

5043

**FEASIBILITY STUDY REPORT AND PROPOSED
PLAN FOR OPERABLE UNIT 4 RESPONSES TO
COMMENTS DECEMBER 1993**

12/21/93

**DOE-FN/EPA
100
RESPONSES**

**FEASIBILITY STUDY REPORT
AND
PROPOSED PLAN
FOR OPERABLE UNIT 4
RESPONSE TO COMMENTS**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO**



DECEMBER 1993

**U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE**

FEASIBILITY STUDY REPORT AND PROPOSED PLAN
FOR OPERABLE UNIT 4
RESPONSE TO COMMENTS

Fernald Environmental Management Project
Fernald, Ohio

December 1993

U.S. Department of Energy
Fernald Field Office

Section 1 U.S. EPA Region V FS Comments
by James Saric

Section 2 U.S. EPA Region V Radiation Section FS Comments

Section 3 U.S. EPA Region V PP Comments
by James Saric

Section 4 U.S. EPA Region V Radiation Section PP Comments

Section 5 U.S. EPA Region V CRARE Comments
by James Saric

Section 6 U.S. EPA Region V Technical Comments
by Pat Van Leeuwen

Section 7 U.S. EPA Region V CRARE Comments
by Pat Van Leeuwen

Section 8 Ohio EPA Comments
by Graham Mitchell and Tom Schneider

NOTE: All comment references to sections, page numbers, and lines in the text refer to either the Draft Feasibility Study Report for Operable Unit 4, September 1993 or the Draft Proposed Plan for Remedial Actions at Operable Unit 4, September 1993.

Section 1

U.S. EPA Region V FS Comments

By James Saric

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2 - 5 Page #: NA Line #: NA Code:
Original Comment #: General Comment 1

Comment: In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Section 300.400(e)(3)(ii), during the feasibility study (FS) the lead agency should develop one or more alternatives that involve little or no treatment, but provide protection of human health and the environment through engineering controls. Based on risk information presented in the discussion of Alternative B1 (see Specific Comment No. 99), and because of the high costs of removal and treatment, the U.S. Department of Energy (U.S. DOE) should fully evaluate an in situ containment alternative or an alternative using an on-site disposal vault with no treatment.

Response: Pursuant to the November 15, 1993 teleconference between U.S. EPA, OEPA, and DOE, DOE concurs with developing a new alternative.

Action: DOE will develop and evaluate an additional alternative for Subunit B composed of Removal, No Treatment, and On-Property Disposal.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: All Page #: NA Line #: NA Code:
Original Comment #: General Comment 2

Comment: The FS discusses Resource Conservation and Recovery Act (RCRA) applicable or relevant and appropriate requirements (ARAR). The FS finds that RCRA regulations governing hazardous waste management are relevant and appropriate to Silo 1, 2, and 3 wastes because these wastes are characteristic RCRA wastes according to the RCRA toxicity characteristic leaching procedure (TCLP) test. Because RCRA is an ARAR, the new corrective action management unit (CAMU) rule and temporary unit (TU) are also classified as ARARs. The FS should describe the CAMU and TU rule and discuss how these rules impact the various alternatives.

Response: The CAMU and TU rules under RCRA are already included as relevant and appropriate ARARs in the FS.

Action: Additional text will be added to Appendix F of the document to discuss use of the concepts, and to the text of the FS to describe specific impacts associated with each alternative to which the CAMU and TU concepts can be applied.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2 - 5 Page #: NA Line #: NA Code:
Original Comment #: General Comment 3

Comment: The on-site disposal system proposed for OU4 is an above-grade disposal vault. Based on recent technical meetings for OU1, U.S. DOE is considering a typical landfill for on-site disposal. The reason given for not considering an above-grade disposal vault was that over time, the concrete in a disposal vault degrades to a soil-like condition and the vault becomes, in effect, a typical landfill. U.S. DOE should explain why a crete vault is being proposed for OU4 wastes in light of its assessment that concrete vaults become landfills over time.

Response: The above-grade disposal vault proposed for Operable Unit 4 waste is based on the technology screening presented in Chapter 2 of the FS. It includes a large concrete vault underneath a multimedia cap with an intruder barrier for Subunits A and B waste. Also included is a leachate collection system. In addition, provisions are included for

5049

refinement to this conceptual design to better accommodate the characteristics of Subunit C waste.

The above grade disposal vault was selected as a representative technology which was evaluated in the Detailed Analysis of Alternatives. A significant consideration unique to Operable Unit 4 related to providing sufficient levels of protectiveness from the relatively high gamma emissions from the Operable Unit 4 Subunit A (K-65 Silo) wastes. Operable Unit 1, on the other hand, is considering an alternative facility for disposal of their waste materials based on reduced technical requirements specific to that operable unit and its wastes' characteristics.

An above grade disposal vault constructed of concrete can be designed to accommodate a 1,000 year disposal period. It is a fact that concrete structures exist today that are well over 1,000 years old. In fact, the dome of the world famous Pantheon in Rome which spans a distance exceeding 100 feet, was constructed of concrete in 150 A.D. during the period of the ancient Romans. It has been in service for a period of 1,850 years! With today's advancements in cement products, additives, and concrete mix design, achievement of the required disposal goal has a high likelihood of success.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3 Page #: ALL Line #: NA Code:
Original Comment #: General Comment 4

Comment: This section evaluates and screens alternatives. The effectiveness evaluation for each of the alternatives should also include a discussion of compliance with ARARs. Consideration of this criterion is important because it is a threshold criterion. Alternatives that cannot meet this criterion should not be considered in the detailed analysis.

Response: The DOE agreed with the U.S. EPA to discuss compliance with ARARs in the preliminary screening of alternatives discussion of effectiveness (Section 3).

Action: DOE will include a brief one sentence description of whether the alternative complies or does not comply with ARARs.

Commenting Organization:
Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.0 Page #: ALL Line #: NA Code:
Original Comment #: General Comment 5

Comment: Section 4.0 evaluates alternatives according to nine evaluation criteria. In order to be consistent with the NCP, the discussion of the criterion that examines reductions in the toxicity, volume, and mobility of contaminants through treatment should discuss the principal threats for OU4. Therefore, the principal threats associated with OU4 should be identified and discussed in Section 4.0 and an evaluation of each alternative should assess the extent to which the principal threats are treated.

Response: Agreed.

Action: A discussion describing the principal threats associated with Operable unit 4 will be presented on a subunit basis and added as an introduction to the detailed analysis of Sections 4.2, 4.3, and 4.4. This text will facilitate a better understanding of the subsequent discussions regarding the alternatives' ability and extent to which reductions

in toxicity, volume, and mobility for the principal threats are addressed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.0 Page #: NA Line #: NA Code:
Original Comment #: General Comment 6

Comment: This section presents the detailed analysis of alternatives. The two modifying criteria, state acceptance and community acceptance, are not discussed. When state and community acceptance are known for an alternative, they should be addressed in the detailed evaluation. When state and community acceptance are unknown, the document should indicate that these criteria will be evaluated after receipt of public comment. This will require the addition of one or two sections to the evaluations of each of the Subunit alternatives.

Response: The two modifying criteria, state acceptance and community acceptance, are unknown for consideration in the detailed analysis of alternatives at this time. Because formal state and community comments will not be received until after the Feasibility Study Report and Proposed Plan for Remedial Actions at Operable Unit 4 has been issued for review, these modifying criteria will be addressed in the responsiveness summary and Record of Decision that will be prepared following the public review period.

Action: Two sections will be added to each alternative; which will state that because formal public and state comments will not be received until after the FS and PP have been issued for public review, these two modifying criteria will be addressed in the Responsiveness Summary and ROD that will be prepared following the public comment period.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original Comment #: General Comment 7

Comment: This appendix presents the following three treatability studies: (1) cement stabilization, (2) chemical extraction, and (3) vitrification. For each treatability study, the appendix presents a pertinent discussion of the methods, analysis results, comparison data for treated and untreated TCLP results, and conclusions.

For each treatability study, the discussion points out that the test results indicated increased levels of various constituents. However, the conclusion drawn is that the treatment method is technically feasible without addressing the issue of such constituents. For the vitrification study, no final conclusion is drawn; only a comparison to the objective is made. Also, there is no comparison drawn between the results of all three treatability studies with respect to each of the constituents of concern. This information should be added to the appendix.

Response: An explanation and recommendation relative to increased levels for various constituents has been incorporated into the cement stabilization process option discussion (see response to Specific Comment #110). In addition, a new section has been provided comparing the results of the vitrification and cement stabilization process options. No discussion of increased constituent levels, nor comparison with other process options was performed for the chemical extraction process since that process option did not survive the FS initial screening of alternatives (see FS Section 3).

Action: Explanations related to increased in accordance with response to Specific Comment #110 concentrations in cement stabilized waste have been incorporated into Section C.1.0. For the vitrification process option, a new Section C.3.6 entitled "Conclusions" has been

provided.

A new Section C.4.0 has been provided which contains a comparison of the vitrification and cement stabilization process options.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Cost Information Page #: NA Line #: NA Code:
Original Comment #: General Comment 8

Comment: The FS presents cost information for Subunits A, B, and C. Many of the alternatives in Subunits A and B have duplicate components that are accounted for individually. One example of this is the waste removal system for the silo wastes. In Section 4, removal of Subunit A and B wastes from the silos is certain, which would mean only one waste removal system would need to be constructed. It is unclear if the Subunit alternative costs take this into consideration. This issue should be resolved.

Response: It is agreed that additional clarification is needed.

Action: Additional text will be added in Appendix E. Because it is not known in the Feasibility Study Report which remedial alternatives will be identified as the preferred alternative for each of the subunits, it is not known which cost components can be considered as duplicate costs between subunit alternatives. Therefore, the Feasibility study only presents remedial alternative cost estimates on a subunit basis.

It would be too cumbersome to develop detailed cost estimates for all the various possible combinations of remedial alternatives. Wherever possible, major components will be identified as duplicates. The Proposed Plan will provide a total cost for the combined, preferred alternative. This total cost will eliminate any duplicate cost components.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: All Page #: NA Line #: NA Code:
Original Comment #: General Comment 9

Comment: Many of the specific comments on one section of the FS affect other sections of the FS. U.S. Environmental Protection Agency (U.S. EPA) has tried to note when this occurs by cross-referencing such comments. However, U.S. DOE should ensure that any changes made in response to U.S. EPA comments in one section are also incorporated into other sections as appropriate.

Response: The U.S. EPA concerns are noted by the U.S. DOE.

Action: The U.S. DOE will conduct an internal review of the revised documents to ensure that any changes made in response to U.S. EPA comments in one section are also appropriately incorporated in other related sections, especially where U.S. EPA cross-referencing of comments occur.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Subunit 3 Waste Page #: NA Line #: NA Code:
Original Comment #: General Comment 10

Comment: The FS and Proposed Plan present significantly different approaches for treatment and disposal of Subunit 3 waste. The FS should discuss all alternatives in detail, whereas the Proposed Plan should summarize the alternatives. A separate alternative describing the Proposed Plan approach of storing Subunit C wastes in interim storage and addressing these wastes in interim storage and addressing these wastes under OU3 and OU5 should

Response: be added to the OU4 FS and then should be summarized in the Proposed Plan. DOE acknowledges that there is a discontinuity between the approach presented in the Proposed Plan for the disposal of Subunit C waste and the methods discussed in the OU4 FS (Alternative 2C). DOE recommends that interim storage of waste be introduced as a component in the on-property disposal process option in Section 2.5.7.2. The process option would be further developed in section 3.3.3 under Alternative 2C, "Demolition, Removal, On-Property Disposal." The text will be consistent with the Proposed Plan summarization of the preferred alternative emphasizing the opportunities for site-wide integration of waste management. This would allow the interim storage option for Subunit C to be fully evaluated in Sections 4 and 5.

The Proposed Plan would, therefore, select Alternative 2C as the preferred alternative for Subunit C. On-property disposal would continue to be held in abeyance until decisions are reached in the OU3 and OU5 RODs for final disposal of rubble and soils.

The OU4 ROD will state that on-property disposal of OU4 Subunit C materials separate from the disposition of OU3 and OU5 materials is held in abeyance. Therefore, the decision to hold on-property disposal in abeyance is binding in the ROD until the OU3 and OU5 RODs are issued. Should unforeseen and unlikely circumstances preclude the integration of the Subunit C materials with OU3 and OU5 necessitating a change to the OU4 ROD, the decision to proceed with on-property disposal would be documented as an explanation of significant differences (ESD) or ROD amendment in accordance with Section 117(c) of CERCLA and EPA guidance.

This approach will enable the interim storage to be carried forward as a component of on-property disposal in an alternative that includes a final disposition of materials.

Action: The text will be modified as noted in the response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.4.1.1 Page #: 1 - 21 Line #: 19 - 25 Code:

Original Comment #: Specific Comment 1

Comment: This section of the FS discusses the site-wide hydrogeology and points out that the Great Miami Aquifer is a sole source aquifer. A sentence should be added to this discussion to explain that because the Great Miami Aquifer is a sole source aquifer it is categorized as a Class I aquifer according to the U.S. EPA groundwater protection strategy. This designation significantly affects the cleanup level of the aquifer required by the Superfund program. The designation also potentially affects cleanup of contaminated soil that may leach contaminants to the groundwater.

Response: Agreed.

Action: The Great Miami Aquifer will be designated as a Class I Aquifer.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.2.4 Page #: 2 - 27 Line #: NA Code:

Original Comment #: Specific Comment 2

Comment: This table lists the preliminary remediation goals (PRG) and ARARs and other advisories or criteria to be considered (TBC) for OU4 contaminants of potential concern. The ARAR/TBC for lead is listed as having a maximum contaminant level goal (MCLG) of zero and the state standard is listed as 0.05 milligrams per liter (mg/L). The ARAR/TBC

for lead should be 15 micrograms per liter (ug/L), which is the promulgated action level for lead. This action level is being used by the Superfund program as the groundwater cleanup level for lead. The table should be revised accordingly.

Response: Agreed.

Action: Revise the table to show the MCLG for lead to be zero and the MCL to be 15 ug/l. A footnote will indicate this level is a promulgated action level rather than a true MCL.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 2.2.2.4 Page #: 2 - 27 Line #: NA Code:
 Original Comment #: Specific Comment 3

Comment: This table lists the PRGs and ARAR/TBCs for OU4 contaminants. The table erroneously identifies the maximum contaminant level (MCL) as the federal ARAR for thallium. The MCLG for thallium should be used as the ARAR/TBC instead of the MCL because the NCP states that non-zero MCLGs will be considered ARARs for groundwater. The table should be revised accordingly. Also in this table, the MCLG of 1.3 mg/L is listed as the ARAR for copper. The value listed for copper is an action level, not an MCLG. The table should be revised accordingly.

Response: The table will be revised.

Action: The MCLG for thallium will be used as the ARAR. The ARAR for copper will be shown as the federal enforceable action level at 1.3 mg/l.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 2.2.2.4 Page #: 2 - 28 Line #: NA Code:
 Original Comment #: Specific Comment 4

Comment: This table lists the PRGs and ARAR/TBCs for OU4 contaminants. An ARAR/TBC is not listed for the compound bis(2-ethylhexyl)phthalate. An MCL should also be listed for this compound as it has an MCL of 0.006 mg/L. The proposed MCLs for chrysene and dibenzo(a,h)anthracene are not listed on the table. The table should be revised to include this information.

Response: MCL for bis(2-ethylhexyl)phthalate was promulgated. However, the proposed MCLs for chrysene and dibenzo(a,h)anthracene were deleted by the agency when the MCL for benzo(a)pyrene was promulgated in the July 17, 1992 Federal Register. Therefore, MCLs for chrysene and dibenzo(a,h)anthracene are not being incorporated into the table.

Action: The MCL for BEHP will be added as an ARAR.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 2.2.2.4 Page #: 2 - 29 Line #: NA Code:
 Original Comment #: Specific Comment 5

Comment: This table lists the PRGs and ARAR/TBCs for OU4 contaminants. The MCL for indeno(1,2,3,-cd)pyrene is not listed. This compound has a proposed MCL and an MCLG. The table should be revised accordingly.

Response: The proposed MCL for indeno(1,2,3-cd)pyrene was deleted by the agency when the MCL for benzo(a)pyrene was promulgated in the July 17, 1992 Federal Register; therefore, an MCL for indeno(1,2,3-cd)pyrene is not being incorporated into the table.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 2.2.2.4 Page #: 2 - 30 Line #: NA Code:

Original Comment #: Specific Comment 6

Comment: This table lists the PRGs and ARAR/TBCs for OU4 contaminants. The footnote definition section of the table contains a definition of footnote "1." Footnote "1" does not appear on the table. This discrepancy should be corrected.

Response: Agreed.

Action: The list of footnotes will be corrected as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.3 Page #: 2-33 to 2-39 Line #: NA Code:

Original Comment #: Specific Comment 7

Comment: This section discusses remedial action objectives (RAO) for the OU4 response. None of the RAOs presented discusses migration of contamination to surface water. Each medium discussed in this section should have an RAO that prevents migration of surface contamination which would result in a discharge to surface water in excess of state discharge requirements. The RAOs should be revised to include the prevention of migration of contaminants to surface water.

Response: It is agreed that the RAOs should be revised to include prevention of migration of contaminants to surface water.

Action: RAOs will be revised to include prevention of migration of contaminants to surface water and sediment that would result in concentrations in excess of state discharge requirements.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.6.1 Page #: 2 - 58 Line #: 25 to 29 Code:

Original Comment #: Specific Comment 8

Comment: This section discusses the various in situ treatment technologies considered for the three subunits comprising OU4. The text states that the technologies apply to Subunit A (contents of Silo 1 and 2), Subunit B (contents of Silo 3), and soils in Subunit C (silo structures, piping, sump tank, and contaminated soil and debris). This paragraph should explain how in situ options can be considered for Subunits A and B, but not for the Subunit C silo structures themselves. Because the silos now contain the waste to be treated in situ, they would need to be considered for purely in situ treatment technologies. This discrepancy needs to be resolved.

Response: The use of in situ treatment technologies would likely be combined with containment process options. In situ treatment of the silo residues would utilize the existing silo structure as containment in conjunction with additional containment process options (i.e., capping). Therefore, although the silo structures themselves would not be treated they would be part of the containment of the silo contents treated in situ. No in situ treatment would occur on the silo structures themselves because the available treatment options would require physical manipulation which would destroy the silo structures.

Action: Text revised to better explain the role of the silo structures in conjunction with the in situ treatment technologies for Subunits A and B.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.6.1 Page #: 2 - 59 Line #: 8 to 13 Code:

Original Comment #: Specific Comment 9

Comment: This section discusses in situ vitrification as a potential treatment technology. It seems that in situ treatment is only viable for subsurface soils because the other subunit wastes

are already ex situ. This paragraph should briefly discuss what happens to the silo structures during vitrification.

Response: In situ vitrification was screened in Section 2.6.6.1. In situ vitrification was screened because it could not effectively vitrify material at the depth (approximately 20' - 30') of the residues in the silos. This occurred prior to consideration of the effects of vitrification on the silos walls.

Action: No action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.6.6 Page #: 2-56 and 2-57 Line #: ALL Code:
Original Comment #: Specific Comment 10

Comment: This section discusses biological treatment technologies as potential treatment options for the OU4 wastes. This technology type should be eliminated from consideration based on the lack of organics associated with the OU4 wastes and the inability of this technology to effectively treat radionuclides and most inorganic compounds. The text should be revised to eliminate this technology type.

Response: Each of the bioremediation process options were screened in section 2.5 because the process options did not treat inorganics. Evaluation of the bioremediation technologies was performed in conjunction with other treatment technologies to assure a wide variety of treatment technologies was considered for remediation of Operable Unit 4.

Action: No action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.4.1 Page #: 2 - 84 Line #: 15 to 33 Code:
Original Comment #: Specific Comment 11

Comment: This section evaluates the effectiveness, implementability, and cost of slurry walls. Slurry walls are most effective if there is a low permeability subsurface feature to key the slurry wall into. An example of this type of subsurface feature is a thick clay layer or bedrock unit. Although the text briefly discusses site geology as a potentially limiting factor, it does not discuss the OU4 area or the proposed on-property disposal facility area. It also does not explain how geology limits or supports the use of slurry walls. The text should be revised to include how site geology, especially in the area of OU4, limits or supports the use of slurry walls.

Response: Agreed.

Action: Discussion will be provided describing how site geology will effect the use of slurry walls.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.4.4 Page #: 2 - 92 Line #: 6 to 23 Code:
Original Comment #: Specific Comment 12

Comment: This section evaluates the silo rehabilitation process option. Based on statements in the text, it appears that the silos will not be renovated regardless of which remedy is selected. This process option should not be evaluated if silo renovation is not a consideration. Therefore, silo renovation should be deleted from this FS.

Response: The silo rehabilitation process option was included as part of the universe of potential process options available for remediation of Operable Unit 4. As stated, it is DOE's intent to remove the silos in the event that waste removal options are selected for the silo contents. However, based on this decision, the silo rehabilitation process option should

be screened in the Identification and Screening of Technologies and Process Options, Section 2.5, instead of carrying it into the Evaluation of Technologies and Process Options.

Action: The silo rehabilitation process option has been screened in section 2.5 and the evaluation of that process option has been removed from Section 2.6.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.6.6 Pg. Page #: 2-117 to 2-119 Line #NA
Original Comment #: Specific Comment 13

Comment: This section evaluates the decontamination and decommissioning (D&D) process options. The evaluations of the four D&D options are not consistent with one another. Process options that create dust, generate water, or are ineffective in reducing subsurface contamination were eliminated in lieu of other process options that also pose the same problems. The text should be revised to provide consistent evaluations among the D&D process options.

Response: Agreed.

Action: The evaluations for the D&D process options have been revised to better reflect the basis for selection and elimination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6 Page #: NA Line #: NA Code:
Original Comment #: Specific Comment 14

Comment: A table summarizing the results of the evaluation and screening of process options and technology types should be added to the end of Section 2.6.

Response: Tables 2-9 through 2-13 provide the summary information requested.

Action: No action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.4.2 Page #: NA Line #: 24 to 30 Code:
Original Comment #: Specific Comment 15

Comment: A figure showing the proposed location of the slurry wall should be provided to help clarify the information in this section.

Response: Agreed.

Action: Figure showing the plan view of this alternative will be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.4.3 Page #: 3 - 35 Line #: 1 and 2 Code:
Original Comment #: Specific Comment 16

Comment: This section discusses the spatial requirements for implementing Alternative 2A. The disposal vault spatial requirements for vitrification and cementation do not correlate with the estimated volumes of vitrified and cement-stabilized products. There would be nearly eight times the amount of cement-stabilized product, than vitrified product, yet the disposal vault area for the cement-stabilized product is less than twice the size of the disposal vault for the vitrified product. This apparent inconsistency should be resolved.

Response: The size of the disposal vault is dependent on various factors of which volume of waste material is only one of these factors. Three additional factors impacting disposal vault spatial requirements are (1) height of disposal vault, (2) institutional control area, and (3) unit size of the disposal cell. The height of the disposal cell influences the area required

due to the slope requirement of the cap, which is one component of the overall spatial requirements of the vault. Since the height of the disposal vault is the same for either the vitrified or cement-stabilized material, the spatial requirement of the cap due to the sloping requirements only (e.g., not including the portion of the cap covering the disposal vault) for all alternatives is a 33-m (111-ft) wide area around the perimeter of the disposal vault.

Another component of the vault spatial requirement is a 30-m (100-ft) wide area around the perimeter of the cap for implementation of institutional controls (e.g., fencing, monitoring). This is also fixed, regardless of the volume of material to be disposed. The last factor impacting the size of the disposal vault is that a unit disposal cell size was assumed for estimating the number of disposal cells required for each alternative. If a partial cell was needed, the number of cells was rounded up to determine the overall vault size. Thus, the spatial requirement of the disposal vault for each alternative is not directly proportional to the volume of waste to be disposed.

Action: The text in Section 3 of the FS will be revised to provide additional explanation of how the disposal vault spatial requirements were derived.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.4.2 Page #: 3 - 35 Line #: 6 and 7 Code:
Original Comment #: Specific Comment 17

Comment: This section discusses the waste generated during the implementation of Alternative 2A. The text states that contaminated debris and rubble would be dispositioned as part of Subunit C. The composition of contaminated debris and rubble mentioned in this discussion should be better defined. In addition, the text should clarify which of the wastes included in the list from Lines 8 to 15 on Page 3-35 will be disposed of in the on-site vault.

Response: It is agreed that the contamination debris and rubble for disposition under Subunit C should be better defined. The only material to be disposed in the vault under this alternative is the silos contents which have been cement stabilized or vitrified. As previously described, the aqueous streams will be managed at the FEMP AWWT. The clean/non-hazardous waste will be either recycled, reused, or disposed in a solid waste/sanitary landfill.

Action: The text will be revised to clarify the disposition of waste generated by this alternative.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.4.4 Page #: 3 - 37 Line #: 16 to 18 Code:
Original Comment #: Specific Comment 18

Comment: This section discusses the spatial requirements for implementing Alternative 5A. The spatial requirements for vitrification and cement stabilization are different for the on-site and off-site disposal alternatives although the stabilization processes proposed for both on-site and off-site disposal appear to be identical. this inconsistency should be explained or corrected.

Response: There appears to be inconsistency between the spatial requirements for processing the material by the way the text was written. The text should have stated the total spatial requirement for the alternatives, and then the area within that total used for disposal.

Action: The text has been revised to clarify the spatial requirements of the alternative.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.4.6 Page #: 3 - 44 Line #: 7 to 12 Code:
Original Comment #: Specific Comment 19

Comment: This section discusses Alternatives 5A.1 and 5A.2. The reference to Alternatives 4A.1 and 4A.2 should be changed to Alternatives 5A.1 and 5A.2 because the numbering is incorrect.

Response: Agreed.

Action: Text has been revised to correctly reference the alternative numbers.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.5.2 Page #: 3 - 49 Line #: 15 to 17 Code:
Original Comment #: Specific Comment 20

Comment: This section discusses the in situ containment Alternative 1B. The proposed slurry wall location does not appear to include Silo 3. The location of the proposed slurry wall should be indicated on a figure and the text should explain why the location was proposed for preventing leachate migration from the Silo 3 area to Paddy's Run.

Response: The text incorrectly referenced the location of the slurry wall to be around Silos 1 and 2. The location of the slurry wall would be around Silo 3. It is agreed that a figure showing the location of the slurry wall should be added. In Section 1.5.2.2, the migration of water below the silos is described as migrating west towards Paddys Run, justifying the location of the slurry wall. As this information was previously provided, it was not restated in this text.

Action: The text has been corrected to state that the slurry wall is around Silo 3. A figure showing the location of the slurry wall has been added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.5.3 Page #: 3 - 53 Line #: 22 to 24 Code:
Original Comment #: Specific Comment 21

Comment: This section discusses Alternative 2B. The statement regarding the handling of water used to remove the Silo 3 contents should be deleted because the proposed removal method for Silo 3 uses air, not water.

Response: Agreed.

