confusion. The appendix should be revised to consistently incorporate section numbers into the page numbering format.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: All Line #: NA
Original General Comment #: 12
Comment: The Appendix B ES discusses contamination associated with different study areas at OU5. However, these study areas are not introduced in the ES. The ES should be revised to include a brief introduction to the study areas designated for the site-wide ecological risk assessment at OU5.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: NA Line #: NA
Original General Comment #: 13
Comment: Figures and tables presented in Appendix B do not include page numbers. These figures and tables should have page numbers, and these page numbers should be included in the Table of Contents.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.1.2.3 Page #: B-7 Line #: NA
Original General Comment #: 14
Comment: Section B.1.1.2.3 introduces OU5 Study Areas C, D, and E, which consist of grassland communities. However, the text does not explain why the grasslands were divided into these three study areas. The text should be revised to include criteria that distinguishes these three areas.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.2 Page #: All Line #: NA
Original General Comment #: 15
Comment: Section B.1.2 provides a media-specific discussion of the nature and extent of contamination at the Fernald Environmental Management Project (FEMP). However, the text does not relate this contamination to the specific OU5 study areas previously designated in Appendix B. The text should be revised to discuss the nature and extent of contamination at the FEMP in relation to the environmental media at each of the OU5 study areas.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2 and B.3 Page #: NA Line #: NA
Original General Comment #: 16
Comment: Section B.2 includes tables that summarize factors contributing to uncertainty regarding the different risk assessment elements for nonradiological contaminants (for example, exposure assessment, toxicity screening, and risk characterization). Information regarding the uncertainty should also be provided in Section B.3 for radiological contaminants. Additionally, these tables should interpret whether each uncertainty factor contributes to the overestimation or underestimation of risk, as well as explain the relative magnitude of this contribution.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.4 Page #: All Line #: NA
Original General Comment #: 17
Comment: Section B.4 refers to several figures that are not included in Appendix B. These figures should be included in Appendix B, or the text should specifically state where these figures are located.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.4.2 Page #: All Line #: NA
Original General Comment #: 18
Comment: Section B.4.2 summarizes the ecological risk assessment results, including the CPCs present in various environmental media and respective study areas. This section should include a table presenting the CPC information in a more clear and concise manner. The table should summarize CPCs and their corresponding benchmarks according to study area and environmental media. Additionally, a table such as this should be included in Volume 1 of 5, Section 7.6.4, of the Draft Remedial Investigation Report for OU5.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.2 and F.3 Page #: NA Line #: NA
Original General Comment #: 19
Comment: Figures F.3.7-15 and F.3.7-16 show modeled uranium concentrations in the Great Miami Aquifer (GMA) without remediation at 210 and 1,000 years, respectively. The maximum uranium concentration shown at 210 years is 9,052 parts per billion (ppb) while the maximum concentration shown at 1,000 years is 9,063 ppb. Both maximum concentrations occur near the storm sewer outfall ditch (SSOD) and Paddys Run, implying that contaminant loading from these surface water bodies is the main influence of uranium concentrations in the GMA. However, the SSOD and Paddys Run source terms used as input to calculate future GMA uranium concentrations do not account for the high GMA uranium concentrations generated by the model. According to Table F.2.5-1, the maximum measured and modeled surface water uranium concentrations for the SSOD and Paddys Run are 8,148 and 914 ppb, respectively. These maximum concentrations representing potential GMA contaminant source terms are well below the modeled GMA contaminant levels. The maximum surface water or sediment concentrations would most likely have occurred already because the production area, which is the main source of OU5 soil contamination at the site, is no longer operating, and according to the attachments in Appendix F-3, most of the soluble uranium has already leached out of the soil. Appendix F.3 should further explain the modeled concentrations and contaminant source terms because the future concentrations predicted by the model appear unreasonable.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F.3 Page #: NA Line #: NA
Original General Comment #: 20
Comment: Appendix F.3 primarily discusses historical airborne releases of uranium at the FEMP. While airborne releases of uranium from other OUs (waste pits, silos, and so forth) are discussed, it is not clear whether other OU mass loadings and geochemical concepts related to non-airborne releases (leachate) have been accounted for in the OU5 fate and transport model. The fate and transport model should clearly indicate whether and how non-airborne, OU-specific source terms and geochemical factors have been integrated into the OU5 fate and transport model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F.3 Page #: NA Line #: NA
Original General Comment #: 21
Comment: The text cites pH values used in the various fate and transport calculations. The pH of various waters at the site should not be expected to vary significantly; however, the pH values reportedly used in the calculations do vary significantly. For instance, the pH equilibrium constant used in the EQ3/6 database is reported on Page F.3.I.3-2 as 7.0, while a pH of 5.0 is reported in Table F.3.I.3-2. Similarly, the pH of FEMP groundwater is stated as "generally near 7.5" on Page F.3.I.3-6. Discrepancies also exist throughout the text for the reported Eh values. Because these equilibrium equations are extremely sensitive to changes in pH and Eh, accurate equilibrium constant input values are critical. The text should explain the variations in these input values and discuss their ramifications on the calculations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F.3 Page #: NA Line #: NA
Original General Comment #: 22
Comment: Time is a critical factor in the various chemical and physical processes affecting the fate and transport of uranium. The report presents numerous conclusions involving time factors for source input, source depletion, retardation, and transport. An example of such a conclusion is found on page F.3.I.3-3, lines 4 to 6: "UF_4 is not expected to persist in the environment for long periods of time due to its high solubility." While it is understood that chemical and physical processes affecting contaminant fate and transport are complex, most of the statements and conclusions regarding fate and transport processes are vague. In most cases, it is not clear whether reactions heading toward equilibrium require days, decades, or centuries. The report should more clearly indicate the amount of time that affects the fate and transport processes.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F.3 Page #: NA Line #: NA
Original General Comment #: 23
Comment: The fate and transport models use only two different leaching coefficient (K_l) and partition coefficient (K_d) values. Low K_l and K_d values represent areas where high-concentration, aqueous sources are present; and high K_l and K_d values represent areas where airborne or depleted sources dominate. Given the large amount of analytical data available and the great diversity of uranium contaminant types and concentrations, the use of only two K_l and K_d values appears to oversimplify actual FEMP conditions. Wherever possible, K_l and K_d values as determined by site-specific data should be used to characterize as many distinct source terms as possible.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.2 Page #: NA Line #: NA
Original General Comment #: 24
Comment: The groundwater model source term development presented in this section uses soil samples collected from the top 1.5 feet of soil. According to Appendix F-3, a great deal of soil contamination favoring uranium desorption exists at depth at the site; however, this deeper contaminated soil is not used in the source term development. The text should be revised to state why contaminated soil greater than 1.5 feet below ground surface was not used in the source term development for the groundwater fate and transport model.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.6 Page #: 2-30 to 2-31 Line #: NA
Original Specific Comment #: 1
Comment: Section 2.4.6 states that the objective of the Remedial Investigation and Feasibility Study (RI/FS) surface water and sediment sampling programs was to characterize the surface water and sediment in the drainage ditches both on and off site. However, the sediment samples from the pilot plant drainage ditch were not analyzed for radiological parameters. The text also lacks organic and inorganic analytical data for sediment in the south drainage area along the west side of the inactive fly ash pile. Additional sampling should be conducted to better characterize the sediment in the pilot plant drainage ditch and the inactive flyash pile south drainage areas.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.6.1 Page #: 2-31 Line #: 19 to 20
Original Specific Comment #: 2
Comment: Section 2.4.6.1 describes where surface water and sediment samples were collected. The text indicates that both surface water and sediment samples were collected at location W-7; however, Figure 2-16 indicates that only surface water was collected at location W-7. This discrepancy needs to be rectified and the text should be revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.6.1 Page #: 2-31 to 2-32 Line #: 28 to 34
Original Specific Comment #: 3
Comment: Section 2.4.6.1 describes surface water and sediment sampling along the Great Miami River. According to the analytical tables in Appendix G, no sediment samples collected upstream of the effluent outfall line were analyzed for hazardous substance list (HSL) parameters. Thus, no background data exists against which to compare HSL analytical results for sediment samples. Additional sediment sampling should be conducted to provide background data for the Great Miami River.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.6.1 Page #: 2-31 to 2-32 Line #: 36 to 13
Original Specific Comment #: 4
Comment: Section 2.4.6.1 describes the laboratory analysis for surface water and sediment samples, but does not clearly delineate which samples were analyzed for HSL parameters. Specifically, the text (page 2-31, lines 37 to 38) states that selected surface water and sediment samples were analyzed for HSL organics; however, the analytical tables in Appendix G show that these samples were also analyzed for HSL inorganic parameters. Lines 11 to 13 on page 2-32 indicate that selected surface water samples from drainage ditches were analyzed for HSL inorganic parameters. The analytical tables in Appendix G show some surface water and sediment samples collected from the drainage ditches were also analyzed for HSL organic parameters. Finally, the tables indicate that selected sediment samples were analyzed for HSL inorganic parameters. Discrepancies between the text and the analytical tables in Appendix G need to be corrected.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.4.2 Page #: 2-40 Line #: 8
Original Specific Comment #: 5
Comment: Section 2.5.4.2 describes the analysis of surface soil samples collected from the Plant 1 Pad area before and after excavation. The text states that some of the samples

collected were not analyzed, but were archived. The text should clearly state which samples were actually analyzed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.6.1.1 Page #: 3-44 Line #: 12 to 13
Original Specific Comment #: 6
Comment: Section 3.6.1.1 discusses the core permeability test performed on 41 core samples collected from the glacial overburden. The text should indicate the soil type from which the cores were collected to facilitate comparison of the slug test data and the core permeability test results.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.2.1 Page #: 4-25 Line #: 5
Original Specific Comment #: 7
Comment: The text indicates that no fissionable or uranium activation radionuclides were detected above background levels in surface water samples from the pilot plant drainage ditch. However, the detection limits for these radionuclides are above the background concentrations. In addition, fissionable and uranium activation radionuclides were detected in sediment samples at concentrations above background and could therefore be present in the surface water. The samples with lower detection limits should be reanalyzed or the text should explain how this data limitation will affect the risk assessment and feasibility study.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.2.2 Page #: 4-25 Line #: 30
Original Specific Comment #: 8
Comment: The investigation of the pilot plant drainage ditch did not include collecting and analyzing sediment samples for fissionable or uranium activation radionuclides such as plutonium or neptunium. These radionuclides were detected in surface water samples at levels significantly above background concentrations. In addition, the environmental monitoring data indicate that other fissionable radionuclides (ruthenium and cesium) were detected at concentrations above background. Sediment samples should be collected and analyzed for fissionable radionuclides to more accurately estimate the risk to human receptors and the environment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.2.3 Page #: 4-28 Line #: 9
Original Specific Comment #: 9
Comment: Surface water and sediment samples from the SSOD were collected during only one sampling event and at only the head and the mouth of the SSOD. In addition, these surface water and sediment samples were not analyzed for any fissionable radionuclides. Fissionable radionuclides are

very likely present in the SSOD because it is one of the main drainage sources for the production area. The limited characterization of the SSOD precludes the accurate assessment of risk, limits accurate determination of contaminant loading to the GMA from the SSOD, and limits the ability to screen remedial alternatives. Because the SSOD is one of the main drainage ways of the production area, it is a likely deposition point of contamination and should therefore be further characterized. Additional samples should be collected over time to adequately characterize the contamination in the SSOD and to evaluate the sources of contamination to the SSOD.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.2.5 Page #: 4-29 Line #: 19
Original Specific Comment #: 10
Comment: Surface water and sediment samples collected from Paddys Run were not analyzed for any fissionable radionuclides. Fissionable radionuclides are very likely present in Paddys Run because fissionable radionuclides were detected in the pilot plant samples at levels greater than five times background. The limited characterization of Paddys Run precludes the accurate assessment of risk and limits the ability to screen remedial alternatives. Paddys Run should be further characterized.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.4.5 Page #: 4-41 Line #: 1
Original Specific Comment #: 11
Comment: Section 4.5.4.5 states that no additional characterization is necessary to complete the RI/FS. Specific comments provided above indicate where additional characterization is necessary to assess risk to human health and to completely screen remedial alternatives. Areas that need additional investigation include the northeast drainage ditch, the east drainage area, the pilot plant drainage ditch, the SSOD, and Paddys Run.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.1.2 Page #: 4-75 Line #: 11
Original Specific Comment #: 12
Comment: Section 4.6.1.2 discusses lead contamination in subsurface soil. However, no subsurface soil samples were collected in the trap range area. This area is known to have extensive lead contamination in the surface soil. Addition sampling is necessary to adequately characterize the trap range subsurface soils and screen alternatives in the FS.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-84 Line #: 4
Original Specific Comment #: 13
Comment: Section 4.6.2 presents several profiles of the total uranium contamination in the subsurface soil at various places at the FEMP. However, soil profiles overstate the accuracy of the subsurface characterization. No soil samples were collected in many boreholes from the lower portion of the borehole; however, the profiles contain closed contours indicating a known boundary to uranium contamination. This situation is present at boreholes 1142 and 1145 in profile KK-KK'; at boreholes 1338, 3421, and 4013 in profile FF-FF'; at borehole 1505 in profile EE-EE'; and at boreholes 1139, 1142, 1144, 1148, and 1294 in profile AA-AA'. Either additional soil samples should be collected in these areas to define the vertical extent of soil contamination or the RI should be revised to state that the vertical extent of contamination indicated by the contours is inferred.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-84 Line #: 4
Original Specific Comment #: 14
Comment: The profiles presented as part of Section 4.6.2 indicate that soil contamination does not exist in the deeper portions of the glacial till. However, groundwater samples from the lower portions of the glacial till indicate significant groundwater contamination. The conclusion that no soil contamination exists in the same interval where groundwater contamination exists is not supported because soil samples were not collected at this interval. This lack of data may significantly impact the estimated volume of soil requiring remediation. Data ia lacking for boring 1336 in profile EE-EE'; borings 1179, 1190, 1220, 1231, and 1234 in profile V-V'; borehole 1423 in profile AA-AA', and borehole 1142 in profile KK-KK'. Soil samples should be collected to further characterize the vertical extent of soil contamination or the RI should be revised to state that the vertical extent of contamination indicated by the profiles is not known.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-84 Line #: 4
Original Specific Comment #: 15
Comment: The subsurface contamination in profile AA-AA' is not presented accurately. Soil samples collected from borehole 1086 indicate that total uranium levels are as high as 71 milligrams per kilogram (mg/kg); however, the profile does not indicate any isoconcentration lines in this area. The profile and the text should be revised to include this area of contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.7.1.1.1 Page #: 4-116 Line #: 4
Original Specific Comment #: 16
Comment: Well 1728 is located in a fringe area of the FEMP and has a total uranium concentration of greater than 2 times background. This well is in close proximity to the waste pit area, a known source of groundwater contamination. Further investigation is needed in the area of well 1728 to define the source and extent of groundwater contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.7.1.1.1 Page #: 4-120 Line #: 7
Original Specific Comment #: 17
Comment: The text cites a vertical retardation factor of 20 to 80 for uranium. However, this factor appears high considering the site-specific analytical data. Appendix F-3 states that the uranium retardation factor in the glacial overburden is between 9 and 12. Also, at three lysimeter locations at the FEMP, uranium has percolated through 20 to 30 feet of till in less than 40 years. This indicates a retardation factor in the range of 2 to 3 assuming a vertical seepage rate of about 1 foot per year as stated in the text. The vertical retardation factor should be revised to consider the site-specific analytical data.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.7.1.1.3 Page #: 4-121 Line #: 27
Original Specific Comment #: 18
Comment: Section 4.7.1.1.3 discusses the extent of thorium contamination plumes estimated from filtered and unfiltered groundwater samples. However, the extent of these plumes may be underestimated because groundwater from numerous wells in the production area near the estimated fringes of the plumes were not sampled or analyzed for thorium. Additional groundwater samples should be collected to further characterize the thorium plumes, or the text should be revised to acknowledge this data limitation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.7.1.1.3 Page #: 4-121 Line #: 27
Original Specific Comment #: 19
Comment: The extent to which the thorium contamination plume estimated from filtered samples extends east near the sewage treatment plant is not characterized. Additional groundwater samples should be collected to define the eastern extent of the thorium contamination plume, or the text should be revised to reflect this data limitation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.7.1.1.5 Page #: 4-123 Line #: 16
Original Specific Comment #: 20
Comment: The text does not list the sewage treatment plant as an area of groundwater contaminated with strontium-90. The groundwater at the sewage treatment plant was not analyzed for strontium-90 even though the surface soil contains strontium-90 contamination above background levels. Additional groundwater samples should be collected and analyzed for strontium-90 to further characterize the groundwater contamination in the sewage treatment plant area, or the text should be revised to reflect this data limitation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.7.1.1.5 Page #: 4-123 Line #: 21
Original Specific Comment #: 21
Comment: The text describes several groundwater contamination plumes resulting from technetium-99 contamination. However, these contamination plumes may be underestimated in several areas because groundwater from numerous wells was not analyzed for technetium-99. These areas include the following: (1) the K-65/clearwell line where technetium-99 was detected in surface soil samples at over 100 mg/kg and where no groundwater samples were collected in the area; (2) the southern area of the southwest portion of the production area where the existing technetium-99 contamination plume is present but the southern extent is not characterized; (3) near the drum reconditioning building where soil samples contain up to 20 mg/kg technetium-99 and where no groundwater samples were collected; and (4) south and west of the laboratory where technetium-99 was detected in soil samples but where no groundwater samples were analyzed for technetium-99. The text should be revised to address sampling activities in these areas.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.0 Page #: NA Line #: NA
Original Specific Comment #: 22
Comment: Section 6.0 refers to Tables 6-1 through 6-7, which summarize the results of the risk characterization. However, these tables are not included in Section 6.0; the tables are instead included in Section A.6.0 of Appendix A. Section 6.0 should therefore be revised to include Tables 6-1 through 6-7.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.0 Page #: NA Line #: NA
Original Specific Comment #: 23
Comment: Section 6.0 includes Figures 6-1 through 6-7. However, the text refers only to Figures 6-1 and 6-2. The text