Action: Text has been deleted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.5.3 Page #: 3 - 56 Line #: 7 to 10 Code:
Original Comment #: Specific Comment 22

Comment: This section discusses the spatial requirements for Alternative 2B. The text should explain why the spatial requirements for the disposal of the vitrified material (6 acres) and cement-stabilized product (7.5 acres) do not correlate with the amount of vitrified material (1,900 yd³) and cement-stabilized product (7,900 yd³).

Response: See response to USEPA Specific Comment #16.

Action: The text in Section 3 of the FS will be revised to provide additional explanation of the disposal vault spatial requirements.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.5.3 Page #: 3 - 58 Line #: 6 and 7 Code:
Original Comment #: Specific Comment 23

Comment: This section discusses the spatial requirements for Alternative 3B. The text should explain why the spatial requirements for stabilizing Silo 3 contents under Alternative 3B are different than the spatial requirements for stabilizing Silo 3 contents under Alternative 2B even though the stabilization process for each alternative appears to be identical.

Response: Same as Specific Comment #18.

Action: Same as Specific Comment #18.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6 Page #: 3 - 59 Line #: 7 to 9 Code:
Original Comment #: Specific Comment 24

Comment: This section discusses Subunit C preliminary alternatives. It is unclear from the text if the in-place containment alternatives for Subunits A and B place include capping Silo 4. The text should clarify if the in-place containment alternative for Subunits A and B would include capping Silo 4. It would be helpful to provide a figure showing the location of the cap proposed for the in-place containment alternatives to help clarify this section.

Response: In situ containment for Subunits A and B would not include capping of Silo 4. Silo 4 would be removed if the in situ containment alternatives would be chosen for Subunits A and B. The locations of the caps for Subunits A and B are provided in the same figures which were added to address Specific Comments #15 and #20.

Action: Text has been added explaining the fate of Silo 4 in the event that in situ containment alternatives would be chosen for Subunits A and B. Figures for cap locations have already been provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6.2 Page #: 3 - 59 Line #: 27 to 30 Code:
Original Comment #: Specific Comment 25

Comment: This section discusses Alternative C. The text should explain how the soils beneath Silo 1 and 2 and the decant sump will be removed under Alternative 1C. According to Subunits A and B alternatives, the footers and floors of the silos are to remain in place and the decant sump tank is to be emptied of water, filled with grout, and left in place.

Response: The Subunit A and B alternatives reference are in situ containment alternatives. As described in Section 3.2.6, Subunit C Preliminary Alternatives, the use of the in situ alternatives for Subunits A and B would preclude the use of the in situ alternative for Subunit C. Therefore, the soils and decant sump tank would not be removed but would remain in place.

Action: No action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6.2 Page #: 3 - 64 Line #: 17 to 23 Code:
Original Comment #: Specific Comment 26

Comment: A description of the proposed location of the slurry wall should be provided to clarify the text.

Response: Agreed.

Action: Figure showing the site plan for this alternative is provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6.2 Page #: 3 - 68 Line #: 12
Original Comment #: Specific Comment 27

Comment: The list of wastes generated does not include decontamination water from the high-pressure water jet. The list of wastes generated should include decontamination water from the proposed high-pressure water jet. This omission should be resolved.

Response: Agreed.

Action: Water generated from high pressure washing has been added to the lists of wastes generated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6.3 Page #: 3 - 73 Line #: 1 to 4 Code:
Original Comment #: Specific Comment 28

Comment: The list of wastes generated does not include decontamination water form the high-pressure water jet. The list of wastes generated should include decontamination water form the proposed high-pressure water jet. This omission should be resolved.

Response: Agreed.

Action: Water generated from high pressure washing has been added to the lists of wastes generated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6.4 Page #: 3 - 73 Line #: 30 and 31 Code:
Original Comment #: Specific Comment 29

Comment: Based on past discussions, the Nevada Test Site (NTS) acceptance criterion for moisture content is quite low. The text should explain how this criterion will be met without pretreatment of the wastes associated with Subunit C.

Response: NTS criteria addresses only free liquids. The NTS waste acceptance criteria states that in no case can waste contain free liquids equal to or exceeding 0.5 percent by volume of the stream. NTS has no criteria specifying moisture content limitations.

Action: No action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6.4 Page #: 3 - 74 Line #: 6 Code:
Original Comment #: Specific Comment 30

Comment: This sentence incorrectly uses the word "stabilized." The word "stabilized" should be changed to "containerized" because there is no stabilization proposed with this alternative.

Response: Agreed.

Action: Text revised according to comment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.6.4 Page #: 3 - 74 Line #: 25 to 27 Code:
Original Comment #: Specific Comment 31

Comment: The list of wastes generated does not include decontamination water from the proposed high-pressure water jet. The list of wastes generated should include decontamination water from the proposed high-pressure water jet.

Response: Agreed.

Action: Water generated from high pressure washing has been added to the lists of wastes generated.

-5043

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.1 Page #: 3 - 78 Line #: NA Code:
Original Comment #: Specific Comment 32
Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
Response: See General Comment #4.
Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.2 Page #: 3 - 80 Line #: NA Code:
Original Comment #: Specific Comment 33
Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
Response: See General Comment #4.
Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.2 Page #: 3 - 80 Line #: 18 to 23 Code:
Original Comment #: Specific Comment 34
Comment: This section evaluates the effectiveness of Alternative 1A. The statement that "long-term protectiveness could not be assured because of reliance on institutional controls and perpetual maintenance" is true for all alternatives because they all rely on containment, with the exception of taking no action. The difficulty associated with maintaining long-term protectiveness and qualitative risks associated with releases of untreated material, should containment be breached, should be emphasized rather than stating that long-term protectiveness cannot be assured.
Response: Agreed.
Action: The text has been revised to state why long term protection could not be assured.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.2 Page #: 3 - 81 Line #: 5 and 6 Code:
Original Comment #: Specific Comment 35
Comment: This section evaluates Alternative 1A and discusses ARARs for siting disposal facilities. The statement regarding siting conditions and compliance with ARARs should be deleted. Disposal facility siting requirements would not be considered ARARs if this alternative were selected because no placement would occur.
Response: This in-situ alternative (1A) does not involve placement of any waste material, therefore, regulatory requirements governing siting of a disposal facility under OAC regulations would not be triggered.
Action: Reference to siting requirements will be deleted, as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.2. Page #: 3 - 81 Line #: 16 to 21 Code:
Original Comment #: Specific Comment 36
Comment: This section evaluates the short-term effectiveness of Alternative 1A. The text should clarify how relocation of Paddy's Run presents a greater potential for exposure to trespassing children. In addition, the environmental impacts of partially relocating Paddy's Run should be discussed qualitatively.

Response: The partial relocation of Paddys Run presents a greater potential for exposure to trespassing children due to the close proximity of residents to this area and the temporary displacement of the fence in this area anticipated during construction activities. Environmental impacts of partially relocating Paddys Run include potential impact to the State threatened Sloan's crayfish.

Action: The text will be revised to further clarify how relocation of Paddys Run presents an exposure potential. Text will also be added regarding the environmental impacts to the Sloan's crayfish.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.2 Page #: 3 - 81 Line #: 26 to 28 Code:
Original Comment #: Specific Comment 37

Comment: This section evaluates the implementability of Alternative 1A. The text should describe in greater detail the technical difficulty associated with installing an effective leachate collection and detection system (LC/DS) under the existing silos. This discussion should expand on the statement on Page 3-80, Line 24, which describes the feasibility of installing an effective LC/DS as "questionable."

Response: Agreed.

Action: Text describing the technical difficulty of installing an efficient LC/DS will be added to the technical feasibility section of this alternative.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.2 Page #: 3-82 and 3-83 Line #: 23 to 28 and 1 to 5 Code:
Original Comment #: Specific Comment 38

Comment: This section summarizes the screening of Alternative 1A. The text needs to be carefully worded to show why the long-term containment proposed here is less desirable than the long-term containment proposed by the other alternatives. The text should emphasize that long-term protectiveness is more difficult to ensure because of the uncertain effectiveness of the LC/DS and because the waste remains untreated making any breach in containment more serious. The need to relocate Paddy's Run also presents short-term environmental impacts not presented by the other "action" alternatives. The phrase regarding siting ARARs should be deleted because it is inaccurate. Disposal facility siting requirements would not be considered ARARs.

Response: Agreed.

Action: Summary of the screening of alternatives will be revised to include the additional discussions and deletions requested.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.3 Page #: 3 - 83 Line #: NA Code:
Original Comment #: Specific Comment 39

Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs. Specifically, disposal facility siting ARARs would need to be addressed under this alternative.

Response: Agreed.

Action: A brief one sentence description of whether the alternative complies or does not comply with ARARs will be provided. Additional text pertaining to siting requirements will also be provided.

-5048

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.3 Page #: 3 - 84 Line # 5 to 7 Code:
Original Comment #: Specific Comment 40

Comment: This section evaluates the effectiveness of Alternative 2A. In regard to the treatment of radioactive wastes, a statement should be added to the text explaining that there is no treatment technology to reduce the direct radiation from radioactive materials and that natural decay is the only known process that reduces direct radiation.

Response: Agreed.

Action: Text added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.3 Page #: 3 - 84 Line #: 9 and 10 Code:
Original Comment #: Specific Comment 41

Comment: This section evaluates the effectiveness of Alternative 2A. To fully support the evaluation of the long-term protectiveness of Alternative 2A, a statement should be added to the text to explain the redundant safety features associated with the on-property disposal system. The text should note that these features make infiltration into and migration from the disposal unit much more difficult. The safety features also make detection and collection of any infiltration into and migration from the disposal unit much easier.

Response: Specific information regarding the design of the disposal vault may be referenced in Section 2.5.7.2 (Section 2.5.4.2 for the multi-media cap) and Appendix B.

Action: Text stating that features of the disposal system are designed to minimize infiltration into and migration from the facility has been added. Text stating that a monitoring system to detect migration from and infiltration into the disposal facility would be incorporated into the disposal facility design has been added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.3 Page #: 3 - 84 Line #: 11 to 13 Code:
Original Comment #: Specific Comment 42

Comment: This section evaluates the effectiveness of Alternative 2A. The text should be revised to explain the "difficulty" in ensuring long-term protectiveness instead of the "uncertainty" associated with the long-term protectiveness.

Response: Agreed.

Action: The term "uncertainty" has been replaced with "difficulty."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.3 Page #: 3 - 84 Line #: 29 and 30 Code:
Original Comment #: Specific Comment 43

Comment: This section evaluates the effectiveness of Alternative 2A. The last sentence should be revised to state that although this alternative presents greater potential short-term impacts, these impacts can be effectively controlled.

Response: Agreed.

Action: Sentence was added stating that although greater potential short-term impacts exist, these impacts can be controlled. Thus, this alternative will be effective in providing short-term protection of human health and the environment.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.1.4 Page #: 3 - 86 Line #: NA Code:
 Original Comment #: Specific Comment 44
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.1.4 Page #: 3 - 87 Line #: 25 and 26 Code:
 Original Comment #: Specific Comment 45
 Comment: This section evaluates the effectiveness of Alternative 3A.1. The text here implies that the Silo 1 and 2 wastes are not considered low-level radioactive wastes. This is not consistent with statements on Page 2-70, Lines 21 to 27, that imply the Silo 1 and 2 wastes are low-level radioactive wastes. This inconsistency should be resolved.
 Response: The text on page 2-70, lines 21-27, described the silo contents as by-product material, as defined by 11(e)2 of the AEA. This description is consistent with the classification of the silo contents as 11(e)2 by-product material provided in this section. The radioactive characteristics of by-product material is material which contains low-levels of naturally occurring radionuclides, but is not low-level waste. Classification of waste as 11(e)2 by-product material is contingent upon the generation process.
 Action: No action. The description provided for the silos contents is accurately reflected in the text provided.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.1.5 Page #: 3 - 88 Line #: NA Code:
 Original Comment #: Specific Comment 46
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.1.5 Page #: 3 - 89 Line #: 27 and 28 Code:
 Original Comment #: Specific Comment 47
 Comment: This section evaluates the effectiveness of Alternative 3A.1. The text states that the availability of services and materials for this alternative is comparable to the availability for Alternative 2A. Because a disposal facility is unavailable within 300 miles of Fernald Environmental Management Project (FEMP), the potential to implement this alternative is severely limited. Therefore, the text should be revised.
 Response: The administrative feasibility section of this alternative discusses the difficulties of obtaining the permits and approval to create a new radioactive waste disposal facility within 300 miles of the FEMP. The availability of services and material section describes only the physically availability of services and materials to build the facility. Therefore, the difficulty encountered with this alternative is in obtaining permits and approvals to begin construction of the facility with services and material which are as readily available as those for Alternative 2A.
 Action: No action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.6 Page #: 3 - 90 Line #: NA Code: .
Original Comment #: Specific Comment 48
Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
Response: See General Comment #4.
Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.7 Page #: 3 - 92 Line #: NA Code:
Original Comment #: Specific Comment 49
Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
Response: See General Comment #4.
Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.1.8 Page #: 3 - 94 Line #: NA Code:
Original Comment #: Specific Comment 50
Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
Response: See General Comment #4.
Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.2.1 Page #: 3 - 95 Line #: NA Code:
Original Comment #: Specific Comment 51
Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
Response: See General Comment #4.
Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.2.2 Page #: 3 - 97 Line #: NA Code:
Original Comment #: Specific Comment 52
Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
Response: See General Comment #4.
Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.2.2 Page #: 3 - 97 Line #: 12 to 17 Code:
Original Comment #: Specific Comment 53
Comment: See Specific Comment No. 34.
Response: Same as Specific Comment #34.
Action: Same as Specific Comment #34.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.2 Page #: 3 - 97 Line #: 25 and 26 Code:
 Original Comment #: Specific Comment 54
 Comment: See Specific Comment No. 35.
 Response: This in-situ alternative (1B) does not involve placement of any waste material, therefore, regulatory requirements governing siting of a disposal facility under OAC regulations would not be triggered.
 Action: Reference to siting requirements will be deleted, as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.2 Page #: 3 - 98 Line #: 10 to 14 Code:
 Original Comment #: Specific Comment 55
 Comment: See Specific Comment No. 36.
 Response: See response to USEPA Specific Comment #36.
 Action: The text will be revised to further clarify how relocation of Paddys Run presents an exposure potential. Text will also be added regarding the environmental impacts to the Sloan's crayfish.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.2 Page #: 3 - 98 Line #: 10 to 14 Code:
 Original Comment #: Specific Comment 56
 Comment: See Specific Comment No. 37.
 Response: Same as specific Comment #37.
 Action: Same as Specific Comment #37.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.2 Page #: 3 - 99 Line #: 5 and 6 Code:
 Original Comment #: Specific Comment 57
 Comment: This section evaluates the cost of Alternative 1B. The text should clarify how the cost of Alternative 1B was calculated. Many Alternative 1B components would be conducted under Alternative 1A. The text should explain the interaction of Alternatives 1A and 1B.
 Response: It is agreed that additional clarification of costs is needed.
 Action: Additional text will be added to Appendix E, with minor modifications of the text in Section 3. As discussed in response to USEPA General Comment #8, because it is not known in the feasibility study report which remedial alternative will be identified as the preferred alternative for each of the subunits, it is not known which cost components can be considered as duplicate costs between subunit alternatives. Therefore, the FS only presents remedial alternative cost estimates on a subunit basis, without consideration for potential cost savings between alternatives, but the Proposed Plan does consider the overall cost of the entire operable unit.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.2 Page #: 3 - 99 Line #: 13 to 23 Code:
 Original Comment #: Specific Comment 58
 Comment: See Specific Comment No. 38.
 Response: Same as Specific Comment #38.
 Action: Same as Specific Comment #38.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.3 Page #: 3 - 99 Line #: NA Code:
 Original Comment #: Specific Comment 59
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.3 Page #: 3 - 100 Line #: 14 and 15 Code:
 Original Comment #: Specific Comment 60
 Comment: This section evaluates the effectiveness of Alternative 2B. The text regarding the slight reduction in toxicity through organic destruction by vitrification should be revised. Based on the representations of U.S. DOE and Fernald Environmental Management Corporation (FERMCO), Silo 3 contains no organic material.
 Response: Agreed.
 Action: Reference to reduction in toxicity through destruction of the organics has been deleted.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.3 Page #: 3 - 100 Line #: 23 and 24 Code:
 Original Comment #: Specific Comment 61
 Comment: This section evaluates the effectiveness of Alternative 2B. The text states that after vitrification, radon emissions would be eliminated. Based on the site history and current operations of the radon treatment system for Silos 1 and 2 only, it is not clear why radon emissions from Silo 3 residues are a concern. The text should clarify this point.
 Response: The primary sources of radon within Operable Unit 4 are the contents of Silos 1 and 2. Mitigation of the radon emanation from these sources has been the primary goal of removal actions within Operable Unit 4. Although Silo 3 was not party to these removal actions, radon does emanate from its contents at rates exceeding those common to soils. However, when comparing the Radium-226 concentrations of the silo contents (Radium-226 decays to form radon gas), those of Silo 3 are only approximately 1/100 of those in Silos 1 and 2. Even with utilization of the removal actions to mitigate radon emanation from Silos 1 and 2, they are still the primary source of radon from Operable Unit 4.
 Action: The text has been revised to stress that the radon emanation from Silo 3 is limited.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.4 Page #: 3 - 102 Line #: NA Code:
 Original Comment #: Specific Comment 62
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.2.4 Page #: 3 - 103 Line #: 28 and 29 Code:
 Original Comment #: Specific Comment 63
 Comment: See Specific Comment No. 45.
 Response: Same as Specific Comment #45.

Action: Same as Specific Comment #45.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.2.5 Page #: 3 - 104 Line #: NA Code:

Original Comment #: Specific Comment 64

Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.

Response: See General Comment #4.

Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.2.5 Page #: 3 - 106 Line #: 1 and 2 Code:

Original Comment #: Specific Comment 65

Comment: See Specific Comment No. 47

Response: Same as Specific Comment #47.

Action: Same as Specific Comment #47.

Commenting Organization: U. S. EPA Commentor: Saric
Section #: 3.3.3.1 Page #: 3 - 106 Line #: NA Code:

Original Comment #: Specific Comment 66

Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.

Response: See General Comment #4.

Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.3.2 Page #: 3 - 108 Line #: NA Code:

Original Comment #: Specific Comment 67

Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.

Response: See General Comment #4.

Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.3.2 Page #: 3 - 108 Line #: 15 and 16 Code:

Original Comment #: Specific Comment 68

Comment: This section discusses the effectiveness of Alternative 1C. The text should clarify why there is significant uncertainty associated with the long-term effectiveness of the capping system located next to Paddy's Run. This explanation is necessary because Paddy's Run is to be partially relocated, presumably to increase effectiveness of the cap.

Response: The text is incorrect. As discussed in the remainder of the paragraph, the cap would be designed to preclude active maintenance for 1000 years, and, therefore, would prevent erosion of the facility by Paddys Run.

Action: Sentence in question was deleted from text.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.2 Page #: 3 - 109 Line #: 3 to 7 Code:
 Original Comment #: Specific Comment 69
 Comment: See Specific Comment No. 36.
 Response: See response to USEPA Specific Comment #36.
 Action: The text will be revised to further clarify how relocation of Paddys Run presents an exposure potential. Text will also be added regarding the environmental impacts to the Sloan's crayfish.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.2 Page #: 3 - 109 Line #: 18 to 22 Code:
 Original Comment #: Specific Comment 70
 Comment: See Specific Comment No. 35.
 Response: This in-situ alternative (1C) does not involve placement of any waste material, therefore, regulatory requirements governing siting of a disposal facility under OAC regulations would not be triggered.
 Action: Reference to siting requirements will be deleted, as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.3 Page #: 3 - 110 Line #: NA Code:
 Original Comment #: Specific Comment 71
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.4 Page #: 3 - 112 Line #: NA Code:
 Original Comment #: Specific Comment 72
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.4 Page #: 3 - 114 Line #: 1 and 2 Code:
 Original Comment #: Specific Comment 73
 Comment: See Specific Comment No. 45.
 Response: Same as Specific Comment #45.
 Action: Same as Specific Comment #45.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.5 Page #: 3 - 114 Line #: NA Code:
 Original Comment #: Specific Comment 74
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.6 Page #: 3 - 116 Line #: NA Code:
 Original Comment #: Specific Comment 75
 Comment: As stated in General Comment No. 4, evaluation of each alternative should include a discussion of ARARs.
 Response: See General Comment #4.
 Action: See General Comment #4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.3.3.6 Page #: 3 - 117 Line #: 3 and 4 Code:
 Original Comment #: Specific Comment 76
 Comment: See Specific Comment No. 47.
 Response: Same as Specific Comment #47.
 Action: Same as Specific Comment #47.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.4.1 Page #: 3 - 118 Line #: 26 Code:
 Original Comment #: Specific Comment 77
 Comment: This section summarizes the screening of Subunit A alternatives. The reference to disposal facility siting ARARs not being attained for the in situ containment option should be deleted because it is inaccurate. Disposal facility siting requirements would not be considered ARARs for in situ containment because no placement of waste would take place.
 Response: See Specific Comment #35.
 Action: Text will be revised according to the response for Specific Comment #35.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.4.2 Page #: 3 - 119 Line #: 21 Code:
 Original Comment #: Specific Comment 78
 Comment: See Specific Comment No. 77.
 Response: See Specific Comment #35.
 Action: Text will be revised according to the response for Specific Comment #35.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 3.4.3 Page #: 3 - 120 Line #: 10 Code:
 Original Comment #: Specific Comment 79
 Comment: See Specific Comment No. 77.
 Response: See Specific Comment #35.
 Action: Text will be revised according to the response for Specific Comment #35

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Table 3-3 to 3-5 Page #: 3-121 to 3-128 Line #: NA
 Code:
 Original Comment #: Specific Comment 80
 Comment: These tables summarize the results of the initial screening of alternatives. The summary statements in these tables should be revised in accordance with U.S. EPA comments on the text. Most notably, the discussion on siting ARARs for in situ containment should be revised.

5048

Response: Agreed.

Action: Summary tables will be revised according to responses for comments on the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.3 Page #: 4-10 and 4-11 Line #: 27 & 28 & 1 & 2 Code:
Original Comment #: Specific Comment 81

Comment: Section 4.0 includes five subsections, Sections 4.5 through 4.9, that are not required by the CERCLA FS guidance. The purpose of these sections, such as meeting U.S. DOE National Environmental Policy Act (NU.S. EPA) requirements, should be explained.

Response: Agreed.

Action: A brief explanation regarding the reason for Subsections 4.5 - 4.9 will be included in Section 4.1.3 of the FS.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.1.2 Page #: 4 - 12 Line #: 1 to 4 Code:
Original Comment #: Specific Comment 82

Comment: This section evaluates the no action alternative's ability to meet ARARs and TBCs. This section mentions that landfill siting and RCRA closure performance standards would not be met by the no action alternative. However, landfill siting and RCRA closure requirements would not be ARARs for the no action alternative because no placement of wastes would occur. The text should be revised accordingly.

Response: Agreed.

Action: The language referring to landfill siting criteria has been deleted since these requirements are neither applicable nor relevant and appropriate to the no-action alternative. This language will also be deleted from Section 4.3.1.2, the no-action alternative for Subunit B material. However, RCRA closure performance standard requirements are passive requirements that would be relevant and appropriate to material left in silos during closure of the FEMP facility. This is the only RCRA closure requirement which will be retained. All other action-based requirements for this alternative will be deleted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2 Page #: 4 - 18 Line #: 24 to 26 Code:
Original Comment #: Specific Comment 83

Comment: This section states that the molten glass from the vitrification process would be poured into disposal containers, allowed to cool, and would be sampled before disposal in the on-site vault. The text should indicate how long it will take the molten glass to cool and should specify what type of sampling would be conducted.

Response: The design of the vitrification plant is based on a one day cooling period. This length of time has been determined to be adequate to allow for sufficient reduction in temperature to permit movement of the container, without jeopardizing the eventual quality of the glass product.

Sampling of the vitrified waste form would mainly be limited to measurement of dose rate. Rigorous sampling during the optimization and pilot plant phase has and will define radon emanation rates and leaching potential. Statistically based periodic sampling of the waste form (radon and leaching) will ensure achievement of disposal waste acceptance criteria requirements.

Action: Additional text will be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2 Page #: 4 - 18 Line #: 28 to 30 Code:
Original Comment #: Specific Comment 84

Comment: This section describes the vitrification process off-gas treatment system. The text should describe how the treatment residuals from the scrubber, carbon adsorbers ("absorbers" in the text), and HEPA filters would be handled.

Response: Treatment residuals from the scrubber will be handled through the Advanced Wastewater Treatment (AWWT). Specific details of waste treatment should perhaps be left for the Remedial Design state of the process, as discussions at this level of detail may change with refinement of the treatment process. An example of this was the previous plans to dispose of the charcoal of the charcoal canister by vitrifying it. Recent information developed in the Glass Optimization Study indicates that this would cause reduction (of metal) problems within the melter. Therefore, at present, this approach is not advocated. Current intentions are to reduce the carbon to ash (utilizing the same off gas treatment control as the vitrifier) and then dispose of the ash in the melter. This same concept may be extended to the HEPA filters. Scrubber residuals are intended to be managed by utilizing the Advanced Wastewater Treatment System (AWWT).

Action: The text will be expanded to discuss this approach for the handling of treatment residues.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2 Page #:4-20 and 4-21 Line #: NA Code:
Original Comment #: Specific Comment 85

Comment: These two pages present Figures 4-4 and 4-5. Most of the letters and numbers on these figures are unreadable. The figures should be revised so all the letters and numbers can be read.

Response: Agreed.

Action: The text on Figures 4-4 and 4-5 will be revised and made more legible.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2. Page #: 4 - 27 Line #: 11 to 13 Code:
Original Comment #: Specific Comment 86

Comment: The text states that while the FEMP property would continue to be federally owned, no active controls would be provided for the completed on-site disposal vault. This statement is not consistent with the statement on Page 4-26, Lines 14 to 16, where active leachate collection and treatment are described. This inconsistency should be reconciled.

Response: It is agreed that additional clarification is needed to make the text more consistent.

Action: 1. Additional text will be added after line 16 on page 4-26 as follows:

For purposes of this FS it has been assumed that active maintenance and pumping of the leachate collection system will continue for a period of 30 years. The thirty year time period was adopted as it is considered to best represent the time required to achieve sitewide remedial action objectives for the five FEMP operable units. It is anticipated, however, that active maintenance of the leachate collection system will not be required for the entire 30 year timeframe due to the design of the capping system (i.e., infiltration barriers). In the unlikely event active maintenance of the leachate collection system is required beyond the end of active on-site remedial activities (i.e., 30 years) so to ensure protection of human health and the environment, such active maintenance will be continued until such time as deemed unnecessary by DOE and EPA.

5048

This same discussion will be added to the text at line 23, page 4-99 and at line 9, page 4-162, where similar discussions occur for Subunits B and C respectively.