should be revised to include references to Figures 6-3 through 6-7.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.7 Page #: 7-60 Line #: 9
Original Specific Comment #: 24
Comment: Section 7.7 presents several data limitations but should also address the additional data limitations presented in the above comments. In addition, Table 7-10 indicates that the impact of the data limitations is to overestimate risk for certain media. However, the risk is underestimated in some media because no data regarding the level of contamination is available. The table should be revised to reflect all data limitations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.7 Page #: 7-60 Line #: 9
Original Specific Comment #: 25
Comment: Section 7.7 states that soils contamination data is lacking for soils below 20 feet below ground surface (bgs). While this statement is accurate, it is somewhat misleading. Data is also lacking for depths between 1.5 and 20 feet bgs. Even less data is available for depths below 20 feet bgs. The lack of data between 1.5 and 20 feet presents a significant data limitation to both the risk assessment and the screening of alternatives. This section of the RI should address this data limitation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.0 Page #: A.1-1 Line #: 15 to 19
Original Specific Comment #: 26
Comment: These lines specify that groundwater, surface water, and sediment will be evaluated in the baseline risk assessment. However, the text does not specify whether the actual concentration of CPCs will be evaluated for these media or whether modeled concentrations will be used. The text should be revised to clearly state whether modeled or actual concentrations will be used to evaluate these media.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.1 Page #: A.1-2 Line #: 6 to 14
Original Specific Comment #: 27
Comment: These lines discuss the specific objectives of the baseline risk assessment. However, these lines do not clearly state that the assessment evaluates both current and potential future risks. The text should be revised to clearly state that potential future risks are also assessed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.1 Page #: A.1-2 Line #: 22
Original Specific Comment #: 28
Comment: This line states that one specific objective of the risk assessment is to identify specific areas of contaminated environmental media for which site cleanup is appropriate. However, this is not an objective of a baseline risk assessment; it is instead an objective of a feasibility study. This line should be deleted from the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.2 Page #: A.1-4 Line #: 12 to 14
Original Specific Comment #: 29
Comment: These lines state that the site became contaminated as a result of processing and disposal activities that took place during production activities at the facility. However, the text does not state what was produced at the facility. The text should be revised to state what was produced at the facility.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.2.2 Page #: A.1-8 Line #: 17 and 18
Original Specific Comment #: 30
Comment: These lines state that the site maintains long-term storage facilities for thorium materials. The presence of such long-term storage facilities within specific OUs or parts of the site is relevant to potential exposures and risks to receptors in these various OUs and parts of the site. Therefore, the lines should be revised to indicate where the long-term thorium storage facilities are located within the FEMP. If the thorium storage facilities are located in OU5, then the text should be revised to indicate whether and how potential exposure to thorium from the storage facilities was addressed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3.1 Page #: A.1-10 Line #: 5
Original Specific Comment #: 31
Comment: This line discusses emissions that are considered "minimally leachable." This term should be defined. The line should be revised to describe the criteria that were used to define that emissions were "minimally leachable."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3.1 Page #: A.1-11 Line #: 6 and 7
Original Specific Comment #: 32
Comment: These lines present estimated airborne uranium emissions for 1992. However, it is not clear whether the presented value (0.23 kilogram) represents an annual total or daily average value. The text should be revised to clarify the meaning of the value.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3.1 Page #: A.1-12 Line #: 1
Original Specific Comment #: 33
Comment: This line presents a value (1.8 billion gallons) that represents a volume of water that flowed past the facility's effluent line. However, the text does not indicate whether this is a daily or annual total. The text should be revised to clarify the meaning of this value.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3.1 Page #: A.1-12 Line #: 9
Original Specific Comment #: 34
Comment: This line states that runoff conveys contaminants into surface water, groundwater, and wastewater effluent. Runoff may also convey contaminants into areas of uncontaminated soil. This line should be revised to include uncontaminated soil as a potential receptor point for contaminated runoff.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3.1 Page #: A.1-13 Line #: 8
Original Specific Comment #: 35
Comment: This line refers to an 8.5-million-gallon BSL. However, the acronym "BSL" is not defined in the text. The acronym "BSL" should be defined in the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3.1 Page #: A.1-14 Line #: 5
Original Specific Comment #: 36
Comment: This line defines the waste storage area as "(Operable Unit 1)". However, elsewhere in the report (for example, on page A.1-8), the waste storage area is defined as including parts of OUs 1, 2, and 4. This line should be revised to define the waste storage area in a manner that is consistent with the remainder of the report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3.2 Page #: A.1-16 Line #: 2 to 4
Original Specific Comment #: 37
Comment: These lines indicate that removal actions not fully implemented by June 1994 are not incorporated into the risk assessment. Earlier this section lists the removal actions associated with OU5. Lines 2 to 4 should be revised to clearly indicate, by action number, which removal actions are not considered in the risk assessment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.5.4 Page #: A.1-20 Line #: 9 to 11
Original Specific Comment #: 38
Comment: These lines begin by stating, "Exposure pathways are considered if they are ..." However, as written, the sentence does not appear to be logical. The text should be

revised to state, "Exposure pathways are considered complete if the following elements are present ..."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.0 Page #: NA Line #: NA
Original Specific Comment #: 39
Comment: Figure A.1-2 presents OUs for the FEMP RI/FS. This figure requires some clarification and modification. First, the waste storage area is defined as OU1. However, elsewhere in the report, the waste storage area is defined as including all or parts of OUs 1, 2, and 4. The definition of the waste storage area in this figure should be revised as necessary to be consistent with the remainder of the report. Second, the figure should be revised to clearly define the boundaries of the FEMP.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.0 Page #: NA Line #: NA
Original Specific Comment #: 40
Comment: Figure A.1-3 shows the land use adjacent to the FEMP. This figure should be revised to show the location of the nearest residence.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.0 Page #: NA Line #: NA
Original Specific Comment #: 41
Comment: Figure A.1-4 shows the location of private wells near the FEMP. The figure includes a legend that defines bedrock areas. However, the figure does not show the FEMP and surrounding areas as being underlain by bedrock. The figure should be revised to clarify that the areas shown as "bedrock" are in fact areas of bedrock that are exposed at the surface.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.0 Page #: A.2-1 Line #: 11 to 13
Original Specific Comment #: 42
Comment: These lines state that CPCs detected in the GMA and potentially impacted soil, surface water, and sediment, regardless of their location, will be addressed as part of OU5. However, the text does not state whether the OU5 baseline risk assessment will consider potential future migration of contaminants from other OUs to OU5 media. The text should be revised to clearly state whether the future impact of other OUs on OU5 media will be considered in this risk assessment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.2.2 Page #: A.2-6 Line #: 6 and 7
Original Specific Comment #: 43
Comment: These lines discuss the use of the Shapiro and Wilk and Shapiro-Francia goodness-of-fit tests. However, no

reference for these tests is cited. The text should be revised to reference either the source document for all statistical tests or the section of the baseline risk assessment where these tests are discussed in greater detail.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.2.2 Page #: A.2-6 Line #: 26
Original Specific Comment #: 44
Comment: Equation A.2-2 presents the value (n-t). However, this value appears to be a typographical error. The value (n-t) should be replaced with (n-1).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.2.2 Page #: A.2-6 Line #: 36 to 38
Original Specific Comment #: 45
Comment: These lines state that values equal to one-half the sample quantitation limit (SQL) were used in equations A.2-1 and A.2-2 to represent chemical concentrations reported as not detected. However, the text does not state how substituting these values may affect statistical procedures used to determine the distribution of the data. The text should be revised to clearly state how these substitutions may affect statistical procedures applied to the data.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.3.1 Page #: A.2-7 Line #: 27 and 28
Original Specific Comment #: 46
Comment: These lines state that an initial screening excluded contaminants that would not contribute to human health risk. This statement should be revised to state that the initial screening excluded contaminants that would not "likely" contribute to human health risk.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.3.1 Page #: A.2-8 Line #: 24 to 34
Original Specific Comment #: 47
Comment: These lines present a concentration-toxicity screen used to eliminate CPCs based on relative risk. However, no CPCs present at concentrations greater than their estimated RBCs should be eliminated from the risk assessment. Therefore, all CPCs present at concentrations greater than their estimated RBCs should be retained in the risk assessment, and the text should be revised to clearly state that such CPCs were retained.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.4 Page #: All Line #: All
Original Specific Comment #: 48
Comment: Section A.2.4 presents the results of selecting CPCs for OU5. However, no radionuclide CPCs are presented. The

text should be revised to present the radionuclide CPCs that were selected or should explain their omission.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.4 Page #: All Line #: All
Original Specific Comment #: 49
Comment: Tables within the text of Section A.2.4 present CPCs selected for OU5. However, a number of inconsistencies exist between these tables and corresponding tables that follow the text. For example, acetonitrile, acrolein, and acrylonitrile are presented as CPCs in the table on page A.2-13, but are not shown in Tables A.2-3 through A.2-7. Also, frequencies of detection presented in the text for groundwater and surface water CPCs could not be replicated when compared to values in Tables A.2-3 through A.2-7. Furthermore, polychlorinated biphenyls (PCBs) detected in facility soil are not listed in the text as CPCs. Therefore, all tables in this section should be reviewed for consistency and revised as needed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.4.1 Page #: A.2-13 Line #: 2
Original Specific Comment #: 50
Comment: This line states that pesticides detected in OU5 are probably due to past pest control activities conducted within the study area. However, the text does not state whether this assertion is used to exclude pesticides as a CPC. The text should be revised to clarify this statement and its impact on the risk assessment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.4.4 Page #: A.2-17 Line #: 5 to 8
Original Specific Comment #: 51
Comment: These lines state that no organics other than those presented in the tables on page A.2-16 were detected at concentrations exceeding toxicity screen benchmarks. However, Table A.2-10 shows that both acenapthalene and benzo(g,h,i)perylene were detected at concentrations exceeding their toxicity screening levels, yet they are not presented as CPCs on page A.2-16. The text and tables of this section should be thoroughly reviewed for consistency and revised as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.2.4 Page #: NA Line #: NA
Original Specific Comment #: 52
Comment: Tables A.2-1 through A.2-12 contain many apparent errors, omissions, and inconsistencies. For example, no radionuclides are identified as CPCs in Table A.2-1. In addition, carbazole is shown as a CPC in the corresponding text, but is not identified as a CPC in Table A.2-1. Therefore, all tables in this section should be reviewed to

eliminate all inconsistences and should be revised as necessary. During the revision, all headings, footnotes, and symbols should also be reviewed and revised as needed. The revised tables should have clear, consistent column headers and should contain no blank cells.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.1.7 Page #: A.3-10 Line #: 16
Original Specific Comment #: 53
Comment: This line states that an estimated 22,927 people reside within a 5-mile radius of the site. However, page A.1-6 gives the total residents as over 24,000. The report should be revised to consistently report the number of residents within a 5-mile radius of the FEMP.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.1.8 Page #: A.3-11 Line #: 5 to 12
Original Specific Comment #: 54
Comment: This paragraph discusses the land use adjacent to the FEMP. This paragraph should be revised to reference Figure A.1-3, which graphically presents land use adjacent to the site.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.1.10 Page #: A.3-13 Line #: 12 to 17
Original Specific Comment #: 55
Comment: The third bulleted item on this page summarizes the population centers near the site and lists the number of children living within a 5-mile radius of the site. The list of population centers does not include the City of Fernald (listed as a critical subpopulation location in Table A.3-11b). This bulleted item should be revised to include the City of Fernald in the list of population centers and to adjust the number of children to include those who live in the City of Fernald.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.1.10 Page #: A.3-13 Line #: 27 to 35
Original Specific Comment #: 56
Comment: The fifth bulleted item on this page discusses major industries that use chemicals and are located near the site. This information is relevant to the risk assessment but is inappropriate in a section on critical subpopulations. This item should be deleted from Section A.3.1.10 and should be added elsewhere within the report, possibly within Section A.3.1.8.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.1.10 Page #: A.3-13 Line #: 37 to 43
Original Specific Comment #: 57
Comment: This paragraph identifies the receptors used to evaluate sensitive populations. The discussion requires

several modifications. First, Morgan Elementary School is identified in the text as being located northeast of the site; Figure A.3-6 shows it to be located northwest of the site. Second, the fifth school in the list is identified as "Ross High School;" Figure A.3-6 identifies this school as "Ross Middle High School." The text and figure should be revised appropriately to eliminate these inconsistencies. Finally, the first bulleted item on this page identifies the Venice Presbyterian Pre-School as being located only 2 miles northeast of the site. However, this daycare facility is not identified as a potential sensitive population receptor in lines 37 to 43, nor is the facility location identified in Figure A.3-6. The text should be revised to include this daycare facility as a sensitive population receptor or should clearly explain why it is not evaluated as such. Also, Figure A.3-6 should be revised to note the location of the Venice Presbyterian Pre-School.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2 Page #: A.3-16 Line #: 21 to 23
Original Specific Comment #: 58
Comment: These lines refer to potential surface water and sediment receptor locations; however, these locations are not discussed in the text. The text should be revised to briefly discuss these potential surface water and sediment receptor locations, including reference to a figure showing these locations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2 Page #: A.3-16 Line #: 32 to 35
Original Specific Comment #: 59
Comment: These lines refer to potential receptors located northeast and southeast of the site. The discussion should refer to Figure A.3-6, which shows off-property receptor locations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2 Page #: A.3-17 Line #: 1 to 16
Original Specific Comment #: 60
Comment: This paragraph discusses potential on-site receptor locations under future land use scenarios. The discussion should be revised to reference Figure A.3-17, which graphically presents these receptor locations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2 Page #: A.3-17 Line #: 31 to 32
Original Specific Comment #: 61
Comment: These lines introduce the fenceline and off-property receptor locations that were evaluated. The sentence should be revised to reference Figure A.3-16, which graphically presents these receptor locations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.1 Page #: A.3-18 Line #: 22 and 23
Original Specific Comment #: 62
Comment: These lines identify the major drainageways at the site. However, the discussion does not refer to the SSOD. The text should be revised to include this ditch as one of the major drainageways at the site or to explain its exclusion as a major drainageway.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.1 Page #: A.3-19 Line #: 3
Original Specific Comment #: 63
Comment: This line discusses the presence of contaminants in Great Miami River sediment "in the vicinity" of the outfall line. This phrase is rather vague. The text should be revised to clarify where the contamination is located. For example, upstream of the outfall, at the outfall, or downstream of the outfall.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.1 Page #: A.3-20 Line #: 1 to 4
Original Specific Comment #: 64
Comment: These lines discuss the presence of contaminants in groundwater plumes emanating from the site. In line 1, the text refers to "some inorganics." These contaminants should be identified. Lines 2 and 3 refer to "radionuclides, inorganics, and VOCs" present as "isolated occurrences above background." The text should be revised to identify the most significant contaminants of each of these three types. Furthermore, the text should be revised to clarify that the presence of any volatile organic compounds (VOC) is above background because VOCs do not naturally occur.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.1 Page #: A.3-20 Line #: 40 and 41
Original Specific Comment #: 65
Comment: This line implies that surface and subsurface soil contamination at the site is solely the result of deposition of particulate emissions. As described elsewhere in the report, soil contamination is also the result of spills, leaks, and surface water runoff. Lines 40 and 41 should be revised to include these other contaminant sources.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.2.1 Page #: A.3-22 Line #: 16 and 17
Original Specific Comment #: 66
Comment: These lines indicate that the property's vegetative cover is assumed to be consistent with the cover present at surrounding properties (85 percent cover) for the purposes of evaluating the current land use scenario. However, the degree of cover under the current land use scenario should be based on the existing quantity and quality of vegetative

cover at the site. The text and possibly the exposure calculations should be revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.3.2 Page #: A.3-25 Line #: 2 and 3
Original Specific Comment #: 67
Comment: These lines discuss the deposition of particulates onto the soil or edible plants present at farms. The deposited particulates can also impact vegetable gardens. The text should be revised to refer to both farmland and gardens.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.3.4 Page #: A.3-25 Line #: 18
Original Specific Comment #: 68
Comment: This line implies that potentially contaminated edible tissue or milk can be ingested only by off-site residents. As noted in Figure A.3-2, future on-site receptors may also ingest contaminated edible tissue and milk. The text should be revised to indicate that both on-site and off-site residents may ingest contaminated edible tissue and milk.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.4.1 Page #: A.3-28 Line #: 8
Original Specific Comment #: 69
Comment: This line indicates that risks are characterized for the trespassing youth for all areas of the site except the production area (Areas 1 to 4). However, in the paragraph immediately preceding the first bulleted item on page A.3-28, the text states that the trespassing youth does not have access to the production area (Areas 2, 3, and 4) and the sewage treatment plant (Area 6). The text should be revised to consistently describe the areas to which the trespassing youth is assumed to have access and for which risks will be evaluated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.4.1 Page #: A.3-28 Line #: 35 to 37
Original Specific Comment #: 70
Comment: These lines state that under current land use with access controls, the off-property farmer and child are assumed to be supplied with bottled water; therefore, exposures of these receptors to groundwater are not evaluated. This assumption needs to be justified. If families near the site are currently receiving bottled water, then the assumption is appropriate. However, if bottled water is not currently being supplied, then potential exposure to groundwater should be evaluated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.4.1 Page #: A.3-29 Line #: 3 and 4
Original Specific Comment #: 71
Comment: These lines state that exposure to the off-property user of surface water in the Great Miami River will be evaluated at the outfall effluent line and at the confluence of the Great Miami River and Paddys Run. This appears to be consistent with Table A.3-16, but is inconsistent with the exposure point locations presented on page A.3-40, which describe a third exposure point in the Great Miami River between the outfall line and the confluence of the Great Miami River and Paddys Run. The report should be revised to consistently present and evaluate surface water and sediment exposure points.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.4.1 Page #: A.3-29 Line #: 30 to 33
Original Specific Comment #: 72
Comment: These lines describe the ages of the critical subpopulations that are evaluated for potential exposure to resuspended soil. The ages of these children are described as grades kindergarten through 12. However, this age range is not consistent with Section A.3.1.10, which describes critical subpopulations including several daycare centers. Also, Figure A.3-6 presents the locations of off-property receptor locations and includes the location of one daycare facility. The text should be revised to be consistent with the discussion presented in Section A.3.1.10; specifically, critical subpopulations should be described as including children attending local daycare facilities.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.4.3 Page #: A.3-31 Line #: 19 to 21
Original Specific Comment #: 73
Comment: These lines describe additional off-property locations considered under future land use that were not considered under current land use conditions. These additional locations include well 2071, well 2119, and a well located near the Great Miami River. The text should be revised to explain how and why these additional locations were selected. The text should also be revised to more clearly identify the well located "near the Great Miami River." If this well has a name or number, then the well should be so identified. If the well has no existing identifier, then the report should provide such an identifier.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.2.4.3 Page #: A.3-32 Line #: 19 to 30
Original Specific Comment #: 74
Comment: These lines describe Scenario B, the Undeveloped Park with Limited Facilities. However, unlike Scenarios A and C, the description of Scenario B does not clearly indicate the

ages of the potential receptors. The text should be revised to indicate the ages of the potential receptors.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.3 Page #: A.3-35 Line #: 13
Original Specific Comment #: 75
Comment: This line refers to Table A.3-2. No Table A.3-2 was found; instead four tables, A.3-2A through A.3-2D, were located. The text should be revised to refer to all of these tables and should briefly explain the content of each.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.3.1 Page #: A.3-36 Line #: 2
Original Specific Comment #: 76
Comment: This line lists the home builder as one of the receptors that will be exposed to surface soil. Specifically, it refers to contaminant concentrations in soil 1.5 bgs as presented in Table A.3-6. However, Section A.3.2.4 (page A.3-34) states that the home builder will be exposed to deeper soils "(deeper than 1.5 feet below ground surface)." The text should be revised to indicate that the home builder will be exposed to contaminants in both surface and subsurface soil. The text should also be revised to specify the contaminant concentrations used to evaluate exposure to both types of soil.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.3.2 Page #: A.3-36 Line #: 17 to 33
Original Specific Comment #: 77
Comment: These lines indicate that radon modeling results from a series of tables (A.3-9 to A.3-12) are summarized in the in-text table. The tables referred to do not present radon modeling results for the grazing areas; yet the in-text table summarizes radon modeling results for the grazing areas. The text should be revised to refer to the appropriate table containing radon modeling results.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.3.3 Page #: A.3-38 Line #: 1 to 5
Original Specific Comment #: 78
Comment: These lines present wells evaluated for several exposure point locations. Table A.3-13 lists the area "Northeast of FEMP" as one of the off-property exposure point locations. These lines should be revised to include the area "Northeast of FEMP" as an exposure point location and should list specific wells used to evaluate this location.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.3.3 Page #: A.3-38 Line #: 3 and 4
Original Specific Comment #: 79
Comment: These lines refer to "South Plume Wells" but do not clearly define these wells. First, the South Plume Wells are said to "(correspond to Uranium Plume)." Section A.3.2.1 discusses six different plumes, none of which is identified as the "Uranium Plume." Lines 3 and 4 should be revised to clearly explain the reference to the "Uranium Plume." Second, the lines describe in narrative fashion the wells being referred to in the South Plume Wells. The narrative should be replaced by a list of wells, similar to the lists of wells for the other groundwater exposure point locations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.3.3 Page #: A.3-39 Line #: 15 and 16
Original Specific Comment #: 80
Comment: These lines refer to "the three well locations to the east of the FEMP." Because more than three wells are located to the east of the FEMP, the lines should be revised to more clearly identify the wells to which reference is being made.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.3.4 Page #: A.3-40 Line #: 12
Original Specific Comment #: 81
Comment: This line indicates that Table A.3-16 presents current exposure point concentrations for surface water. Table A.3-16 presents concentrations for two exposure points in the Great Miami River: at the effluent outfall and at the confluence of the Great Miami River and Paddys Run. These exposure point concentrations are consistent with the discussion on page A.3-29. However, lines 5 to 8 on page A.3-40 present sampling point locations for two exposure point locations: the confluence of the Great Miami River and Paddys Run (as discussed above) and the Great Miami River between the Outfall line and the confluence (not discussed in line 12 or in Table A.3-16. The entire report should be reviewed and revised as necessary to consistently present and discuss surface water exposure point locations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4 Page #: A.3-42 Line #: 7
Original Specific Comment #: 82
Comment: This line refers to "reasonable" exposure pathways. The meaning of the term "reasonable" is subjective, and should be clearly explained. The explanation should reference Figures A.3-1 and A.3-2.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.1.2 Page #: A.3-44 Line #: 3 and 10
Original Specific Comment #: 83
Comment: Line 10 states that "Other values used in this report are presented in Section A.4.0." However, Section A.4.0 does not include chemical-specific dermal absorption values. The line should be revised to clearly indicate where the remaining dermal absorption values are presented. Without these values, dermal exposure and risk calculations cannot be verified.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.1.3 Page #: A.3-44 Line #: 26
Original Specific Comment #: 84
Comment: This line presents and defines the variable exposure duration (ED). The units for this variable are presented as "years per lifetime," which appears to be incorrect. The units should be changed to be expressed instead as "years."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.2.4 Page #: A.3-47 Line #: 32
Original Specific Comment #: 85
Comment: This line presents and defines the parameter time of event (ET). The units of measure for this parameter are defined as hours, which appears to be incorrect. The line should be revised to present the units of measure for the parameter ET, as hour per event.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.4.2 Page #: A.3-55 Line #: 24
Original Specific Comment #: 86
Comment: This line presents the equations used to calculate exposures to contaminants in beef and milk. Equation A.3-32 is used to calculate exposures to radionuclides in beef. The first parameter in this equation is the concentration of the radionuclide in beef (C_{ib}). In Equation A.3-28, the units of measure for this parameter are defined as picocuries per gram (pCi/g). If these units are used in Equation A.3-32, a conversion factor (CF) with units of grams per kilograms (g/kg) is required for the equation to produce an exposure in the proper units. Equations A.3-28 and A.3-32 should be reviewed and the units for the parameter "C_{ib}" should be consistently presented and used.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.4.3 Page #: A.3-56 Line #: 25 and 26
Original Specific Comment #: 87
Comment: These lines present the units for the parameter "C_{if}." However, the units of measure for radionuclide and chemical constituents are reversed. The lines should be revised to correctly present the units for radionuclide and chemical constituents.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.4.3 Page #: A.3-57 Line #: 29
Original Specific Comment #: 88
Comment: This line presents units for the parameter "C_{if};" the units are presented as pCi/g and mg/kg for radionuclide and chemical constituents, respectively. The units for this parameter were defined as pCi/g and milligram per gram (mg/g) in Equation A.3-36. If the units for the parameter "C_{if}" presented in Equation A.3-36 are used, then a conversion factor needs to be added to Equation A.3-40. If the units for the parameter "C_{if}" presented in Line 29 are used, then the conversion factor in Equation A.3-41 should be removed. Equations A.3-36, A.3-40, and A.3-41 should be reviewed and the units for the parameter should be consistently presented and used.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.6.1 Page #: A.3-58 Line #: 30
Original Specific Comment #: 89
Comment: This line describes the age of the trespassing youth as "between the ages of six and 18." Table A.3-20 presents the age of this receptor as 7 to 18. The age of the trespassing youth should be consistently presented and used.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.4.6.3 Page #: A.3-63 Line #: 17 to 19
Original Specific Comment #: 90
Comment: These lines describe how the value for the parameter, exposure time, was determined for critical subpopulation receptors. Again, the discussion refers only to school-age children. Critical subpopulation receptors have been defined elsewhere in the report as including children attending daycare. The text should be revised to clearly define the value for the parameter, exposure time, used to evaluate exposure to children attending daycare.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 91
Comment: Table A.3-D summarizes exposure point information under future land use without federal ownership. For the on-property resident farmer and child, the table indicates that two reasonable maximum exposure (RME) locations were selected. These locations are described as the former production area and Area No. 7. However, the text on page A.3-35 indicates that the locations evaluated included the former production area and an area northeast of the production area consisting of Areas No. 5 through 7. In fact, this area is referred to in Figure A.3-7 and in the exposure calculations as the "Northeast Area." Table A.3-D should be revised to specify the second RME location as the Northeast Area, rather than as Area No. 7.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 92
Comment: Table A.3-10 contains the entries "NA" under the column headings "Northeast of FEMP" and "Southeast of FEMP" for radon-222. It is not clear why concentrations of radon-222 could not be modeled for these two areas. The table should clearly explain why such modeling could not be performed in these areas.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 93
Comment: Table A.3-11b presents air concentrations for critical subpopulations. However, the subpopulations for which concentrations are calculated are inconsistent with the discussion in Section A.3.1.10. Specifically, Section A.3.1.10 identifies children attending the Venice Presbyterian Pre-School as a critical subpopulation. The Venice Presbyterian Pre-School is not included in Table A.3-11b. Table A.3-11b should be revised to include air concentrations for the Venice Presbyterian Pre-School or the table should be footnoted to explain why this previously identified critical subpopulation was excluded.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 94
Comment: Table A.3-20 presents exposure input parameters for current land use receptors. Three problems were identified with this table. First, parameters were developed for two age groups of students to represent critical subpopulations. Elsewhere in the report, critical subpopulations are defined as including children attending daycare facilities. The table (and all related tables and text) should be revised to include parameters (and results) for children under kindergarten age who attend local daycare facilities. As an alternative, the report (and Table A.3-20 in particular) should be revised to clearly explain and justify the use of students to represent all critical subpopulations. Second, the fraction ingested (FI) parameters included with incidental ingestion of soil and sediment are presented in Table A.3-20 as 0.06 and 0.19, respectively. The footnote suggests that these values are based at least in part on the fraction of waking hours spent on the property. The approach summarized in the footnote seems logical and consistent with other site documents. Therefore, the table should be revised to use soil and sediment FIs equal to 0.25 (4 hours on site out of 16 waking hours). Finally, the age of the trespassing youth and exploring youth is presented as 7 to 18 years old. However, Section A.3.4.6.1 describes the age range of this group as 6 to 18 years old. This

inconsistency should be resolved and text should be revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 95
Comment: Table A.3-21a presents exposure input parameters for future land use receptors. The parameters for incidental ingestion of soil do not include values for FI; therefore, the table should be revised to include these values. Second, the exposure frequency for the on-property home builder is listed as 50 days per year. However, the footnote does not clearly explain the derivation of this value. Footnote "d" should be revised to clearly explain how the value, 50 days per year, was derived.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 96
Comment: Table A.3-23 presents partitioning coefficients and biotransfer factors for CPCs. Footnote "f" in this table cites the reference "(Lyman, et al. 1982)." Because this reference is not included in the reference section, the reference section should be revised to include this reference. Also, footnote "g" indicates that the leaching coefficient $Lambda_{Li}$ was calculated from K_d; the footnote should be revised to indicate how the value was calculated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 97
Comment: Figure A.3-1 presents the conceptual site model for the current source term. The figure does not include off-property critical subpopulations as potential receptors. The figure should be revised to summarize potential exposures to off-property critical subpopulations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 98
Comment: Figure A.3-2 presents the conceptual site model for the future source term. The figure indicates that ingestion of perched groundwater will be evaluated for the central tendency (CT) on-property resident farmer. However, Section A.3.2.4.4 indicates that ingestion will not be evaluated. This inconsistency should be resolved. The figure also indicates that ingestion of perched groundwater will be evaluated for the RME on-property resident farmer and child. However, Section A.3.2.4.4 indicates that ingestion of perched groundwater will only be evaluated for the RME on-property resident farmer and not for the child. The figure should be footnoted to indicate this. The entire text

should be reviewed (including Section A.3.2.4.4) to consistently describe CT exposures for the on-property farmer and child. Finally, the table indicates that exposure via direct radiation as a result of recreational use of surface waters will not be evaluated for recreational receptors. However, Table A.3-1 indicates that such exposure will be evaluated. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.0 Page #: NA Line #: NA
Original Specific Comment #: 99
Comment: Figure A.3-6 presents off-property receptor locations. Several problems with this table were noted. First, some off-property receptors discussed in the text are not shown in the figure. For example, the southeast receptor, off-property air receptors, and off-property surface water and sediment receptors are not shown. The figure should be revised to include the locations of these receptors. Second, the figure shows a well labeled "Stickers Grove Well" located very close to the Great Miami River. This well may be the well referenced in the text as the well "near the Great Miami River." If so, the text should be revised to consistently refer to the "Stickers Grove Well" rather than the well "near the Great Miami River." Third, the figure should be revised to note the location of the Venice Presbyterian Pre-School. Finally, the legend to the figure indicates that the distances associated with each receptor point represent the distance from the map's edge. With this in mind, the distances presented in the figure do not appear to correspond to the distances stated in the text. For example, Section A.3.1.10 states that the Ross County Day Nursery is located about 2.5 miles northeast of the center of the site. The figure however, indicates that this same facility is located 2.0 miles northeast of the northeast corner of the map. This would appear to place the facility about 4 miles northeast of the center of the site. The distances to all receptors should be checked and revised as necessary.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.4.1.3 Page #: A.4-7 Line #: 34
Original Specific Comment #: 100
Comment: The citation "EPA 1993a" occurs here, later in this section, and on most pages of Section A-V. However, because this reference is not included in the reference section (Page A-R-25), the data could not be verified. This reference should be added to the list.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.4.1.4 Page #: A-9 Line #: 23
Original Specific Comment #: 101
Comment: The reference "DOE 1992" is unclear because Page A-R-21 includes references "DOE 1992a," "DOE 1992b," and two entries called "DOE 1992d." These citations and references should be revised appropriately.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.5 Page #: NA Line #: NA
Original Specific Comment #: 102
Comment: Tables A.5-1 through A.5-20 summarize carcinogenic and noncarcinogenic risks to receptors under various land use scenarios. In these tables, a value of "0" is used to show that no risk was calculated for a particular exposure medium. Use of this value may be misleading. Although no risk was calculated, risk may indeed exist. The value "0" should be replaced by a term such as "Not Available (NA)" or "Not Calculated (NC)."

Also, it is difficult to identify the tables in Attachment A.IV that are summarized in each of the Section A.5 summaries. Therefore, an additional column should be added to each of the Section A.5 tables citing which Attachment A.IV tables are summarized.