2. Clarification text will replace lines 11-14 on page 4-27 as follows:

Under continued federal ownership, the government is assumed to discontinue active access controls and site maintenance following completion of remedial activities and attainment of site-wide remedial action objectives. While the federal government would not maintain a continued site presence after completion of site cleanup, the government would continue to exercise their rights of ownership to preclude site development. Monitoring of the site would continue, as necessary, to support CERCLA 5-year reviews. The monitoring network would include wells located appropriately to indicate the effectiveness of the above-grade disposal facility and ensuring the continued protection of human health and the environment.

This same discussion will be added to the text at line 20 on page 100 and at line 4 on page 163, where similar discussions occur for Subunits B and C respectively.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2.1 Page #: 4 - 28 Line #: 7 and 8 Code:
Original Comment #: Specific Comment 87

Comment: The text states that the on-site disposal vault would be designed for a life of 1,000 years with no active maintenance. This statement is not consistent with the statement on Page 4-26, Lines 14 to 16, where active leachate collection and treatment are described. This inconsistency should be reconciled.

Response: Agreed.

Action: Additional clarification text will be provided (consistent with the response to comment #86) at line 8 on page 4-28 as follows:

". . . designed for a life of 1000 years. The vault would be designed so as to preclude the need for long-term active maintenance. The design features of the vault, including the infiltration barriers, are anticipated to eliminate the need for the active operation, maintenance, and monitoring of the leachate collection system. The leachate system will be monitored with collected waters pumped (if necessary) during the active operational phase of site remedial actions (i.e., approximately 30 years). It is anticipated that such operations and maintenance of the leachate collection will not be warranted (i.e., due to lack of flow) beyond this timeframe. As discussed above, continued long term. . ."

In addition, this same discussion will be added to the text at line 14, page 4-101 and at line 9, page 4-164, where similar discussions occur for Subunits B and C respectively.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2.1 Page #: 4-28 and 4-29 Line #: 27 to 30 & 1 to 3
Code:

Original Comment #: Specific Comment 88

Comment: This section describes how Alternative 2A/Vitrification, provides overall protection of human health and the environment. This section should explain how long the wastes in Silos 1 and 2 must be contained until radioactive decay renders them "safe."

Response: Consistent with the standard health physics concept of radioactive decay, it is generally recognized that a period of seven half-lives will yield a material that presents negligible risks or is considered "safe." The primary radionuclide of concern in K-65 material is radium. It has a half life of more than 1600 years. If the period of seven half lives is used to determine "safety", it would be over 11,000 years before radioactive decay would render the material "safe." Vitrified material should be stable well past this period of time. The half life of Th-230 is 80,000 years. The seven half life period for this radionuclide would be on the order of a half million years.

Action: Additional text will be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2.2 Page #: 4 - 32 Line #: 28 to 31 Code:
Original Comment #: Specific Comment 89

Comment: The text states that through the definition of an area of contamination (AOC) for OU4, the State's disposal facility siting requirements are relevant and appropriate. It is unclear how the definition of an AOC impacts the relevancy and appropriateness of State disposal facility siting requirements. The concept of AOCs has been replaced by CAMU under the new RCRA CAMU rule. The text should describe the CAMU rule, as well as the closely associated TU rule, and discuss how these new rules affect this and other alternatives.

Response: The CAMU and TU rules under RCRA are included as relevant and appropriate ARARs in the FS. While the CAMU concept under RCRA is similar to the AOC concept under CERCLA, it is incorrect to say that the promulgation of the CAMU rule under 40 CFR §264 Subpart S replaced the AOC. The AOC is a concept described in the NCP which may still be used at CERCLA sites. In our case, however, since RCRA requirements have been identified for remediation of OU4 wastes, the use of the CAMU concept is more appropriate than the AOC, and will be referenced in the document as appropriate.

Action: Text of this section will be revised to delete reference to area of contamination (AOC), and discuss use of the CAMU concept.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2.2 Page #: 4 - 35 Line #: 27 to 30 Code:
Original Comment #: 90

Comment: This section discusses potential ARARs for Alternative 2/Vitrification. The text references a letter from U.S. EPA to U.S. DOE directing U.S. DOE to consider 40 CFR 191 Subpart B a TBC for on-site disposal alternatives. According to the NCP definition of ARAR and TBC, it would be inappropriate to consider a promulgated and generally enforceable standard (such as 40 CFR 191 Subpart B) anything other than a potential ARAR. Because 40 CFR 191 is potentially relevant and appropriate, but not applicable, those subparts of the regulation that are not both relevant and appropriate would not be considered ARARs. This allows great flexibility in deciding which provisions of a regulation are ARARs and which are not. The text should be revised to indicate that 40 CFR 191 Subpart B is a potential ARAR and should identify which provisions of the regulation are or are not relevant and appropriate.

Response: Per direction provided by U.S. EPA during teleconference between FERMCO, DOE, and U.S. EPA on November 15, 1993, DOE will not make any changes to the FS/PP/ROD on the basis of this comment.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2.3 Page #: 4 - 40 Line #: 1 and 2 Code:
Original Comment #: Specific Comment 91

Comment: This section discusses the reliability and adequacy of vitrification. U.S. DOE should anticipate public scrutiny of vitrification based on the recent 60 Minutes television news story on U.S. DOE sites that concluded vitrification was being unsuccessfully tested at the U.S. DOE Savannah River Site (SRS). In anticipation of such scrutiny, it may be prudent to address the problems, if any, with vitrification at SRS and explain why these will not negatively impact the vitrification proposed for OU4.

Response: Vitrification technology at Savannah River Site (SRS) is quite different from the proposed vitrification technology at Fernald. At SRS, the waste to be vitrified is high level waste, requiring much remote manipulation and control. The feed material at SRS required significant effort to cause it to vitrify into an acceptable waste form. In contrast, the waste material of OU4 is readily amendable to vitrification technology. The K-65 (Silo 1 and 2) residues, in particular, easily forms a good glass without significant additives or process adjustments. The dose rate associated with OU4 material made it much easier to process than high level waste. Finally, the vitrification technology intended to be used for OU4 material is quite similar to the technology used in commercial glass making. This similarity indicates the likelihood of success. Vitrification at Fernald should not be connected to the vitrification effort at SRS since there is little similarity beyond the name of the process.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2.3 Page #: 4 - 41 Line #: 18 Code:
Original Comment #: Specific Comment 92

Comment: This section evaluates the long-term environmental impacts of Alternative 2A/Vitrification. The text states that the on-site disposal vault would be actively maintained and monitored. This statement is not consistent with previous statements that report that no active maintenance would be conducted (Section 4.2.2.1, Page 4-28, Lines 7 and 8). This inconsistency should be corrected.

Response: Agreed.

Action: Additional clarification text will be provided. See response to U.S. EPA Specific Comments #86 and #87.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.2.6 Page #: 4 - 54 Line #: 28 to 30 Code:
Original Comment #: Specific Comment 93

Comment: This section evaluates the technical feasibility of Alternative 2A/Vitrification. The text states that a full-scale facility for vitrification of materials similar to the K-65 wastes has never been built. Therefore, the text should explain what type of facility is under construction at SRS, as explained in Specific Comment No. 91

Response: As stated in U.S. EPA Specific Comment #91, quite similar full-scale facilities have been constructed for the commercial glassmaking industry. Therefore, a high level waste unit such as at SRS is not directly comparable.

Action: No Action

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3 Page #: 4 - 65 Line #: 4 to 11 Code:
Original Comment #: Specific Comment 94

Comment: This section describes the material processing involved with cement stabilization. Figure 4-11 presents the cement stabilization process flow diagram. The letters and numbers on Figure 4-11 are illegible. Figure 4-11 should be revised so that all numbers and letters are legible.

Response: Agreed.

Action: The text on Figure 4-11 will be revised and made more legible.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3.2 Page #: 4 - 68 Line #: 1 and 2 Code:
Original Comment #: Specific Comment 95

Comment: See Specific Comment No. 90.

Response: Per direction provided by U.S. EPA during teleconference between FERMCO, DOE, and U.S. EPA on November 15, 1993, DOE will not make any changes to the FS/PP/ROD on the basis of this comment.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.4.1 Page #: Page 4 - 76 Line #: 7 and 8 Code:
Original Comment #: Specific Comment 96

Comment: This section evaluates the overall protectiveness of Alternative 3.A.1/Vitrification. The text states that the vitrified waste will meet NTS acceptance criteria. This statement appears to be inconsistent with the statement on Page 3-87, Lines 25 and 26, which states that a variance from U.s. DOE Order 5820.A would be needed to take vitrified Silo 1 and 2 wastes to NTS. This inconsistency should be corrected or explained.

Response: The residues in Silos 1, 2, and 3 are classified as 11(e)2 by-product material as defined by the Atomic Energy Act. DOE Order 5820.2A excludes 11(e)2 by-product material from the definition of low-level waste. NTS is a radioactive waste disposal facility which accepts only low-level waste from DOE facilities and operates under DOE Order 5820.2A. Based on this information NTS would not be eligible to accept the residues in Silos 1, 2, and 3 due to their status as 11(e)2 by-product material. However, DOE Order 5820.2A policy for managing 11(e)2 by-product material states that "with approval from the appropriate field organization (DOE), small volumes of 11(e) by-product material" may be disposed at DOE low-level waste sites. Therefore, a "variance" would not be required, but approval to dispose the silo residues at NTS would be required.

Action: The term "variance" will be replace with "approval from the appropriate field office" on page 3-87.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.4.6 Page #: 4 - 83 Line #: 23 to 29 Code:
Original Comment #: Specific Comment 97

Comment: This section discusses the administrative feasibility of Alternative 3A.1/Vitrification. The text states that an addendum to the site's current waste shipping application would be necessary. It is unclear if this addendum is the same as the variance to U.S. DOE Order 5820.A mentioned on Page 3-87, Lines 25 and 26. This issue should be clarified. If the addendum is not the same as the variance, then a discussion of the variance should

be added here.

Response: The "variance" and the addendum are not the same. As described above, a "variance" is not required, but approval from the appropriate field organization (DOE) to manage 11(e)2 by-product material at a low-level waste site is required. The addendum is used to add a new waste stream to the current "FEMP Application to Ship Waste to the Nevada Test Site." Each waste stream being sent to NTS for disposal has this addendum demonstrating the characteristics of that waste stream and compliance of that waste stream with the NTS waste acceptance criteria. Approval of this addendum by NTS is required.

Action: Text on pages 3-87 and 4-83 will be changed to clarify the purpose and need of the addendum.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.5.1 Page #: 4 - 87 Line #: 19 and 20 Code:
Original Comment #: Specific Comment 98

Comment: See Specific Comment No. 96.

Response: The residues in Silos 1, 2, and 3 are classified as 11(e)2 by-product material as defined by the Atomic Energy Act. DOE Order 5820.2A excludes 11(e)2 by-product material from the definition of low-level waste. NTS is a radioactive waste disposal facility which accepts only low-level waste from DOE facilities and operates under DOE Order 5820.2A. Based on this information NTS would not be eligible to accept the residues in Silos 1, 2, and 3 due to their status as 11(e)2 by-product material. However, DOE Order 5820.2A policy for managing 11(e)2 by-product material states that "with approval from the appropriate field organization (DOE), small volumes of 11(e) by-product material" may be disposed at DOE low-level waste sites. Therefore, a "variance" would not be required, but approval to dispose the silo residues at NTS would be required.

Action: The term "variance" will be replace with "approval from the appropriate field office" on page 3-87.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.3 Page #: 4 - 104 Line #: 25 - 27 Code:
Original Comment #: Specific Comment 99

Comment: This section evaluates the long-term effectiveness of Alternative 2B/Vitrification. The text states that the risk from leaching of untreated wastes using the Hydrologic Evaluation of Landfill Performance (HELP) model maximum infiltration rate of 15 centimeters per year (cm/yr) is the same as the risk from infiltration of 1.3 cm/yr through a slightly degraded on-site disposal vault cover. This data presents a compelling reason for either not treating the waste or for not containing the waste in such an impermeable on-site disposal vault. However, disposal without treatment was not evaluated in this FS. Based on this risk information and in accordance with the NCP, this FS should fully evaluate a containment option that uses little or no treatment, either in situ containment or containment in an on-site disposal vault without treatment of the waste. See General Comment No. 1.

Response: See comment response to U.S. EPA General Comment No. 1.

Action: An alternative that includes little or no treatment will be developed in the FS for Subunit B, based on the risk information presented. The data discussed for Alternative 2B/Vit will also be revised to clarify that the risk information is specific to Uranium-238, the only constituent predicted to ever reach the aquifer.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.3 Page #: 4 - 107 Line #: 23 to 30 Code:
Original Comment #: Specific Comment 100

Comment: This section evaluates the reduction in toxicity, mobility, and volume of contaminants associated with Alternative 2B/Vitrification. The text states that the Silo 3 wastes were reduced in volume by 62 percent and that organic compounds would be destroyed during vitrification. In Section 3.3.2.3, Page 3-100, Lines 14 and 15, a reduction in volume is attributed to organic destruction. However, Silo 3 contains very few organic compounds. The text in this section and in previous sections discussing Alternative 2B/Vitrification should explain why there is a volume reduction despite the fact that the Silo 3 waste is in organic in nature.

Response: Organic compounds were removed from Silo 3 waste during calcining prior to their placement in Silo 3. The reduction in volume of Silo 3 waste by vitrification is, therefore, not based on destruction of organic compounds, but rather on the chemical (thermal) destruction of sulfates, phosphates, nitrates, and carbonates. There is also a reduction in volume due to a closer packing arrangement of the material in glass as opposed to the particle-void-particle arrangement of the waste in its present form.

Action: Additional clarification text will be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.7 Page #: 4 - 123 Line #: 12 to 14 Code:
Original Comment #: Specific Comment 101

Comment: This section discusses the assumptions made for estimating the cost of Alternative 2B/Vitrification. The text erroneously lists the vitrification equipment associated with the sludge-like wastes in Silos 1 and 2. The text should be revised to list the vitrification equipment associated with the dry waste in Silo 3.

Response: It is agreed that the vitrification equipment listed is appropriate for Subunit A wastes, not Silo 3 (Subunit B) material.

Action: The text will be modified to list the appropriate vitrification equipment for Silo 3 material (e.g., surge tank, silica, alumina, and borate storage/feed facilities, process piping, pumps, mixers, and a joule-heated melter).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.5.7 Page #: 4-146 Line #: 19 to 22 Code:
Original Comment #: Specific Comment 102

Comment: This section evaluates the costs of Alternative 3B.1/Cementation. The text erroneously lists the hydraulic removal and transfer system. The text should be revised to list the pneumatic removal and transfer system because pneumatic removal is proposed for this alternative.

Response: It is agreed that the pneumatic removal/transfer system is the appropriate equipment for Alternative 3B.1/Cem, not the hydraulic system.

Action: The text will be modified to list the appropriate removal/transfer system for Alternative 3B.1/Cem.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.1.1 Page #: 4 - 149 Line #: 19 to 21 Code:
Original Comment #: Specific Comment 103

Comment: This section evaluates the overall protectiveness of Alternative OC. The text makes

reference to the collapse of Silos 1, 2, and 3. This reference should be revised to note that Silo 1, 2, and 3 may be empty under Alternative OC. Collapse of these silos, if they were empty, would present much less risk than if they were full.

Response: Agreed.
Action: Additional text will be added at line 21, page 4-149 as follows:

"It should also be noted that Silos 1, 2, and 3 may be empty under Alternative OC. That is, the contents of each silo may be removed as part of the selected remedial alternatives for Subunits A and B. Collapse of these silos, if they are empty, would present much less risk that if they were full."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5-4.9 Page #: 4-190 & 191 Line #: 38 & 29 & 1 & 2
Code:

Original Comment #: Specific Comment 104
Comment: These sections discuss items not typically required in an FS. The purpose of these sections should be explained in the text.

Response: Agreed.
Action: A brief explanation regarding the reason for Subsections 4.5 - 4.9 will be included in section 4.1.3 of the FS. (See U.S. EPA Specific Comment #81.)

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.2.1.2 Page #: 5 - 16 Line #: NA Code:
Original Comment #: Specific Comment 105

Comment: See Specific Comment No. 90.
Response: Per direction provided by U.S. EPA during teleconference between FERMC0, DOE, and U.S. EPA on November 15, 1993, DOE will not make any changes to the FS/PP/ROD on the basis of this comment.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.2.2.2 Page #: 5 - 19 Line #: 8 to 31 Code:
Original Comment #: Specific Comment 106

Comment: This section compares the reductions in toxicity, mobility, and volume of contaminants for Subunit A alternatives. Additions to the text are necessary to identify the key advantages and trade-offs. The following items should be added to the text:

- * vitrification significantly reduces volume
- * cementation significantly increases volume
- * cementation is reversible

Response: Agreed.
Action: Text will be modified.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.2.2.4 Page #: 5 - 21 Line #: NA Code:
Original Comment #: Specific Comment 107

Comment: See Specific Comment No. 91.
Response: See response to Specific Comment #91.
Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 5.3.2.2 Page #: 5 - 32 Line #: 19 to 21 Code:
 Original Comment #: Specific Comment 108
 Comment: See Specific Comment No. 60.
 Response: Agreed.
 Action: The text in Section 5.3.2.2 will be corrected. Text corrections will be consistent with the response/action to U.S. EPA Specific Comment #60.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 5.3.2.2 Page #: 5 - 33 Line #: 1 and 2 Code:
 Original Comment #: Specific Comment 109
 Comment: This section compares the reductions in toxicity, mobility, and volume of contaminants associated with Subunit B alternatives. The text erroneously states that this criterion is not applicable to the no action alternative. The text should be revised to state that the no action alternative does not provide any reduction in toxicity, mobility, or volume of contaminants.
 Response: Agreed.
 Action: The text will be corrected to state that the no-action alternative does not provide any reduction in toxicity, mobility or volume of contaminants. This erroneous statement was also found and corrected in Section 4.2.1.4.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix C, 1.4.4 Page #: C-1-17 Line #: 14 to 29
 Code:
 Original Comment #: Specific Comment 110
 Comment: This section compares the TCLP leaching of treated and untreated wastes. Silo 1 zone composite samples consisting of barium, boron, selenium, vanadium, and molybdenum had increased concentrations using formulas 1 and 2. Silo 2 zone composite samples consisting of molybdenum, 2-butanone, barium, and chromium had increased concentrations. Silo 3 composite samples consisting of barium had increased concentrations. The study should discuss how these constituents of concern will be processed if reductions are not achieved.
 Response: A discussion addressing why the concentration increased for these constituents has been incorporated into Section C.1.4. No discussion of processing requirements has been incorporated for the following reasons:
 1. The leachate concentrations are below the RCRA regulatory levels,
 2. All the COCs which showed an increased leachate concentration from the treated waste were at low concentrations, and
 3. These low COC concentrations contribute little to the overall risk. Therefore, the treated formulation is likely to be acceptable without additional processing.
 Action: Incorporated response into Section C.1.0.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix C, 1.4.4 Page #: C-1-17 Line #: 25 Code:
 Original Comment #: Specific Comment 111

Comment: This section compares the TCLP leaching of treated and untreated wastes. An increase in 2-butanone may indicate that the test data is inaccurate. Typically, 2-butanone totally disappears during the treatment or substantially reduces in quantity. The text should be revised to explain this discrepancy.

Response: Several compounds are common laboratory contaminants in the TCLP analysis, i.e., chloroform, methylene chloride, and 2-butanone. The latter compound is an impurity commonly found in methanol, which is a solvent often used in preparation of samples for volatile compound analysis.

The measured concentrations of 2-butanone in the TCLP of the untreated and treated silo material were very low. For Silo 1, the range of 2-butanone in the untreated and treated materials ranged from nondetectable levels to 10 parts per billion (ppb) and from nondetectable levels to 6 ppb, respectively. For Silo 2, the corresponding ranges were nondetectable levels to 2 ppb and nondetectable to 8 ppb, respectively. These low levels of 2-butanone in the samples with values above nondetectable levels are likely the result of laboratory contamination.

Action: Revised Section C.1.4.4 to incorporate response.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix C, 1.5 Page #: C-1-43 Line #: 1 to 3 Code:
 Original Comment #: Specific Comment 112

Comment: This section discusses the conclusion of the treatability study for cement stabilization. The conclusion should indicate any existing exceptions because the various formulas show increased concentrations of several contaminants.

Response: See Comment Response #110.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: C, 2.4.3 Page #: C-2-16 Line #: 8 to 11 Code:
 Original Comment #: Specific Comment 113

Comment: This section discusses the advanced stage of the chemical extraction treatability study. Possible explanations are presented for the increased concentrations of uranium and thorium, but they do not meet the objective of demonstrating the removal of these constituents as described in Section C.2.2, Page C-2-1, Lines 25 and 26. The text should explain in the recommendations section why the increases occurred.

Response: Disagree. Since the chemical extraction process option did not survive the initial screening of alternatives (see Section 3), it was not deemed prudent to further evaluate this process options.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix F, 4.1 Page #: F-4-2 Line #: 1 and 2 Code:
 Original Comment #: Specific Comment 114

Comment: This section discusses why RCRA hazardous waste management regulations are relevant and appropriate to Silo 1, 2, and 3 wastes. The text states that because RCRA is an

ARAR the substantive requirements of RCRA Land Disposal Restrictions (LDR) must be met. This statement is no longer true because of the CAMU rule. The text should be revised to explain that the CAMU rule is an ARAR and to describe the impact the CAMU rule has on evaluation of the alternatives. The new RCRA TU rule should also be described and discussed.

Response: The RCRA Land Disposal Restriction (LDR) ARAR has been deleted from the list of ARARs for all alternatives in the FS.

Action: The CAMU and TU rules under RCRA are already included as relevant and appropriate ARARs in the FS. Additional text will be added to Appendix F of the document to discuss use of the concepts, and to the text of the FS to describe specific impacts associated with each alternative to which the CAMU and TU concepts can be applied.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F, 4.1 Page #: F-4-3 Line #: 3 to 5 Code:

Original Comment #: Specific Comment 115

Comment: See Specific Comment No. 90.

Response: Per direction provided by U.S. EPA during teleconference between FERMCO, DOE, and U.S. EPA on November 15, 1993, DOE will not make any changes to the FS/PP/ROD on the basis of this comment.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F Page #: F.2-1a-1 Line #: NA Code:

Original Comment #: Specific Comment 116

Comment: This table lists chemical-specific ARARs. The ARAR for copper is erroneously identified as the State's secondary MCL. The correct ARAR should be the federal action level. The table should be corrected.

Response: The State secondary MCL for copper was previously incorporated as an ARAR because it was at a level (1.0 mg/L) that offered more protection for human health and the environment than the federal action level (1.3 mg/L). However, since the State secondary MCL for copper is not enforceable, the federal action level at 1.3 mg/l will be included instead.

Action: The table will be revised to indicate the ARAR for copper is the federal action level.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F Page #: F.2-1c-13 Line #: NA Code:

Original Comment #: Specific Comment 117

Comment: This table lists the action-specific ARARs. The table lists RCRA LDRs as being ARARs. This is no longer correct because of the CAMU rule. The table should be revised to delete LDRs and insert the CAMU rule and TU rule, as appropriate.

Response: The RCRA Land Disposal Restriction (LDR) ARAR has been deleted from the list of ARARs for all alternatives in the FS.

Action: The CAMU and TU rules under RCRA are already included as relevant and appropriate ARARs in the FS. Additional text will be added to Appendix F of the document to discuss use of the concepts, and to the text of the FS to describe specific impacts associated with each alternative to which the CAMU and TU concepts can be applied.

Commenting Organization: U.S. EPA Commentor: Saric

Section #: Appendix F Page #: F.2-1c-17 Line #: NA Code:
 Original Comment #: Specific Comment 118
 Comment: See Specific Comment No. 90.
 Response: Per direction provided by U.S. EPA during teleconference between FERMCO, DOE, and U.S. EPA on November 15, 1993, DOE will not make any changes to the FS/PP/ROD on the basis of this comment.
 Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix F Page #: F.2-2-7 Line #: NA Code:
 Original Comment #: Specific Comment 119
 Comment: See Specific Comment No. 117.
 Response: The RCRA Land Disposal Restriction (LDR) ARAR has been deleted from the list of ARARs for all alternatives in the FS.
 Action: The CAMU and TU rules under RCRA are already included as relevant and appropriate ARARs in the FS. Additional text will be added to appendix F of the document to discuss use of the concepts, and to the text of the FS to describe specific impacts associated with each alternative to which the CAMU and TU concepts can be applied.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix F Page #: F.2-2-9 & 10 Line #: NA Code:
 Original Comment #: Specific Comment 120
 Comment: See Specific Comment No. 90.
 Response: Per direction provided by U.S. EPA during teleconference between FERMCO, DOE, and U.S. EPA on November 15, 1993, DOE will not make any changes to the FS/PP/ROD on the basis of this comment.
 Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix F Page #: F.2-3-8 Line #: NA Code:
 Original Comment #: Specific Comment 121
 Comment: See Specific Comment No. 117.
 Response: The RCRA Land Disposal Restriction (LDR) ARAR has been deleted from the list of ARARs for all alternatives in the FS.
 Action: The CAMU and TU rules under RCRA are already included as relevant and appropriate ARARs in the FS. Additional text will be added to Appendix F of the document to discuss use of the concepts, and to the text of the FS to describe specific impacts associated with each alternative to which the CAMU and TU concepts can be applied.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix F Page #: F.2-4-7 Line #: NA Code:
 Original Comment #: Specific Comment 122
 Comment: See Specific Comment No. 117.
 Response: The RCRA Land Disposal Restriction (LDR) ARAR has been deleted from the list of ARARs for all alternatives in the FS.
 Action: The CAMU and TU rules under RCRA are already included as relevant and appropriate ARARs in the FS. Additional text will be added to Appendix F of the document to discuss use of the concepts, and to the text of the FS to describe specific impacts

associated with each alternative to which the CAMU and TU concepts can be applied.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix G Page #: NA Line #: NA Code:
Original Comment #: Specific Comment 123

Comment: This appendix summarized the comparative analysis of alternatives presented in Section 5.0 of the FS. U.S. EPA comments on Section 5 should be incorporated in the Appendix G tables as appropriate.

Response: Agreed.

Action: U.S. EPA comments on Section 5 of the FS will be incorporated in the Appendix G as appropriate.

Section 2

U.S. EPA Region V Radiation Section FS Comments

Comments on the September 1993 Draft "Feasibility Study Report for Operable Unit 4"
U.S. EPA Region 5 Radiation Section
October 1993

Commenting Organization: U.S. EPA, Radiation Section
Executive Summary Page #: ES-6 Line #: 23 Code: C
Original Comment #: 1.

Comment: Due to recent findings regarding the K-65 Silos, there is no solid basis for stating that a 99 percent Rn-222 concentration reduction occurred in the headspace of the silos following the application of the bentonite clay. It was only this year when it was discovered that the Pylon radon monitors were not properly measuring the headspace concentrations, grossly underestimating headspace concentrations by a factor of 10 as discovered when modifications to the scintillating cells were made. Recent measurements reveal that Silo 2 headspace concentrations are increasing, with a recently cited value of over 4,000,000 pCi/l. Compared to the pre-bentonite radon concentration of 30,000,000 pCi/l, this suggests only an 85 percent headspace reduction, provided that the initial pre-bentonite headspace concentration data is correct.