In addition, the tables in Section A.5 summarize chemical carcinogenic risk, but do not indicate whether this risk is based on toxicity equivalency factors for polycyclic aromatic hydrocarbons (PAH) or the assumption that all PAHs are toxically equivalent to benzo(a)pyrene. The Section A.5 tables should be footnoted appropriately.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.5 Page #: NA Line #: NA
Original Specific Comment #: 103
Comment: Table A.5-10 summarizes risk to a user of a wildlife refuge on the site of the shooting range. However, no corresponding table could be found in Attachment A.VI. The tables and text should be revised to eliminate this inconsistency.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.5 Page #: NA Line #: NA
Original Specific Comment #: 104
Comment: Tables A.5-19 and A.5-20 both summarize risks to nearby sensitive subpopulations (grade and high school students). However, no corresponding tables were identified in Attachment A.IV. Tables should be added to Attachment A.IV to show how the risks to these sensitive subpopulations were calculated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.5.3.11 Page #: A.5-24 Line #: 9 to 17
Original Specific Comment #: 105
Comment: These lines summarizes risks to critical subpopulations. However, tables showing how these risks were calculated are not included in Attachment A.VII. Tables showing the calculation of these risks should be added to Attachment A.VII.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.0 Page #: NA Line #: NA
Original Specific Comment #: 106
Comment: This section discusses uncertainties in the risk assessment. However, the uncertainty contributed by future behavior patterns is not discussed. Because this is potentially a significant source of uncertainty, it should be discussed in the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.0 Page #: NA Line #: NA
Original Specific Comment #: 107
Comment: Tables 6-1 through 6-7, which summarize risks to receptors under various land use scenarios, were not introduced or referred to anywhere in Section A.6.0. Instead, these tables are referred to, but not included in, Section 6.0 of the body of the report. Furthermore, these tables appear to be identical to Tables A.7-1 through A.7-7. Therefore, Tables 6-1 through 6-7 should be transferred to Section 6.0 of the body of the report. In addition, the tables do not clearly indicate whether the risks were estimated for the RME or CT receptor. These tables should be clearly labeled to indicate the receptors for which risks are estimated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.1 Page #: A.6-2 Line #: 18 and 19
Original Specific Comment #: 108
Comment: These lines refer to a combination of events and conditions that will not occur in an actual receptor population. Because actual exposure conditions are not known at this time, these lines should be revised to address the probability of such a combination of events and conditions rather than definitively stating that such a combination cannot occur.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.1 Page #: All Line #: All
Original Specific Comment #: 109
Comment: This section portrays the risks estimated for the RME individual as risks that will not occur. However, because actual exposure patterns are not known and many other uncertainties exist within the risk assessment process, this

section should be revised to address the probability of such extreme risk estimates rather than making statements that cannot be verified at this time.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.2 Page #: A.6-4 Line #: 19 to 24
Original Specific Comment #: 110
Comment: These lines discuss the uncertainties related to insufficient documentation of all pockets of elevated contamination. The text states that all pockets of radiological contamination have likely been identified. The text does not discuss whether all pockets of elevated chemical contamination have been identified. Even though radiological risks exceed chemical risks in most areas and for many exposure pathways, risks associated with chemical contaminants are significantly above 10^{-6} and in some instances above 10^{-4}. Therefore, the lines should be revised to address any uncertainties related to insufficient documentation regarding pockets of elevated chemical contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.2 Page #: A.6-4 Line #: 34 to 37
Original Specific Comment #: 111
Comment: These lines discuss the possibility of eliminating certain chemicals as chemicals of potential concern because of a limited database, even though the chemicals may be site-related. As stated in EPA guidance, site-relatedness should be considered in identifying chemicals as chemicals of potential concern. An extensive amount of information exists about chemicals used at the site during production processes and about chemicals present in waste streams generated and managed at the site. Therefore, the lines should be revised to qualify as minimal, the likelihood of chemicals being excluded as chemicals of potential concern that are related to site activities.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.2 Page #: A.6-5 Line #: 14 to 16
Original Specific Comment #: 112
Comment: These lines refer to a risk evaluation of soil and groundwater data generated by the on-site monitoring laboratory. However, this information was not identified or referred to elsewhere in the report. The lines should be revised to eliminate reference to this risk evaluation if it was not performed, or the report should identify and refer to this information.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.2 Page #: A.6-5 Line #: 32 to 36
Original Specific Comment #: 113
Comment: These lines discuss the ratio of chromium III to chromium VI in FEMP media. However, this section does not discuss how this data was obtained. The text should be revised to include the methods used to determine the above-mentioned ratio and discuss any uncertainties in the methods used.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.2 Page #: A.6-5 Line #: 46 and 47
Original Specific Comment #: 114
Comment: These lines state that the majority of risks for most receptors are attributable to exposure to contaminated soils. However, exposure to contaminated groundwater also contributes significantly to the total risks for many receptors. The lines should be revised to discuss the impact of the identified uncertainties on risks attributable to groundwater.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.3 Page #: A.6-7 Line #: 1 to 8
Original Specific Comment #: 115
Comment: These lines discuss the uncertainties associated with the use of maximum concentrations for databases with less than seven detections. The first line states that "great overestimation" of exposure concentrations exists as a result. The fifth line states that this approach "may result in an overestimation." These two statements appear to be inconsistent. For large databases in which many samples were collected and minimal detections were identified, use of the maximum concentration may result in significant overestimation. However, in other instances where the entire database is small, the number of samples may be insufficient to fully characterize a particular exposure point, location, or area. In these instances, use of the maximum concentration may or may not result in overestimation. Lines 1 to 8 should be revised to more fully discuss the impacts of the use of the maximum concentrations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.6 Page #: All Line #: All
Original Specific Comment #: 116
Comment: This section discusses uncertainty in the toxicity assessment phase of the baseline risk assessment. However, uncertainty contributed by the lack of risk factors for some CPCs is not discussed. The text should be revised to discuss this uncertainty.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.6.2.6 Page #: A.6-12 Line #: 4
Original Specific Comment #: 117
Comment: This line introduces a source of uncertainty associated with calculating risks from exposure to external radiation from soils. The line states that the uncertainty is related only to surface soils. However, the same uncertainty exists regarding exposure to external radiation from subsurface soils by home builders. The line should be revised to refer to both surface and subsurface soils.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.0 Page #: All Line #: All
Original Specific Comment #: 118
Comment: Section A.7. summarizes estimated risks and compares them to risks estimated for background (off-site) concentrations of CPCs. However, the summary is inconsistent and confusing. The summary should be revised to (1) clearly present the objective of the section; (2) address significant pathways, routes, and receptors; and (3) include ranges for both carcinogenic and noncarcinogenic risks.

Also, several general statements made in this section appear to be inaccurate. For example, lines 27 to 29 on page A.7-1 state that estimated carcinogenic risks associated with scenarios involving current concentrations and continued access control range from 1E-3 to 1E-6. However, the carcinogenic risk for the off-property RME farmer presented in Table A.5-5 is 1E-02. Also, lines 18 and 19 on page A.7-2 state that magnesium appears to contribute significantly to noncarcinogenic risk via ingestion of milk. However, Table A.VII-8a shows that thallium contributes a greater percentage of this risk. This section should be revised to provide a complete, comprehensive, and accurate summary of risks.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.1 Page #: A.7-1 Line #: 15 and 16
Original Specific Comment #: 119
Comment: These lines discuss the selection of CPCs. The text indicates that CPCs were determined for each media type. Constituents should also be identified for each exposure area. Lines 15 and 16 should be revised to clarify whether CPCs were identified for different exposure areas within each medium.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.2 Page #: All Line #: All
Original Specific Comment #: 120
Comment: This section presents risks calculated using "background" concentrations of CPCs. Because these risks

are estimated for only RME exposures, they should be compared only to similar exposures for on-site concentrations of CPCs. This section should be reviewed to ensure that only similar exposure scenarios are compared and that the text clearly presents the exposure scenarios being compared.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.2 Page #: A.7-5 Line #: 11 to 13
Original Specific Comment #: 121
Comment: These lines introduce risk and hazard quotient results calculated based on background concentrations. The results are correctly identified as being presented in Tables A.7-8 through A.7-19. Because these tables are summary tables, the results should also be presented in detail tables similar to those for site-related concentrations. The report should be revised to include detailed exposure and risk results related to background concentrations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.2 Page #: A.7-5 Line #: 6 to 8
Original Specific Comment #: 122
Comment: These lines state that in many cases, CPCs in OU5 are at or only slightly above natural background concentrations. This is confusing because one of the CPC screening procedures involved a statistical comparison to background levels. The text should be revised to clarify or delete this statement.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.2 Page #: A.7-6 Line #: 8 to 10
Original Specific Comment #: 123
Comment: These lines correctly state that the results of background calculations indicate that toxic effects can occur from background concentrations of radionuclides and chemical constituents. However, the discussion concludes that these results indicate that the procedures used to determine background risks have a conservative bias. The fact that potential risks are identified through their association with background concentrations in no way suggests that the procedures used to determine risks have a conservative bias. It is possible that exposure to naturally occurring constituents can result in some degree of risk for potential receptors. Lines 8 to 10 should be revised to amend the conclusion that the calculation of background risks shows that the procedures used to calculate those risks have a conservative bias.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.2 Page #: A.7-6 Line #: 12 to 18
Original Specific Comment #: 124
Comment: These lines discuss background risks and risks from on-site media. Several of the statements generalize conflicting information, and the major point of these lines is not clear. These lines should be revised for clarity and accuracy.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.3 Page #: A.7-6 Line #: All
Original Specific Comment #: 125
Comment: Section A.7.3 discusses calculating PRGs. However, two issues regarding the estimated PRGs were identified. First, it is unclear why PRGs were estimated for all CPCs rather than simply focusing on the COCs. Second, it is unclear why PRGs were estimated only for the most conservative scenario rather than for a range of scenarios to allow comparison of the effects of various land uses. This section should be revised to address these issues.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7.3 Page #: A.7-6 Line #: NA
Original Specific Comment #: 126
Comment: Section A.7.3 introduces and presents PRGs calculated for OU5; however, the text does not refer to the procedures used to calculate these PRGs. The section should be revised to reference the procedures used to calculate the PRGs and to clearly describe how these PRGs will be used.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7 Page #: NA Line #: NA
Original Specific Comment #: 127
Comment: Table A.7-13 presents noncarcinogenic background risks from perched groundwater. However, some of the values presented in the table as representative background concentrations do not coincide with those presented in Table A.I-1. For example, the value presented in Table A.7-13 for manganese (2.1E-02) does not correspond to any value presented in Table A.I-1 for manganese. Also, the value presented for zinc in Table A.7-13 (3.2E-01) does not correspond to the value presented in Table A.I-1 (3.5E-01). These tables should be revised to eliminate any inconsistencies.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7 Page #: NA Line #: NA
Original Specific Comment #: 128
Comment: Table A.7-16 presents background carcinogenic risks estimated from exposure to sediment, but does not indicate whether the sediment is located in Paddys Run or the Great Miami River. Also, the value presented as the

representative background concentration for radium-226+5D (4.3E-01) does not correspond with the value presented in Table A.I-8 (5.0E-01). These tables should be revised to eliminate inconsistencies.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7 Page #: NA Line #: NA
Original Specific Comment #: 129
Comment: Table A.7-17 presents background noncarcinogenic risks from exposure to sediment, but does not indicate whether the sediment is located in Paddys Run or the Great Miami River. Also, several of the representative background concentration values presented in Table A.7-17 do not correspond to values presented in Table A.I-8. For example, the value presented for aluminum in Table A.7-17 (3.9E+03) does not correspond to the value presented in Table A.I-8 (1.97E+03). Also, the value presented in Table A.7-17 for copper (1.5E+01) does not correspond to the value presented in Table A.I-8. These tables should be revised to eliminate these inconsistencies.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.7 Page #: NA Line #: NA
Original Specific Comment #: 130
Comment: Tables A.7-20 through A.7-26 present PRGs for media at the FEMP facility. However, no tables showing the calculation of the PRGs are included in the report. The report should be revised to include tables showing the calculation of the PRGs.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.II.1.2.1 Page #: A.II-2 Line #: 14
Original Specific Comment #: 131
Comment: This line states that the underlying data distributions were determined to be normal, lognormal, or "neither." In some cases, however, insufficient data points are identified to adequately characterize the underlying distribution. Therefore, the text should be revised to present the three possible characterizations as normal, lognormal, and undetermined.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.II.1.2.1.1 Page #: A.II-4 Line #: 9
Original Specific Comment #: 132
Comment: This line refers to Table A-2. However, no such table was included in the document reviewed. The text should be revised to reference another table, or Table A-2 should be added to the document.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.II.1.2.1.1 Page #: A.II-6 Line #: All
Original Specific Comment #: 133
Comment: This section discusses the Shapiro-Francia goodness-of-fit test. However, no reference for the source of this test is provided. The text should be revised to reference this test.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.II.1.2.1 Page #: A.II-8 Line #: 28
Original Specific Comment #: 134
Comment: This line refers to Table B-2 as a source of the data used for an example calculation. However, the referenced table appears to include only data for sample numbers 56 through 81. The text or table should be revised to resolve this discrepancy.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.III.1 Page #: A-III-2 Line #: 1 to 9
Original Specific Comment #: 135
Comment: These lines discuss the differences between PRGs and RBCs. However, based on this discussion, it would appear that the only difference between these values is the target risk. If this is true, then the PRG and RBC values should only differ by factors of 10, which is not the case. This section should be revised to more clearly present the differences between PRGs and RBCs.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.III.3.2 Page #: A-III-4 Line #: All
Original Specific Comment #: 136
Comment: Several deficiencies were noted in Table A.III.1. These include the following: (1) carcinogenic slope factors for oral exposure and inhalation exposure to radionuclides are not defined, (2) a value is presented for a gamma shielding factor without referencing the source or function of the value, and (3) a volatilization factor of 0.5 liter per cubic meter (L/m^3) is presented when, in some cases, a volatilization factor of 0 L/m^3 is used. This table should be revised as appropriate to address these deficiencies.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.III.3.2 Page #: A-III-5 Line #: 4 to 7
Original Specific Comment #: 137
Comment: These lines present equations for estimating noncarcinogenic RBCs for groundwater and surface water. Several errors were identified in these equations. These include (1) using the parameters "TR" and "AT_c" in the numerator in place of "THQ" and "ATn," and (2) using the parameter "SF_i" in the denominator in place of the parameter "$1/RfD_i$." These equations should be revised as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.III.3.3 Page #: All Line #: All
Original Specific Comment #: 138
Comment: Section A.III.3.3 presents the methodology used to calculate the RBCs for soil and sediment at the facility. However, volatilization from and particulate generation of contaminated soil are exposure pathways not considered in calculating the RBCs. These pathways should be included in setting soil RBCs, or the text should be revised to justify their exclusion.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.III.3.3 Page #: A-III-6 Line #: 1 to 7
Original Specific Comment #: 139
Comment: These lines present equations used to calculate RBCs for soil and sediment at the facility. However, the concentration term in the first and third equations is presented as "C_w" rather than as "C_s." These equations should be revised to include the appropriate concentration parameter.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.V.3.1 Page #: A-V-2 Line #: NA
Original Specific Comment #: 140
Comment: Acetonitrile, like acrylonitrile, has cyanide-like biological actions. This should be mentioned here, as it was in Section A.V.5.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.V.26 Page #: A-V-17 Line #: NA
Original Specific Comment #: 141
Comment: Although minimal data are available regarding the toxicity of cesium, most available information is from cesium-137 studies. The similarities between the chemistry and biochemistry of cesium and potassium should be noted in the text. Summaries are available in compendia such as Stokinger (1981), which was mislabeled as "Stokinger 1982" on Page A-R-19, and in Carson and others (1986).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.V.89 Page #: A-V-61 Line #: 5
Original Specific Comment #: 142
Comment: The statement that "EPA stated that the dinitrophenols are administrative" should be clarified.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.V.99 Page #: A-V-76 Line #: NA
Original Specific Comment #: 143
Comment: As with cesium, a discussion of the biochemistry of ruthenium should be included in the text. Stokinger (1981), Carson and others (1986), or similar compendia should be researched further.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.VII Page #: All Line #: All
Original Specific Comment #: 144
Comment: The tables presented in this section use the term "Not Applicable (NA)" when either a chemical is not a chemical of interest for a particular medium or when the exposure pathway is not applicable. Although both of these circumstances result in no quantification of risk, the rationale behind each is very different. To ease review and interpretation of these tables, the abbreviation "NA" should be replaced with two separate and distinct terms that indicate the reason that no risk was quantified.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.VII Page #: NA Line #: NA
Original Specific Comment #: 145
Comment: Apparent errors and inconsistencies were discovered during review of several tables in this section. For example, Table A.VIII-1c, which lists carcinogenic risks for the groundskeeper in Area 3 (northeast corner of the production area), does not list several carcinogenic chemicals presented as surface soil CPCs for this area in Table A.IV-3. Chemicals that were omitted include 1,1,2,2-tetrachlorethane; 2,4-dinitrotoluene; 2,6-dinitrotoluene; 3,3'-dichlorobenzidine; and beta-BHC.

Another example regards apparent errors in Table A.VII-1a. Errors in this table include the following:
(1) tetrachloroethene is presented with an inhalation slope factor when no inhalation slope factor is presented for this chemical in Section A.4, and (2) risks presented for inhalation and ingestion of chrysene, and dermal contact with beryllium and Aroclor-1254 could not be replicated. Also, it appears that all risks from dermal contact with PAHs were assumed to be equal to risks from oral exposure. The tables in this section should be revised as necessary to eliminate any calculation errors, to ensure agreement with tables in Section A.VII, and to footnote any procedural derivations or assumptions.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.VIII Page #: A.VIII-2 Line #: 29 to 31
Original Specific Comment #: 146
Comment: These lines state that intakes were calculated using parameter values presented in Table A.3-20. However, some of the values in the table conflict with those that were actually used to calculate radon-222 intakes. Because the values actually used to calculate intake are presented in footnotes to Table A.VIII-1, the text should be revised appropriately.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.VIII Page #: NA Line #: All
Original Specific Comment #: 147
Comment: Several errors were identified in Table A.VIII-1. These include the following: (1) a failure to identify the source of the radium-226 levels for the Southern Area, (2) an apparent contradiction between symbols in the table and associated equations, and (3) incomplete and inconsistent footnoting to the table. The table and text should be revised as necessary to clearly identify the sources of all soil radium-226 concentrations used in the model, to ensure that all symbols used in the tables and corresponding equations are consistent, and to provide full and comprehensive footnotes for the table.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.VIII-1 Page #: NA Line #: NA
Original Specific Comment #: 148
Comment: Exhibit A.VIII-1 presents input parameters for the RAETRAD model used to estimate the movement of radon-222 into residences. Because the nature of the model is not clearly presented, it cannot be determined whether the presented parameters represent an RME scenario. Specifically, the parameters show a pressure gradient that would force air into a residence from the surrounding atmosphere. This may increase radon-222 concentrations from radon-222 in air surrounding the house, but may dampen radon-222 movement into the residence through the foundation. The text should clearly show that the selected input parameters represent an RME exposure scenario, or alternative parameters should be used that establish such a scenario.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: B-ES-1 Line #: 27 to 28
Original Specific Comment #: 149
Comment: This sentence states that representative concentrations of nonradiological contaminants were compared to benchmark values that are protective of ecological receptors. However, it does not explain how these benchmark values were established. The ES should briefly explain how these benchmark values were established.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.0 Page #: B-2 Line #: 15 to 17
Original Specific Comment #: 150
Comment: This sentence states that ecological risks associated with CPCs present in groundwater were indirectly evaluated when the CPCs detected in surface water were examined. This statement implies that such an evaluation is possible because groundwater in the Great Miami Aquifer is directly discharging to all surface water bodies examined in OU5.