Response: Agreed.

Action: The text has been revised to show that radon emanation rates have been reduced by 85%.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 1.4.2.1 Page #: 1-34 Line #: 24 Code: C
Original Comment #: 2.

Comment: Please include information on the application of the foam coating to the domes, its purpose, and its intended and/or eventual effect.

Response: Agreed.

Action: Text has been included as requested.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 1.4.1.1 Page #: 1-25 Line #: 17 Code: E
Original Comment #: 3.

Comment: This background information section, Population and Land Use, focuses on local land use, but lacks information on population, specifically on population densities in areas surrounding the Fernald site; please revise.

Response: Agreed.

Action: The next version of the FS will include information on population densities in areas surrounding the Fernald site.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 1.4.2.1 Page #: 1-33 Line #: 19 Code: E
Original Comment #: 4.

Comment: Please include a description of "gunite" and the purpose it serves as a covering on the K-65 silo sides.

Response: Agreed.

Action: Text has been included as requested.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 2.2.2.1 Page #: 2-13 Line #: 11 Code: C

Original Comment #: 5.

Comment: The general principles used to develop PRGs for carcinogenic constituents should be the same whether the carcinogenicity is due to the radioactive or chemical nature of the constituent. Specifically, exposures to radionuclides should either not result in an ILCR of more than 10^6 to 10^4 , or be reduced to levels as low as reasonably achievable (ALARA) as limited by the natural presence of radionuclides in soil and groundwater.

Response: Agreed.

Action: Insert after "groundwater" the text "and/or result in an incremental carcinogenic risk of less than 10^6 to 10^4 ."

Commenting Organization: U.S. EPA, Radiation Section

Section #: 2.2.2.3 Page #: 2-17 Line #: 16 Code: M

Original Comment #: 6.

Comment: Please explain why preliminary remediation goals (PRGs) for actinium-227, protactinium-231, thorium-230, thorium-232, uranium-234, and uranium-235 in soils were not developed and presented in Table 2-5. These radionuclides are known contaminants in surrounding soils and pose considerable risks, as do their progeny.

Response: These radionuclides were eliminated because their incremental risk from the baseline risk assessment was less than 10^6 .

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 2.2.2.4 Page #: 2-31 Line #'s: 10 and 11 Code: C

Original Comment #: 7.

Comment: Being that this section concerns preliminary remediation goals for groundwater, please review these two lines to ensure accuracy in context as far as units used and what type of PRG is being derived.

Response: Agreed.

Action: The text will be reviewed and revised as necessary.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 2.2.3.1 Page #: 2-33 Line #: 26 Code: C

Original Comment #: 8.

Comment: This remedial action objective for waste material should include that emissions of radionuclides to the ambient air 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/year, per radionuclide NESHAP Subpart H.

Response: Agreed.

Action: Section D.3.4.1.2, "Short-Term Risk Evaluation of Workers," and D.3.4.2.2, "Short-Term Risk Evaluation of the Public," will be revised to compare and contrast the calculated potential air pathway ratio - logical doses to the NESHAP limit of 10 mrem.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 2.2.3.3 Page #: 2-39 Line #: 9 Code: C

Original Comment #: 9.

Comment: This remedial action objective for soils within the Operable Unit 4 boundaries should include that emissions of radionuclides to the ambient air 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/year, per radionuclide NESHAP Subpart H.

Response: Agreed.

Action: Section D.3.4.1.2, "Short-Term Risk Evaluation of Workers," and D.3.4.2.2, "Short-Term Risk Evaluation of the Public," will be revised to compare and contrast the calculated potential air pathway ratio - logical doses to the NESHAP limit of 10 mrem.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.1.2.2 Page #: 4-6 Line #: 26 Code: M

Original Comment #: 10.

Comment: A potential chemical-specific ARAR that must be included in this list is radionuclide NESHAP 40 CFR 61 Subpart H, which covers emissions of radionuclides other than radon from U.S. DOE facilities.

Response: The citation for 40 CFR 61 Subpart H (radionuclides other than radon) is already included as an applicable ARAR.

Action: Text in Section 4 of the FS will be revised, as appropriate, to discuss compliance with this specific ARAR.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-15 Line #: 19 Code: C

Original Comment #: 11.

Comment: It is mentioned that the berm material opposite the silo wall would be removed to ensure the forces are balanced, as the contents are removed from the silos. Please explain what effect this balancing may have on the two load-spreading dome covers and their effectiveness in containing the silos' contents in the event of a silo dome collapse.

Response: The concept of removal of the berm soil in conjunction with the removal of the contents of the K-65 silos stems from the Comargo study of silo structural integrity. One of the conclusions of the study was that the berm provided stability to the silos from the pressure of the soil against the silo walls and that to prevent structure failure of the silo walls, the berm soil should be removed to a level corresponding to the removal of residues. Although there has been considerable doubt that this load balancing would be necessary (due to stability of the walls prior to berm installation), to be conservative in regard to safety, this viewpoint has generally been accepted. This concept relates to the effectiveness of the dome covers in that the dome covers depend upon the structural integrity of the silos. A serious loss of structural integrity of the silo would potentially impact the dome covers if the walls and, therefore, the domes themselves were affected. To avoid this current plans are to remove silo contents and berm soils simultaneously, coordinating the removal so that they correspond.

Action:

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-18 Line #: 25 Code: C

Original Comment #: 12.

Comment: It has been previously mentioned that the molten glass product would be formed into small, marble-like pieces. Please discuss this change as it would seem that a more effective, observable, and controllable cure would be achieved with a smaller form than with a larger, poured form.

Response: Current planning focuses on a monolith as the preferred waste form. There are no problems of curing anticipated. The final waste form will be optimized in the pilot plant phase, at present there are understood to be several advantages in a monolith. The most significant of these is radon emanation rate, because of the increased surface area of marbles, the rate is large for the waste form. There is also the marble making machinery which if eliminated would allow for more rapid

processing of the material. A final decision will occur in the pilot plant phase.

Action: Additional text will be provided.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-18 Line #: 25 Code: C

Original Comment #: 13.

Comment: Please describe in text the DOT specification 7A Type A packaging to be used to contain the poured molten glass, specifically the container volume, material, and its ability to withstand molten glass temperature and contact without degradation.

Response: Information describing the packaging is provided in Section 2.5.7.1 and again in the packaging section of Section 4.2.2.7. The containers would be constructed of carbon steel. The containers and the packaging system would be designed so that the containers would not be damaged during the direct pours. The highest melting temperatures of the glass would still be approximately 300°F below that of the melting point of carbon steel.

Action: Text will be added emphasizing the point that the containers would not be damaged by the direct pour. Additional information will be provided in Section 2.5.7.1 that the containers will be constructed of carbon steel.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-18 Line #: 28 Code: C

Original Comment #: 14.

Comment: Please explain whether continuous radionuclide emission monitoring would be performed at the exhausts of the off-gas treatment system and the radon treatment system.

Response: There will be continuous radionuclide emission monitoring of the off-gas treatment system and the radon treatment system.

Action: Additional text will be provided.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Pages #: 4-20 and 4-21 Code: E

Original Comment #: 15.

Comment: Please do something to make the Figure 4-4 and 4-5 process flow diagrams readable, maybe print the diagrams on 11" x 17" paper or use a bigger font size.

Response: Agreed.

Action: Figures 4-4 and 4-5 text will be revised and made more legible.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-22 Line #: 7 Code: C

Original Comment #: 16.

Comment: Specify the meaning of "disposed of appropriately" with regard to the decontamination and decommissioning of the facilities and equipment used in the vitrification process. Also, explain whether "uncontaminated" materials includes those materials that were previously decontaminated, as well as what criteria would be used for the unrestricted release of materials.

Response: All waste generated from the dismantling of the processing facilities, processing equipment, contact waste, and soils would be dispositioned as part of the remedial alternative selected for Subunit C. Therefore, no D&D will occur in Subunits A and B. Subunit C will utilize decontamination to reduce the quantity of waste requiring management as radioactive waste. The basis for confirming that the materials are no longer contaminated will be developed in the RD/RA work plan in conjunction with DOE order 5400.5.

Action: Discussions in the alternatives will be revised to better express the handling and disposition of materials for D&D.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-26 Line #: 14 Code: C

Original Comment #: 17.

Comment: Explain somewhere in this document what will happen to collected leachate from the vault and multimedia cap combination once construction of the disposal vault is complete.

Response: It is agreed that additional clarification is necessary. See response to U.S. EPA (Saric) Specific Comment No. 86.

Action: Additional clarification text will be provided at line 16, page 4-26 to clarify this point.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-26 Line #: 17 Code: C

Original Comment #: 18.

Comment: The Proposed Plan for Remedial Actions at Operable Unit 4 describes a multimedia cap that would provide for a minimum 5 meter (16.4 feet) cover over the disposed wastes, while Figure 4-6, Above Grade Disposal Vaults, indicates a 2.74 meter (9 foot) cover; please explain.

Response: The multimedia cap over the in situ wastes in remediation Alternatives 1A and 1B and the multimedia cap over the treated wastes in the disposal vaults in remediation Alternatives 2A, 2B, and 2C both conform to 10 CFR 61 disposal facility design criteria. 10 CFR 61 states that Class C waste must be disposed of so that the top of the waste is a minimum of 5 meters (16.4 feet) below the surface of the cover or must be disposed with intruder barriers that are designed to protect against an inadvertent intrusion for at least 500 years. The 2.74 m (9 foot) cap over the disposal vaults incorporates a .7 m (2.3 ft) cobblestone layer which functions as an inadvertent intrusion barrier and is used in lieu of the 15 m (16.4 ft) criteria. The multimedia cap over the untreated silo wastes is 15 m (16.4 ft) thick because an engineered inadvertent intrusion barrier was not designed into the cap (no credit is taken from the grout in the silo headspaces).

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-26 Line #: 20 Code: C

Original Comment #: 19.

Comment: Regarding the multimedia cap, please explain whether the uncompacted vegetative layer would have a feature to inhibit tree growth which could damage the geotextile membrane and the drainage layer underneath.

Response: The multimedia cap does not have an engineered feature to inhibit tree growth in the uncompacted vegetative layer. The multimedia cap maintenance activities (i.e., mowing, revegetation, mulching, repairs, etc.) during the 30 year institutional control period will prevent the growth of trees and shrubs in the vegetative layer. Following cessation of maintenance activities at the end of the institutional control activities and without human intervention, native vegetation will eventually cover the surface of the multimedia cap. At this time the deeper roots of trees and shrubs may or may not penetrate the 40 mil geotextile layer. Should penetration of the geotextile membrane occur, it is possible that fines from the vegetative layer may be introduced into the pea gravel drainage layer thereby affecting the performance of this layer in the vicinity of the penetration. The presence of the roots, however, will reduce the soil moisture in the vicinity of the roots through uptake and transpiration and, therefore, reduce the amount of water that must be removed by the drainage layer. Monitoring of the site would continue, as necessary, to support CERCLA 5-year reviews.

Following the reviews, maintenance and control measures would be implemented as necessary in order to provide assurance that overall protection would be maintained.

The effects of surface vegetation on overall cap performance is not completely understood. The industry (Los Alamos) is currently engaged in a long-term (8 year) study to gain additional insight into the effects vegetation has on soil moisture content and the performance of the surface layers.

Action: No action.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.2.2 Page #: 4-27 Line #: 9 Code: C
Original Comment #: 20

Comment: The perimeter of institutional control should ensure that gamma measurements at the fenceline are indistinguishable from background, and should probably include the monitoring well areas as a matter of access convenience.

Response: The disposal facility will be designed to conform to the requirements of 10 CFR 61, Licensing Requirements for the Land Disposal of Radioactive Waste, an ARAR for Operable Unit 4. As such, it will meet the performance objectives of Subpart C relating to dose limits to humans due to releases of radioactivity by reference to 10 CFR 20, Standards for Protection Against Radiation, dose limits to humans due to direct radiation. Although these limits will not ensure that gamma radiation levels at the fence line are indistinguishable from background, they will ensure the protection of human health. Practically speaking, the gamma radiation levels at the fenceline will be a background.

Radiation level modeling performed on the silos themselves showed that gamma dose rates through the berm were zero with as little as two to three feet of berm material. Given that radiation from the vitrified waste in the disposal vault will have to pass through a steel disposal box, the concrete wall of the disposal vault, several feet of clean fill, nine feet of the cap which includes three feet of cobblestones, and approximately two hundred feet of air before reaching the fence line, it is highly unlikely that the waste will contribute to the gamma radiation levels at the fenceline.

10 CFR 20 states that buffer zone of the disposal site, that area between the disposal unit and the perimeter of the disposal site, shall be large enough to carry out any requisite environmental monitoring activities. The current pre-conceptual design of the disposal facility places the groundwater monitoring wells outside the perimeter or fenceline of the disposal site. This layout can be modified to reflect the requirements of 10 CFR 20 but monitoring well placement will ultimately be dependent on hydrogeologic characteristics of the chosen disposal site and its surroundings.

Action: Figure 4-8 will be revised to show the monitoring wells inside the perimeter of the fenceline.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.2.2.3 Page #: 4-40 Line #: 8 Code: C
Original Comment #: 21

Comment: It is stated that the maximum expected effective dose equivalent associated with the treated K-65 residues would be 1.5 rem/hour. Please explain how this exposure rate was derived and where an individual would have to be, relative to the solidified waste form, to receive this maximum dose.

Response: The referenced text is incorrect and will be revised.

Action: Sentences 2 and 3 will be deleted and replaced with "The potential dose rate to an individual from intruding into the disposal vault has been approximated by the Baseline Risk Assessment's calculation of potential dose rates above the untreated silo contents. The baseline risk assessment

calculated the potential dose to a trespasser on the silo dome to be 3.5 mrem/hr. To address direct intrusion onto the top of the wastes, the baseline calculations were modified to eliminate shielding and distance between the source and receptor. The resultant dose rate increased to approximately 80 mrem/hr at a point of 1 meter (3 ft) above the waste surface. Actual dose rates would vary as a result of variable contaminant concentration and waste form density."

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.2.4 Page #: 4-75 Line #: 18 Code: C
Original Comment #: 22

Comment: Under this alternative, the Nevada Test Site would be utilized for the final disposal of processed silos contents. If at some later time the processed silo material is not be allowed into Nevada, are there alternative sites for disposal, such as Envirocare, or would on-site disposal or long-term interim storage of the processed silo material be necessary?

Response: Because treatability studies (for cementation and vitrification) have demonstrated that the treated material would meet the NTS waste acceptance criteria no delays in obtaining approval are anticipated. No alternate facilities have been identified which can accept Subunit A waste. [Note: The radionuclide concentration of Subunit A and B materials are higher than the limits for disposal at a typical commercial facility.] In the unlikely event that NTS closes its facility to receipt of additional waste, then the next highest rated alternative will be utilized.

Action: No action.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.4.2 Page #: 4-157 Line #: 31 Code: C
Original Comment #: 23

Comment: Please explain how backfilling will be performed, whether clean soil of standard depth will be applied or a return to original grade following excavation.

Response: Agreed.

Action: An explanation of how backfilling would be performed will be included in Section 4.4.2 of the FS.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.4.2 Page #: 4-158 Table #: 4-10 Code: M
Original Comment #: 24

Comment: In Table 4-10, Proposed Remediation Levels in Soils - Radionuclides, notes "(a)" and "(c)" indicate that the risk to the on-property farmer was calculated assuming that the placement of six inches of clean fill precludes direct radiation (a only), incidental ingestion (a and c), and dermal contact (a only). Six inches of fill is a rather thin considering a farmer disturbs soil depths of several feet during normal crop work; NUREG-0706, the FGEIS on uranium milling, recommends a minimum cover thickness of 10 feet. Unless this depth of clean backfill will be used, it seems inappropriate to rule out direct radiation, incidental ingestion, and dermal contact pathways for the on-property farmer.

Response: Agreed.

Action: Section D.3.5, "Long-Term Risk Assessment," will be revised to include the calculation of potential risks to the on-property farmer from exposure to contaminants present in the soil.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.4.2 Page #: 4-158 Table #: 4-10 Code: M
Original Comment #: 25

Comment: The Proposed Remediation Levels in Soils (radionuclides) table fails to list remediation levels for the actinium series radionuclides (uranium-235, actinium-227), thorium-230, and uranium-234. These radionuclides are known constituents of the K-65 residues as well as contaminants of surrounding soils; please propose remediation levels that take into account all constituents of the K-65 materials.

Response: Since all silo contents will be removed and these radionuclides were not present in the surface soils or sub surface soils at levels to be of concern (Baseline Risk Assessment), the radionuclides were not considered.

Action: No action

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.4.2 Page #: 4-158 Table #: 4-10 Code: C

Original Comment #: 26

Comment: Considering the on-property farmer scenario and the fact that some exposure pathways were left out to develop the risk numbers (direct radiation, incidental ingestion, dermal contact), the proposed remediation levels do not seem adequately protective for the on-property farmer. Also, since ultimate future use of the land has not yet been determined, it would be appropriate to include risk values for commercial/industrial and residential scenarios.

Response: It is agreed that the remediation goals were not protective of the on-property farmer. The proposed future use has been re-explored and is discussed in Attachment D.II where continued institutional control is justified.

Action: The text and tables were revised and moved to Section 2.2.2. Also see Attachment D.II and response to comment #24.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.4.2 Page #: 4-160 Line #: 3 Code: C

Original Comment #: 27

Comment: There is not enough information presented to support the proposed radionuclide remediation levels listed in Table 5-2. The total risk to the on-property farmer exceeds 1.5×10^3 with the given information. The proposed remediation levels should either be reevaluated so that a total risk of less than 10^4 is attained, or looked upon as interim levels pending the final site-wide (OU5) remediation. There is not enough information presented to support the proposed radionuclide remediation levels listed in Table 5-2. Using default residential soil scenario factors, the proposed remediation levels for radium-226, radium-228, thorium-228, and uranium-228 individually pose risks that exceed 1×10^4 with a total risk of approximately 1×10^3 . The proposed remediation levels should either be reevaluated so that an acceptable risk level is attained, or looked upon as interim levels pending the final site-wide (OU5) remediation.

Response: U.S. EPA has indicated that the document should be modified to either show protection of the resident farmer or designate that the clean up goals are proposed. It is DOE's opinion that it is not technically feasible to protect the on-site farmer and that the OU5 FS will provide the justification for that determination. The OU5 FS is the best document to present this information because it will contain the vast majority of the individual site risk. It is important to remember that Proposed Remediation Levels (PRLs) are only proposed clean up levels. Final clean up levels are not established until the Record of Decision (ROD).

Action: In order to ensure that it is clear to the readers that these PRLs are proposed levels for soil cleanup that may be modified based on public input including input on land use and technical information that will be provided in the CRU4 Feasibility Study (FS), DOE will designate the remediation levels throughout the FS as Proposed Remediation Levels. The purpose of this designation will be explained in the appropriate places in the CRU4 FS and Proposed Plan. The following language is

an example of how this issue will be addressed.

PROPOSED REMEDIATION LEVELS Cleanup goals for soil from OU4 have been termed proposed to call attention to the fact that additional information on soil cleanup levels will be presented with the OU5 FS. OU5 contains the major portion of site-wide soils to be addressed for remediation and; therefore, is currently evaluating the technologies and alternatives potentially applicable to soils. To avoid the selection of site-wide final soil cleanup levels based upon the OU4 volume of soil which represents less than one percent of the total volume site-wide, the PRLs final goals reflect preliminary technology considerations and a future land use and RME consistent with the SWCR and the CRARE. In the absence of continued federal ownership and control of the OU4 site, it has been determined that it is not feasible to protect an on property (OU4) resident farmer. A continued federal ownership land use which restricts the future use of the (OU4) site for residential farming will be protective of an RME expanded trespasser (as defined in the OU4 FS). However, OU5 will provide the detailed input on the feasibility of meeting other soil cleanup level for the FEMP site. Further, additional input is expected from the Fernald Advisory Task Force and the public on future land use and cleanup levels. Therefore, the cleanup levels for OU4 soils are subject to change based upon information provided in the OU5 FS and from public input on land use and are Proposed Levels pending this input or until the Record of Decision (ROD) for OU4 is signed.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.1.1

Page #: 5-7

Table #: 5-4

Code: C

Original Comment #: 28

Comment: For Alternative 3B, the transport environmental impact has a stated ILCR of 9×10^{-2} along the route to NTS, please reexamine.

Response: Agreed.

Action: Table 5-4 will be updated to reflect the correct transportation ILCR values for each alternative as calculated and presented in Appendix D.

Section 3

U.S. EPA Region V PP Comments

By James Saric

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code: M
Original Comment #: General Comment # 1

Comment: The Proposed Plan (PP) should be a short and concise summary of the remedial investigation and feasibility study (RI/FS). It is not meant to be a substitute for the RI/FS. The operable unit (OU) 4 PP is too long and therefore, should be abbreviated.

Response: The length of Operable Unit 4 Proposed Plan will be reduced by approximately 20 pages. Areas to be shortened will be Site Description and History, Alternative Description, Risk Presentation, and Evaluation of Alternatives.

Action: Revise per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.0 Page #: NA Line #: NA Code: M
Original Comment #: General Comment # 2

Comment: This section provides introductory information on the PP. This section is not formatted in accordance with the U.S. Environmental Protection Agency's (U.S. EPA) "Guidance on Preparing Superfund Decision Documents," July 1989, and does not contain specific information required by the guidance. The purpose of the PP and a reference to Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) should be given in the opening paragraphs of Section 1.0 (see specific comments on Section 1).

Response: Agreed. Suggested changes will be made.

Action: The purpose of the Proposed Plan and a reference to Section 117(a) of CERCLA will be given in the opening paragraphs of Section 1.0. The format of the PP has been reviewed against EPA guidance and the appropriate format changes will be made.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.0 Page #: NA Line #: NA Code:
Original Comment #: General Comment # 3

Comment: This section presents the Fernald Environmental Management Project (FEMP) site background. Much of the information presented in this section should be deleted because it is not relevant to the decision-making process. At the same time, information on waste disposal and generation, contaminants of concern, contained media, and extent of contamination were omitted. The unnecessary information should be deleted and the omitted information should be added in accordance with U.S. EPA guidance (see specific comments on Section 2).

Response: It is agreed that unnecessary information on site background is provided, and information on waste disposal and generation, contaminants of concern, contaminated media, and extent of contamination was not provided in this section.

Action: The text will be modified to omit the extraneous information and to include the required information (to be moved from Section 4.1 to Section 2, per USEPA Proposed Plan Specific Comment #9).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 and 6 Page #: NA Line #: NA Code:
Original Comment #: General Comment # 4

Comment: Section 5 describes the alternatives evaluated during the detailed analysis of alternatives

and Section 6 summarizes the evaluation of the alternatives presented in detail in the OU4 FS. Changes to the OU4 FS from incorporation of U.S. EPA comments will necessitate corresponding changes to the PP. The PP should be revised to incorporate any changes made to the OU4 FS as a result of U.S. EPA comments (also see specific comments on Sections 5 and 6).

Response: Agreed.

Action: The Proposed Plan will be revised to incorporate any changes made to the OU4 FS as a result of U.S. EPA comments.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6 Page #: NA Line #: NA Code:
Original Comment #: General Comment # 5

Comment: This section presents the preferred alternative, describes and discusses the nine evaluation criteria, and summarizes the comparative analysis of alternatives presented in detail on the OU4 FS. This section is not formatted correctly and presents information that is much too detailed for the purpose of the PP. This section should be revised in accordance with the specific comments given on Section 6. These revisions are necessary to make the PP conform more closely with U.S. EPA guidance and to shorten the PP.

Response: Agreed.

Action: This section will be revised.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.3.1 Page #: 89 to 93 Line #: NA Code:
Original Comment #: General Comment # 6

Comment: This section discusses considerations for FEMP site-wide waste management integration. This section changes the approach for the final disposal of Subunit C wastes from methods discussed in detail in the OU4 FS, This is not appropriate because it does not develop rationale well enough for the public to comment on the approach and it makes the majority of comments on the OU4 FS which discusses Subunit C irrelevant. A different alternative describing the approach of storing Subunit C wastes in interim storage and addressing these wastes under Operable Units 3 and 5 (OU3 and OU5) should be added to the OU4 FS and then summarized in this PP.

Response: See response to U.S. EPA FS General Comment #10.

Action: The text in the OU4 FS will be revised consistent with the approach adopted by the OU4 PP.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.3.2 Page #: NA Line #: NA Code:
Original Comment #: General Comment # 7

Comment: This section describes the preferred remedial alternative for OU4. Based on the uncertainty associated with vitrification, U.S. DOE should consider proposing a contingent remedy for the Subunits A and B. The contingent remedy would be implemented if the innovative vitrification technology does not work. The contingent remedy could be any one of the protective and applicable or relevant and appropriate requirements (ARAR)-compliant remedies evaluated in the detailed analysis of alternatives. Such an approach would eliminate the requirement for a Record of Decision amendment if vitrification cannot be used to treat the waste. U.S. EPA advocates this approach if an innovative and unproven technology is proposed as the preferred

alternative and has provided guidance on how to propose and document a contingent remedy in the PP.

Response: Vitrification (glassmaking) is not an innovative technology; however, the application of the vitrification technology to treatment of hazardous and radioactive waste is innovative. For the Operable Unit 4 Subunits A and B materials, a contingent alternative is not considered necessary in light of the significant quantity of available process knowledge information which has been accumulated from the extensive Operable Unit 4 vitrification treatability studies already completed.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.0 Page #: 2 and 3 Line #: 33 to 34 and 1 to 15 Code:
Original Comment #: Specific Comment 1

Comment: This section provides introductory information on the PP. The information on the above-referenced pages and lines should be moved to directly follow the first full lines should be moved to directly follow the first full paragraph of the PP. In accordance with U.S. EPA's, "Guidance on Preparing Superfund Decision Documents," July 1989, the introduction of the PP should describe the purpose of the PP. A statement should be added explaining that this PP is not a substitute for the information contained in the OU4 RI/FS. In addition, a reference to Section 117(a) of CERCLA should be added to this initial discussion.

Response: Agreed.

Action: The purpose of the PP will be moved to directly follow the first full paragraph of the PP. Also, will add "DOE is issuing this PP as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) to this initial discussion of Section 1.0.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.0 Page #: 2 Line #: 20 to 27 Code:
Original Comment #: Specific Comment 2

Comment: This paragraph describes the importance of public comment in the CERCLA and National Environmental Policy Act (NEPA) processes. This information should be moved to directly follow the purpose of the PP (see Specific Comment No.1). The explanation of CERCLA and NEPA integration should follow the introductory information described in this specific comment and in Specific Comment No. 1.

Response: Agreed.

Action: Information in Section 1.0 regarding the importance of the public comment period and NEPA/CERCLA integration will be transferred to the PP directly following details regarding the purpose of the PP.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.0 Page #: 4 Line #: 9 to 18 Code:
Original Comment #: Specific Comment 3

Comment: This paragraph describes the importance of public comment in the decision making process. This paragraph should be moved to follow the information referenced in Specific Comment No. 2. This change should be made to make the PP conform more closely with U.S. EPA guidance.

Response: Agreed.

Action: The paragraph that describes the importance of public comment in the decision making process will be moved to follow the information referenced in Specific Comment #2.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.0 Page #: NA Line #: NA Code:
Original Comment #: Specific Comment 4

Comment: The remainder of the information contained in Section 1.0 of the PP which is not referenced in Specific Comments No. 1 through 3, is not necessary and should be deleted with one exception. The information provided on Page 4, Lines 19 to 32, regarding the content of the PP, should remain in the introductory section. The preferred alternative does not need to be introduced in the introductory section, nor does the introductory section need to describe the site problems or risks. This information is presented in later sections of the PP. These changes are necessary to shorten the PP and to make it conform more closely with U.S. EPA guidance.

Response: Agreed.

Action: Text will be revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1 Page #: 5 and 6 Line #: 1 to 30 and 1 to 4 Code:
Original Comment #: Specific Comment 5

Comment: This information describes FEMP's production activities. Most of the information contained in this section should be deleted. The information should be summarized in one or two paragraphs. This change is necessary to shorten the PP in order to make it conform more closely with U.S. EPA guidance.

Response: It is agreed that extraneous information on FEMP's production activities should be deleted.

Action: The text will be modified to omit the extraneous information and to summarize FEMP production activity information in one or two paragraphs.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1.2 Page #: 7 Line #: All Code:
Original Comment #: Specific Comment 6

Comment: This information describes the operating history of FEMP. Most of the information in this section should be deleted because it is unnecessary. For example, the rate of uranium production in the various years of operation is secondary to the issue at hand. This section should be summarized in one paragraph. This change is necessary to shorten the PP and to present information important to the decision-making process, in accordance with U.S. EPA guidance.

Response: It is agreed that the operating history presented of the FEMP is too long.

Action: The text will be modified to omit the extraneous information and to summarize FEMP operating history in one or two paragraphs.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2 Page #: 7 and 8 Line #: All Code:
Original Comment #: Specific Comment 7

Comment: This section describes the FEMP site. Essential information on waste generation and disposal that has taken place at FEMP and especially at OU4 is not provided, nor is information on the major contaminants and the extent of contamination. Brief and

summary information on waste generation and disposal, major contaminants of concern, and the extent of contamination should be added to this section in accordance with U.S. EPA guidance.

Response: It is agreed that essential information on waste generation and disposal is not provided.
Action: The text will be modified to discuss information on the major contaminants of concern, waste generation and disposal, and the extent of contamination.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2 Page #: 7 and 8 Line #: NA Code:
Original Comment #: Specific Comment 8

Comment: This section describes the scope and role of OU4 in the overall remedial strategy for FEMP. Although this section describes the scope and role of OU4, it does not identify the principal threats associated with OU4. Identification of the principal threats is necessary to establish the basis for the finding made in the Record of Decision as to whether or not the selected remedy satisfies the statutory preference for treatment. This section should identify the principal threats associated with OU4.

Response: It is agreed that the principal threats associated with Operable Unit 4 are not provided in this section.

Action: The text will be modified to discuss the principal threat information in this section, as discussed in Proposed Plan USEPA Specific Comment #9.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1 Page #: 17 to 19 Line #: All Code:
Original Comment #: Specific Comment 9

Comment: This section describes the characteristics of the OU4 wastes. The information presented in this section should be briefly summarized and moved to Section 2 (see specific Comment No. 7). This change is necessary to make the PP more closely conform to U.S. EPA guidance.

Response: It is agreed that the characteristics of Operable Unit 4 wastes are not properly presented.

Action: The text on the characteristics of Operable Unit 4 wastes presented in Section 4.1 will be summarized and moved to Section 2.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4 and 4.5 Page #: 41 Line #: NA Code:
Original Comment #: Specific Comment 10

Comment: These sections summarize the baseline human health and ecological risk assessments. U.S. EPA guidance requires that the following statement conclude the summary of the baseline risk assessments:

"Actual or threatened releases of hazardous substances from the site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or the environment."

This statement needs to only appear once at the end of Section 4.0. This statement should be added to the conclusion of Section 4.5 on Page 41.

Response: It is agreed that a conclusion statement of the baseline human health and ecological risk assessments should be provided in Section 4.

Action: The text in Section 4.5 will be modified to include the conclusion statement provided by

USEPA.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.0 Page #: 43 Line #: NA Code:
Original Comment #: Specific Comment 11

Comment: This table summarizes the alternatives for Subunits A, B, and C. In accordance with General Comment No. 1 on the OU4 FS, additional alternatives should be added to Subunits A and B which rely on containment with little or no treatment.

Response: Pursuant to the U.S. EPA/OEPA/DOE teleconference conducted on Monday, November 15, 1993, an Alternative 4B, "Removal and On-Property Disposal," will be added to this Table 5-1 in accordance with General Comment #1 on the OU4 FS.

Action: Revise per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.1 -5.4 Page #: 44 to 64 Line #: Na Code:
Original Comment #: Specific Comment 12

Comment: These sections describe the alternatives evaluated in the detailed analysis of alternatives. These sections provide more detail than is required according to U.S. EPA guidance. Appendix A of the U.S. EPA's "Guidance on Preparing Superfund Decision Documents," July 1989, provides examples of the degree of detail necessary for these sections. In addition, the descriptions of the alternatives do not identify the major ARARs associated with each option as required by U.S. EPA guidance. The narrative descriptions should be reduced in length and the major ARARs for each alternative should be identified. U.S. EPA strongly suggests that the description of the alternatives be presented in the format of above-referenced Appendix A. This would involve presenting a summary of costs and the time necessary to implement each alternative below the title of the alternative and above the narrative.

Response: Agreed. The narrative description will be reduced in length and the major ARARs for each alternative will be identified. In addition, costs and time necessary to implement each alternative will be moved to below the title and above the narrative.

Action: Revise per comment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.1 Page #: 65 and 66 Line #: All Code:
Original Comment #: Specific Comment 13

Comment: This section describes the nine evaluation criteria and discusses how they are used in the Superfund program. In accordance with U.S. EPA guidance, this section should be the second subsection in Section 6. This section should be moved and renamed to become Subsection 6.2 in Section 6.

Response: Agreed. This Section 6.1 will be moved and renamed to become Subsection 6.2 in Section 6 of the PP.

Action: Revise per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.1 Page #: 66 Line #: 18 to 25 Code:
Original Comment #: Specific Comment 14

Comment: This paragraph describes the modifying criteria, state and community acceptance. The text states that the modifying criteria will be addressed in the Record of Decision. In

accordance with U.S. EPA guidance, state acceptance and community acceptance should be addressed in the PP based on information that is available at the time (see General Comment No. 6 on the OU4 FS). Sections discussing these criteria should be added.

Response: The two modifying criteria, state acceptance and community acceptance, are unknown for consideration in the detailed analysis of alternatives at this time. Because formal state and community comments will not be received until after the Feasibility Study Report and Proposed Plan for Remedial Actions at Operable Unit 4 has been issued for review, these modifying criteria will be addressed in the responsiveness summary and Record of Decision that will be prepared following the public review period.

Action: Two sections will be added to each subunit alternative in the Proposed Plan; which will state that because formal comments will not be received until after the public review, these criteria will be addressed in the responsiveness summary and included in the Record of Decision for Operable Unit 4.

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: 6.2 **Page #:** 66 to 68 **Line #:** All **Code:**
Original Comment #: Specific Comment 15

Comment: This section summarizes the comparative analysis of alternatives presented in detail in the OU4 FS. In accordance with U.S. EPA guidance, this subsection should be the third subsection in Section 6. Subsection 6.2 should be moved to become Subsection 6.3 in Section 6 of the PP.

Response: Agreed. This Subsection 6.2 will be moved and become Subsection 6.3 in Section 6 of the PP.

Action: Revise per response.

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: 6.2 **Page #:** 66 to 88 **Line #:** NA **Code:**
Original Comment #: Specific Comment 16

Comment: This section summarizes the comparative analysis of alternatives presented in detail in the OU4 FS. The information in this section is too detailed for purposes of the PP. According to the U.S. EPA guidance, "The discussion in this section of the PP should develop initial rationale for the preferred alternative; however, it need not provide a comprehensive analysis of each alternative in relation to each of the nine criteria ..." This section should be revised to provide rationale for the preferred alternative by profiling it against the nine criteria and highlighting how the rationale compares to the other alternatives by comparing major advantages and disadvantages. Appendix A of U.S. EPA's guidance provides a good example of the level of detail necessary in this section.

Response: It is agreed that the comparative analysis of alternatives presented in the Proposed Plan is too detailed.

Action: The text will be modified to present a summary evaluation of alternatives in relation to each of the nine criteria.

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: 6.2.1.1-6.2.3.1 **Page #:** NA **Line #:** NA **Code:**
Original Comment #: Specific Comment 17

Comment: These sections describe how the various subunit alternatives provide overall protection of human health and the environment. These sections also describe how the alternatives

comply with applicable or relevant and appropriate requirements (ARAR). Summary statements in these sections erroneously state that the preferred alternative provides a greater degree of overall protectiveness. Overall protectiveness is a threshold criterion and cannot be measured in degrees because an alternative either does or does not provide overall protection. Statements referring to degrees of protectiveness should be corrected.

The text lists and discusses nearly all the ARARs for each alternative. This degree of detail is not necessary. Key alternatives should be identified and very briefly discussed; and the issue of whether any ARAR waivers would be required should be discussed. These changes should be made to the ARARs discussions in these sections

Response: It is agreed that the overall protectiveness is a threshold criterion and cannot be measured in degrees and the ARARs discussion for each alternative is too detailed.

Action: The text will be modified to correct statements referring to degrees of protectiveness and briefly discuss ARARs for key alternatives only.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.3 Page #: 88 and 89 Line #: All Code:
Original Comment #: Specific Comment 18

Comment: This section identifies the preferred alternative. In accordance with U.S. EPA guidance, this section should be the first subsection in Section 6. This section should be moved and renamed to become Subsection 6.1 in Section 6.

Response: Agreed. This Subsection 6.3 will be moved and become Subsection 6.1 in Section 6 of the PP.

Action: Revise per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.3.1 Page #: 89 to 93 Line #: NA Code:
Original Comment #: Specific Comment 19

Comment: See General Comment No. 6 on the PP.

Response: See response to U.S. EPA PP General Comment Number 6.

Action: The text in the PP will be revised consistent with the approach adopted by the FS.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.3.2 Page #: NA Line #: NA Code:
Original Comment #: Specific Comment # 20

Comment: See General Comment No. 7 on the PP.

Response: See response to U.S. EPA PP General Comment Number 7.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.3.2 Page #: 96 Line #: 23 Code:
Original Comment #: Specific Comment # 21

Comment: This paragraph discusses the statutory findings required for remedy selection. The text states that the preferred alternative will "comply with all regulatory requirements." The text should be revised to state that the preferred alternative will "comply with ARARs." This change is necessary to conform with U.S. EPA guidance. In addition, this paragraph should reference CERCLA Section 121.

Response: Agreed.
Action: The text will be revised to state that the preferred alternative will "comply with ARARs."
The text "Comply with all regulatory requirements" will be deleted.

Section 4

U.S. EPA Region V Radiation Section PP Comments

Comments on the "Proposed Plan for Remedial Actions at Operable Unit 4"
U.S. EPA Region 5 Radiation Section
October 1993

Commenting Organization: U.S. EPA, Radiation Section
Section #: 3.2 Page #: 15 Bullet #: 2 (of page) Code: C
Original Comment #: 1

Comment: The direct-penetrating radiation fields in the vicinity of the silos are probably due to the silos themselves, please revise.

Response: Agreed.

Action: Text will be revised to indicate that this is due to the silos.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 3.2 Page #: 15 Para. #: 3 Code: C
Original Comment #: 2

Comment: It is stated here that Silo 3 has a significantly lower radon emanation rate than Silos 1 and 2. However, according to the Remedial Investigation Report for Operable Unit 4, the Silo 3 annual radon release rate and emission flux is greater than that of Silo 1; a radon emission flux of 108 pCi/m²-sec is not insignificant.

Response: Silo 3 does have a significantly lower emanation rate than Silos 1 and 2. Review of the Silo 3 radon flux calculations presented in the Remedial Investigation Report revealed that the Silo 3 headspace volume was overestimated by 4.6 times. This resulted in the use of a much higher estimated breathing rate to calculate radon for the Silo 3 (radon flux is assumed to be a function of the breathing rate induced by fluctuations in ambient temperature and pressure which causes headspace gas to expelled through the silo dome). Because of this lower breathing rate, the estimated radon flux for Silo 3 is approximately 20 pCi/m²-sec.

Although this is a significant reduction in the estimated baseline radon release from Silo 3, the overall impact on the reasonable maximum exposure (RME) is very small under the current source-term scenario since Silo 2 dominates all other Operable Unit 4 sources. This reduction would result in a six percent decrease in the radon concentration at the off-property RME receptor exposure point under the current source-term scenario and a one percent reduction at the on-property RME receptor exposure point. The incremental lifetime cancer risk (ILCR) from radon via the air pathway would decrease proportionally. When viewed in the context of all constituents of concern, the change in radon source term is even less significant since radon contributes less than 0.1 percent of the on-property resident farmer (RME) radiological ILCR under the current source-term scenario. For the off property receptor (farmer), radon dominates all radiological risk, but is less than 0.1 percent of the total ILCR from all constituents of concern under the current source-term scenario.

Action: None required.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.2 Page #: 21 Para. #: 1 Code: C
Original Comment #: 3

Comment: Rather than merely saying that radon is a radioactive element, it would be appropriate to add that radon is a colorless, odor-less, radioactive noble gas that further decays into a series of radioactive progeny.

Response: Agreed. Suggested changes will be made.

Action: Will delete "Radon is a radioactive element" and add "Radon is a colorless, odorless, radioactive

-5043

noble gas that further decays into a series of radioactive progeny" to PP Section 4.2.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2 Page #: 44 Line #: N/A Code: C

Original Comment #: 4

Comment: Please explain the status of previously discussed alternatives that involved in-situ containment and chemical extraction of the Silo 1, 2, and 3 residues.

Response: The alternatives that involved in-site containment and chemical extraction were screened out (See FS Chapter 3 for more information). According to EPA guidance, only alternatives that are carried through the screening into detailed analysis should be discussed in this section.

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.1 Page #: 45 Para. #: 4 (bottom) Code: C

Original Comment #: 5

Comment: It would be useful if an illustration of the material removal work platform was included in this document.

Response: For the purpose of brief and to shorten the Proposed Plan, an illustration of the material removal work platform will not be included in the Proposed Plan. The reader may refer to the FS for additional details.

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.1 Page #: 47 Para. #: 1 Code: C

Original Comment #: 6

Comment: It is stated that the molten glass would be poured directly into containers, but the container type is not stated. Also, please state why the glass product is being poured directly into containers rather formed into beads (marbles) as discussed in the past.

Response: The containers for the vitrified product are DOT specification 7A Type A containers.

In regard to the waste form, it is evident from treatability studies that the safest waste form generated from vitrification which offers the lowest radon emanation rate, is the monolith. However, additional factors related to the vitrified waste form are being investigated through pilot plant projects. These factors include the use of gems as a potential final waste form, which could facilitate waste handling and remelt of off-specification batches. For the purposes of cost estimating and completion of the OU4 FS, it was decided that the monolithic form would be the representative form of the vitrified product.

Action: The text will be revised per the response.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.1 Page #: 47 Para. #: 2 Code: C

Original Comment #: 7

Comment: Please explain whether the radon treatment system (RTS) discussed here is the same as the RTS already in place in operable unit 4.

Response: The radon treatment system (RTS) discussed in Section 5.2.1 is the RTS to be used in support of remediation. It is not the existing RTS. For the sake of brevity and to shorten the Proposed Plan, the RTS discussion will be removed. The reader may refer to the FS for additional details.

Action: Delete RTS discussion paragraph.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.1 Page #: 48 Line #: 6 Code: E

Original Comment #: 8

Comment: Five (5) meters is equal to 16.4 feet, not 15 feet as stated.

Response: Agreed. Five meters is equal to 16.4 feet. For the sake of brevity and to shorten the PP, Section 5 will be revised and this information will be deleted.

Action: Revise per response.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.1 Page #: 48 Para. #: 4 Code: C

Original Comment #: 9

Comment: Would this vault and multimedia cap allow managed retrieval without a major excavation effort; would entry points into the vault (through the cap) be clearly marked?

Response: The proposed vault and multimedia cap design will not allow retrieval once the capping system is completed and no entry points into the vault will be designed or constructed.

Action: The text will be revised to state that the disposal vault is nonretrievable disposal.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.2 Page #: 49 Para. #: 3 (bottom) Code: C

Original Comment #: 10

Comment: Please explain what kind of disposal boxes would be used for containing and curing the cement-slurried K-65 residues.

Response: The containers used for the cement slurried product would be DOT specification 7A Type A containers.

Action: The text will be modified to identify the container type used.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.2.3 Page #: 51 Para. #: 1 Code: C

Original Comment #: 11

Comment: Under this alternative, the Nevada Test Site would be used for final disposal of processed Silo 1 and 2 contents. If at some later time the processed material would not be allowed into Nevada, are there alternative sites for disposal, such as Envirocare, or would on-site disposal be a necessity?

Response: Because treatability studies (for cementation and vitrification) have demonstrated that the treated material would meet the NTS waste acceptance criteria no delays in obtaining approval are anticipated. In addition, no alternate facilities have been identified which can accept Subunit A waste. [Note: The radionuclide concentration of Subunits A and B materials are higher than the limits for disposal at Envirocare.] In the unlikely event that NTS closes its facility to receipt of additional waste, then the next highest rated alternative will be utilized.

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.3.3 Page #: 55 Para. #: 5 (bottom) Code: C

Original Comment #: 12

Comment: Under this alternative, the Nevada Test Site would be used for final disposal of processed Silo 3 contents. If at some later time the processed material would not be allowed into Nevada, are there alternative sites for disposal of thorium wastes, such as Envirocare, or would on-site disposal be necessary?

Response: Because treatability studies (for cementation and vitrification) have demonstrated that the treated

material would meet the NTS waste acceptance criteria no delays in obtaining approval are anticipated. In addition, no alternate facilities have been identified which can accept Subunits A and B waste. [Note: The radionuclide concentration of Subunits A and B materials are higher than the limits for disposal at Envirocare.] In the unlikely event that NTS closes its facility to receipt of additional waste, then the next highest rated alternative will be utilized.

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.4.1

Page #: 58

Para. #: 3

Code: C

Original Comment #: 13

Comment: This paragraph discussing silo demolition initially states, relative to the other three silos, that the Silo 4 dome will be dismantled first, later stating that the Silo 4 dome will be dismantled last; which is it?

Response: The Silo 4 dome will be dismantled first.

Action: Text will be revised.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.4.1

Page #: 59

Para. #: 3

Code: M

Original Comment #: 14

Comment: There is not enough information presented to support the proposed radionuclide remediation levels listed in Table 5-2. Using default residential soil scenario factors, the proposed remediation levels for radium-226, radium-228, thorium-228, and uranium-228 individually pose risks that exceed 1×10^{-4} with a total risk of approximately 1×10^3 . The proposed remediation levels should either be reevaluated so that an acceptable risk level is attained, or looked upon as interim levels pending the final site-wide (OU5) remediation.

Response: U.S. EPA has indicated that the document should be modified to either show protection of the resident farmer or designate that the clean up goals are proposed. It is DOE's opinion that it is not technically feasible to protect the on-site farmer and that the OU5 FS will provide the justification for that determination. The OU5 FS is the best document to present this information because it will contain the vast majority of the individual site risk. It is important to remember that Proposed Remediation Levels are only proposed clean up levels. Final clean up levels are not established until the Record of Decision (ROD).

Action: In order to ensure that it is clear to the readers that these PRLs are proposed levels for soil cleanup that may be modified based on public input including input on land use and technical information that will be provided in the CRU4 Feasibility study (FS), DOE will designate the remediation levels throughout the FS as Proposed Remediation Levels. The purpose of this designation will be explained in the appropriate places in the CRU4 FS and Proposed Plan. The following language is an example of how this issue will be addressed.

PROPOSED REMEDIATION LEVELS Cleanup goals for soil from OU4 have been termed proposed to call attention to the fact that additional information on soil cleanup levels will be presented with the OU5 FS. OU5 contains the major portion of site-wide soils to be addressed for remediation and; therefore, is currently evaluating the technologies and alternatives potentially applicable to soils. To avoid the selection of site-wide final soil cleanup levels based upon the OU4 volume of soil which represents less than one percent of the total volume site-wide, the PRLs reflect preliminary technology considerations and a future land use and RME consistent with the SWCR and the CRARE. In the absence of continued federal ownership and control of the OU4 site, it has been determined that it is not feasible to protect an on-property (OU4) resident farmer. A continued

federal ownership land use which restricts the future use of the (OU4) site for residential farming will be protective of an RME expanded trespasser (as defined in the OU4 FS). However, OU5 will provide the detailed input on the feasibility of meeting other soil cleanup level for the FEMP site. Further, additional input is expected from the Fernald Advisory Task Force and the public on future land use and cleanup levels. Therefore, the cleanup levels for OU4 soils are subject to change based upon information provided in the OU5 FS and from public input on land use and are Proposed Levels pending this input or until the Record of Decision (ROD) for OU5 is signed.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 5.4.1 Page #: 59 Line #: 27 Code: M
Original Comment #: 15

Comment: How can it be said that the proposed remediation levels are considered protective of all reasonable future receptors, including hypothetical on-property residents, when the 60 Pci/g level for uranium-238 was derived assuming the recreational user, as stated in Section 2.2.2.3 of the Feasibility Study for OU4 (FS); please explain. The FS states a proposed remediation goal of 0.47 Pci/g for U-238 in soil when considering the on-site resident farmer scenario.

Response: Agreed.

Action: The tables and text have been revised. The on-property farmer is no longer portrayed as being protected.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 5.4.1 Page #: 60 Table #: 5-2 Code: M
Original Comment #: 16

Comment: The Proposed Remediation Levels in Soils table fails to list remediation levels for the actinium series radionuclides (uranium-235, actinium-227), thorium-230, and uranium-234. These radionuclides are known constituents of the K-65 residues as well as contaminants of surrounding soils; please propose remediation levels that take into account all constituents of the K-65 materials.

Response: The PRGs and PRLs are based on berm, surface soils, and subsurface soils. All waste constituents will be removed, treated, and placed for disposal. These constituents referenced in the comment were not found to cause an excess risk due to soil exposure. Therefore, there is no need to calculate PRGs or PRLs for these compounds.

Action: No action.

Commenting Organization: U.S. EPA, Radiation Section
Section #: 5.4.1 Page #: 59 Para. #: 4 Code: M
Original Comment #: 17

Comment: It is stated that following excavation, affected areas will be returned to original grade with the placement of clean backfill and seeded. Being that this contaminated soil excavation will not be the final excavation conducted in OU4, please explain the purpose temporarily backfilling with clean soil, an action which may only increase the volume of waste generated during the final OU5 remedial action. It would seem appropriate to only seed, with very minimal or no additional soil cover, the excavated areas prior to a final cleanup level decision.

Response: Before the Operable Unit 4 remedial actions are implemented in the field, the Operable Unit 5 Feasibility Study Report would have already been completed. The Operable Unit 5 Feasibility Study Report will reexamine the final remediation levels established for Operable Unit 4 soils and would determine if the Operable Unit 4 final remediation levels for soil are still protective on a site-wide basis. If necessary, the Operable Unit 5 ROD would adjust the Operable Unit 4 final remediation levels for soils downward. The current schedule for these activities would preclude reexcavation of

048
the Operable Unit 4 areas of backfilled excavation.
Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 5.4.3 Page #: 63 Para. #: 1 Code: C

Original Comment #: 18

Comment: This stated alternative features off-site disposal at a facility near Clive, Utah, yet this facility is not yet fully licensed to receive by-products materials such as those in Subunit C. Please state what licenses still need to be obtained, the timeframe by which this is expected to occur, and whether this is compatible with scheduled activities under this alternative. Are there any disposal

Response: The off-site disposal facility near Clive, Utah, received its license to accept for disposal, 11(e)2 by-product material the week of November 15, 1993.

Action: Text will be revised to show that the disposal facility is authorized to receive by-product material.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 6.2.1.1 Page #: 71 Para. #: 2 Code: C

Original Comment #: 19

Comment: It is stated that the vitrified or cement stabilized residues would resist leaching; please explain which of the two technologies offer greater leaching resistance for the Silos 1 and 2 contaminants.

Response: The Proposed Plan states that "Vitrified or cement stabilized residues resist leaching." It does not differentiate between either process option as being more protective. This is a reasonable statement for the level of detail normally found in the Proposed Plan. If a more detailed explanation of leachability results is desired, please see the recently developed comparative text of treatability process options contained in FS Section C.4.0.

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 6.2.1.1 Page #: 73 Para. #: 2 Code: C

Original Comment #: 20

Comment: It is stated that all surface water releases via the vault leachate collection/detection system would be directed to the FEMP Advanced Wastewater Treatment Facility (AWWT) for treatment and released. This feature assumes the continued operation of the FEMP AWWT, probably beyond the 30 or so years required for site remediation, an active operation that is more demanding than simply placing deed restrictions and boundary markers on the vault area. Please elaborate on the intended operational life of the AWWT and where else vault-generated leachate may be treated in the absence of the AWWT.

Response: See response to U.S.EPA FS specific comment #86. Leachate would not be collected after the 30 year period required for site remediation, therefore, the AWWT facility is not required to support the LC/DS.

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 6.2.1.2 Page #: 75 Para. #: 5 (bottom) Code: C

Original Comment #: 21

Comment: It is stated that vitrification would be effective in reducing radon emanation and in minimizing the leaching of constituents, while cement stabilization would be effective in preventing the movement of constituents from the stabilized form. Please explain the effectiveness of cement stabilization in controlling radon emanation and minimizing the leaching of constituents. Also, present a

comparison of both technologies and their ability to control radon emanation and leaching.

Response: The Proposed Plan contains the appropriate level of detail normally found in this type of document. If a more detailed explanation of radon emanation and general leachability results is desired, please see the recently developed comparative text on treatability process options contained in FS Section C.4.0. Also, if more detailed information is required on radon emanation and leaching from cement stabilized waste, see Appendix H.

Action: No Action.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 6.2.1.2 Page #: 75 Para. #: 5 (bottom) Code: C

Original Comment #: 22

Comment: Please elaborate on the "not-irreversible" nature of the cement stabilization process and the consequences that may effect the long-term durability of cement-stabilized forms.

Response: The cement stabilization process is an irreversible process. The long-term durability of this process is controlled by an adequate mix design and a high level of quality control during processing. The statement in the Proposed Plan is in error.

Action: The text in the Proposed Plan will be revised.