However, even if the surface water bodies are hydraulically connected to groundwater, the risk associated with contaminants in surface water does not necessarily characterize the risk posed by groundwater because the contaminant concentrations in groundwater may not be evenly distributed. Therefore, periodic increases or decreases in the discharge of contaminants to the surface water may occur. The text should be revised to clearly state and justify any such assumptions.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.1.2.3 Page #: B-7 Line #: 13
Original Specific Comment #: 151
Comment: This sentence refers to the SSOD included in Study Area E. However, the SSOD is not shown in Figure B.1-1, which shows the study areas included in OU5. Figure B.1-1 should be revised to show the location of the SSOD.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.1.2.3 Page #: B-7 Line #: 25
Original Specific Comment #: 152
Comment: This sentence refers to the active flyash pile from which drainageways in Study Area E receive runoff. However, Figure B.1-1, shows only the inactive flyash pile. Figure B.1-1 should be revised to show the location of the active flyash pile.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.1.2.3 Page #: B-8 Line #: 26 to 32
Original Specific Comment #: 153
Comment: This paragraph discusses sampling reaches along Paddys Run; however, this section does not provide a figure that shows these reaches. The sampling reaches along Paddys Run should be shown in a figure similar to Figure B.1-4 for the Great Miami River.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.3 Page #: B-12 Line #: 14 to 15
Original Specific Comment #: 154
Comment: Section B.1.3 is introduced as a summary of removal actions most likely to directly impact ecological receptors. The text of Section B.1.3 should be revised to clarify how these actions impact ecological receptors and should specify the receptors being impacted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.4.1 Page #: B-14 Line #: 7 to 11
Original Specific Comment #: 155
Comment: This sentence designates contaminated surface soil and contaminated surface water and sediment in Paddys Run and the Great Miami River as the OU5 contaminant sources of

"greatest importance." The text should explain the rationale for this designation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.1.4.2 Page #: B-16 Line #: 27
Original Specific Comment #: 156
Comment: This sentence refers to Figure B.1-6; however, no such figure is provided in the report. Either Figure B.1-6 should be provided or its reference should be deleted from the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: NA Line #: NA
Original Specific Comment #: 157
Comment: Figure B.1-1 designates the study areas for the Site-Wide Ecological Risk Assessment. According to the figure, Study Areas A and E apparently overlap. Also, it is unclear what the dotted and vertical hatch marks designate. For clarity, the legend should explain all hatch marks used in the figure.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.0 Page #: B-1 Line #: 6 to 7
Original Specific Comment #: 158
Comment: This sentence refers to media-specific benchmark values that are protective of ecological receptors, but does not refer to the specific source of these values. The text should briefly discuss the specific source of or type of values used (for example, ambient water quality criteria) or should refer to a discussion of this elsewhere in the report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.1 Page #: B-1 Line #: 12
Original Specific Comment #: 159
Comment: This sentence refers to U.S. EPA Region 5 guidelines used in the exposure assessment. These guidelines should be specifically identified or referenced in the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.1 Page #: B-6 Line #: 2 to 4
Original Specific Comment #: 160
Comment: This sentence states that only those drainages that are known to contain water for a "large portion" of the year were considered. The description "large portion" is vague and should be defined.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.1 Page #: B-7 Line #: 21 to 25
Original Specific Comment #: 161
Comment: This paragraph states that although mercury levels in the Great Miami River were significantly lower than reported

background values, this metal was retained for further consideration in this risk assessment. Justification for retaining mercury as a CPC should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.1 Page #: B-7 Line #: 25
Original Specific Comment #: 162
Comment: This sentence refers to Attachment B.I for a summary of the CPC screening process. However, no such summary is apparent in Attachment B.I. This discrepancy should be resolved, and the text should be revised appropriately.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.1 Page #: B-9 Line #: 18 to 20
Original Specific Comment #: 163
Comment: This sentence refers to contaminants identified as "final surface water CPCs terrestrial receptors exclusively relying on drainage ditches..." This sentence appears to be incomplete and should be clarified.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.2 Page #: B-11 Line #: 19 and 25
Original Specific Comment #: 164
Comment: This section identifies uranium as a final inorganic sediment CPC for Paddys Run and the Great Miami River. However, Attachment B.IV, which is referred to in this section, does not identify uranium as a CPC. This discrepancy should be resolved, and the text or attachment revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.3 Page #: B-13 Line #: 21 to 22
Original Specific Comment #: 165
Comment: This sentence identifies thorium as a final inorganic soil CPC. However, Attachment B.V, which is referred to in this section, does not identify thorium as a CPC. This discrepancy should be resolved, and the text or attachment revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.4.1 Page #: B-28 Line #: 1 to 2
Original Specific Comment #: 166
Comment: This sentence states that quotient values for aluminum exceeding 1.0 were detected in samples collected from Reaches 1 and 2 on the Great Miami River. However, Table B.2-4 indicates that quotient values for aluminum exceeding 1.0 were detected in samples collected from Reaches 2 and 3. This discrepancy between the text and table should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.4.3 Page #: B-33 Line #: 30 to 32
Original Specific Comment #: 167
Comment: This paragraph identifies study areas in which quotient values for CPCs in surface soil are greater than or equal to 1.0. In Study Areas B and F, chrysene and seven PAHs, respectively, are identified as having a quotient value greater than 1.0. However, Table B.2-6 identifies quotient values greater than 1.0 for chrysene and the seven PAHs in Study Areas A and E, respectively, but does not identify quotient values greater than 1.0 for these contaminants in Study Areas B and F. This discrepancy should be resolved, and the text revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.4.3 Page #: B-34 Line #: 18 to 19
Original Specific Comment #: 168
Comment: This sentence states that representative concentrations of manganese in the outer contour exceeded the benchmark criterion. However, Table B.2-6 indicates that representative manganese concentrations exceeded benchmark criterion only in the inner contour. This discrepancy should be resolved, and the text revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: NA Line #: NA
Original Specific Comment #: 169
Comment: Table B.2-2 is intended to summarize the steps followed to identify media-specific final CPCs. Although this table identifies the criteria used in evaluating potential CPCs, it does not specify how these criteria were applied. This table should be revised to reflect not only the criteria used, but also the process or steps followed when evaluating these criteria to determine final CPCs. A flow chart would be the most appropriate means of presenting this information.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.0 Page #: B-1 Line #: 16
Original Specific Comment #: 170
Comment: This sentence states that no threat of "severe" radiation effects exists to populations of terrestrial or aquatic biota. The term "severe" is unclear and should be quantified or further defined in the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.2.1 Page #: B-5 Line #: 10
Original Specific Comment #: 171
Comment: This sentence assumes a radius of 100 meters and a thickness of 5 feet for the cylinder that represents the volume of soil for the MicroShield® computer program used to calculate the absorbed dose to mammals. Justification for

the 5-foot thickness is provided; however, no such justification is provided for the 100-meter cylinder radius. The text should be revised to include the rationale for the radius.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.2.2 Page #: B-6 Line #: 11
Original Specific Comment #: 172
Comment: As discussed in Specific Comment #171, the 100-meter cylinder radius assumed to calculate the absorbed dose to pine trees should be explained in the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.2.3 Page #: B-7 Line #: 13
Original Specific Comment #: 173
Comment: This sentence assumes a radius of 10 meters and a thickness of 30.5 centimeters for the cylinder that represents the volume of sediment for the MicroShield® computer program used to calculate the absorbed dose to shiners. Justification for the 10-meter radius is provided; however, no such justification is provided for the 30.5-centimeter cylinder thickness. The text should include the rationale for the thickness.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.2.3 Page #: B-8 Line #: 22
Original Specific Comment #: 174
Comment: This sentence states that a "slight overestimation" results from assuming unity for the absorbed fraction for photon radiation. The term "slight overestimation" should be further defined.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.4.2 Page #: B.4-12 Line #: 4 to 5
Original Specific Comment #: 175
Comment: The summary of ecological risk assessment results presented in Section B.4.2 states that biological studies conducted over the years suggest that biological communities have apparently remained stable over the period of operations at the FEMP. This sentence is too general in its description of these studies. The text should be revised to present additional information that identifies and briefly summarizes the specific studies conducted and that specifies which "communities" have apparently remained stable.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: NA Line #: NA
Original Specific Comment #: 176
Comment: Table B.4.2 summarizes the fish species collected from Paddys Run. Although the table adequately presents information on fish species found within each study area, as it is currently formatted, the table makes it difficult to

observe trends in the fish population over the years of FEMP operation. This table should be reformatted or divided into separate tables for each study area, similar to Table B.4.3, to more clearly show the population trends of fish species over time.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: NA Line #: NA
Original Specific Comment #: 177
Comment: Table B.4.3 does not include a heading explaining the information presented in the second column from the left. The table should be modified to include a heading for this column.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.IX Page #: NA Line #: NA
Original Specific Comment #: 178
Comment: Table B.IX-1 presents a summary of absorbed dose by areas and pathway. Within this table, the terms "awaiting" and "n/a" are included along with the maximum and mean absorbed doses, but are not defined. These terms should be defined as they apply to the information presented in the table.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.2 Page #: D.2-21 Line #: 26
Original Specific Comment #: 179
Comment: The text states that total uranium was present in the 15- to 20-foot-depth interval with concentrations of 2.65 to 735 mg/kg. However, a review of the data indicates that contamination in the area may not be fully characterized. Appendix F-3 states that Plant 2/3 was a major source of highly contaminated spills and episodic discharges. Because of the limited data available on subsurface contamination associated with the Plant 2/3 Area, further investigation may be required to determine the extent of radionuclide contamination and the potential for further contaminant migration.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.3 Page #: D.2-26 Line #: 10
Original Specific Comment #: 180
Comment: The text states that uranium isotopes including uranium-238, uranium-234, and uranium-235/236 all exhibited elevated activity levels, primarily within the 3- to 5-foot-depth interval. Uranium-238 was detected at five times the background value in five samples from the 5- to 10-foot-depth interval; however, subsurface soil samples were not collected and analyzed for uranium-238 at the 10- to 15-foot-depth interval. Additional soil samples should be collected at 10 feet bgs and should be analyzed for uranium-238 to determine the extent and volume of

uranium-238-contaminated soil at 10 feet bgs requiring remediation. Total uranium was also detected at five times the background value in 11 samples at the 10- to 15-foot-depth interval, but subsurface soil samples were not collected and analyzed for total uranium at the 15- to 20-foot-depth interval. The text should be revised to state that additional soil samples should also be collected and analyzed for total uranium to determine the total extent and volume of uranium-contaminated soil requiring remediation at 15 feet bgs.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.4 Page #: D.2-31 Line #: 9
Original Specific Comment #: 181
Comment: The text states that levels of cadmium and cyanide at least five times background were detected in the 3- to 5-foot-depth interval in the Plant 6 area. Table D.2-4 shows no samples that were collected and analyzed for cadmium and two samples collected and analyzed for cyanide but from the 5- to 10-foot-depth interval. The text should be revised to state that additional subsurface soil sampling should be conducted to determine the vertical and lateral extent of cadmium and cyanide contamination in the Plant 6 area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.4 Page #: D.2-32 Line #: 12
Original Specific Comment #: 182
Comment: The conclusion section of the report states that the elevated inorganic and organic levels were detected primarily in the upper 5 feet of soil in the Plant 6 area. Table D.2-4 shows that only two samples were collected and analyzed at the 5- to 10-foot-depth interval for inorganic and organic constituents. The available data indicate that the subsurface soil is not adequately characterized. The text should be revised to state that additional subsurface soil sampling should be conducted for inorganic and organic constituents to determine the vertical and lateral extent of contamination in the Plant 6 area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.5 Page #: D.2-33 Line #: 35
Original Specific Comment #: 183
Comment: The text states that a program consisting of one surface soil sample (PA-SS-13) and one soil boring (11095) was completed as part of the 1993 investigation to analyze for inorganic and organic constituents in the Plant 8 area. One surface soil sample and one boring do not appear to be sufficient to characterize this significant source of contamination. The text should be revised to state that further data should be collected, or to discuss the absence of the data.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.5 Page #: D.2-35 Line #: 15
Original Specific Comment #: 184
Comment: The text states that no samples containing inorganic constituents were collected below the 5- to 10-foot-depth interval. Table D.2-5 shows that beryllium and cadmium were found to be elevated between two and five times the background value at the 5- to 10-foot-depth interval. However, no data are available from below this depth to characterize the extent of this contamination. The text should be revised to state that additional subsurface soil samples should be collected below the 10-foot-depth interval to determine the vertical extent of beryllium and cadmium contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.6 Page #: D.2-38 Line #: 31
Original Specific Comment #: 185
Comment: The text states that levels of strontium-90 were detected in the Plant 9 area soils at levels greater than five times background at depths of 1.5 to 3.0 feet. Samples were not collected and analyzed for strontium-90 below the 3-foot-depth interval. Therefore, the text should state that additional subsurface soil samples should be collected below the 3-foot-depth interval to determine the vertical extent of strontium-90 contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.6 Page #: D.2-39 Line #: 1
Original Specific Comment #: 186
Comment: The text states that other radionuclide levels were typically found to be below the background value. Table D.2-6 shows that technetium-99 was detected in subsurface soil from the 1.5- to 3.0-foot-depth interval. The background value for technetium-99 is zero. Therefore, the text should be revised to indicate that technetium-99 was detected in subsurface soil. Also, the text should state that additional subsurface soil samples should be collected below the 3-foot-depth interval to determine the vertical extent of technetium-99 contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.7 Page #: D.2-42 Line #: 15
Original Specific Comment #: 187
Comment: The text discusses levels of radionuclides in the Sewage Treatment Plant area. It is not known whether the level of radionuclide contamination given is for soil samples collected before or after the removal action. The text should be revised to indicate whether these levels were determined before or after the removal action occurred in this area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.7 Page #: D.2-43 Line #: 15
Original Specific Comment #: 188
Comment: The text states that the only radionuclides in the subsurface soil in this area to display values greater than twice background were the three uranium isotopes, total uranium, and strontium-90. However, Table D.2-7 shows that thorium-234, protactinium-231, actinium-227, and radium-224 were detected at significant levels in the 0- to 0.5-foot-depth interval, but samples were not collected and analyzed for these parameters below the 0.5-foot-depth interval. The text should be revised to state that additional surface and subsurface soil samples should be collected and analyzed to determine the vertical extent of thorium-234, protactinium-231, actinium-227, and radium-224 contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.8 Page #: D.2-49 Line #: 11
Original Specific Comment #: 189
Comment: The text states that contamination is present generally from the ground surface to a depth of 15 feet. This statement underestimates the extent of contamination because total uranium was detected at a concentration 5 times background below the 15-foot-depth interval. In addition, Table D.2-8 shows that subsurface soil samples collected below the 15-foot-depth interval were not analyzed for uranium-238, uranium-234, radium-226, uranium-235/236, radium-228, strontium-90, or technetium-99. Each of these radionuclides were present at significant contaminant levels at the 15-foot-depth interval. The text should be revised to accurately describe the extent of contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.9 Page #: D.2-54 Line #: 11
Original Specific Comment #: 190
Comment: The text states that beryllium and zinc were found in samples collected from depth intervals of 10 to 15 feet and from 15 to 20 feet. Table D.2-9 shows that zinc was not detected at 10 to 15 feet, instead it was detected at a depth interval of 5 to 10 feet. The text should be revised to correct this discrepancy.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.10 Page #: D.2-59 Line #: 14
Original Specific Comment #: 191
Comment: The text states that most of the inorganic parameters were detected in samples from the 0- to 0.5-foot and from the 1.0- to 1.5-foot-depth intervals, implying that no parameters were detected in the 0.5- to 1.0-foot interval. However, according to Table D.2-10, no samples were collected from the 0.5- to 1.0-foot-depth interval. The

text should be revised to clearly state that no samples were collected from this interval.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.10 Page #: D.2-59 Line #: 16
Original Specific Comment #: 192
Comment: The text states that beryllium was detected at concentrations greater than two times background in samples collected form the 1.0- to 1.5-foot-depth interval at Boring 11109. Table D.2-10 shows that lead was also detected at concentrations greater than two times background in samples collected from the 1.0- to 1.5-foot-depth interval. According to tables in Appendix H-10, this detection was also from Boring 11109. The text should be revised to clearly state that lead was also detected at this interval and boring.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.10 Page #: D.2-60 Line #: 11
Original Specific Comment #: 193
Comment: The text states that several inorganic contaminants were detected in samples from the 1.5- to 3.0-foot and 5- to 10-foot-depth intervals, implying that no contaminants were detected in the 3- to 5-foot-depth interval. However, according to Table D.2-10, no samples were collected from the 3- to 5-foot-depth interval or below the 10-foot-depth interval. The text should be revised to clearly state that no samples were collected from these intervals. Also, additional soil samples should be collected and analyzed to determine the vertical extent of inorganic contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.11 Page #: D.2-63 Line #: 13
Original Specific Comment #: 194
Comment: The text states that radiological and chemical contamination was detected only in samples from the 0- to 0.5-foot-depth interval and that no validated contamination was reported in the other intervals of the surface soil. According to Table D.2-11, no samples were collected below the 0.5-foot-depth interval. The text should be revised to clearly state that no samples were collected below this interval. Also, the text should state that additional surface and subsurface soil samples should be collected and analyzed to determine the vertical and lateral extent of radiological and chemical contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.11 Page #: D.2-64 Line #: 3
Original Specific Comment #: 195
Comment: The text states that subsurface soil samples were collected from two borings at depth intervals of 2, 5, 10,