Commenting Organization: U.S. EPA, Radiation Section

Section #: 6.3.1 Page #: 93 Para. #: 2 Code: C

Original Comment #: 23

Comment: On page 91 of this document, U.S. DOE proposes that the decision regarding the type and location of the final disposition of the Operable Unit 4 soil and debris be placed in abeyance to facilitate the proper integration of this decision with forthcoming decisions for Operable Units 3 and 5. In light of this proposal, it is inappropriate to plan for the on-property disposal in the event that the operable unit coordination efforts become infeasible. Therefore, off-site disposal and release of the soil and debris should not be ruled out at this time.

Response: See response to U.S. EPA Saric FS General Comment Number 10.

Action: The text will be modified as noted in the response.

Section 5

U.S. EPA Region V CRARE Comments

By James Saric

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.1.1 Page #: K-1-3 Line #: Figure K.1-1 Code:
Original Comment #: 1

Comment: The U.S. Department of Energy (U.S. DOE) proposes to develop cumulative site-wide final remedial goals (FRG) from preliminary remediation goals (PRG) developed for each operable unit (OU) within the site. However, PRGs developed for different OUs may be based on different exposure routes. For example, a chemical-specific PRG at one OU may consider exposure via ingestion and dermal contact, while a PRG developed for the same chemical at another OU may consider inhalation in addition to ingestion and dermal contact. Furthermore, if models are used to estimate exposure point concentrations, PRGs may be specific to receptor locations. Therefore, U.S. DOE should include a thorough discussion of the approach used to develop FRGs and clearly indicate how the approach will consider different OU-specific PRGs in the development of FRGs.

Response: The PRGs for each OU are developed during each OU's feasibility study. The CRARE only evaluates the specific OU's PRGs in concert with the plans of the other OUs. It does not set limits. A thorough discussion of OU-specific PRGs and the development of proposed remediation levels (in lieu of FRGs) should occur in each OU's feasibility study and would be misplaced in the CRARE.

Action: Figure K.1-1 is intended only to summarize the process. However, further explanation has been added to the text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.1.3.1 Page #: K-1-7 Line #: 12 Code:
Original Comment #: 2

Comment: The lowest temperature is reported as -33.3°C or -25°F. A temperature value of -33.3°C converts to -28°F. U.S. DOE should check the temperature values and revise the text.

Response: Agreed.

Action: The text now reads "-32°C (-25°F)."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.1.3.2 Page #: K-1-7 and K-1-8 Line #: NA Code:
Original Comment #: 3

Comment: Surface water hydrology is discussed in this section. However, the section is difficult to review without reference to a facility map. Therefore, U.S. DOE should provide a facility map showing surface water bodies to assist readers.

Response: Agreed.

Action: A map has been provided as Figure K.1-3.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.1.3.3 Page #: K-1-8 Line #: 22 Code:
Original Comment #: 4

Comment: The range of glacial overburden is listed as "1.5 to 150 meters or 5 to 50 feet." Because 150 meters is approximately equal to 492 feet, it appears that there is a transcription error in the values presented. U.S. DOE should check the values and revise the text accordingly.

Response: Agreed.

Action: The text now reads: "1.5 to 15 meters or 5 to 50 feet."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.1.5.1 Page #: K-1-18 Line #: 19-22 Code:
Original Comment #: 5

Comment: It appears that the contamination sources that underwent or are currently under removal actions were not considered in the risk assessment. Because this removal action may reduce, but not eliminate radon concentrations in the silos, discussion should be added to address why the radon levels are considered insignificant during risk assessment.

Response: The CRARE evaluates the postremediation time period after all intended remedies have been completed. As such, the silos will be long gone for the purposes of the CRARE. For a detailed treatment of existing risk from the silos, the Operable Unit 4 RI Baseline Risk Assessment is the best source of information. For the risk due to silo removal, the OU4 FS Risk Assessment is the best source of information.

Action: Additional text has been added to clarify that removal actions will be completed well before the timeline considered for the CRARE (i.e., postremediation of all OUs).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.1.6 Page #: K-1-27 Line #: Figure K.1-10 Code:
Original Comment #: 6

Comment: For the current land use scenario, residual surface water concentrations are not included as a source of contamination, although soils, groundwater, and vegetation are included. Residual surface water concentrations should be included as a source of contamination or a justification should be provided for their exclusion.

Response: Under the Current Land Use scenario (which begins just after the FEMP remediation is complete) surface water runoff from the former OUs will be collected and treated. Uncollected surface water will then be essentially free from contamination. Under the Future Land Use scenarios (a period of 1000 years after remediation is complete), the collection basins and treatment system are assumed to have been shut down. As such, surface water residual concentrations are addressed within Land Use conceptual models.

Action: Text has been added to clarify per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.2.1 Page #: K-2-2 Line #: 11-17 Code:
Original Comment #: 7

Comment: This section states that volatile organic compounds (VOC) and semivolatile organic compounds (SVOC) would be reduced in groundwater through pump and treat operations. The discussion that follows does not provide adequate information regarding the impact of reduced VOC and SVOC levels. Discussion should be added to address whether reduced VOC and SVOC concentrations are expected to significantly contribute to the total risk.

Response: An explicit assumption in the CRARE regarding groundwater is the assumption that contaminants currently in the groundwater which present the potential of excess risk due to elevated concentrations will be remediated. The start of the CRARE period of evaluation is after all remedial actions have been concluded including groundwater cleanup. The target remediation levels are assumed to be risk based. Therefore, the reduction of VOC and SVOCs should result in a decrease in overall risk. The full depiction of the current risk and magnitude of reduction will be discussed in the OU5 RI

and FS. Discussion will be added to present the reduction of risk through pump and treat operations and the relative VOC/SVOC contribution to total risk.

Action: The text in the bullet on VOCs has been revised to include discussion on the potential reduction in risk and the relative contribution of organics to total risk.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.2.1 Page #: K-2-4 Line #: 10-13 Code:
Original Comment #: 8

Comment: The assumption that contaminants present in groundwater at concentrations less than the maximum contaminant level goals (MCLG) would not make a significant contribution to overall risk requires further justification. However, it is possible that contaminants present at concentrations just below the MCLG could still result in a carcinogenic risk within an order of magnitude of the target risk of 1E-06 or in a noncarcinogenic risk comparable to the target hazard index value of 1. Therefore, U.S. DOE should list each contaminant excluded from groundwater modeling based on its criteria and provide further justification for its exclusion.

Response: This bulleted item relative to COC screening based on MCLGs has been deleted. It was not utilized as a contaminant screening tool in the CRARE, nor will it be utilized in future FEMP CRAREs.

Action: Delete bulleted item per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.3.2 Page #: K-3-5 Line #: 12-18 Code:
Original Comment #: 9

Comment: In this paragraph, U.S. DOE states that only restricted future use (recreational land use) of the site is envisioned because soil washing studies indicate that a U-238 cleanup level of less than 60 picocurie per gram (pCi/g) may not be achievable. The text should include a discussion regarding expected cleanup levels using other innovative or current technologies. U.S. DOE should provide further justification regarding why it assumes that a cleanup level less than 60 pCi/g is not achievable.

Response: The CRARE is regarded as a reporting document with alternative cleanup methods being presented and discussed in the main body of the FS report. The current methods of soil cleanup were presented in the SWCR, and OU5 is performing on-going studies. As additional FSs are prepared, the updated information on soil remediation can be added. The current information regarding soil cleanup is that 60 pCi/g is at the limit. A particular issue is that the use of the on-property resident farmer for the development of remedial goals may require cleaning up to background. Additional information regarding the selection of future land use was discussed with EPA on December 1, 1993. FS Attachment D.II provides more information on this subject, therefore, this point does need to be more fully developed in the CRARE.

Action: Incorporate appropriate text into Section K.3.2 from Attachment D.II regarding future land use selection and key receptors for remedial level development.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.3.2.2 Page #: I-3-9 Line #: 24-26 Code:
Original Comment #: 10

Comment: In this paragraph, U.S. DOE lists discrete receptors included in the air pathway analysis. However, it is not clear if the residences closest to the site property are included. Text

in this paragraph should be revised to state whether the receptors included in the air pathway analysis represent the nearest residences and, if they do not, justify their exclusion.

Response: The air pathway analysis assumed that the nearest off-property resident was located at the property fenceline where the air contaminant concentration was the highest. The analysis assumed that the on-property resident was located at the point of the highest on-property air contaminant concentration. These receptor points represent the RME locations which will have a higher risk than the nearest resident currently living in Fernald. Therefore, the analysis did not include the nearest residential location as a discrete receptor.

Action: The text has been revised to clarify this point.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.3.3 Page #: K-3-11 to 3-14 Line #: Table K.3-1 Code:
Original Comment #: 11

Comment: 11-1) The inhalation rate (IR) for the groundskeeper and recreation users for the exposure pathway of inhalation of dust and radon is listed as 0.83 cubic meter per hour (m³/hr). The risk assessment work plan addendum (RAWPA) suggested using an IR of 0.83 m³/hr if specific activity patterns are unknown. Activity levels for the groundskeeper and recreation users are expected to be light to moderate. The IRs for light and moderate activity levels are listed as 0.6 and 2.1 m³/hr, respectively, in the RAWPA. Justification should be provided for use of an IR of 0.83 m³/hr or a revised rate should be developed.

11-2) For the exposure scenario of incidental ingestion while wading in water, a groundskeeper or a maintenance worker is not included as a receptor. It seems reasonable to assume that such people could be exposed through this pathway during routine maintenance work. Justification should be provided for excluding on-site maintenance workers as potential receptors or include them as receptors for risk evaluation.

11-3) The ingestion rate for the groundskeeper and adult receptors for the exposure pathway of incidental ingestion of soil and sediment is listed as 0.18 gram/day. Justification should be provided for the ingestion rate value, because it is not in agreement with the value listed in the RAWPA.

11-4) The absorption factor (ABS) values are listed as chemical-specific values (CSV) in this table. These CSVs should be presented in a separate table for all contaminants of concern (COC).

11-5) The fraction of day (FD) outdoor values listed for a groundskeeper and a youth need further clarification, because it is not clear how U.S. DOE obtained these values.

11-6) The ingestion rate of vegetables and fruit times the fraction ingested from a contaminated source value for a child needs further clarification. It is not clear how U.S. DOE obtained this value.

Response: 11-1) The 0.83 m³/hr inhalation rate for the groundskeeper and recreational user (now the "expanded trespasser") was chosen as a compromise between the 0.6 m³/hr IR for light activity and 2.1 m³/hr IR for moderate activity (listed in the RAWPA). For an on-site groundskeeper and recreational user, specific activity patterns are unknown, but are assumed to range from light to moderate. As such, the uncertainties associated with this IR would be in the range for the inhalation rate uncertainties (a factor of 3) as presented in the CRARE (Section 10.4.7, Inhalation Exposures).

Action: 11-1) A footnote to Table K.3-1 has been added for clarification.

Response: 11-2) Disagree. Paddys Run is an intermittent stream. As such, it is reasonable to assume that the groundkeeper's activities would be scheduled for times when the stream is dry or at its lowest rate, thereby excluding incidental ingestion of its water by the groundskeeper.

Action: 11-2) None.

Response: 11-3) The soil ingestion rate for the RME adult farmer is a site-specific time-weighted average value which is consistent with the value used in the OU4 RI (RI Table D.3-12). It is based on specific activities performed during the course of the receptor's lifetime and the relative length of time spent in each activity. The first six years of this receptor's life are spent as a young child ingesting 0.2g/day for 350 days/year (a total of 420g). Between 18 and 70 years of age, the RME farmer is assumed to spend 50 years working a farm. Assuming the farmer follows the usual and recommended agricultural practices in Hamilton County, he will spend 100 days/year outdoors working the land, during which he is assumed to consume 0.48g day/of soil, (a total of 2400g). During the remaining 14 years (12 years as an older child and 2 years as an adult), it is assumed that the soil ingestion rate is 0.1g/day for each of the 350 days/year spent on site (a total of 490g). The total soil ingestion, 4560g, divided by 25,550 days (365 days x 70 years) yields a time-weighted average intake of 0.18g/day. This value was also chosen for the groundskeeper. Consistent with the RI, except a 250 day exposure frequency was selected to represent greater outdoor activity in the CRARE future land use scenario.

Action: 11-3) Incorporate response into Section K.3.3 text and revise Table K.3-1 footnote.

Response: 11-4) Agreed.

Action: 11-4) The requested table for dermal absorption factor values has been added. These are also presented in Attachment K.IV for each chemical contact/intake.

Response: 11-5) Agreed.

Action: 11-5) This section has been modified to reflect the values in the OU4 RI.

Response: 11-6) Agreed.

Action: 11-6) The table has been revised to present both IR and FI values, which reflect the OU4 RI.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.4.4 Page #: K-4-8 Line #: NA Code:

Original Comment #: 12

Comment: The discussion in this section states that all VOCs were eliminated because they would be lost over the post-remediation time frames. While this may be a reasonable assumption under the future land use scenario, VOCs are expected to be present during the current land use scenario. Therefore, U.S. DOE should include volatiles as COCs under the current land use scenario.

Response: See response to Comment #7.

Action: See response to Comment #7.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.1.2 Page #: K-6-7 Line #: 8-16 Code:

Original Comment #: 13

Comment: The text in this paragraph indicates that several COCs were eliminated from the groundwater pathway, but does not list the COCs eliminated. U.S. DOE should provide a list of all COCs eliminated from the groundwater pathway.

Response: The requested COC information is contained in Table K.6-1 for this list.

049

Action: Footnotes have been added to Table K.6-1 for clarification.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.1.3.1 Page #: K-6-15 Line #: 4 Code:
Original Comment #: 14

Comment: The text indicates that a sensitivity test was run for Sr-90, but does not provide a discussion of the test. The text should be revised to provide details of the sensitivity test for Sr-90.

Response: Agreed.

Action: Details of the sensitivity test have been added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.1.3.1 Page #: K-6-15 Line #: 8-10 Code:
Original Comment #: 15

Comment: The report states that technetium, cyanide, and 2-chlorophenol concentrations were developed with U-238 level set at 35 pCi/g. U.S. DOE should revise the text to explain why the U-238 level was set at 35 pCi/g instead of the estimated residual level of 60 pCi/g and why this is not expected to significantly affect the results.

Response: A preliminary model screening run was performed at approximately one half of the 60 pCi/g U-238 PRG. All other contaminant concentrations for this modeling were appropriately scaled down from their existing soil concentrations consistent with the U-238 reduction predicted to result from remediation. This screening run showed that the predicted levels of technetium, cyanide, and 2-chlorophenol in the aquifer would not yield risk results greater than 10^{-7} , nor an HI greater than 0.1. Since it was demonstrated that a factor of 2 did not cause these COCs to be above screening levels, these COCs were not included in the final modeling run. It is not anticipated that inclusion of these COCs would change the final risk estimates resulting from modeling.

Action: Text has been revised per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.1.4.1 Page #: K-6-30 Line #: Table K.6-3 Code:
Original Comment #: 16

Comment: Retardation factors (Rf) for different sorption coefficient (Kd) values are presented in this table. However, values of bulk density and moisture content which also determine Rf are not provided. The text should be revised to include these values.

Response: Agreed.

Action: Bulk Density and moisture content values have been added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.1.5.1 Page #: K-6-35 Line #: 28 Code:
Original Comment #: 17

Comment: The report states that modeling results predicted COC concentrations in receiving streams to be very low. However, U.S. DOE does not define what "very low" means. The text should be revised to define what "very low" means. U.S. DOE should also evaluate the impact of COC concentrations on the water quality of the receiving water bodies.

Response: Agreed. The SWCR conducted surface water modeling for a wide range of COCs and reported that, with the exception of uranium, concentrations in receiving streams were predicted to be generally very low. Very low would be defined by the SWCR estimates

for future surface water concentrations in the Great Miami River which would be below 1 pCi/l for all radionuclides except the uranium isotopes. Activity concentrations for U-234, U-235/236, and U-238 are estimated at 24, 1.3, and 28 pCi/l, respectively. Modeled concentrations for organic compounds range from 4.9×10^{-11} to 1.1×10^{-4} mg/l and are all below usual analytical detection levels. Modeled concentrations for inorganics except uranium range from 3.8×10^{-7} to 1.4×10^{-5} mg/l, also below analytical detection levels. The SWCR also includes risk assessments for surface water concentrations. Additional COCs may be evaluated for surface water transport in future versions of the CRARE.

Action: Text revised per response.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.1.5.2 Page #: K-6-45 Line #: 3 Code:
Original Comment #: 18

Comment: U.S. DOE states that most of the cyanide present in the vadose zone will biodegrade. However, the text does not include a discussion to support this assumption. Therefore, discussion should be added regarding the biodegradation potential of cyanide.

Response: Agreed.

Action: A discussion of the degradation rate for cyanide has been added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.1.6.2 Page #: K-6-62 Line #: 5-6 Code:
Original Comment #: 19

Comment: The report lists the TC-99 concentration in groundwater and states that this concentration does not represent a significant contribution to risk. The text should be revised to explain why such concentration does not represent a significant contribution to risk.

Response: Agreed.

Action: A discussion of Tc-99 risks has been added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.6.2 Page #: K-6-65 Line #: 10-12 Code:
Original Comment #: 20

Comment: U.S. DOE estimated a flux of Rn-222 gas from soil and waste using an emission model. The text should include a discussion of why the flux of VOCs were not estimated.

Response: No VOCs remain in the soil for the time periods analyzed under the CRARE scenarios (see response to Comment #7). Therefore, no estimate of VOC flux is necessary.

Action: See Comment #7.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.7.5.5 Page #: K-7-15 Line #: 23 Code:
Original Comment #: 21

Comment: In this line, the text introduces doses in Becquerels. However, all previous references to doses were presented in rads or rem. U.S. DOE should be consistent in what units of measure it uses.

Response: Agreed.

Action: Becquerels have been converted to picocuries.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.7.5.9 Page #: K-7-23 Line #: 11-13 Code:
Original Comment #: 22

Comment: The report presented no toxicity assessment of ruthenium-106. However, this compound is fairly well studied. Therefore, U.S. DOE should review available literature and present the information in a revised document.

Response: Ruthenium-106 is not a contaminant of concern in the OU4 CRARE. A toxicity assessment will be provided in future CRAREs as needed for operable units in which it is a contaminant of concern.

Action: The text has been modified to clarify this point.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.7.6.6 Page #: K-7-40 Line #: 11-30 Code:
Original Comment #: 23

Comment: This section regarding Aroclors does not include a discussion of the relative potency of the different Aroclors. The section should be revised to discuss the relationship between increased chlorination and increased toxicity.

Response: Agreed.

Action: The toxicity profile for the Aroclors has been revised to include a discussion of the relative potency of the different Aroclors and the relationship between increased chlorination and increased toxicity.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.7.6.18 Page #: K-7-55 Line #: 1-20 Code:
Original Comment #: 24

Comment: This section does not include a discussion of the uptake biokinetic model. Because biokinetic models are one of the few tools available to estimate lead risks, the text should be revised to add such discussion.

Response: Agreed.

Action: The text has been revised to include a discussion of the uptake/biokinetic model for lead and why it is not applicable to the OU4 CRARE.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.9.1.2 Page #: K-9-3 Line #: 23-24 Code:
Original Comment #: 25

Comment: The report states that if the hazard index (HI) is greater than 1, there is concern for potential health effects. Potential health effects may occur if the HI is equal to or greater than 1. Therefore, this statement should be revised accordingly.

Response: Disagree. Risk Assessment Guidance for Superfund, Volume 1, Part A (EPA/540/1-89/002) page 8-13, line 12, Non-carcinogen Effects; states: "When the hazard index exceeds unity, there may be concern for potential health effects," therefore, the statement in the CRARE is in full compliance with EPA guidance.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.9.2 Page #: K-9-6 Line #: 2 Code:
Original Comment #: 26

Comment: The report states that for the trespassing youth, the noncarcinogenic hazard quotient (HQ)

is 0.1 HQ values are developed for each noncarcinogenic contaminant. Risk to a receptor should be expressed as HI, which is a summation of all HQ values. The text should be revised to express noncarcinogenic risks as Hi of 0.1.

Response: Agreed.
Action: The text has been revised as requested.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: K.9.3 Page #: K-9-8 to K-9-21 Line #: Tables K.9-2 K.9-161-3 Code:
Original Comment #: 27

Comment: Noncarcinogenic risks for specific receptors are expressed as HQ in all these tables. The tables should be revised to replace HQ with HI.

Response: Agreed.
Action: The tables have been revised as requested.

5043

Section 6

U.S. EPA Region V Technical Comments

By Pat Van Leeuwen

0000

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.1/2.2.2.1/AD Page #: 2-4/2-14/D.2-1 Line #: 16/15/7 Code: E
Original Comment #: 1

Comment: I see again the use of "BRA" in reference to the Baseline Risk Assessment. I still think that this acronym may be offensive to the public and should not be used in a public document. Please devise another acronym.

Response: Disagree.

Action: This acronym is used in U.S. EPA guidance, literature, and has been used at the FEMP for a number of years. To date, the public has never indicated to any degree that the acronym "BRA" is offensive. However, for the purpose of this FS document, the acronym "BRA" will be replaced with the words "Baseline Risk Assessment."

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.1 Page #: 2-10 Line #: 27 Code:
Original Comment #: 2

Comment: This statement is not quite correct. The 1e-4 value is not a discrete limit. Sites with a total estimated ILCR in the 1e-4 to 1e-6 range may be subject to remedial action; total residual risk must be less than 1e-4 after remedial action.

Response: The sentence should be reworded.

Action: The phrase ". . . is not usually warranted." is replaced by ". . . may not be warranted." Add sentence, "However, this incremental risk should be less than 10⁻⁴ after remediation."

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.1 Page #: 2-13 Line #: 1-7 Code:
Original Comment #: 3

Comment: This is a biased statement. See above. Risks above 1e-4 might be acceptable or risks below that level might be unacceptable, based on site-specific conditions.

Response: The paragraph will be revised.

Action: After ". . . site specific conditions. . ." add "as well as risks below 10⁻⁴ may not be acceptable."

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.1 Page #: 2-14 Line #: 6 Code:
Original Comment #: 4

Comment: I usually suggest that PRGs be calculated for the 1e-6, 1e-5 and 1e-4 risk levels to enable flexibility in the remedial decisions and save calculations by the risk manager and public. Tables should present all three numbers, as well as the Detection Limits for each chemical.

Response: FEMP agrees with the inclusion of 10⁻⁵ risk level to show the spectrum of potential remedial goals. However, FEMP does not believe the addition of the detection limits will be beneficial. In part, this is because the detection limits for soil vary widely depending on the soil matrix and the analytical requirements. This is particularly true for radionuclides.

Action: Include the 10⁻⁵ risk level PRG in text and tables.

-5043

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.1 Page #: 2-10/2-14 Line #: 1/13 Code:
Original Comment #: 5

Comment: I usually suggest calculation of concentration levels at the HQ = 0.1 and 1.0 levels, unless there are few non-carcinogens. Using a HQ of 0.2 only allows a combo of 5 chemicals plus 5 pathways before the HI of 1.0 is exceeded. This is especially important if remedies for different media/operable units are considered separately.

Response: Both the Risk Assessment Work Plan and Part III of the Sitewide Characterization Report specify the use of a HI of 0.2 as the target for calculating PRGs. The PRGs presented in this FS are multipathway PRGs which encompass all exposure pathways for a receptor. An additional consideration is that the OU4 area is a small part of the overall site acreage and represents a small part of the overall receptor exposure.

Action: No action.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.1 Page #: 2-16 Line #: 15-17 Code:
Original Comment #: 6

Comment: Labels are not consistent with the RI and serve to confuse the reader. The "Future Land Use with Federal controls" is not a change in land use; this is the Current Land Use with Controls described in the RI. The "Future Land Use Without Federal Controls" is the Future Land Use in the RI. The scenarios and exposure parameter values should be identical.

Response: Additional clarification text will be provided.

Action: The referenced text has been revised to indicate that in addition to the Future Land Use Without Federal ownership scenario evaluated in the Baseline Risk Assessment, the FS has developed a new scenario, Future Land Use with Continued Federal Ownership, to facilitate evaluation of long-term risks with continued land use restrictions.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Table 2-5 Page #: 2-19 Line #: Code:
Original Comment #: 7

Comment: What is the basis for the PRGs for the carcinogenic PAHs? Are they based on Benzo(a)pyrene? There are no toxicity values for the dermal exposure pathways for PAHs. Describe how these values were calculated and modified to include dermal considerations.

Response: They were based on benzo(a)pyrene. They will be re-calculated to be based on the TEF values.

Action: Recalculations of PRGs.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.3 Page #: 2-22, 2-23 Line #: Calculations Code:
Original Comment #: 8

Comment: I know it does not matter whether you calculate the soil PRG based on an Air PRG (do Air calculation first) or calculate the soil PRG based on the total unit risk. However, the methods used for the calculation of the soil PRGs for the on-site farmer and the off-site farmer should be identical for clarity. Not everyone will understand your logic. Please revise the off-site farmer calculations to be consistent with the other scenario calculations presented.

Response: The method of calculating the PRGs was changed. In addition, all parameter changes resulting from comments on the Baseline Risk Assessment were incorporated into the calculations. As a result, the presentation of PRG calculations was changed.

Action: The presentation of PRG calculations will be changed.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
 Section #: 2.2.2.3 Page #: 2-23 Line #: 24 - 27 Code:
 Original Comment #: 9

Comment: There seems to be a major problem here. I am concerned with the calculation of PRGs that are "2.6 and 36 times less than background." Risks from exposure to radionuclides were to be based on concentrations above background, so PRGs based on these same concentrations should not present unrealistic levels of attainment.

Response: The intent of this statement is to show that the calculated PRGs for the RME on-property resident farmer are indistinguishable from background concentrations. The purpose of the Table 2-5 is to present the calculated remediation levels values which are to be considered in addition to background values. It is noted that background concentrations result in risk greater than 1×10^{-4} .

Action: Modify the text by inserting the following sentence after "...respectively." "The PRGs for Ra-226 and U-238 are indistinguishable from either the respective ARAR or background concentrations. Therefore, if ARAR or background concentrations were chosen as the remedial goal, there would not be an incremental risk due to the presence of Ra-226 or U-238."

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
 Section #: 2.2.2.3 Page #: 2-23 Line #: 28 Code:
 Original Comment #: 10

Comment: The mill tailings standards referred to here are not risk-based and are not considered protective for Superfund; Region V (Larry Jensen) has been working on new guidelines for clean-up of radionuclides in soil. Should discuss these also.

Response: FEMP agrees that these cleanup goals are not risk based and are not directly applicable to Superfund remedial goals. However, they do represent cleanup goals at other sites where radionuclides are COCs and represent what may be technologically feasible. They were presented to give the broad picture of remedial goals. At the present time the FEMP does not have a copy of these draft guidelines.

Action: No action.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
 Section #: 2.2.2.3 Page #: 2-23 Line #: 11-15 Code:
 Original Comment #: 11

Comment: The description of the recreational scenario presented here does not match the description presented on page 2-16, lines 3-14. Where are the Unit Risk Factor calculations for this exposure scenario? If not in the RI, reference the appropriate section in the FS,

Response: Agreed.

Action: Change 120 days on page 2-16, line 9 to 110 days.

048

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Table 2-6 Page #: 2-26 - 2-30 Line #: Code:
Original Comment #: 12

Comment: A) Identify the scenario used as the basis of PRGs. B) It is not clear what the units are for the ARAR-based PRGs. C) List CRQLs for all chemicals; add 1e-5 risks to table.

Response: A) Agreed.

Action: Add "Groundwater Use by a Farmer" to the table title.

Response: B) Agreed.

Action: Add units to ARAR column.

Response: C) See response to comment #4.

Action: Add 10⁻⁵ risks to table.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.4 Page #: 2-31 Line #: 10, 11 Code:
Original Comment #: 13

Comment: The PRG is identified as the Soil PRG; it should be the Groundwater PRG.

Response: Agreed.

Action: Change to Groundwater PRG.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2.2.2.4 Page #: 2-31 Line #: 12-17 Code:
Original Comment #: 14

Comment: Regarding the discussion of MCLs, indicate that MCLs are not risk-based, but are based on technology and economics. They are also based on a single pathway of exposure. Therefore, PRGs often are lower than MCLs. The CRQLs used may not be appropriate for this site if they cannot be used to characterize the risk.

Response: Agreed that MCLs are not necessarily risk based and represent a single pathway of exposure, but are risk based modified by technology and economic considerations.

Action: The text will be modified.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Table D.3-4 Page #: D-3-13 Line #: Code:
Original Comment #: 15

Comment: A) It does not seem reasonable to calculate risks from exposure of berm removal to the non-remediation worker using an exposure duration of 3 years if this activity is expected to be completed in a shorter time period, e.g., one work season. The method used averages the risk over a longer time period than the actual exposure and may underestimate the risk to this receptor. If the work is expected to take 750 hours, an exposure period of 8 hrs/day x 94 days would be more appropriate. I recommend doing and discussing alternate exposure periods in Section D.3.4.1.2. B) The SA value for the Dermal Contact pathway is the CT value, not the RME (95th percentile) value. This SA was also addressed in the RI review.

Response: A) The berm soil will be removed in stages during the waste removal/treatment operations that occur over a period of 3 years. As such, the duration of intermittent exposure is 3 years. Assuming continuous exposure over a period of 94 days would be

inappropriate. No document changes required. B) Agreed.
Action: A) No Action. B) Table D.3-4 will be revised to incorporate the parameter values contained in the Final Baseline Risk Assessment. The risks presented elsewhere in Appendix D will be recalculated using these parameter values.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: D.3.2.2.3 Page #: D-3-19 Line #: Code:
Original Comment #: 16

Comment: Problem with consistency between RI and FS reports in the labeling of scenarios. Again, the basis of notation should be land use, not time. The scenarios described here change with land use and federal control. They should be identical to scenarios developed in the RI, as these are the scenarios to be addressed in the FS. This change in emphasis confuses the reader. See discussion of this point in Comment #6.

Response: Additional clarification in the text will be provided.

Action: The referenced text has been revised to indicate that in addition to the Future Land Use Without Federal Ownership scenario evaluated in the Final Baseline Risk Assessment, the FS has developed a new scenario, Future Land Use with Continued Federal Ownership, to facilitate evaluation of long-term risks with continued land use restrictions. Further discussion can be found in Attachment D.II.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Table D.3-6 Page #: D-3-22 Line #: Code:
Original Comment #: 17

Comment: The SA values presented for the Dermal Contact while Bathing pathway are CT values, RME values. See discussion in the RI review also.

Response: Agreed.

Action: Table D.3-6 will be revised to incorporate the parameter values contained in the Final Baseline Risk Assessment. The risks presented elsewhere in Appendix D will be recalculated using these parameter values.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Table D.3-9 Page #: D-3-35 Line #: Code:
Original Comment #: 18

Comment: A) Where did the Cancer SF of 17 for the carcinogenic PAHs come from? There are no Cancer SFs for dermal exposure to PAHs. This exposure is expressed in a semi-quantitative manner; in general, it is assumed that the risk from dermal exposure to PAHs is at least as great as the risk from oral exposure. B) I do not understand the value or discussion of the cadmium oral RfD. Who did these calculations? Who reviewed the values? The HEAST office in ECAO, Cincinnati, reports that the IRIS value of 5e-4 is the only verified RfD for cadmium. C) The RfD for fluoranthene (IRIS) is 4e-2, not 4e-1. D) What is the basis of the RfD calculation for thallium? Most thallium salts have RfDs in the 7-9e-5 range. E) Re the use of "QUAL", this should only be used if the contaminant is indeed discussed qualitatively. It makes no sense to discuss qualitatively carcinogenic effects from exposure to non-carcinogens. Reserve the designation for valid applications.

Response: Agreed.

Action: Table D.3-9, as well as Tables D.3-10 and D.3-11, will be replaced with Tables D.4-1 through D.4-4 from the Final Baseline Risk Assessment. The risks presented elsewhere in Appendix D will be recalculated using these parameter values.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: D.3.3.1 Page #: D-3-34 Line #: 14-17 Code:

Original Comment #: 19

Comment: I have previously commented that inhalation RfCs should be used when provided; contractors should not calculate RfDs from RfCs.

Response: The inhalation RfCs were taken from the OU4 Baseline Risk Assessment. In the RI Report for Operable Unit 4 Section D.4, the method of calculation was presented. This method is also referenced in RAGS.

Action: No Action.

Section 7

U.S. EPA Region V CRARE Comments

By Pat Van Leeuwen

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: App K Page #: General Line #: Code:
Original Comment #: 1

Comment: Land Use Scenarios. The scenarios are not consistent with the RI Risk Assessment or FS scenarios and serve to confuse the reader. The differences between the FS "Future Land Use With Federal Controls," the RI "Current Land Use With Controls," and the CRARE "Future Land Use, Government Scenario" may not be apparent to all readers. The FS "Future Land Use Without Federal Controls" is labeled the "Future Land Use" in the RI and "Future Land Use, Private Sector" in the CRARE. The latter scenarios and exposure parameter values appear to be identical, adding to the confusion. A consistent set of scenarios for risk evaluation should be developed for use in all documents. If a particular scenario is not applicable for a particular OU CRARE, it should be listed with a NA designation. The development of some consistency at this stage of the site investigation will allow evaluation of risks in a consistent manner for all reports within a given Operable Unit and facilitate the summing of risks in the CRAREs and final site wide risk assessment. Without such consistency, I fear we will all lose our way. I am already flipping between documents and this is only the first CRARE!

Response: Agreed. Multiple names for similar land uses can lead to confusion, as well as, differences between baseline and remediation scenarios. One purpose of the meeting in Chicago with EPA on December 1, 1993, was to help illustrate both the consistencies and differences between the risk assessments. Text has been added to both the FS and risk assessment (Attachment D.II) and the CRARE to clarify this issue.

Action: Text and tables have been revised for clarity in Sections K.1 and K.5.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: App K Page #: General Line #: Code:
Original Comment #: 2

Comment: Other Consistency Issues. 2-1) All terms should be given the name labels in all documents. One example is the label "Chemicals of Concern (COCs)" which was changed to "Chemicals of Potential concern (COPCs)" in the RI, making it inconsistent with the FS and CRARE reports.

2-2) All exposure pathway parameter values and toxicity values should be the same in all reports for an individual Operable Unit. Any corrections made in the RI Risk Assessment should be carried into the FS and CRARE reports. RI Risk Assessment comments should be reviewed to assure this consistency.

Response: 2-1) The CRARE is a post-remediation time frame document. As such, total potential chemicals of concern will be reduced to reflect the screening in both the RI and FS. Further, some constituents will be removed, treated or contained such that exposure to humans and the environment is precluded.

Action: 2-1) Provided clarification in Section K.4.1.

Response: 2-2) The final, approved RI has been reviewed and its parameters/toxicity values used. If exceptions are warranted due to the CRARE being both a site-wide and a postremediation document, they will be so noted.

Action: 2-2) Incorporated RI parameter and toxicity values per response.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen

Section #: App K Page #: K-2-3 Line #: Code:

Original Comment #: 3

Comment: Population Demographics. The discussion of population demographics on page K-2-3 proposes that the population density of the area will remain at the present levels for the 1000-year evaluation period. Other sections of the document propose no change in land use. This proposal is not realistic. The population growth and land use should be coupled to some reasonable growth and land use projections. The State should be able to provide more appropriate and acceptable assumptions.

Response: Disagree. For the purposes of the CRARE, the off-property resident farmer is the theoretical point of maximum fence-line impact for both air and groundwater COC modeling. Predicting the actual location of populations over the next 1000 years would at best be a guess. Even if the FEMP was surrounded on all sides by residential housing 100 years in the future, the risk would be no greater than that of the off-property resident farmer, since a farmer's exposure exceeds that of a resident.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: App K Page #: Line #: Code:

Original Comment #: 4

Comment: Use of MCLGs to Eliminate COCs. I know of no case where it would be appropriate to eliminate contaminants from the risk assessment based on MCLGs. MCLs and MCLGs are single chemical, single pathway values, and are based on technology, not risk. It has not been demonstrated that elimination of chemicals in groundwater, based on their MCLGs, would not make a significant change in the risk calculation, especially when the chemical is present in other media.

Response: See U.S. EPA (Saric) CRARE Comment #8.

Action: See U.S. EPA (Saric) CRARE Comment #8.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: App K Page #: Line #: Code:

Original Comment #: 5

Comment: HI Benchmark Value. The CERCLA benchmark of 1.0 refers to the cumulative (all chemical, all pathway) HI. This distinction should be noted. The Benchmark should be further examined for target organ/mechanism of action impact.

Response: These HI benchmark distinctions have been added to the text in Section K.2.4. The target organ/mechanism of action impact is not provided in this CRARE, but will be provided in the next CRARE.

Action: Text has been modified per response.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: K.3.3 Page #: K-2-14 Line #: 16-20 Code:

Original Comment #: 6

Comment: Farmer Soil Ingestion Rate. Comments on other Operable Unit 4 reports have already noted that the adult farmer ingestion rate is 480 mg/day while farming. I cannot derive the 180 mg/day value given here using the farm exposure parameter values listed. Some explanation/adjustment is required.

Response: See U.S. EPA (Saric) CRARE Comment #11-3.

Action: See U.S. EPA (Saric) CRARE Comment #11-3.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Page #: K-3-2 Line #: Code:
Original Comment #: 7

Comment: Selection of PRG for U-238. The selection of the PRG for U-238, based on the recreational user in the CRARE "Future Land Use, Government scenario" appears to be somewhat arbitrary. The appearance is that this scenario was developed in the CRARE to defend the 60 pCi/g clean-up level rather than the 0.28 pCi/g level estimated in the SWCR. As we discussed in the Tuesday teleconference, a better strategy would be to develop a tiered approach, listing PRGs for levels of land uses. It would then be reasonable to select OU appropriate PRGs based on technical feasibility and cost. The major decision is whether this should be presented in the FS, the CRARE, or both.

Response: The 60 pCi/g cleanup level is consistent with the OU4 FS Proposed Remediation Level (PRL). PRGs are set in each OU's FS, and are merely evaluated in the CRARE. This PRL was developed consistent with the approach presented to EPA on December 1, 1993. Attachment D.II contains the additional relevant discussion.

Action: Expanded discussion in Section K.3-1 consistent with response.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Table K.3-1 Page #: Line #: Code:
Original Comment #: 8

Comment: Recreational User Definition. The parameter values for the recreational scenarios presented in Table K.3-1 were judged by USEPA and Ohio EPA as not being very conservative. We expect to see the development of the recreational user scenarios reflect more closely the idea that the area may revert to a very attractive area for hunters, hikers, bikers, etc.

Response: The description of the recreational user scenario has been modified in accordance with agreements reached at the December 1, 1993 meeting with EPA. No change to exposure parameters were necessitated, but a more complete description of this scenario including a name change to "expanded trespasser" has been provided in both the FS Section 2 and CRARE Section K.5.1.4.

Action: Modified Section K.5.1.4 and provided reference to Section K.5.1.4 discussion in Section K-3.2 per response.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: K.4-0 Page #: Tables Line #: Code:
Original Comment #: 9

Comment: This section presents tables of potential COCs in various media after multiple screenings. The reader cannot follow the elimination.

- A) I did not see a list of the COCs in each OU before the second screening, so I can't follow what was eliminated.
- B) Some VOCs in the subsurface soil/groundwater are eliminated. Where did they go? The chlorinated hydrocarbons disappear without a resulting increase in vinyl chloride. My understanding, is that the modeling did not consider degradation, only volatilization. Please explain in more detail.
- C) Additional explanation has been provided in Section K.4-2, Figure K.4-1 and

footnote of Table K.4-6. Table K.4-10 gives the list of potential COCs retained after final screening for all OUs. There are no PAHs, hydrocarbons, phthalates, etc., in this list. Some media in some OUs must contain these additional contaminants. The methodology of this whole chapter is unclear.

Response:

A) A list of potential COCs by media and OU has been provided to illustrate those COCs surviving the initial screening process.

B) Organic degradation is considered using decay rates in Howard et. al (as specified in the RAWPA). Further, for the CRARE it is assumed that all groundwater pump and treat operations are completed, which remove VOCs and other organics.

C) The CRARE is a post remediation document. As such, all VOCs with a vapor pressure of 10mm of Hg or higher would be gone, and other organic chemicals subject to degradation or remediation will also be gone.

Action:

A) Expanded and modified Table K.4-2 per response.

B) Additional explanation has been provided in Section K.4-2, Figure K.4-1, and footnote to Table K.4-6.

C) Text has been added in Section K.4-2 to more fully explain the screening methodology.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen

Section #: Page #: K-5-7 Line #: 16-18 Code:

Original Comment #: 10

Comment: Discussion of the RME. Page K-5-7, lines 16-18 refers to the use of receptor characteristics, such as "behavior" and "physical attributes" to develop receptor intakes. What is referred to by these labels, exposure characteristics, and definitions of populations of concern?

Response: Text has been added to clarify the exposure parameters.

Action: Modified text per response.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Page #: K.5-11 Line #: 1-6 Code:
Original Comment #: 11

Comment: "Home-Builder" Receptor. This rationalization might be defensible for this OU, but I do not think that it will apply to all OUs. The "home-builder" may well be exposed to additional media and by additional pathways than the on-site farmer, such as ingestion of subsurface soil and surface water.

Response: Agreed.
Action: None.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Table K.7-2 Page #: Line #: Code:
Original Comment #: 12

Comment: Toxicity Values. I noted that the oral Cancer Slope Factor for benzo(a)anthracene, based on benzo(a)pyrene, listed in Table K.7-2 is incorrect. The correct value is 7.3. Check also any incorrect toxicity values noted in prior OU4 reviews.

Response: Agreed.
Action: This value for benzo(a)anthracene has been changed and the accuracy of other toxicity values have been checked.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Page #: K-7-55 Line #: Code:
Original Comment #: 13

Comment: Toxicological Profiles. A) I have commented on omissions in tox profiles in prior OU4 reviews. Please review these. The Lead Tox Profile, page K-7-55, does not include a discussion of the EPA OSWER Directive on Lead Soil Clean-up Levels or the EPA Lead IEUBK Model, leading the reader to mistakenly conclude that the health effects of lead cannot be addressed in the risk assessment.

B) I did not see any Tox Profile for PAHs or the many COCs that were omitted as discussed above. These may need to be included.

Response: A) Agreed.
Action: A) Discussions have been added to the lead toxicity profile as requested.
Response: B) Since the CRARE is a postremediation document, it is reasonable to anticipate that most, if not all, of the COCs in the environmental media would be gone or isolated from the environment. Therefore, it is not appropriate to discuss the omitted COCs in the CRARE.

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Page #: Line #: Code:
Original Comment #: 14

Comment: All comments presented in other OU4 reviews should be examined for application in the OU4 CRARE.

Response: Agreed.
Action: The FS and RI comments have been reviewed and any necessary changes have been incorporated.

Section 8

Ohio EPA Comments

by

Graham Mitchell
and
Tom Schneider

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: Table 2-6 Pg #: 2-27 Line #: Code: e
Original Comment #: 9

Comment: DOE should maintain consistent notation throughout the table. The scientific notation under the risk based PRGs should be replaced with decimals to match the rest of the table.

Response: Agreed.

Action: The format of number presentation will be reviewed. In certain cases the number of decimals may preclude presenting decimals and scientific notation will be used.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 2.2.2.4 Pg #: 2-31 Line #: 1-11 Code: c
Original Comment #: 10

Comment: This section of text initially discusses groundwater pathways and then discusses a soil PRG of 0.5 pCi/l. It would seem the section needs some revision or clarification.

Response: Agreed. This was a typographical error.

Action: Change to "groundwater PRG."

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 2.2.3.2 Pg #: 2-38 Line #: 18-19 Code: c
Original Comment #: 11

Comment: The document should define the free release limits provided in DOE Order 5400.5. Additionally, DOE has failed to define the ILCR associated with these limits.

Response: Release criteria specified under DOE Order 5400.5 should be added. The free release criteria was developed based on limiting doses to the public. This criteria is used every day at DOE facilities to allow vehicles and other materials unrestricted use off DOE sites. Based on its day-to-day use and accepted basis for the established criteria, DOE believes these criteria require no further analysis in this FS.

Action: Release criteria (see Comment #6) will be added.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 2.6.4.1 Pg #: 2-85 Line #: 23-25 Code: c
Original Comment #: 12

Comment: DOE should retain the option of pumping wells for remedial action. The fact that the decant sump tank lies within the perched groundwater would suggest the need for pumping wells to draw down the water table prior to tank and associated soil removal.

Response: Section 1.0 defines the environmental media of which Operable Unit 4 consists. The Operable Unit 4 environmental media includes only perched water which would be encountered during remediation. Sampling activities in this area have been restricted due to extremely low levels of perched groundwater encountered. The use of pumping wells to lower the water table is not envisioned. However, any perched water encounter during excavations would be pumped from the excavation by standard construction methods to a portable tank and treated.

Action: No action.

alternatives are almost identical, with the Subunit A and B off-site alternatives remaining slightly less expensive than the on-property alternatives.

In the case of Subunit C, a bulk rate quote has been received from the permitted commercial disposal facility since the submittal of the FS, lowering the cost of the off-site alternative. The deletion of packaging from the cost significantly decreases the off-site disposal at a permitted commercial facility alternative. However, the addition of a staging facility should also be added to the cost of this alternative. All of these changes result in an off-site disposal cost that is lower than the on-property alternative. Thus, the inconsistencies amongst subunits is no longer an issue.

Action: The cost estimates will be revised to include a staging facility for all off-site alternatives, packaging will be deleted from the cost of Alternative 3C.2, and a bulk disposal rate will be used for estimation of Alternative 3C.2 cost.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 3.3.3.5 Pg #: 3-115 Line #: 1-7 Code: c
Original Comment #: 17

Comment: Since this alternative does not require both truck and rail shipment, it would seem the short-term risks would be lower than Alternative 3C.1. Alternative 3C.1 requires that the waste be unloaded from the train and then transported via truck additional miles. Both of these activities would seem to increase the short-term risk via exposure and accident probability over alternative 3C.2.

Response: Agreed.

Action: The referenced text will be revised to indicate that the contribution to short-term risks associated with off-site waste transportation is estimated to be less than Alternative 3C.1 because shipment to the permitted commercial disposal site does not require the use of trucks.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.1.2.2 Pg #: 4-6 Line #: 18 Code: c
Original Comment #: 18

Comment: DOE should include the NRC Branch Technical Position Paper which provides uranium and thorium cleanup criteria as a chemical specific TBC.

Response: The NRC Branch Technical Position paper was considered for use as an ARAR/TBC. However, it was decided that the paper was outdated and provided no additional benefit to determine cleanup levels for Operable Unit 4. The levels established in DOE Order 5400.5 were equally or more protective than those presented in this position paper.

Action: No Action.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.1.2.2 Pg #: 4-6 Line #: 28 Code: c
Original Comment #: 19

Comment: DOE should include these location specific ARARS A) Ohio Endangered Species Act ORC 1518, OAC 1501:18-1-01, ORC 1513.25. B) 40 CFR 6.302(a) (Executive Order 11990). C) All of 3745-27-07(B). D) DOE should review the document "Potential ARARs: Engineered Waste Management Facility" (6/92) for additional ARARs.

Response: A) The ARARs listed in Section 4.1.2.2 are only those that have been considered to be "major" ARARs. A complete listing of ARARs is presented in Appendix F. Location-specific ARARs presented in Table F.2-1b include Ohio Endangered Species Act ORC 1518

supported by DOE's use of residential wells, located within the overburden, as background groundwater sampling locations.

Response: There are a number of "water supply wells" completed in the glacial overburden of the FEMP area. The wells have low yields relative to wells completed in the underlying Great Miami Aquifer (GMA). The FEMP has used residential wells completed in glacial overburden for background groundwater sampling locations. These wells are not currently used for residential water supply.

DOE contends that the status of the glacial overburden as an aquifer can be established by comparing the relative attributes of the glacial overburden and the GMA. Though a small number of wells were completed in the glacial overburden as groundwater supply wells, the wells are not used today for drinking water supply. Additionally, it is unlikely that future domestic wells would be completed in the glacial overburden, because the glacial overburden has a low and generally inadequate yield relative to the underlying GMA. The glacial overburden is not considered a "viable source of groundwater" when compared to the potential yield of the GMA. The current local use of groundwater demonstrates that the GMA is favored for groundwater supply and the glacial overburden is only used in locations upgradient of the FEMP where sand and gravel of the GMA is not present beneath the glacial overburden.

Action: The text will be revised so that the aquifer designation is clear and not contradictory.

Commenting Organization: Ohio EPA **Commentor:** T. Schneider

Section #: 4.2.2.2 **Pg #:** 4-30 **Line #:** 26-27 **Code:** c

Original Comment #: 23

Comment: DOE's statement that, "there are no known groundwater supply wells completed in the till downgradient of the FEMP" must be qualified with the statement that, there is minimal or no till downgradient of the FEMP.

Response: In fact, there is a significant area of land (several square miles) downgradient of the FEMP that does have 20 to 30 feet of glacial overburden lying above the Great Miami Aquifer (GMA). There are few residences on this land; however, each residence has its own domestic supply well completed in the underlying GMA. The use of groundwater at each residence supports DOE's position that the glacial overburden is not the uppermost aquifer.

Action: DOE will revise the text to specifically quantify the area of land downgradient of the FEMP that has glacial overburden.

Commenting Organization: Ohio EPA **Commentor:** T. Schneider

Section #: 4.2.2.2 **Pg #:** 4-32 **Line #:** 23-24 **Code:** c

Original Comment #: 24

Comment: When was the determination made that the proposed location of the disposal vault does not jeopardize endangered or threatened species or their habitat? It was Ohio EPA's understanding that DOE was continuing to evaluate the potential presence of the Indiana bat and its habitat on the FEMP. Additionally, this section fails to consider Ohio's Endangered Species Act and the potential impact to state endangered species.

Response: Agreed.

Action: Information regarding additional investigations to be conducted for the Indiana bat will be added to the FS; however, habitat for the Indiana bat exists only in riparian areas along Paddys Run. Text will be included to correct this inconsistency.

November 9, 1993

-5043

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.2.2.2 Pg #: 4-32 Line #: 28-31 Code: c
Original Comment #: 25

Comment: DOE should provide a citation/reference for the Area of Contamination definition and requirements which support the proposed definition.

Response: The CAMU and TU rules under RCRA are included as relevant and appropriate ARARs in the FS.

Action: Text of this section will be revised to delete reference to area of contamination (AOC), and discuss use of the CAMU concept.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.2.2.2 Pg #: 4-33 Line #: Code: c
Original Comment #: 26

Comment: This section should be revised to include a discussion of all criteria provided in OAC 3745-27-07 B(1-15) and how the proposed disposal facility will meet or not meet them.

Response: Section 4.2.2.2 of the FS report presented an analysis of the pertinent location specific ARARs. The analysis looked at Ohio Solid Waste Rule 3745-27-07 and determined that all of OAC 3745-27-07 is considered relevant and appropriate for new on-site disposal facilities; the specific siting prohibition for the GMA found at 3745-27-07(B)(5) is included in that. The entire cite is adopted in the FS, but the discussion concentrates on exemption criteria for siting a solid waste disposal facility above a sole source aquifer.

Action: The text will be revised to state that the alternative meets all criteria of 3745-27-07 except (B)(5), and that the discussion of Section 4.2.2 focuses on how the alternative meets all criteria necessary to gain exemption from (B)(5) per OEPA DDAGW guidance [GD0202.101 (5-6-91)]. A table will be created to show the 15 criteria [(B)(1-15)] and how the alternative meets each criterium.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.2.2.5 Pg #: 4-51 Line #: 14-15 Code: c
Original Comment #: 27

Comment: The elimination of forested wetlands due to the installation of the disposal facility is a permanent loss of habitat. The sentence should be deleted.

Response: Agreed.

Action: The sentence on pg. 4-51, line 14-15 will be deleted. Note that long-term impacts to habitat as a result of the disposal facility for Alternative 2A/Vit is discussed during long-term environmental impacts from Alternative 2A/Vit (Section 4.2.2.3 - Biotic Resources). Inconsistencies regarding biotic resources will be corrected in the next version of the FS. For further explanation, see comment OEPA FS 2.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.2.2.5 Pg #: 4-61 Line #: 18-20 Code: c
Original Comment #: 28

Comment: Was the design of these roads based upon the expected truck traffic of 600 one-way trips per day for the duration of this alternative? It would seem a more substantial road may be necessary.

Response: As noted in the response to OEPA Comment #48, the number of truck trips provided is incorrect. It is estimated that approximately 19 one-way truck trips per working day are required for Alternative 2A/Vit. The design of the roads is more than adequate for this

anticipated need.

Action: The text will be clarified to state that a total of 19 one-way truck trips per day are required.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.2.2.5 Pg #: 4-63 Line #: 16-20 Code: c

Original Comment #: 29

Comment: Do the calculations of #'s of package take into account weight requirements per package? In other words, did DOE assume the package could be completely filled or was a per package weight limit also considered? Previously, Ohio EPA has been told that waste packages of soil couldn't be completely filled because of weight requirements thus necessitating additional packaging. DOE should discuss the potential for such requirements for both on-property and off-property disposal options.

Response: The calculated number of containers required to implement the alternatives took into account, weight requirements, which are restricted not only by DOT and NTS, but also handling capabilities within the FEMP. Due to the density of the material for disposal, a smaller container than those currently used at the FEMP was specified for use. The proposed container size was reduced to minimize void space within the containers.

Action: Added statements in the text regarding the weight limitations which were utilized to facilitate calculations for the number of containers utilized.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: Figure 4-11 Pg #: 4-65 Line #: Code: e

Original Comment #: 30

Comment: The majority of the text on this figure is unreadable.

Response: Agreed.

Action: Figure 4-11 text will be revised and made more legible.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.2.4.5 Pg #: 4-82 Line #: 11-12 Code: c

Original Comment #: 31

Comment: The document should discuss the decrease in the number of truck trips in the off-property vs. on-property disposal option. The text should briefly discuss the objective of the truck traffic under each option. Additionally, the cost tables do not reflect any difference in these costs between off-property and on-property options. DOE should provide a justification for the differences truck traffic and no subsequent difference in cost.