and 15 feet. Because this information does not appear in Table D.2-11, it should be added to the table.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.13 Page #: D.2-69 Line #: 26
Original Specific Comment #: 196
Comment: The text states that five surface soil samples were collected and analyzed for total uranium. According to Table D.2-13, two samples were collected from the 0- to 0.5-foot-depth interval and one sample was collected from the 1.0- to 1.5-foot-depth interval and analyzed for total uranium. This discrepancy should be reconciled, and the text revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.13 Page #: D.2-69 Line #: 32
Original Specific Comment #: 197
Comment: The text states that, except for total thorium, all other radionuclides were detected below background levels. However, according to Table D.2-13, no samples were collected below the 0.5-foot depth. As a result, the extent of contamination has not been fully defined. Additional samples should be collected and analyzed to define the nature and extent of contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.13 Page #: D.2-70 Line #: 25
Original Specific Comment #: 198
Comment: The text states that levels of cadmium and magnesium at least five times background occurred to depths of 5 feet, which is the maximum depth interval sampled at location 1572. The text should state why sampling was not conducted to a maximum depth of 20 feet to determine the vertical extent of contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.15 Page #: D.2-76 Line #: 35
Original Specific Comment #: 199
Comment: The text states that samples from nearly all locations were tested for total uranium and total thorium, while samples from no more than three locations were tested for other radionuclides. As a result, the existing data does not provide enough information to determine the extent of soil contamination. The text should be revised to state that additional surface and subsurface soil samples should be collected and analyzed for other radionuclides to determine the volume of soil requiring remediation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.15 Page #: D.2-77 Line #: 7
Original Specific Comment #: 200
Comment: The text states that one sample from each of the 1.5-to 3.0- and 3.0- to 5.0-foot-intervals were analyzed for inorganics and that no contaminant was detected at greater than twice background levels. However, one soil sample collected from two intervals is not sufficient to characterize the lateral extent of contamination. The text should be revised to state that additional surface and subsurface soil samples should be collected to determine the volume of soil requiring remediation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.19 Page #: D.2-90 Line #: 27
Original Specific Comment #: 201
Comment: The text states that the primary inorganic contaminant present at the trap range is lead. However, only surface soil samples were collected and analyzed for lead. The text should be revised to state that additional surface and subsurface soil samples should be collected to determine the volume of soil requiring remediation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.21 Page #: D.2-97 Line #: 8
Original Specific Comment #: 202
Comment: Section D.2.21 concludes that contaminants were detected only sporadically at depths greater than 5 feet bgs in the K-65/Clearwell line area. This conclusion is misleading because samples were collected from subsurface materials at only one location (1031). Furthermore, the K-65/Clearwell line is a significant source of contamination and requires extensive characterization. The subsurface contamination associated with the K-65/Clearwell line is not well characterized and requires further investigation to determine the extent of contamination and the potential for further contaminant migration. The text should be revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.24 Page #: D.2-106 Line #: 8
Original Specific Comment #: 203
Comment: The text states that no analyses were conducted for inorganic constituents, volatile or semivolatile organic compounds, PCBs, or pesticides. The text should explain why analyses were not conducted for these constituents.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.27 Page #: D.2-116 Line #: 26
Original Specific Comment #: 204
Comment: The text states that no analyses were conducted for inorganic constituents in the subsurface soil samples

collected from the southern area of the FEMP. The implied interpretation that no inorganic contamination exists in subsurface soil is misleading. The text should state that additional subsurface soil samples should be collected to determine the vertical extent of inorganic contamination in this area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.27 Page #: D.2-117 Line #: 17
Original Specific Comment #: 205
Comment: The text states that possible sources for the elevated levels of uranium in subsurface soils in the southern area of the FEMP include: vertical migration of contaminated perched groundwater, cross-contamination of the samples, laboratory error, or mislabeling of samples. The text should be revised to state that a reevaluation of the data or additional sampling should be conducted to determine if the observed uranium contamination is site related.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.30 Page #: D.2-126 Line #: 9
Original Specific Comment #: 206
Comment: The text refers to Figure D.2-34; however, Figure D.2-34 is missing from this section. As a result, comments referring to this figure could not be verified. Figure D.2-34 should therefore be added to this section.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.30 Page #: D.2-131 Line #: 7
Original Specific Comment #: 207
Comment: The text states that most of the radiological contamination detected in the area outside the boundary adjacent to the FEMP was present in the 0- to 2-inch samples from the 0- to 0.5-foot surface soil depth interval. However, no samples were collected below the 1.0-foot-depth interval. Furthermore, Appendix F-3 states that uranium contamination in surface soil from airborne deposition can migrate at least 30 feet below the ground surface. The text should be revised to state that samples should be collected below the 1.0-foot-depth interval to determine the vertical extent of radiological contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.31 Page #: D.2-134 Line #: 35
Original Specific Comment #: 208
Comment: The text states that the majority of surface soil samples collected from the area 2 to 5 miles outside the FEMP boundary in the 0- to 0.5-depth interval did not exhibit elevated uranium contamination. However, Table D.2-31 shows that only one sample was collected from the 0.5- to 1.0-foot-depth interval, which does not verify a lack of contamination. The text should be revised to state that

additional surface and subsurface soil samples should be collected to determine the extent of the vertical radiological contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: E.1.1.2 Page #: E.3.1-7 Line #: 14 to 16
Original Specific Comment #: 209
Comment: Section E.1.1.2 discusses the occurrence of thorium-232 in the perched groundwater and concludes that elevated concentrations of thorium-232 are isolated and localized. This statement is misleading. A number of samples from wells in the production area (near the Pilot Plant and Plants 2/3) were not analyzed for thorium-232. The text should state that additional samples should be collected to more fully characterize the extent of contamination in the area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: E.1.1.3 Page #: E.1-12 Line #: 1
Original Specific Comment #: 210
Comment: Section E.1.1.3 discusses the occurrence of technetium-99 in the perched groundwater. Elevated concentrations of technetium-99 in the groundwater were found near Plant 2/3. Soil samples collected from this area show high concentrations of technetium-99 not only around Plant 2/3, but also in the area of the Pilot Plant. However, no wells in the vicinity of the Pilot Plant were analyzed for technetium-99. Therefore, elevated concentrations of technetium-99 in the perched groundwater may also extend further south under the Pilot Plant. The text should state that additional samples should be collected to more fully characterize the extent of contamination in the area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: E.1.2.24 Page #: E.1-38 Line #: 22 to 27
Original Specific Comment #: 211
Comment: Section E.1.2.24 discusses the occurrence of thallium in the perched groundwater. The text incorrectly states that thallium was only detected in three wells; however, thallium was actually detected in six wells. The three additional wells (wells No. 1770, 1771, and 1772) are all located in the waste pit area. The text should be revised to include these three wells in the analytical discussion.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.1.2.1 Page #: F.1-2 Line #: 10 to 14
Original Specific Comment #: 212
Comment: Section F.1.2.1 states that a vegetative cover of 85 percent is assumed for the current land-use scenario, and 50 percent for the agricultural scenario. However, no evidence is provided to support these assumptions. The text should

be revised to include supporting evidence for these assumptions.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.1.2.2 Page #: F.1-2 Line #: 22
Original Specific Comment #: 213
Comment: Section F.1.2.2 states that meteorological data from Dayton, Ohio, was used in this modeling effort because it is the closest source of data. However, Cincinnati International Airport is actually closer than the Dayton airport. The modeling results may need to be revised based on the use of Cincinnati information.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.1.2.5.6 Page #: F.1-7 Line #: NA
Original Specific Comment #: 214
Comment: Section F.1.2.5.6 states that the threshold wind speed of 5.4 meters per second (m/s) was used in the modeling calculations. However, Attachment F.1-I indicates that a threshold wind speed of 0.2 m/s was used. This is apparently based on calculations presented in Attachment F.1-III, which calibrates the model to measured dust concentrations. A consistent value for the threshold wind speed should be stated, and supporting calculations for this value provided.

In addition, the model calibration presented in Attachment F.1-III is flawed. The calibration first uses the maximum detected fenceline concentration to back-calculate an emission rate that assumed a limited erosion potential. Then the emission rate was used to calculate a threshold friction velocity and modal soil diameter, which assumed an unlimited erosion potential. These back-calculations mix two different models, the limited erosion potential and the unlimited erosion potential models. The source areas should be evaluated to determine which model is applicable, and then the Attachment F.1-III calibration should be recalculated using the correct erosion potential model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.1.3.1 Page #: F.1-7 Line #: 37
Original Specific Comment #: 215
Comment: The text states that inorganic and organic screening levels were derived using methods described by U.S. EPA (1989), and modified using commercial and industrial equations to account for an inhalation pathway. A more recent version of the same U.S. EPA document (U.S. EPA 1991) includes equations to account for an inhalation pathway. The text should be revised to use the more recent U.S. EPA document.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.2.5.1 Page #: F.2-35 Line #: 22 to 24
Original Specific Comment #: 216
Comment: The text states that the average of the surface soil sampling data, instead of the upper confidence limit (UCL), was used for the source characterization in the surface water model because it provides a more reasonable, but less conservative, source concentration when comparing the surface water model output to sampling data for calibration. The text should be revised to state why the UCL gives a less reasonable surface water model source concentration, especially when the UCL was used for the source characterization in the groundwater fate and transport model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.2.5.3 Page #: F.2-37 Line #: 26 to 30
Original Specific Comment #: 217
Comment: The text states that modeled sediment concentrations that are higher than measured concentrations in Paddys Run may be due to the difficulty of collecting samples that contain only sediment and not bed materials. The bed materials in Paddys Run would be less contaminated than sediment and would thereby decrease the overall measured concentration of sediment. The text should be revised to state if these difficulties occurred in other sediment sampling locations, and if not, why the difficulties were only encountered in Paddys Run. Additionally, other scenarios explaining the observed discrepancies should be evaluated, particularly the likelihood that contaminated sediments are washed downstream during high flow events.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.2.5.3 Page #: NA Line #: NA
Original Specific Comment #: 218
Comment: The text in Section F.2.5.3 discusses the significance of modeling results presented in Table F.2.5-2. According to the table, great discrepancies exist between the modeled and measured sediment concentrations in the Pilot Plant Drainage Ditch and the Waste Pit Area; however, these discrepancies are not discussed in the text in Section F.2.5.3. The data should be reevaluated to address these discrepancies between modeled and measured concentrations. Remaining discrepancies and their implications should be thoroughly discussed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.2.5.4 Page #: F.2-39 Line #: 9 to 12
Original Specific Comment #: 219
Comment: The text states that, of 5,100 kilograms (kg) of uranium within the plume of significant concentration in the GMA, about 1,900 kg is attributed solely to surface water

loading. The value of 1,900 kg is about 12 percent of the minimum range for the modeled total uranium and about 14 percent of the minimum range for the estimated total uranium released to Paddys Run and the SSOD, respectively. Because this value affects the groundwater fate and transport model, the text should be revised to state how 1,900 kg of uranium in the GMA due to surface water loading was derived.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.1 Page #: F.3-2 Line #: 8 and 9
Original Specific Comment #: 220
Comment: The text references Figure F.3.1-2 for the overall surface source areas considered in the groundwater modeling; however, the text does not state how these areas were defined. The text should be revised to state how these areas were defined, and justification should be provided for delineating the various boundaries as shown. Also, the text should provide evidence that the area west of Paddys Run does not have surface soil contamination that can serve as a source of groundwater or surface water contamination. These comments should also be addressed for Figure F.3.4-1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.2.1 Page #: F.3-4 Line #: 13 to 15
Original Specific Comment #: 221
Comment: The text states that contaminants that flow overland can reach erosional features in the glacial overburden, such as Paddys Run or the SSOD, and can then flow into the GMA. This type of contaminant flow is included in the groundwater modeling. It is not apparent in the text if overland contaminant flow to the south where the glacial overburden disappears (see OU2 RI) is included in the groundwater modeling. Overland contaminant flow and loading in this area should be included because it can serve as an additional source of groundwater contamination. The text should be revised to address this issue.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.2.3 Page #: F.3-6 Line #: 1 and 2
Original Specific Comment #: 222
Comment: The text references Figure F.3.2-3, which shows generalized cross-sections for the infiltration zones in the groundwater model and the vertical hydraulic conductivity (K_v) used for the respective layers in each zone. For the brown clay and brown clay and sand, K_v is derived from horizontal hydraulic conductivity (K_h) slug test values, while the K_v for the brown and gray sand is derived from K_h slug test values divided by 10. The text should state why the K_v values for the brown clay and brown clay and sand are not derived from K_h values divided by 10.

Also, it is not apparent why K_h and K_v are determined for these layers because they are not included in the groundwater fate and transport model. According to Section F.3.2.3, contaminant loading starts below the brown clay; therefore, it is not apparent why K_h and K_v values are determined for layers above the brown clay. The text should be revised to state whether these layers are included in the fate and transport model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.2.3 Page #: F.3-6 Line #: 11 and 12
Original Specific Comment #: 223
Comment: The text states that perched groundwater occurs exclusively within the sand lens by the waste pits located in Zone I. However, according to OU2 investigations, perched water also occurs beneath OU2 by the South Field, the Inactive Flyash Pile, and the Active Flyash Pile. These areas of OU2 should be included in the perched groundwater modeling because the glacial overburden thins and pinches out in this area, and therefore, contaminants emanating from perched groundwater have direct access to the GMA.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.3.1 Page #: F.3-8 Line #: 35 to 37
Original Specific Comment #: 224
Comment: The text states that initial groundwater conditions in the GMA were delineated as the highest concentration for a particular block from 40-year (present day) model runs with loading from OUs 1, 2, and 4 and contoured monitoring data for Types 2, 3, and 4 monitoring wells. It is assumed that the 40-year model runs are SWIFT model runs and should have been calibrated to present-day monitoring well data. The output, therefore, for these 40-year model runs should be similar to present-day monitoring well data to ensure proper calibration. The text should be revised to state why 40-year calibrated model data or present-day measured data were used for present-day conditions in the GMA. The text should also explain why one set of data was preferred over the other.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.2 Page #: F.3-21 Line #: 24 to 26
Original Specific Comment #: 225
Comment: The text states that one assumption in the groundwater model assumes uniform concentration within each source area shown in Figure F.3.4-1. Because Appendix F-3 stresses the differences of the loading effect between aqueous spills and airborne contaminant deposition, the procedure of using uniform source terms in each source area is not advised. This approach will likely "smooth out" hot spots. The model should be revised to use source terms based on observed soil concentrations, or further information justifying the

uniform source term approach should be provided. Also, if uniform concentrations are used, maps should be provided showing (1) the soil concentrations that were contoured to define the source areas and (2) the uniform concentration assigned to each source area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.2 Page #: F.3-21 Line #: 32 and 33
Original Specific Comment #: 226
Comment: The text states that contaminants in the OU5 area are generally confined in the surface soil (less than 1.5 feet deep) except in localized areas in the production area. The text references Table F.3.4-2 to support this statement. According to Table F.3.4-2, other OUs are included as sources for the OU5 groundwater modeling. Investigations in these other OUs identified contamination at depths greater than 1.5 feet. Also, according to Appendix F-3, uranium particulates move down as deep as 15 feet and are dissolving and adding contamination to the aqueous phase. The text should be revised to state why only contamination less than 1.5 feet deep in other OUs was used in the source characterization for the groundwater fate and transport modeling.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.3 Page #: F.3-23 Line #: 6 and 7
Original Specific Comment #: 227
Comment: The text states that source leaching coefficients K_1 or K_1^{calc} were determined either by using laboratory tests or by calculations of field data. The text should be revised to state how well the K_1 values determined from the two different methods correlated. The text should also provide the rationale for using K_1 versus K_1^{calc} and vice versa.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.3 Page #: F.3-23 Line #: 13 and 14
Original Specific Comment #: 228
Comment: The text references Figure F.3.2-2 for the zones of uranium K_1/K_d values. The figure shows that the production area has a K_1/K_d value much lower than the rest of the site. The text should state the ratio of K_1 to K_d (K_1/K_d) and how it is used in the model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.3 Page #: F.3-26 Line #: 18 and 19
Original Specific Comment #: 229
Comment: The text discusses initial leachate concentrations for contaminant sources defined in OU5. The text should provide a map showing the initial leachate concentrations defined for each OU5 contaminant source area.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.4 Page #: F.3-27 Line #: 18 to 20
Original Specific Comment #: 230
Comment: The text states that loading occurs on reaches CD and DE of Paddys Run and the lower reach of the SSOD, because in these regions the streambed is directly on the unsaturated GMA. According to Figures 5-17 and 5-25, loading also occurs on reach EF of Paddys Run. The text should be revised to state why the loading from reach EF of Paddys Run was not included in the model, or the model should be revised to include this loading.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.4.4 Page #: F.3-28 Line #: 1 and 2
Original Specific Comment #: 231
Comment: The text states that Table F.3.4-7 summarizes the maximum surface water contaminant loading rates to the GMA used in the ECTran modeling to evaluate exposure risk at receptor locations. The contaminants listed in Table F.3.4-7 do not include neptunium-237, radium-226, strontium-90, or technetium-99. However, these contaminants are shown in Table F.3.4-6, which also summarizes contaminant loading rates. The text should be revised to include these contaminants in the ECTran risk exposure evaluation or to provide justification for eliminating these isotopes from the source term.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.5.1 Page #: F.3-31 Line #: 20
Original Specific Comment #: 232
Comment: The text states that a porosity value of 0.2 was used for the clay units in the HELP model. Typical values for clay porosity range from about 0.3 to 0.6. Furthermore, geotechnical data from the OU2 RI presented much higher clay porosity values. The text should be revised to state why a porosity value of 0.2 was used to determine infiltration through the clay.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.5.4.1 Page #: F.3-38 Line #: NA
Original Specific Comment #: 233
Comment: The text discusses the SWIFT model and loading rates. It is not apparent from the text whether loading from surface water sources is included in the SWIFT model. The text should indicate whether surface water loading was used, and if not, the text should be revised to include the results of surface water loading in the groundwater fate and transport model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.5.4.2 Page #: F.3-40 Line #: 16 to 19
Original Specific Comment #: 234
Comment: The text in the first and second bulleted items states that the ECTran model was used in investigating (1) the combined vertical contaminant loading from leachate to the GMA due to surface soil and perched water, and (2) contaminated surface water as a source of vertical loading to the GMA. However, Section F.3.3.3.5 and Figures F.3.3-1 and F.3.3-2 do not describe ECTran as being used for these purposes. The text should be revised to address this discrepancy.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.7.1 Page #: F.3-47 Line #: 9 to 11
Original Specific Comment #: 235
Comment: The text references Figure F.3.7-1 for uranium concentrations at the end of the baseline condition (that is, 70 years) during which the South Groundwater Contamination Plume recovery well system and storm water runoff controls are in operation. Information pertaining to the effectiveness of the recovery well system and storm water runoff controls should be provided or referenced because, based on initial groundwater concentrations presented in Figures F.3.4-6 through F.3.4-8, the recovery well system and the runoff controls would diminish the amount of contamination in the GMA.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.7.1 Page #: F.3-48 Line #: 27 and 28
Original Specific Comment #: 236
Comment: The text references Table F.3.7-3 for the maximum contaminant concentrations and time of maximum concentration in the GMA on site and at the fenceline. According to the table, some contaminants, such as total uranium, have maximum concentrations at the fenceline sooner than maximum on-site concentrations. It is not apparent how maximum fenceline concentrations can occur prior to maximum on-site concentrations. The text should be revised to address this issue.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.3.2 Page #: F.3.I.3-2 Line #: 9
Original Specific Comment #: 237
Comment: The text provides constants used to calculate the solubility of uranium dioxide (UO_2) and uranium tetrafluoride (UF_4) in distilled water. The partial pressure of oxygen P_{O_2} is given as 10×10^{-39} atmospheres (corresponding to an Eh of 0.24 volts). Water in equilibrium with atmospheric oxygen generally has an Eh of approximately 0.75 volts and partial pressures much greater