Response: As noted in the response to OEPA FS Comment #48, the number of truck trips provided is incorrect. It is estimated that approximately 3 one-way trips per working day are required for Alternative 3A.1/Vit. This difference does not impact the road design requirements; thus, the costs are also the same.

Action: The text will be clarified to state that a total of 3 one-way truck trips will be required for Alternative 3A.1/Vit.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.2.4.7 Pg #: 4-84 Line #: 24-28 Code: c

Original Comment #: 32

Comment: It would seem that the amount of roads and such would be different between the on-property vs. off-property disposal options. This is based on less distance to move the waste and upon the lower number of truck trips required for each option. Such a difference is not evident in

November 9, 1993

-5048

the document, what is DOE's justification for this?

Response: As noted in the response to OEPA FS Comment #48, it is estimated that approximately 30 one-way trips per working day are required on-property alternatives, and approximately 3 truck trips per day are required for the off-site alternatives. This difference does not impact the road design requirements, including the number of roads; thus, the costs are also the same.

Action: No action is required.

Commenting Organization: Ohio EPA

Commentor: T. Schneider

Section #: 4.2.4.7 **Pg #:** 4-86 **Line #:** 10-13 **Code:** c

Original Comment #: 33

Comment: As stated previously it is unclear whether DOE should assume the packages can be completely filled. DOE should discuss within the FS the criteria for waste acceptance used by NTS. Additionally, DOE should discuss any deviations from that criteria which were acceptable for on-property disposal.

Response: For clarification on whether the containers can be completely filled, see response to OEPA Comment #29. The NTS waste shipping application for the FEMP requires that all waste must be containerized. NTS specifies that these containers must meet DOT requirements, must not exceed a total weight of 4082 kg (9000 lb), and must be able to withstand 19,500 kg/m² (4000 lb/ft²). The latter two requirements are to facilitate handling of the containers at NTS [Note: Handling limitations at the FEMP require that containers not exceed a total weight of 3628 kg (8000 lb)]. DOT specification 7A Type A containers will be used to meet these standards. The same DOT specification 7A Type A packaging will be used for disposal in the on-property vault for Subunits A and B waste to facilitate retrievability of the waste prior to the capping of the disposal vault.

Action: Information regarding container requirements for the on-property disposal vault and the NTS will be provided in Section 2.5.7.2 and Section 2.5.7.3, respectively.

Commenting Organization: Ohio EPA

Commentor: T. Schneider

Section #: 4.3.2 **Pg #:** 8-10 **Line #:** 8-10 **Code:** c

Original Comment #: 34

Comment: It is unclear whether this alternative is proposing to use the same vitrification unit as will be used for the Subunit A waste. Additionally, is DOE considering blending the wastes prior to vitrification if the same unit is being used? This is still unclear upon reading the proposed plan. DOE should clarify this especially within the proposed plan.

Response: Similar to the issue discussed in USEPA General Comment #8, each subunit was considered independent of the other. Because it is not known in the Feasibility Study which remedial alternative will be identified as the preferred alternative for each of the subunits, it is not known which equipment items can be considered as duplicate items between subunit alternatives. Therefore, the FS only presents alternatives on a subunit basis. However, the Proposed Plan only includes one vitrification system for both Subunits A and B.

With regard to the issue of blending Subunits A and B residues during vitrification, preliminary treatability data indicate that there is not benefit added to the process. However, additional testing will be performed during the pilot tests which are planned.

Action: The text in the Proposed Plan will be revised to clarify the vitrification process.

November 9, 1993

043

Construction Rubble: Rubble exhibiting direct penetrating radiation fields similar to the waste materials and for which there is significant worker health and safety concerns associated with potential decontamination (i.e., surface scabbling, etc.) efforts will be dispositioned as Subunits A and B waste materials. More definitive criteria for the segregation of these materials will be defined during RD once processing equipment specifications and configurations are more definitively established.

Action: The above bullets will be added to the discussions in Section 4.4.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.4.2 Pg #: 4-157 Line #: 16-23 Code: c

Original Comment #: 38

Comment: DOE must provide a more in depth justification that ensures the Federal government will maintain perpetual ownership of the property. The justification is necessary to convince Ohio EPA that the recreational exposure is the only future exposure scenario. DOE should discuss the extent of property it intends to maintain ownership of at the FEMP. The section should also provide a more in depth discussion of the planned future land use which allows for only a recreational exposure.

Response: Agreed.

Action: A discussion justifying perpetual government ownership of the Operable Unit 4 area is provided within Section 2 of the FS in summary form. Also included is a discussion of the "Expanded Trespasser" receptor scenario (formerly "Recreational User") and the extent of property for which government ownership will be maintained. A more detailed discussion is presented in Appendix D, Attachment 2, which contains the revised White Paper (Tiered Approach for Developing Final Remedial Goals for Operable Unit 4) incorporating the agreements from the December 1, 1993 meeting in Chicago between U.S. EPA, OEPA, DOE-FN, and FERMCO representatives.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.4.2 Pg #: 4-157 Line #: 24-28 Code: c

Original Comment #: 39

Comment: The attainment of cleanup to soil action levels must be determined in accordance with the USEPA guidance document, "Methods for Evaluating the Attainment of Cleanup Standards, Volume 1, Soils and Solid Media." (1989)

Response: Evaluation of the attainment of cleanup standards would take into consideration all appropriate agency guidance available at the time. It is agreed that "Methods for Evaluating the Attainment of Cleanup Standards, Volume 1, Soils and Solid Media," (USEPA 1989) is one of the guidance documents currently available on this matter.

Action: The text will be revised to indicate that appropriate guidance will be considered in determining that cleanup levels are attained.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: Table 4-10 Pg #: 4-158 Line #: Code: c

Original Comment #: 40

Comment: a) Since the proposed remediation levels provided in the table do not agree with the protocol discussed on page 4-160(e.g., Pb-210, etc.), DOE should specify within the table the criteria used for each proposed remediation level. b) The table should include TBC cleanup criteria for both uranium and thorium. c) DOE must include all COCs for surface and berm fill soil

November 9, 1993

-5048

defined within the OU4 RI (Table D.2-5 thru D.2-7) in this table.

Response: a) Agreed. The table should match the rationale. b) The TBC criteria is a risk based criteria and the proposed remedial levels are risk based. c) The FS considers only the contaminants that were of concern in the Baseline Risk Assessment Summary (risk $< 10^{-6}$ or HI < 0.2).

Action: a) Revise the table for consistency. b) No Action. c) No Action.

Commenting Organization: Ohio EPA

Commentor: T. Schneider

Section #: Table 4-11 Pg #: 4-159 Line #:

Code: c

Original Comment #: 41

Comment a) Since the proposed remediation levels provided in the table do not agree with the protocol discussed on page 4-160(e.g., Antimony, etc.), DOE should specify within the table the criteria used for each proposed remediation level. b) DOE must include all COCs for surface and berm fill soil defined within the OU4 RI (Table D.2-5 thru D.2-7) in this table. c) The table should include an HI for uranium. d) The reason for the NAs under the HI column must be justified.

Response: a) See OEPA Comment Number 40a. b) See OEPA Comment Number 40c. c) The SF for U-238 is controlling the development of a PRL. d) Agreed.

Action: a) See OEPA Comment Number 40a. b) See OEPA Comment Number 40c. c) No Action. d) Revise the table.

Commenting Organization: Ohio EPA

Commentor: T. Schneider

Section #: 4.4.2 Pg #: 4-160 Line #: 19-22 Code: c

Original Comment #: 42

Comment: Simply placing six inches of clean fill upon the residual soils is not acceptable protection. DOE is proposing to leave soils contaminated at above background concentrations, which pose a risk greater than 1×10^{-6} and even greater than 1×10^{-4} for the on-property farmer. These soils constitute a solid waste and must undergo closure consistent with solid waste ARARs (OAC 3745-27-11, 3745-27-14 Applicable). If DOE intends to leave residual soils at the proposed levels, a solid waste cap will be required for the residual area.

Response: Disagree.

Action: Although some residual contaminants will remain in OU4 soils, the retained alternatives will result in residual risk to individuals (under the expanded trespasser scenario) which are less than 10^{-6} above background. Therefore, closure of soil media under the state solid waste rules is not required. In addition, in the calculation of risk to a potential receptor from residual soil contaminants concentrations, no credit is taken from the six inches of clean backfill. Moreover, the state solid waste facility closure regulations under OAC 3745-27-11 contain mostly administrative requirements. The substantive portions concerning groundwater monitoring and closure are referenced under the RCRA hazardous waste TSDF closure and groundwater monitoring citations under 40 CFR § 264, with the equivalent OAC cites as appropriate.

Commenting Organization: Ohio EPA

Commentor: T. Schneider

Section #: 4.4.2 Pg #: 4-161 Line #: 10-13 Code: c

Original Comment #: 43

Comment: If the same process options were evaluated, why is the cost for on-property disposal of A & B wastes higher than off-property disposal, while on-property disposal of C wastes is cheaper than off-property disposal? DOE should clearly define within this section those requirements

November 9, 1993

-5048

it is proposing to use for the disposal vault for subunit C material and how exactly it differs from the subunit A & B disposal vault. Additionally, the justification for these differences should be provided.

Response: See response to OEPA FS Comment #16.

Action: The cost estimates will be revised to include a staging facility for all off-site alternatives, packaging will be deleted from the cost of Alternative 3C.2, and a bulk disposal rate will be used for estimation of Alternative 3C.2 cost.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.4.2.1 Pg #: 4-164 Line #: 15-27 Code: c

Original Comment #: 44

Comment: As stated previously, DOE must provide additional detail and justification for the proposed future land use and Federal ownership. Based upon DOE's proposed cleanup levels, the only acceptable land use is recreational. DOE must discuss how it intends to implement this land use.

Response: Agreed.

Action: See response to OEPA Comment #42. In addition, a description of how DOE intends to implement this land use is provided in Section 2 of the FS.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.4.2.2 Pg #: 4-165 Line #: 1-10 Code: c

Original Comment #: 45

Comment: As stated previously, the residual soil DOE proposes to leave in place are a solid waste and must undergo closure. The proposed six inches of clean fill is not an acceptable closure. The alternative as proposed does not comply with OAC 3745-27-11.

Response: Disagree.

Action: Although some residual contaminants will remain in OU4 soils, the retained alternatives will result in residual risk to individuals (under the expanded trespasser scenario) which are less than 10^{-6} above background. Therefore, closure of soil media under the state solid waste rules is not required. Moreover, the state solid waste facility closure regulations under OAC 3745-27-11 contain mostly administrative requirements. The substantive portions concerning groundwater monitoring and closure are referenced under the RCRA hazardous waste TSDF closure and groundwater monitoring citations under 40 CFR § 264, with the equivalent OAC cites as appropriate.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 4.4.2.3 Pg #: 4-169 Line #: 11-16 Code: c

Original Comment #: 46

Comment: It is unclear how the disposal facility for subunit C waste, which is substantially larger than those for A & B waste, will only disturb 0.2 ha of forested wetlands with respect to the large disturbance of wetlands required for A & B disposal. This lack of clarity is partially based upon the fact that no figure within the document provides the locations of the three disposal units and their respective impacts on wetlands.

Response: The Subunit C facility will disturb less acres of wetlands than the Subunits A and B facilities because of the location of the facilities, not the size. The Subunits A and B facilities are proposed for an area just west of the Subunit C facility in a 29 acre area of forested wetlands. Appendix J provides detail regarding impacts to wetlands. Furthermore, Figure J.3.1 shows the proposed location of the Subunit C facility in relation to wetland areas on-site.

Action: Text will be added to Chapter 4.0 (pg. 4-169) referring the reader to Appendix J. In addition, the text will be added to Appendix J, where alternatives are discussed, to clarify the location of the on-property facility for Subunits A and B.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.4.2.4 Pg #: 4-170 Line #: 3-8 Code: c
Original Comment #: 47

Comment: The text should state that this alternative will not meet the statutory preference for treatment defined in the NCP. Additionally, it is equally conceivable (lines 7-8) that the concrete and structural materials could be a characteristic hazardous waste based upon the fact that residues had such characteristics. This possibility is not addressed within the alternative.

Response: Agreed. As written, the alternative for 2C, 3C.1, and 3C.2 did not presume any treatment (with the possible exception of some decontamination) would occur. However, placing this material in abeyance pending the ROD for OU3 may result in additional treatment, thereby satisfying the statutory preference for treatment.

It is possible some concrete or demolition debris will exhibit a RCRA hazardous waste characteristic. Unless it is determined (on the basis of analytical data) that the material is not hazardous, all Subunit C debris will be managed in accordance with pertinent RCRA ARARs and site procedures for hazardous waste management.

Action: Text will be revised to include possible treatment under OU3, and to clarify that Subunit C material will be managed as hazardous waste, if required, (4.4.2).

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.4.2.5 Pg #: 4-173 Line #: 1-4 Code: c
Original Comment #: 48

Comment: DOE should include a brief discussion of the purpose of these trucks and the justification for the number of trips and trucks.

Response: The number of trucks provided throughout Section 4 is incorrect. The intent was to provide the number of trucks to and from the site per day to support remedial alternative activities at the FEMP, but instead, some of the alternatives discuss the total number of trucks (including those used at the off-site disposal facilities). The purpose of these trucks is to transport materials required for the construction of remediation facilities and disposal vaults, as required. Because all alternatives with off-site disposal involve rail transport originating from the site, no trucks to and from the site will be used for the purpose of waste material transport. Thus, the total number of daily truck trips to and from the site is insignificant. The total number of trucks required at the off-site disposal location for waste material transport is correctly identified in Table D.3-18.

Action: The number of truck trips per day (on and off the site only) will be corrected for each alternative.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.4.2.7 Pg #: 4-177 Line #: 4-19 Code: c
Original Comment #: 49

Comment: DOE stated on page 4-161, "...the identical representative process options employed for Subunit A & B waste have been used to evaluate the on-property disposal alternatives for Subunit C waste." The unit cost for the disposal vault for Subunit C waste is substantially less than that of Subunit A waste suggesting identical process options were not used. DOE

November 9, 1993

5043

must discuss the differences between proposed disposal vaults and provide justifications for the differences.

Response: It is agreed that identical process options for disposal vault design were not used for Subunits A and B versus Subunit C. The cost assumption on page 4-177, lines 17-18 correctly indicated a difference in the design, but the text on page 4-161 is incorrect.

Action: The text on page 4-161 will be changed to state that a different vault design was assumed for Subunit C wastes. The text on page 4-177 will be changed to list intrusion and radon barriers as items excluded from the design and cost.

Commenting Organization: Ohio EPA **Commentor:** T. Schneider

Section #: 4.4.3.2 **Pg #:** 4-180 **Line #:** 9-18 **Code:** c

Original Comment #: 50

Comment: See previous comment on section 4.4.2.2.

Response: Disagree.

Action: Although some residual contaminants will remain in OU4 soils, the retained alternatives will result in residual risk to individuals (under the expanded trespasser scenario) which are less than 10^{-6} above background. Therefore, closure of soil media under the state solid waste rules is not required. Moreover, the state solid waste facility closure regulations under OAC 3745-27-11 contain mostly administrative requirements. The substantive portions concerning groundwater monitoring and closure are referenced under the RCRA hazardous waste TSDF closure and groundwater monitoring citations under 40 CFR § 264, with the equivalent OAC cites as appropriate.

Commenting Organization: Ohio EPA **Commentor:** T. Schneider

Section #: 4.4.4 **Pg #:** 4-186 **Line #:** 19-21 **Code:** c

Original Comment #: 51

Comment: DOE is proposing to use the same shipping containers for disposal at NTS and the commercial facility. It is Ohio EPA's understanding that one advantage to the commercial facility is the difference in disposal container requirements or the ability to reuse containers. The document fails to address differences in waste acceptance criteria for NTS and the commercial facility and the resultant impact on costs. The document should be revised to include a discussion on waste acceptance criteria for all three disposal facilities and the resultant impacts on cost.

Response: Based on updated information received after the September 1993 submittal of the OU4 FS, the cost evaluations and container requirements for disposal at the commercial disposal facility will be revised. Waste to be received at the commercial disposal facility will no longer be shipped in containers but will be shipped as bulk waste in covered railcars or covered trucks.

Action: Cost evaluation and packaging requirements for the commercial disposal facility will be revised to reflect new information. Packaging requirements for NTS and the commercial disposal facility will be provided in Section 2.5.7.3. Packaging requirements for the on-property disposal facility will be provided in 2.5.7.2.

Commenting Organization: Ohio EPA **Commentor:** T. Schneider

Section #: 4.4.2.4 **Pg #:** 4-190 **Line #:** 25-29 **Code:** c

Original Comment #: 52

Comment: See previous comment on section 4.4.3.4. Additionally, correct "martials" pg. 4-191, line 1 to read "materials".

Response: See response to Comment #47.

Action: Similar to Section 4.4.2.4, text will be modified in Section 4.4.3.4 and 4.4.4.4 to include possible treatment under OU3 and to clarify that Subunit C material will be managed as hazardous waste as appropriate. The typo "martials" will be corrected.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 4.4.4.7 Pg #: 4-194 Line #: 3 Code: c
Original Comment #: 53

Comment: DOE should provide a discussion of the basis for this unit disposal cost and that required for NTS.

Response: The disposal cost for the commercial disposal facility is being revised to reflect use of bulk shipments and a budget quote from the facility which was estimated based on the volume of waste to be disposed. The new bulk rate estimate, \$15 per cubic foot (cf), will be comparable to that of NTS unit cost, which is \$10/cf. These disposal costs are contingent upon each disposal facility's operating cost and in the case of the commercial facility, profit margins.

Action: Unit disposal cost for Alternative 3C.2, which includes disposal at a permitted commercial disposal facility, will be modified to \$15/cf.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: Table 5-4 Pg #: 5-7 Line #: Code: e
Original Comment #: 54

Comment: Alternative 3B Transport Impacts should probably be revised to "9 X 10⁻¹²".

Response: Agreed.

Action: Table 5-4 will be updated to reflect the correct transportation ILCR values for each alternative, as calculated and presented in Appendix D.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: Table 5-5 Pg #: 5-9 Line #: Code: c
Original Comment #: 55

Comment: a) Table 4-10 contradicts the B.S.L designation for subunit C alternatives for the future on-property farmer. Table 4-10 suggests the radiological ILCR would be $> 1 \times 10^{-3}$ for the future on-property farmer. Additionally, footnote "f" is not appropriate for alternatives 3C.1 and 3C.2, since residual contamination is left in place constituting a radiological ILCR $> 1 \times 10^{-3}$ (Table 4-10). b) Footnotes "b", "g", "h", and "i" are not included within the table. Delete the footnotes or include them in the table.

Response: Agreed.

Action: Table 5-5 will be corrected to reflect the values calculated and presented in Appendix D. The footnotes will be corrected accordingly.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 5.2.1.2 Pg #: 5-13 Line #: 21-29 Code: c
Original Comment #: 56

Comment: This section discusses protection of the uppermost aquifer from waste within the vault, but no section discusses protection of the aquifer from residual soils following cleanup. The document should discuss the potential impacts to the aquifer from the proposed residual soil concentrations.

Response: Section 5.2.1.2 discusses the comparative analysis of Subunit A alternatives and their associated compliance with ARARs (i.e., protection of the uppermost aquifer from waste within the vault). The potential impacts to the aquifer from the proposed residual soil

November 9, 1993

-5048

concentration are discussed and presented in detail in Appendix D, Section D.3.2.2.4, and are summarized in Section D.4.2. In addition, the derivation of ILCRs and HIs for residual soil contamination is presented in Attachment D.III.

Action: No Action.

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: 5.4.1.2 Pg #: 5-39 Line #: 10-18 Code: c

Original Comment #: 57

Comment: As stated previously, the subunit C alternatives will not comply with Applicable solid waste closure requirements (OAC 3745-27-11). The section should also discuss the failure to meet TBC cleanup levels for uranium and thorium.

Response: Ohio solid waste closure requirements (OAC 3745-27-11) were not specifically identified as an ARAR for Subunit C alternatives because this material has the potential to be both radioactive and exhibit a characteristic of hazardous waste. Therefore, with the exception of the specific location requirements for the disposal facility found in OAC 3745-27-07, the design basis of the on-site disposal facility was selected to meet the RCRA ARARs for hazardous waste rather than for a sanitary landfill. The facility also incorporates additional design elements to ensure protectiveness due to associated radioactivity. Moreover, most of the requirements of OAC 3745-27-11 are administrative, rather than substantive. The exceptions, cap design, groundwater monitoring, and closure are covered under §264.310 and §264 F and G respectively, with the state equivalent OAC citations noted in the ARAR tables.

Regarding soil cleanup levels for U and Th, see response to OEPA #7.

Action: No action required.

Commenting Organization: Ohio EPA Commentor: Mitchell

Section #: Page #: 4-194 Line #: Code:

Original Comment #: 58

Comment: In Graham Mitchell's discussions with Envirocare, they apparently had questioned out \$34/cubic foot disposal cost in the FS. Graham would like to know where this figure came from.

Response: The \$34/ft³ disposal cost was estimated as an average disposal cost rate for containerized waste based on informal discussions with a commercial disposal facility.

Action: The disposal cost for the commercial disposal facility is being revised to reflect use of bulk rail shipments and a budget quote from the commercial disposal facility which was based on the volume of waste to be disposed. The new commercial bulk rate estimate of \$15/ft³ will be used.

PROPOSED PLAN COMMENTS

Commenting Organization: Ohio EPA Commentor: T. Schneider

Section #: General Comment Pg #: Line #: Code: c

Original Comment #: 1

Comment: All changes to the FS based upon Ohio EPA comments should also be reflected in the revised Proposed Plan as appropriate.

Response: Agreed. All changes to the FS based upon Ohio EPA comments will be reflected in the revised PP as appropriate.

Action: Revise per comment.

Commenting Organization: Ohio EPA Commentor: G. Mitchell
Section #: 1.0 Pg #: 2 Line #: 18 Code: e
Original Comment #: 2
Comment: Delete "90".
Response: Agreed.
Action: "90" will be deleted.

Commenting Organization: Ohio EPA Commentor: G. Mitchell
Section #: 4.2 Pg #: 20 Line #: 19 Code: e
Original Comment #: 3
Comment: Revise "form" to "from."
Response: Agreed.
Action: "form" will be "from."

Commenting Organization: Ohio EPA Commentor: G. Mitchell
Section #: 4.5 Pg #: 41 Line #: 1-2 Code: c
Original Comment #: 4
Comment: The fact that the predicted potential effects have not occurred should be reserved for the OU5 RI Ecological Assessment when the data can be viewed to verify this conclusion.
Response: Agreed.
Action: Will delete the statement, "This indicates that the predicted potential effects have not occurred."

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 5.4.1 Pg #: 59 Line #: 21-30 Code: c
Original Comment #: 5
Comment: Attainment of any cleanup levels must be determined in accordance with USEPA guidance "Methods for Evaluating the Attainment of Cleanup Standards. Volume 1. Soils and Solid Media." (1989).
Response: See OEPA FS Comment #39 for response.
Action: The text will be revised to indicate that appropriate guidance will be considered in determining that cleanup levels are attained.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 5.4.1 Pg #: 59 Line #: 31-34 Code: c
Original Comment #: 6
Comment: DOE fails to provide any criteria for making the determination whether Subunit C wastes will be dispositioned with Subunit A wastes. DOE should provide such criteria within the FS at a minimum.
Response: See OEPA FS Comment #37 for response.
Action: See OEPA FS Comment #37 for action.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 5.4.1 Pg #: 61 Line #: 14-17 Code: c
Original Comment #: 7
Comment: What basis does DOE have for stating that the soil cleanup levels with the clean fill are protective of a hypothetical future on-property farmer? Table 4-10 in the FS suggests the radiological ILCR alone to this individual would be in greater than 1×10^{-3} . Thus, the

November 9, 1993

-5043

proposed remedy is not protective of a future on-property farmer.

Response: See response to U.S. EPA Region V, Radiation Section, Proposed Plan Comment Number 14.
Action: See response to U.S. EPA Region V, Radiation Section, Proposed Plan Comment Number 14.

Commenting Organization: Ohio EPA Commentor: G. Mitchell
Section #: 6.1 Pg #: 66 Line #: 26 Code: e
Original Comment #: 8
Comment: Delete "in."
Response: Agreed.
Action: Will delete "in."

Commenting Organization: Ohio EPA Commentor: G. Mitchell
Section #: 6.2.1.2 Pg #: 77 Line #: 1-2 & 13-14 Code: c
Original Comment #: 9
Comment: It may be more descriptive to add that engineering controls would be used to address this "uncertainty."
Response: Agreed.
Action: Text will be revised to be more descriptive.

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: 6.2.3.1 Pg #: 85 Line #: 12-31 Code: c
Original Comment #: 10
Comment: The proposed 3C alternatives will not comply with solid waste closure requirements (OAC 3745-27-11) for the residual soils.
Response: See response to OEPA FS Comment Number 10.
Action: No Action.

Commenting Organization: Ohio EPA Commentor: G. Mitchell
Section #: 6.3.2 Pg #: 94 Line #: 2 Code: e
Original Comment #: 11
Comment: Revise "consist" to state "consistent."
Response: Agreed.
Action: Will change "consist" to "consistent."

Commenting Organization: Ohio EPA Commentor: T. Schneider
Section #: Figure 6-3 Pg #: 95 Line #: Code: c
Original Comment #: 12
Comment: The location of the OU4 disposal facility as shown in this drawing appears to conflict with the proposed location of the OU3 storage facility as defined in the OU3 Proposed Plan. The OU3 CSF as drawn in Figure 6-3 does not reflect that presented in the OU3 PP. DOE must provide additional drawings within the OU4 FS of the proposed location for the OU4 disposal facilities and the proposed OU3 storage facility as defined in the OU3 PP to ensure that the two OUs (4&3) are not planning to use the same area. Figure 6-3 should then be revised as appropriate.
Response: In the Operable Unit 4 Feasibility Study Report, the description for Alternative 2C has been revised to include a full discussion on the strategy for integrating efforts with Operable Units

5 and 3 for the final disposition of Operable Unit 4 rubble, debris, and soils. The final disposition of the Operable Unit 4 materials would occur coincidental to the implementation of the Records of Decision for Operable Units 5 and 3. This strategy would promote cost-savings through reduction of volumes requiring disposal and would realize economies-of-scale through treatment by processes developed for larger volumes of soil and debris as well as disposal.

Geotechnical information developed by the Operable Unit 4 FS for this geographical area, indicates that this area offers the best conditions for the siting of an on-property disposal facility. It is recognized that the configuration and proposed location of the on-property disposal facility for the Operable Unit 4, Alternative 2C, lies in an area adjacent to and overlaps a portion of the area identified for the OU3 Controlled Storage Facility (CSF).

Since the Operable Unit 4 contaminated rubble and debris would be dispositioned consistent with the Record of Decision for Operable Unit 3, the siting and configuration of the OU4 on-property disposal facility (if required) would be closely coordinated with OU3 so that no spatial conflicts would result.

Action:

No Action.