than 10×10^{-39} atmospheres. The text should be revised to indicate a more accurate oxygen partial pressure. More important, the text should indicate the P_{O_2} used in the EQ3/6 thermodynamic database for the solubility calculations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.3.2 Page #: F.3.I.3-3 Line #: 5 to 7
Original Specific Comment #: 238
Comment: The text states that little, if any, UF_4 released from operations and accidents remains in soil at the FEMP today. This implies that the less soluble uranium oxides are the predominant uranium contaminant left in production area soils. However, the text tries to show that distinctly different K_1 and K_d values apply for UF_4 spills and airborne oxide or depleted sources. In fact, large areas in the production area have been mapped (see Figure F.3.4-1) where the lower K_1 and K_d values associated with UF4 spills are supposedly dominating the fate and transport process. This contradiction should be addressed. Also, wherever possible, only observed K_1 and K_d values should be used to define the geochemical parameters describing source terms.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.3.3 Page #: F.3.I.3-6 Line #: 3 to 7
Original Specific Comment #: 239
Comment: The text states that adsorption/desorption reactions become irreversible with time, and that only a fraction of what is initially chemisorbed to a solid can be removed or extracted by desorption. Although chemisorption may become irreversible with time, its effect is not very significant if, for instance, it takes many decades for complete chemisorption to occur. This highlights the need to clearly understand and convey the time over which the various geochemical processes are occurring. The text should be revised to provide all available information regarding the length of time required to render these reactions irreversible.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.3.3 Page #: F.3.I.3-6 Line #: NA
Original Specific Comment #: 240
Comment: The text introduces the processes involved in physical and chemical adsorption and desorption. However, it is not clear from the data presented, how much of the total mobile contaminants, in terms of total volume or percentages, are actually involved in adsorption/desorption reactions. A discussion of this issue should be presented.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.3.3 Page #: F.3.I.3-7 Line #: 34 to 36
Original Specific Comment #: 241
Comment: The text states that carbonate minerals in the fractured and weathered glacial overburden should be more efficient in adsorbing uranyl carbonate species because the partial pressure of carbon dioxide (P_{CO_2}) will be kept lower by communication with the air reservoir. While this may be true for carbonate minerals located immediately adjacent to fractures, the bulk of the upper intervals of the overburden would be expected to have high P_{CO_2} because of the organic matter in the soils. This seems to imply that the bulk of the upper overburden soils, with the possible exception of those immediately adjacent to large fractures, would be inefficient at adsorbing uranyl carbonate species. This apparent contradiction and its implications for the fate and transport models should be addressed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.3.4 Page #: F.3.I.3-8 Line #: NA
Original Specific Comment #: 242
Comment: Section F.3.I.3.4 discusses the factors controlling uranium solubility and concentrations in perched groundwater. The discussion is based primarily on geochemical factors. However, the effects of hydrogeological controls such as groundwater flow rates, flow volumes, and residence times should also be discussed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.3.5 Page #: F.3.I.3-9 Line #: 17 to 18
Original Specific Comment #: 243
Comment: The text states that when uranium is released to pore waters and groundwater, the uranium is homogenized throughout the area as uranyl carbonate species. However, the information presented indicates that secondary uranium complexes such as uranyl phosphate are also formed. It would be useful in evaluating the fate and transport models to know how much of the mobile uranium (stated in terms of a percentage) forms uranyl carbonate complexes and how much is used in forming the secondary complexes. This information should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.4.1 Page #: F.3.I.4-1 Line #: 31
Original Specific Comment #: 244
Comment: The text states that aqueous forms of uranium releases outside of the production area are absent. However, aqueous uranium sources occur at OU1, OU2, and OU4 as well as at the K-65 slurry trench. The entire GMA is covered under the OU5 RI and as such, aqueous sources from OU1, OU2, and OU4 should be evaluated in the OU5 fate and transport models.

The K-65 slurry trench is not covered by previous OU RIs and is known to have released aqueous uranium contaminants. The text should indicate whether these sources have been evaluated in the OU5 fate and transport models.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.4.3 Page #: F.3.I.4-4 Line #: 1 to 10
Original Specific Comment #: 245
Comment: The text provides data from lysimeter studies; however, very little information is provided. The text should present or reference information on lysimeter locations, depths, thicknesses of overlying glacial overburden, and overlying contamination sources.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.4.5 Page #: F.3.I.4-5 Line #: 29 to 33
Original Specific Comment #: 246
Comment: The text states that perched groundwater data represents complete equilibrium of the water and soil system, and lysimeter data have solute concentrations somewhere between the disequilibrium conditions at the surface and the equilibrium conditions in perched groundwater. It is not clear why lysimeter concentrations do not reflect equilibrium conditions similar to perched groundwater because this water likely emanates from perched groundwater in the overburden and represents longer residence time in the system. Also, it is unlikely that all perched groundwater represent equilibrium given the multitude of geochemical and hydrogeological factors affecting these reactions. Additional information supporting these conclusions should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.4.5 Page #: F.3.I.4-7 Line #: 15
Original Specific Comment #: 247
Comment: The text states that remediation activities will result in uranium concentrations of 150 mg/kg in the glacial overburden. Section F.3.I.4.4 states that this soil concentration will result in an equilibrium groundwater concentration of 0.064 to 12.5 mg/L uranium. Both of these predicted groundwater values are above the proposed maximum contaminant level (MCL) of 20 μg/L. The text should explain the significance of the predicted equilibrium groundwater values and explain how the 150 mg/kg soil cleanup level was determined.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.5.1 Page #: F.E.I.5-2 Line #: 10 to 20
Original Specific Comment #: 248
Comment: The text gives an example calculation for determining initial aqueous loading of uranium. The equation uses initial soil (source) concentration, the extraction

coefficient (K_e) for uranium, and K_1. It is not clear why the initial source concentration is multiplied by K_e because K_1 appears to already account for the amount of extractable uranium in the source material. The calculated result appears to underestimate the resulting uranium concentration by a factor of two. A thorough explanation should be provided justifying the use of K_e values in conjunction with K_1 values.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.I.5.2 Page #: F.3.I.5-5 Line #: 1 to 7
Original Specific Comment #: 249
Comment: The text states that in areas around Plants 2/3, 6, and 9, the large source of soluble uranium has not been depleted, the plume concentration is increasing, and adsorption is occurring. Analytical soil data has been provided that demonstrates the presence of soluble uranium at the surface in these areas. Furthermore, the boundaries of these areas with low K_1 values appear to have been arbitrarily "boxed in" without any data to support the actual delineation of the boundaries. Analytical data demonstrating both the actual presence of soluble uranium and the boundaries of these spill areas should be provided to justify the mapped locations shown in Figure F.3.4-1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: F.3.II.2.1.1 Page #: F.3.II-5 Line #: 29 to 32
Original Specific Comment #: 250
Comment: The text states that K_e will be assumed to be 100 percent for all contaminants except uranium. The text should indicate why K_e values for all contaminants except uranium is 100 percent. Also, the proposed K_e value for uranium should be presented.

References:

Carson, Bonnie L.; Harry V. Ellis III; and Joy L. McCann. 1986. *Toxicology and Biological Monitoring of Metals in Humans.* Chelsea, Michigan. Lewis Publishers.

Stokinger, Herbert G. 1981. "The Metals" in George D. Clayton and Florence E. Clayton, Editors. *Patty's Industrial Hygiene and Toxicology.* Volume 2A. Third Revised Edition. New York. John Wiley and Sons.

U.S. Environmental Protection Agency (U.S. EPA). 1985. Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites. Office of Health and Environmental Assessment. EPA/600/8-85/002. February.

U.S. EPA. 1989. Risk Assessment Guidance for Superfund, Part B. Office of Emergency Remedial Response. EPA/540/1-89/002.

U.S. EPA. 1991. Risk Assessment Guidance for Superfund, Part B. Office of Emergency Remedial Response. December.

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric

Section #: F.3.7.1 Page #: F.3-47 Line #: NA

Original General Comment #: I.

Comment: This section lists time estimates required for uranium to migrate through the glacial till unit and enter the GMA for various locations within the FEMP. These breakthrough times appear to be largely overestimated. The breakthrough times are listed as 350 and 950 years for the Plant 9 and Plant 2/3 areas respectively. Perched groundwater in the glacial till beneath the Plant 6 area has a total uranium concentration of over 100,000 μ/L within 6 feet of the unsaturated portion of the GMA. In addition, the perched groundwater in the glacial till beneath the plant 2/3 area has a total uranium concentration of over 50,000 μ/L within 15 feet of the unsaturated portion of the GMA. It appears unlikely that it will require the large amount of time estimated in this section to impact the GMA. DOE should review the assumptions made in formulating the estimates and compare the modeled results against the field data.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: September 6, 1994

SUBJECT: Review of the Draft Baseline Risk Assessment for Operable Unit 5, Fernald Environmental Management Project (FEMP), Fernald, OH, June 1994

FROM: Pat Van Leeuwen, Toxicologist
Technical Support Unit

TO: Jim Saric
Project Manager

I have reviewed Appendix A, the Operable Unit 5 Baseline Risk Assessment, and associated text and Appendices for the Remedial Investigation Report for Operable Unit 5 of the Fernald Environmental Management Project (FEMP). The document is extermely large, and it is very difficult to locate supporting sections for review due to the lack of specific references. For example, the references to "section 4.0", or to "modeling in section 5" or "maps and figures in section 4" do not enable the reader (or me) to locate the discussion or data of interest. I suggest that such references be incorporated in the next draft, and the entire document be rereviewed. I am not certain I was able to review everything in the proper context, and I suspect other reviewers had the same problem. I have also found many cases where text from other OU reports was incorporated into this report without the suggested revisions. I suggest that all prior comments on the OU #4 and OU #1 risk assessments be reviewed for consistency.

The following comments outline other areas in need of revision in this document.

If you have any questions on these comments or any risk assessment issues, please contact me at 886-4904.

1) P. A.1-18, section A.1.5.1
The discussion should point out that changes in the source-term configurations and exposure concentrations for the future scenarios rely heavily on assumptions regarding radionuclide and chemical mobility and behavior, which is largely hypothetical.

2) P. A.2-4, line 30
ICP/GFAA refers to the Inductively.....Atomic Absorption instrument. Please change "analysis" to "absorption".

3) P. A.2-6, lines 3-4

I am not certain that I understand this statement. If this is a rule adopted for this Risk Assessment, state that this is the case. Twenty samples is not a magic number needed to calculate the 95th percentile; the number of data points needed depends on the range of values in the data set.

4) Tables A.2-1 through A.2-12

What does the "X" in the "Retained as COC" column mean? Some tables indicate that the correct response is "yes" or "no". Why are radionuclides not chosen as COCs (or perhaps the "X" means not chosen)? Why are the radionuclides/metals/VOCs included in the tables, but not discussed in the text? Some clarification and added discussion is clearly needed in this section.

5) P. A.2-9, lines 22-24

The lead example is not a good one because there is an OSWER Directive for lead in soil which sets the screening level at 400 ppm. Therefore, lead is never chosen as a COC based on a comparison with background. I suggest revising the example based on a different contaminant, perhaps beryllium or manganese.

6) P. A.2-10, section A.2.4

Regarding the determination of COCs:

I have repeatedly remarked that there is no magic number (5% is an example in RAGS) for chosing or eliminating a COC using a "frequency of detection" criterion. It depends on the number of samples in the data set and the location of the hits (example is 25 detects located in one area for 500 samples taken, which indicates a hot spot). The discussion should indicate that these additional criteria were also considered before a contaminant was eliminated.

Also, carcinogens should not be eliminated using a "frequency of detection" rule, but should be discussed in the risk assessment. An example is 1,1,2-TCA.

What is meant by "minimally" on p. A.2-15, line 25?

If a contaminant is a COC in one medium, it should be retained as a COC in all related media.

7) P. A.2-11, Table

Shouldn't the header for "subsurface soil" be >1.5 feet deep?

8) Table A.3-2A

I did not see the residents along the western boundary (the most likely current trespassers in Paddys Run) included under the Off-Property Resident Farmer/Child receptor evaluation. Why are they excluded?

9) Pp A.3-28/A.3-30 Current Land Use Scenarios

The inclusion of the Off-Property Farmer and Child receptors for both the Current Land Use With Access Controls and Without Access Controls scenarios, is based on the use of bottled water; this is rather unconventional. The provision of bottled water is an intervention step, and the unacceptable risk from the off-site use of groundwater is the justification for further action, be it supplying bottled water, installing municipal water systems or restricting building in contaminated areas. Perhaps some futher discussion could be included to indicate that the risk from ingestion of groundwater is being evaluated separately under an additional scenario. A simplier approach would be to look at this receptor population risk with and without the additional of the groundwater pathway. This issue seems to be independent of the facility Control issue.

10) Tables A.3-2A/2B

Scenarios in this section make reference to the use of the 95% UCL contaminant concentrations in groundwater. While, I found the list of wells evaluated for each receptor population, I did not see the lists of contaminants, with their ranges of concentrations (reference problem again). How homogenous were the wells used in each calculation of the concentration term? Were any non-detects included in the calculations? Some further discussion of the methodology (i.e., how wells were chosen for clustering), or more specific references to data used for the groundwater scenarios, is needed.

11) Tables A.3-3.....

What happened to carbon tetrachloride, dieldrin, vinyl chloride, etc.? These contaminants were indicated as COCs in section A.2 (Tables A.2-11/12). Please reevaluate these lists for completeness.

12) Section A.3

Regrouping the ten current on-site areas into 7 land-use areas for the future land use scenarios does not seem justified and may give an erroneous evaluation. For example, the very small, highly contaminated, Area 6 is averaged into Area 7, which then yields low soil levels for some contaminants (see Ur 238 + 2d, Pb) in the Northeast Area. This does not make much sense; Area 6 is a hot spot for some contaminants, and it should not be treated the same as Area 7. The criterion for any regrouping of areas should be homogeneity - of both contaminants and concentrations.

13) Table A.3-7

In the Off-Property, Future Land Use scenarios, the list of radionuclide contaminants has been reduced fron the contaminants evaluated in the Off-Property, Current Land Use scenarios. The earlier tables in this section, which describe the scenarios and the data used for each, indicate that the data bases

used for the two assessments were identical. Please explain the elimination of these radionuclides.

14) Table A.3-9

What is the source of the pesticides and additional organics included as air contaminants in this and other scenarios in this section? These additional contaminants are not listed as surface/subsurface soil COCs. I thought that the air contaminants were modeled from soil. Some further explanation is needed.

15) P. A.3-19, para. 1

The text suggests that the Great Miami River (GMR) sediments have been minimally impacted "due to dilution upon entry into the river". An earlier discussion of Paddys Run suggested that the contaminants remain bound to the sediments and do not move further down the creek (no dilution). These two explainations do not seem to be entirely compatible. Why isn't the GMR sediment impacted at the outfall to the GMR?

16) P. A.3-19/20

I did not see the "uranium plume", refered to earlier, in either the list of perched water plumes or Great Miami Aquifer groundwater plumes. Where is the "uranium plume" located?

17) P. 3-36, lines 5-6

Who are the receptor populations for exposure to subsurface soil? I only see a list for surface soil.

18) P. A.3-38, lines 9-18

The text does now indicate how the wells were combined to give exposure concentrations for each scenario or where the information on each well is located in the document. See my earlier comment on this issue.

19) P. A.3-39, line 16

Where is the discussion of the methodology and assumptions used in the modeling of groudwater for the future off-site residential scenarios? Was degradation comsidered? Were concentration levels averaged over a period of years? Some explanation is needed here, and in the incertainty section.

20) P. A.3-64, lines 18-26

Please include changes made in earlier OU reports to clarify this description of the farmer exposure. A portion of the ingestion exposure (350 days/yr - 100 days/yr = 250 days/year at 100 mg/day) has not been included in this explanation. Review the comments provided for the OU#4 RI, OU#1 RI, etc.

21) Table A.4-5

Why is more than one significant digit indicated for the Relative Potency Factors? This does not follow the 1993 PAH Guidance and has been corrected in prior OU reports. Please review the comments for the OU #4 and OU #1 risk assessments.

22) P. A.5-14, lines 16-19

The reference to the Region III screening concentration for di-n-octyl phthalate in tap water is not really very applicable here. The value of 730 ug/L is based on oral ingestion only; this discussion concerns dermal exposure. In addition, the screening value for this contaminant is 73 ug/L (HI = 0.1), so the detected concentration of 89 ug/L is above the EPA level for evaluation. The text seems to suggest that 89ug/L is a safe level. This would probably be true if only a single chemical, single pathway was being evaluated. This risk assessment addresses the risk from multiple contaminant and multiple pathway exposures.

23) P. A.5-17, lines 17-26

The text indicates that Future Land Use scenarios show lower HIs associated with exposure to groundwater because the future modeling predicts lower concentrations in some areas. I was unable to locate the data used in the modeling, and the assumptions are not clearly described (cross-reference problem again). The text should reference these data and models, and more fully discuss the assumptions used in the modeling.

24) P. A.5-22, lines 28-31

Please update this paragraph, as the information is no longer correct. The July 14, 1994 OSWER Directive addressing lead in soil at Superfund sites sets the screening level at 400 ppm for residential exposure and a clean-up level based on the use of the IEUBK Model for Lead, version 0.99d.

25) P. A.5-21, lines 21-28

To aid in the interpretation of the RME and CT exposure risks, the text should explain that the difference in the RME and CT exposures reflects the difference in the number of people expected to exceed the calculated risk, by definition. At the calculated CT risk level, 50% of the receptors would exceed this risk, while at the RME risk level, only 5% of the receptors would be expected to have a greater risk. Therefore, the CT value gives the average risk for a population, and half the receptors would be expected to have a greater risk. The RME value would simply emcompass a greater portion of the population.

26) Tables A.5-2 thru A.5-12/ A.5-20

I do not know of any exposure which gives a "0E+00" risk. Perhaps this means that the pathway was not evaluated. If this is the case, "Not Applicable" or some other term should be used.

27) P. A.6-5, lines 32-35

The entire paragraph is somewhat academic, as speciation studies are not usually done on any metal contaminants. Therefore, some metal exposure risks may be overestimated, while others may be underestimated. The IRIS toxicity values are usually to the most prominent species.

I was not aware that this assessment considered that the total chromium concentration was hexavalent chrome. The EPA position, given the lack of more definitive data, is to assume that 15% of the total chromium is due to hexavalent chrome. The text should also explain that there is no accurate methodology for distinguishing trivalent chrome from hexavalent chrome, so the estimate of 1.5-2.0% is only an estimate.

28) P. A.6-5, line 47

Due you mean surface soil here? The text indicates that the primary risk to off-site receptors is from exposure to groundwater.

29) P. A.6-8, lines 21-25

While a future on-site farmer may not farm on the production area (he might live there or use the area for other purposes related to farming), I am not convinced that the land uses do not represent a plausible starting point. It is this risk evaluation which will determine if this or any other land uses are plausible. The discussion here needs to clarify the point of the risk evaluation.

30) P. A.6-11, lines 21-31

I do not understand the two bullets addressing the PAH evaluation. The carcinogenic PAHs are evaluated using the Relative Potency Factors for each PAH, not benzo(a)pyrene. The RPF document has undergone numerous reviews, and the values are acceptable for the compounds listed in the 1993 guidance. The text comments lead me tp think that the wrong guidance was used in evaluating the PAH risks. Please review your methodology and correct the cited bullets.

31) P. A.6-12, section A.6.3

This paragraph seems to address the uncertainty in the risk management decision, not the uncertainty in the risk assessment. It should be pointed out that the risk assessment is conducted to identify the extent of risk to the population posed by the levels of contamination found at the site. Identification of the risks incurred by 50% of the receptor population (the CT evaluation) and by 95% of the receptor population (the RME evaluation) are required components of the risk assessment.

32) P. A.7-6, lines 8-10

This is a very biased statement that seems to indicate a total lack of understanding of toxicology and the risk assessment process. The fact that a finite risk can be calculated for background levels of contaminants supports the first principle of toxicology: there is nothing that is not a poison; the dose determines (the extent of) the risk. The level of risk posed by exposure to background levels of contaminants is an accepted risk, just like the risk of death from driving a car, while the risk from a Superfund site is a risk which is imposed without benefit. As such, it is not acceptable. Both risks can be calculated. The background level of contaminants may present the maximumally acceptable risk to an individual or population. It is the addition of the site risk to the always present background risk which elevates the contaminant risk to an unacceptable level and give concern for adverse health effects to the exposed population. I suggest the last two sentences of this paragraph be rewritten to reflect an understanding of the basics of toxicology and the process for evaluating adverse effects of poisons.

33) Attachment A v, Section A.V.68 Lead

The lead profile has not been updated as recommended in comments on prior OU reports. The 1994 OSWER Directive sets a screening level of 400 ppm for residential exposures. I do not see any reference to the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children, version 0.99d in this profile. This is the Superfund tool for evaluating lead exposures.

Comments on the
Operable Unit 5 Draft Remedial Investigation Report (June 1994)

U.S. EPA Region 5 - RCRA Technical Enforcement Section

September 1994

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 4.1.6 Page #: 4-10 Line #: 24
Original Comment #: 1
Comment: This section discusses the analyses of radionuclides using various techniques. As a matter of comparison, the minimum detectable concentrations for the various techniques used to measure total and isotopic uranium should be provided.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 4.1.6 Page #: 4-13 Line #: 18
Original Comment #: 2
Comment: While it is possible to calculate the total uranium from isotopic data, it is not possible to calculate isotopic uranium concentrations from total uranium data unless conversion factors are used that assume a set uranium isotope ratio; The other point that should be made clear is that while total uranium analysis is useful in the toxicity assessment for noncarcinogenic effects, it should not be used as substitute for isotopic uranium analysis when assessing carcinogenic effects.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 4.2 Page #: 4-15 Line #: 32
Original Comment #: 3
Comment: The statement is made that summary statistics are provided for surface-soil sampling for transuranic/fission products; the location of these summary statistics should be indicated.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 4.2 Page #: 4-15 Line #: 32
Original Comment #: 4
Comment: It is stated that strontium-90 was detected only once in the 81 soil samples collected; indicate whether or not background subtraction was then performed for it.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 4.6.1.1.1 Page #: 4-49 Line #: 9
Original Comment #: 5
Comment: It is stated that "uranium-234 and uranium-238 are constituents of total uranium." Past practices have included the processing of materials with as much as 2% uranium-235 as well as uranium-236. Explain in the text why uranium-234 and uranium-238 are constituents of total uranium while uranium-235 and uranium-236 are not.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 4.6.1.1.1 Page #: 4-49 Line #: 10
Original Comment #: 6
Comment: The statement is made that "the uranium-238 isotope accounts for greater than 95 percent of the total uranium on a mass basis; therefore, the nature and extent of contamination of uranium isotopes will be depicted and explained in the discussion on total uranium." Natural uranium contains three isotopes: uranium-234, uranium-235, and uranium-238. The corresponding typical percentages in rock for these isotopes are 0.006, 0.72, and 99.27 percent by weight, respectively. Taking the specific activities of the isotopes uranium-234 and uranium-238 into account (approximately 6,133 pCi/μg and 0.343 pCi/μg, respectively), the activity ratio of uranium-234/uranium-238 is approximately *one* (1). While total uranium data is used to determine toxicity values for noncarcinogenic effects, isotopic uranium values are necessary to determine toxicity values for carcinogenic effects. Discuss any findings and assumptions regarding uranium isotope ratios at the Fernald site, conversion factors used to determine the *activity of total uranium measured as mass* and vice versa, and whether the total uranium values presented result from total uranium analysis and/or are derived from isotopic uranium data.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 6.0 Page #: N/A Line #: N/A
Original Comment #: 7
Comment: This section should include tables of the constituents of potential concern for Operable Unit 5 which indicate the chemical-specific risk and chemical-specific hazard quotient for each constituent. Examples of such tables are presented in Exhibits 8-2 and 8-3 of the *Risk Assessment Guidance for Superfund Volume 1 - Human Health Evaluation Manual (Part A)*.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 7.6.7 Page #: 7-60 Line #: 6
Original Comment #: 8
Comment: The complete list of PRGs by media (Tables A.7-20 – A.7-26) should be presented at the end of this section. Also, there should be some discussion on the information presented in the table. For example, referring to Table 7-12 as presented, is the uranium PRG for a given carcinogenic risk (say 10^{-5}) just accounting for the risk from exposure to uranium isotopes, or does it consider the residual risk from other carcinogenic contaminants removed within the "uranium envelope" during remediation.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: 7.9.5 Page #: 7-68 Line #: 22
Original Comment #: 9
Comment: It is stated that the FEMP fence line concentration of uranium-238 in groundwater is predicted to reach its maximum in the 560th year; please state what this concentration value actually is.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Table #: 7-12 Page #: N/A Line #: N/A
Original Comment #: 10
Comment: In this table of preliminary remediation goals (PRGs) for uranium by media, provide risk-based remediation goals in units of total uranium activity (pCi/g) and include the conversion factor used as a footnote. Also provide the PRGs in units of "ppm" mass since the draft Proposed Plan for Operable Unit 5 (OU5 PP) presents proposed remediation levels for uranium in "ppm" units, and explain why the OU5 PP is providing uranium cleanup levels in "ppm" units. Explain why this RI report does not provide PRGs for soil exhibiting uranium in non-leachable and high-leachable forms as does the OU5 PP. Also explain why Table 7-12 provides PRGs based on a toxicological risk HI of 0.2 when the OU5 PP preferred alternative is only concerned with meeting a HI of 1.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: A.2.3 Page #: A.2.7 Line #: 14 & 15
Original Comment #: 11
Comment: The text refers to a summary list of major constituents used in the manufacturing processes (Table A.2-13) and a summary list of the radionuclides (and their radiological properties) historically present in processed materials (Table A.2-14). These tables were omitted and should actually be included in the document.

Commenting Organization: U.S. EPA Commentor:Jablonowski
Section #: A.3.2.4 Page #: N/A Line #: N/A
Original Comment #: 12
Comment: This section discusses receptor exposure pathway scenarios for the four land uses, and has related information presented in Table A.3-1, *Summary of Exposure Pathways Quantitatively Evaluated in the Baseline Risk Assessment*, and in Figures A.3-1 and A.3-2, *Operable Unit 5 Conceptual Models (Current and Future Source Term and Land Use Scenarios)*. This section and the related table and figures should be reviewed and revised since there are numerous inconsistencies, namely with respect to the exposure routes of the various receptors.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: A.7.3 Page #: A.7-6 Line #: 25
Original Comment #: 13
Comment: This section discusses the calculation of media specific preliminary remediation goals (PRGs) and provides the PRGs in Tables A.7-20 through A.7-26, but fails to explain the form and intent of these PRG tables. In these tables, it is stated that a PRG value for a constituent implies that the calculated level of contaminant must be achieved in a remediation effort in the given media in order to achieve an "acceptable risk" for the receptor evaluated; what this "acceptable risk" is should be clarified in the text. Also to be clarified is the meaning of a constituent's PRG relative to the risk column (10^{-5} for example) for which it's under. In reading the tables, does remediation to a PRG for an individual constituent ensure the risk goal for *only* that single constituent? Or are the tables stating that if remediation is to meet a given risk goal (10^{-5} for example), that remediation should be performed to meet the PRGs for *all* the constituents listing in the given media. Table explanations should be provided in the text and as footnotes in the tables.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: C.1, C.2, & C.3
Original Comment #: 14
Comment: These sections present tables of contaminant parameter data for various drainage areas and media, generally entitled *Summary of Positive/Nonpositive Detections*. These tables should be marked with table and page numbers, and should be indicated in the table of contents.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: B.3.2.1 Page #: B-5 Line #: 10
Original Comment #: 15
Comment: It is stated that the ground *beneath* the animals (white-footed deer mouse/meadow vole) was represented as a cylinder with a radius of 100 meters, and that the animal was assumed to be placed along the central axis of the cylinder; indicate the length of this cylinder. Since the animal is inside the cylinder (being on the central axis), it is then unclear what the intended location of the animal really is, whether it is above the ground or burrowing into contaminated soil. Assuming the animal is on the surface, this *cylinder geometry* approaches a flat plane for a small animal, but it would seem more sensible to use the *infinite plane/slab geometry* provided by MicroShield. If the animal is being modeled as burrowing, a 200 meter diameter cylinder seems inappropriately large for a mouse. This paragraph should be reviewed and revised so that the source-to-receptor geometry can be understood by the reader.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: B.3.2.2 Page #: B-6 Line #: 8
Original Comment #: 16
Comment: This section addresses the calculation of absorbed dose to pine trees due to external exposure; it is assumed that the source of exposure is the contaminated soil beneath the trees, but that is not made clear. If this is the case, then the fact that a pine's root system would not only be in direct contact with, but surrounded by contaminated soil, seems to have been neglected and needs to be considered. In line #20 it is stated that the reported doses are calculated at a height of 3 cm above the ground, though in reality the tree would be in direct contact with contaminated soil; the tree should be modeled at contact with the contaminated soil to address exposure to the roots.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: D.1.1.3.2 Page #: D.1-24 Line #:
Original Comment #: 17
Comment: It is stated that thorium contamination from FEMP activities is mostly from thorium-232. This statement contradicts the results presented in Table A.2-1 which indicates occurrences of thorium-228, thorium-230, and thorium-234 in surface soils at sample frequencies greater than 85% and activities higher than thorium-232. Review the data and revise the text accordingly.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: D.1.1.3.3 Page #: D.1-27 Line #: 20
Original Comment #: 18
Comment: It is stated here that radium-228 is not a significant contaminant of the FEMP. Explain then why, under the current land use scenario, the greatest carcinogenic risks for the exploring youth are due to exposure to surface soil at the former production are, with radium-228 and thorium-228 being the primary contaminants (see section A.7).

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: D.1.1.3.4 Page #: D.1-29 Line #: 19
Original Comment #: 19
Comment: It is stated here that thorium-228 is not a significant contaminant of the FEMP. Explain then why, under the current land use scenario, the greatest carcinogenic risks for the exploring youth are due to exposure to surface soil at the former production are, with radium-228 and thorium-228 being the primary contaminants (see section A.7). Also, thorium-228 was detected at greater than 5 times background almost as often as thorium-230 and thorium-232.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: ARAR-2 Page #: N/A Line #: N/A
Original Comment #: 20
Comment: Certain citations, such as DOE Order 5400.5, are repeatedly listed as a "TBC" with the rationale that the citations are not ARARs because they are not promulgated. Anticipating its promulgation in the near future, the proposed 10 CFR §834 *Radiation Protection of the Public and the Environment* should be incorporated as a TBC where appropriate. The requirements in this part govern activities conducted by, or for, DOE that might result in the release of radioactive material, the exposure of members of the public to radiation, or contamination of the environment with radionuclides from DOE activities. Incorporation of 10 CFR §834 as a TBC, in parallel with the current DOE order and other relevant and appropriate requirements, will later simplify the transition of the rule as an applicable requirement.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Table #: ARAR-2 Page #: N/A Line #: N/A
Original Comment #: 21
Comment: Regarding the EPA National Primary Drinking Water Regulations, it is stated in several instances that the requirement is not applicable to OU5 activities because there are no public drinking water systems involved with this remediation. The EPA National Primary Drinking Water Regulations are in fact applicable since DOE is partially funding a public water supply that will be used during the period of aquifer restoration, which is an element of the remediation of groundwater for the site.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: ARAR-2 Page #: N/A Line #: N/A
Original Comment #: 22
Comment: Regarding the ARAR section on radiation dose limits, 40 CFR §61.41, *National Emission Standard for Beryllium Rocket Motor Firing*, is listed as an applicable requirement; review this citation and requirement and revise the text accordingly.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: ARAR-2 Page #: N/A Line #: N/A
Original Comment #: 23
Comment: Regarding the ARAR section on radiation dose limits, radionuclide NESHAP 40 CFR §61.92 Subpart H should be listed as an applicable requirement. This requirement states that emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: ARAR-2 Page #: N/A Line #: N/A
Original Comment #: 24
Comment: Regarding the ARAR section on the control of radon emissions, radionuclide NESHAP 40 CFR §61.190 Subpart Q should be listed as an applicable requirement since this rule explicitly includes Fernald in its designation of facilities, and since Fernald is presently and/or will continue to be a storage and disposal facility for radium-bearing material. This requirement states that no source at a Department of Energy facility shall emit more than 20 pCi/m^{2}s of radon-222 as an average for the entire source, into the air.

Commenting Organization: U.S. EPA Commentor: Jablonowski
Section #: ARAR-2 Page #: N/A Line #: N/A
Original Comment #: 25
Comment: Regarding the ARAR section on radiation dose limits, radionuclide NESHAP 40 CFR §61.92 Subpart H should be listed as an applicable requirement. This requirement states that emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr.