

6539

U-003-505 .2

**OPERABLE UNIT 1 DRAFT RECORD OF DECISION - RESPONSE TO  
COMMENTS AND CHANGE PAGES**

01/13/95

DOE-0423-95  
DOE-FN        EPAS  
80  
RESPONSES



Department of Energy  
Fernald Environmental Management Project  
P. O. Box 398705  
Cincinnati, Ohio 45239-8705  
(513) 648-3155

6539

DOE-0423-95

JAN 19 1995

Mr. James A. Saric, Remedial Project Manager  
U.S. Environmental Protection Agency  
Region V - 5HRE-8J  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

Mr. Thomas A. Schneider  
Fernald Project Manager  
Office of Federal Facilities Oversight  
Ohio Environmental Protection Agency  
401 East 5th Street  
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

**OPERABLE UNIT 1 DRAFT RECORD OF DECISION - RESPONSE TO COMMENTS AND CHANGE PAGES**

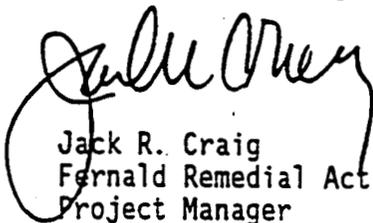
- Reference:
1. Letter, J.A. Saric to J.R. Craig, "Approval of the Draft OUI Record of Decision," December 22, 1994.
  2. Letter, T.A. Schneider to J.R. Craig, "OUI Draft Record of Decision Comments," December 9, 1994.

This letter transmits for the United States Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) review and approval, the enclosed package which addresses comments received from U.S. EPA and OEPA on the November 4, 1994, submittal of the Operable Unit 1 (OUI) Draft Record of Decision (ROD). This package contains both a comment response document and changed pages for the OUI ROD that incorporate these responses.

This response package is being provided to EPA as requested by U.S. EPA in its December 22, 1994, letter, wherein it was noted to submit by facsimile, responses and changed pages to the U.S. EPA prior to submitting the final ROD. The letter further stated that the DOE-FN must incorporate the responses to comments into the ROD and submit a signed final document within 30 days of receipt of that letter. Based on the receipt date of December 27, 1994, for the U.S. EPA letter, a signed final ROD will be submitted to U.S. EPA by January 26, 1995. To support the January 26, 1995, submittal of a DOE signed final ROD consistent with the stated 30-day commitment, EPA feedback on the enclosed Response to Comments and Change Pages is needed by January 19, 1995.

If you or your staff have any questions, please contact Dave Lojek at (513) 648-3127.

Sincerely,



Jack R. Craig  
Fernald Remedial Action  
Project Manager

FN:Lojek

Enclosures: As Stated

cc w/encs:

B. Barwick, USEPA-V  
G. Jablonowski, USEPA-V, AT-18J  
J. Kwasniewski, OEPA-Columbus  
P. Harris, OEPA-Dayton  
M. Proffitt, OEPA-Dayton  
J. Michaels, PRC  
R. Cohan, GeoTrans  
F. Bell, ATSDR  
R. Owen, ODOH  
R. D. George, FERMCO/52-2  
AR Coordinator, FERMCO

cc w/o encs:

K. H. Chaney, EM-423/QO  
S. Fauver, EM-423/QO  
D. Kozlowski, EM-423/QO  
J. Fiori, EM-40/TREV  
G. Mitchell, OEPA-Dayton  
J. Hamric, DOE-OH  
J. Craig, DOE-FN  
J. Reising, DOE-FN  
T. Hagen, FERMCO  
J. Thiesing, FERMCO  
M. Yates, FERMCO/9

000002

OPERABLE UNIT 1 PROPOSED DRAFT RECORD OF DECISION  
U.S. EPA COMMENTS  
FAXED ON DECEMBER 22, 1994  
RECEIVED ON DECEMBER 27, 1994

Commenting Organization: U.S. EPA Commentor: B. Barwick  
Section #: 10 Page #: 10-6, 10-7 Line #: Code:  
Original Comment #: 1 (1)

Comment: On pages 10-6 and 10-7, DOE states that on-site disposal of OU1 wastes is inappropriate. However, we know that on-site disposal of other wastes is being considered. DOE should discuss the special characteristics of OU1 waste which render it inappropriate for on-site disposal.

Response: Agree. Operable Unit 1 waste has special characteristics that render it unsuitable for on-site disposal. Any waste disposed on site would be required to meet the applicable Waste Acceptance Criteria, set by Operable Unit 2. As an illustration of this, an analysis of just one parameter, uranium-238, shows that average uranium-238 concentrations, on a pit-by-pit basis, are greater than allowable under the Proposed Waste Acceptance Criteria, as listed in the conditionally approved Operable Unit 2 Feasibility Study.

Action: Additionally, on-site disposal would require application to the Environmental Protection Agency for a waiver from the State of Ohio applicable requirement that prevents siting hazardous waste facilities over sole-source aquifers. Through detailed and continuous interaction with the State of Ohio, it has become clear the State does not believe a waiver is appropriate for Operable Unit 1 wastes, and the State would not support such a waiver. Page 10-7, line 3. The following footnote number has been added at the end of the sentence: "1"

Page 10-7, last line. The following footnote has been added: "1 Since the Operable Unit 1 Feasibility Study/Proposed Plan have been approved by the U.S. EPA, there have been other efforts at the FEMP to site an on-site disposal cell. OEPA indicated that the maximum on-site disposal facility Waste Acceptance Criteria for U-238 should be a maximum of 360 picoCuries per gram (for Operable Unit 2 material), as presented in the Operable Unit 2 Feasibility Study and as discussed in the OEPA letter dated December 13, 1994. The average U-238 activity for all Operable Unit 1 waste pits exceeds this limit, in some cases by an order of magnitude or more. Thus, the higher concentrations of U-238 in Operable Unit 1 waste material render Operable Unit 1 waste unacceptable for disposal in an on-site disposal cell (as compared to on site contaminated soils and structural material). It is noted, however, that soils beneath the waste that meet the on-site Waste Acceptance Criteria may be disposed of on site."

Commenting Organization: U.S. EPA Commentor: B. Barwick  
 Section #: Page #: Line #: Code:  
 Original Comment #: 2 (2)

Comment: Assuming Enviro-Care and NTS disposal sites are presently in compliance with the Off-Site Rule, what actions will DOE take should the facilities' compliance status change in the future?

Response: Comment Acknowledged. DOE will conduct an audit of the disposal facility prior to shipping Operable Unit 1 waste to confirm the facility's status and compliance history. The review will be conducted annually throughout the term of the remediation project. In the event the compliance status of the disposal facility would change, DOE would temporarily suspend waste shipments until the actions/requirements for regaining acceptability status under the policy were implemented and the facility becomes designated as acceptable.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: B. Barwick  
 Section #: 3 Page #: Line #: Code:  
 Original Comment #: 3 (3)

Comment: If Technical Assistance Grant (TAG) money has been provided to the community (i.e., FRESH), DOE should mention that in the section entitled 3.0 Community Participation.

Response: Comment Acknowledged. U.S. EPA has not provided any Technical Assistance Grants to FRESH or any other stakeholders surrounding the Fernald site.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: B. Barwick  
 Section #: 3 Page #: 3-3 Line #: Code:  
 Original Comment #: 4 (4)

Comment: Page 3.3, third paragraph of the ROD indicates that the public comment period for the proposed plan ran from August 10, 1994, to September 8, 1994; however, the NCP requires that the lead agency shall, "Provide a reasonable opportunity, not less than 30 calendar days, for submission of written and oral comments on the proposed plan..." (See 40 CFR 3 300.430(f)(3)(i)(C).) It appears that the public comment period was only 28 calendar days. Is this correct?

Response: Disagree. The public comment period for the Operable Unit 1 Proposed Plan did run from August 10 - September 8, 1994, as stated in the ROD. This timeframe actually spans 30 calendar days, so the dates are correct as printed.

Action: Page 3-3, line 18: Text now reads, "A 30-day public comment period was held from August 10, 1994, to September 8, 1994, inclusive."

Commenting Organization: U.S. EPA Commentor: B. Barwick  
Section #: 7.2.2, 7.2.3 Page #: Line #: Code:  
Original Comment #: 5 (5)

Comment: In the discussion in sections 7.2.2 and 7.2.3, the on-site disposal alternatives for this ROD state that the waste will be treated to minimum treatment standards that "resist contaminant leaching and meets or exceeds regulatory standards." DOE should expand this discussion.

Response: Agree. Waste solidification technologies are discussed in detail in Section 2.4.6.2 of the Operable Unit 1 Feasibility Study.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: B. Barwick  
Section #: Page #: Line #: Code:  
Original Comment #: 6 (6)

Comment: With respect to the removal actions conducted at the site of OU1, the administrative record for this OU should cross-reference the administrative record indices for the earlier removal actions.

Response: Comment Acknowledged. The Administrative Record for Operable Unit 1 includes documentation of all five Operable Unit 1 study area removal actions. Thus, no cross-referencing would be required.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: B. Barwick  
 Section #: Page #: Line #: Code:  
 Original Comment #: 7 (7)

Comment: DOE should run a check for acronyms; a lot of acronyms are defined more than once in this document (e.g., EPA, DOE, NTS, FEMP, CERCLA, RCRA, NCP, ARAR, TBC).

Response: Comment Acknowledged. According to the FEMP RI/FS Style Guide, the first appearance of a name of an agency, title, legislative act, etc., in every numbered section is to be spelled out and followed by the acronym in parentheses. Thereafter, the acronym only is used. The document has been thoroughly checked and necessary changes have been made to ensure that the ROD follows appropriate style.

Action: Page D-i, line 17. The acronym, "DOE", has been replaced with "the Department of Energy (DOE)", and the acronym, "(NEPA)", has been added after, "National Environmental Policy Act".  
 Page 5-7, line 1. The acronym, "polychlorinated biphenyls (PCBs)", has been replaced with "PCBs".  
 Page 5-7, line 6. The acronym, "(PAH)" has been replaced with "polyaromatic hydrocarbons".  
 Page 6-2, line 6. The acronym, "(COPC)" has been deleted.  
 Page 6-2, line 12. The acronym, "Constituents of Concern (COC)", has been replaced with "COC".  
 Page 7-6, lines 9 and 20. The acronym, "Nevada Test Site (NTS)", has been replaced with "NTS".

Commenting Organization: U.S. EPA Commentor: B. Barwick  
 Section #: Page #: Line #: Code:  
 Original Comment #: 8 (8)

Comment: For this, and other final RODs, DOE should supplement the OU specific administrative record with a list of any guidance used in preparing the ROD. For example, the references listed on Page R-1 should be included in the Administrative Record. Since DOE uses guidance which is applicable to all of its RODs, it may be possible to assemble a lists of this guidance and routinely incorporate it into each administrative record.

Response: Comment Acknowledged. The references listed on page R-1 have already been incorporated into the Administrative Record for Operable Unit 1. This list includes the EPA Guidance on Preparing Superfund Decision Documents.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric  
Section #: Appendix A Summary Comment 1E Page #: A-2-10  
Line #: 3-5 Code:  
Original Comment #: 9 (1)

Comment: On Page A-2-13, Lines 3 through 5, one commentor suggests dividing Operable Unit 1 (OU1) into two parts: the high-level uranium waste of Pits 2, 4, and 6 and the lower-level uranium waste of Pits 1, 3, and 5. The commentor suggests that this division would reduce the need for material to be placed in an off-site disposal facility. The U.S. Department Of Energy (DOE) response to this suggestion on Page A-2-10, Lines 35 and 36, and Page A-2-11, Lines 1 through 3, does not directly address the commentor's description of high- and lower-level uranium wastes present in the contents of the various pits at OU1. U.S. DOE should clarify the fact that the lower-level uranium wastes still contain sufficient levels of uranium to require off-site disposal.

Response: DOE understands that the U.S. EPA issue concerning higher concentrations of U-238, in Operable Unit 1 waste materials as compared to soils, is an important consideration with respect to off-site disposal. Separation of Operable Unit 1 material is in actuality more complex than merely examining the concentration of a single contaminant.

Action: Page A-2-10, line 35 through page A-2-11, lines 1-7. The text has been changed to read as follows:

"The Operable Unit 2 Feasibility Study (which OEPA has conditionally approved), indicated that the maximum acceptable Waste Acceptance Criteria for uranium-238 would be 360 pCi/g (Letter from Thomas A. Schneider, Ohio EPA to Gary Stegner, DOE, dated December 13, 1994). As reported in the Operable Unit 1 Remedial Investigation Report, the average uranium-238 concentration in Waste Pit 1 is 3900 pCi/g; for Waste Pit 3, 978 pCi/g; and for Waste Pit 5, 809 pCi/g. Using the proposed uranium-238 Waste Acceptance Criterion as a guide, it is clear this number is less than the average uranium-238 concentrations found in the waste pits.

It is also important to consider that state acceptance of disposal of waste materials from the pits on site would require an exemption from OEPA or a waiver from U.S. EPA of the regulation that prohibits disposal facilities located above sole-source aquifers. As discussed in Comment #1b, Ohio has indicated that it would not support such a waiver for Operable Unit 1 waste pit material."

Commenting Organization: U.S. EPA Commentor: Saric  
 Section #: Appendix A, Summary Comment 1G Page #: A-2-14  
 Line #: 20-31 Code:  
 Original Comment #: 10 (2)

Comment: On Page A-2-15, Lines 20 through 31, the commentor states that "technologies such as soil washing and vitrification offer significant volume reductions, durable waste forms, and significantly reduced containerization, transportation, and disposal costs (not to mention a reduced risk for exposure during an accident scenario). These savings have not been fairly evaluated or publicized." However, U.S. DOE's response does not address the suggestion of considering soil washing as a potential technology for remediation of OU1. U.S. DOE should address the possibility of using soil washing in a manner similar to its discussion of vitrification.

Response: Comment Acknowledged. Soil washing was screened out of consideration for Operable Unit 1, in Section 2 of the Operable Unit 1 Feasibility Study. Soil washing, under the subheading, Chemical Extraction of Section 2.4.6.4 Chemical Treatment Technologies, was not retained for detailed analysis in the Feasibility Study because the process option has only been proved effective at removing individual contaminants from a soil matrix (i.e., organics, inorganics, or radionuclides); however no complex matrix mixture such as that in the waste pits has ever been tested to prove effectiveness. The unknown interferences that one waste material in the matrix can have on another, coupled with the easily dissolved solids will most likely cause large amounts of reagents to be consumed during processing. The heterogenous nature of the material in the waste pits causes decreases in process efficiency and difficulty in material handling system design.

The majority of the uranium present in the waste pit material (particularly in Waste Pits 4 and 5) is in a depleted form which has been processed and repeatedly extracted under rigorous conditions to reach the economic discard limit of 0.2 to 0.42 percent. While it is possible to remove additional uranium from the waste pit material (NLCO 1978 looked only at Waste Pit 5 material), it is extremely difficult and requires many processing steps under extreme conditions. If the processing operation could be accomplished, the removal (or in the Operable Unit 1 case of recovery) is only estimated at 95 percent (NLCO 1978). This removal efficiency will not satisfy the Operable Unit 1 remedial objectives and would require proper disposal of large amounts of solid waste materials.

The soil washing or chemical extraction process option is moderately difficult to implement because of the large number of processing steps that would be required to remove the numerous types of waste present in the pit material. Large quantities of intermediate liquid streams would require storage and processing capacity.

The capital cost for the chemical extraction system would be high due to the costs of the material handling equipment, process equipment, chemical reagents, and labor. O&M costs would moderate. Overall, costs would be high.

DOE's response to comment #1g has been revised to direct the reader to the section in the Operable Unit 1 Feasibility Study where soil washing is discussed.

**Action:** DOE's response to comment #1g has been revised to include this information. On Page A-2-15, line 19, insert the following statement:

"Soil washing was not retained for detailed analysis for Operable Unit 1. A discussion of soil washing is included in Subsection 2.4.6.4 of the Operable Unit 1 Feasibility Study, under the subheading, Chemical Treatment Technologies."

Commenting Organization: U.S. EPA Commentor: Saric  
Section #: Appendix A, Summary Comment 1G Page #: A-2-15  
Line #: 32-34 Code:  
Original Comment #: 11 (3)

**Comment:** On Page A-2-15, Lines 32 through 34, the commentor states the following: "Cost estimates used in the OU1 FS for vitrification do not appear to be anywhere near realistic. Were these estimates based on actual pilot scale vitrification runs? If not, what type of data were used to develop these estimates, and how old was the data?" In discussing vitrification as a potential technology for remediation of OU1, U.S. DOE does not directly address the cost estimate issue raised by the commentor. Specifically in its response to the commentor, U.S. DOE should specify the type and age of the data used to develop the cost estimates as requested by the commentor.

**Response:** Comment Acknowledged. First, the estimates in the Operable Unit 1 Feasibility Study for vitrification were not based on full-scale pilot scale vitrification runs; none has been performed for the Operable Unit 1 waste. Second, the data used to support the estimate was obtained from a 1992 Conceptual Design Report for the Remediation of Waste Pit Area, Removal, Treatment, and On-site Disposal prepared for FERMCO by Ralph M. Parsons, Corporation. Sources for the data included catalog data, verbal vendor quotations, current contract and FERMCO labor rates, conventional cost estimating guides, and generic unit costs.

**Action:** Page A-2-14, line 12. The following text has been added. "A detailed cost analysis of all elements in each alternative is presented in Appendix E of the Operable Unit 1 Feasibility Study. The estimates in the Operable Unit 1 Feasibility Study for Vitrification were not based on pilot-scale vitrification runs; none has been performed for the Operable Unit 1 waste. In addition, the data used to support the estimate were obtained from a 1992 Conceptual Design Report for the Remediation of Waste Pit Area, Removal, Treatment, and On-site Disposal prepared for FERMCO by Ralph M. Parsons, Corporation, as well as from catalog data, verbal vendor quotations, current contract and FERMCO labor rates, conventional cost estimating guides, and generic unit costs."

OPERABLE UNIT 1 PROPOSED DRAFT RECORD OF DECISION  
OHIO EPA COMMENTS  
DECEMBER 9, 1994

Commenting Organization: Ohio EPA Commentor: OFFO  
Section #: General Comment Page #: Line #: Code: M  
Original Comment #: 1

Comment: DOE should revise the ROD and Responsiveness Summary to reflect the fact that a waiver of DOE Order 5820.2A has been granted for disposal of the OU1 material at the Envirocare facility.

Response: Comment Acknowledged. Appropriate changes should be made in the text reflecting that the requirements of DOE Order 5820.2A, which restricts the disposal of low-level radioactive material at a commercial facility, have been waived by DOE Headquarters for Operable Unit 1 material to be sent to a permitted commercial waste disposal facility.

Action: Page 8-12, lines 16-24. The text now reads: "For Alternative 5B, which proposes off-site disposal at a permitted commercial waste disposal facility, it is noted that DOE Order 5820.2A currently prohibits use of commercial disposal facilities for disposal of low-level radioactive wastes of the type present in Operable Unit 1; but the order does have an exemption provision. An exemption request to DOE Order 5820.2A has been approved by DOE Headquarters, Office of Waste Management, so that Operable Unit 1 pit wastes can be disposed at a permitted commercial waste disposal facility (DOE 1994d)."

Page R-1, Line 27. The following reference has been added: "U.S. Department of Energy, 1994d, Memorandum from Jill E. Lytle, Deputy Assistant Secretary for Waste Management, to John E. Baublitz, Acting Deputy Assistant Secretary for Environmental Restoration, Subject: Approval for disposal of Fernald low-level radioactive waste from Operable Unit 1 at a commercial disposal facility, dated November 8, 1994."

Page A-2-9, lines 23-27. Lines 24, 25, 26, and 27 have been deleted. The response now reads: "An exemption request to DOE Order 5820.2A has been approved by DOE Headquarters, Office of Waste Management, so that Operable Unit 1 pit wastes can be disposed at a permitted commercial waste disposal facility."

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: General Comment Page #: Line #: Code: M  
 Original Comment #: 2  
 Comment: The Ohio EPA makes no evaluation of DOE's applicability and compliance with NEPA. The Ohio EPA does recognize DOE's goal to integrate cleanup actions with the requirements of CERCLA and NEPA, however, it is Ohio EPA's position that CERCLA requirements take precedence, and for the most part, replace NEPA.

Response: The DOE acknowledges this comment for the Administrative Record.  
 Action: No Action.

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: General Comment Page #: Line #: Code: M  
 Original Comment #: 3  
 Comment: Since the remediation levels defined within the ROD are only protective of the expanded trespasser and off-property farmer, DOE must incorporate stronger language committing to perpetual ownership and maintenance of the property. DOE must include a commitment to long-term monitoring of contaminated soils left in place as well as any on-property disposal facilities which may be employed under OU3 or OU5. DOE must preclude development, which would allow exposures exceeding those defined by the expanded trespasser, from occurring within the OU1 area.

Response: Comment Acknowledged. As described in the ROD, all Operable Unit 1 waste will be removed. If found to be necessary, the Operable Unit 5 Record of Decision will modify the Operable Unit 1 remediation levels downward to further ensure protectiveness of human health and the environment. The Operable Unit 5 Record of Decision will be finalized prior to waste pit excavation at Operable Unit 1. Because Operable Unit 1 waste will be removed and because Operable Unit 5 will manage the remaining soil, any long-term monitoring requirements and long-term administrative controls associated with the remaining soils will be set in the Operable Unit 5 Record of Decision.  
 Action: No Action.

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: 2.3 Page #: 2-8 Line #: 9 Code: C  
 Original Comment #: 4  
 Comment: This section might more appropriately be titled "Response Actions".

Response: Agree. The suggested change should be made.  
 Action: Page 2-8, line 9. The section now reads, "2.3 OPERABLE UNIT 1 RESPONSE ACTIONS."

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: 3.0 Page #: 3-2, 3-3 Line #: Code: C  
 Original Comment #: 5  
 Comment: This section should reference the Ohio EPA's availability session concerning the OU1 Proposed Plan held during August.

Response: Agree.

Action: Page 3-3, line 6. The following paragraph has been added: "In addition to the public workshops sponsored by the DOE, Ohio EPA held a local availability session on August 17, 1994. Members of the Fernald Citizens Task Force and representatives from the local citizens group, Fernald Residents for Environmental Safety and Health (FRESH) were invited to attend this session to ask questions about the proposed plan for the cleanup of Operable Unit 1. Representatives from EPA and Ohio EPA were available to answer questions and address concerns from approximately 12 people who attended the session. Announcements about this availability session were made at the prior public workshops sponsored by the DOE, the monthly FRESH meeting, and the monthly Fernald Citizens Task Force meeting."

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: 8.2.6.2 Page #: 8-11 Line #: 19-24 Code: C  
 Original Comment #: 6  
 Comment: Update this section concerning the current status of the waiver.

Response: It is assumed the commentor is referring to page 8-12, rather than 8-11; based on this assumption we agree with the comment. This section should be revised.

Action: Page 8-12, lines 16-24. The text now reads: "For Alternative 5B, which proposes off-site disposal at a permitted commercial waste disposal facility, it is noted that DOE Order 5820.2A currently prohibits use of commercial disposal facilities for disposal of low-level radioactive wastes of the type present in Operable Unit 1; but the order does have an exemption provision. An exemption request to DOE Order 5820.2A has been approved by DOE Headquarters, Office of Waste Management, so that Operable Unit 1 pit wastes can be disposed at a permitted commercial waste disposal facility (DOE 1994d)."

Page R-1, Line 27. The following reference has been added: "U.S. Department of Energy, 1994d, Memorandum from Jill E. Lytle, Deputy Assistant Secretary for Waste Management, to John E. Baublitz, Deputy Assistant Secretary for Environmental Restoration, Subject: Approval for disposal of Fernald low-level radioactive waste from Operable Unit 1 at a commercial disposal facility, dated November 8, 1994."

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: Table 9-2 Page #: 9-5 Line #: Code: C  
 Original Comment #: 7  
 Comment: Footnote "d" is used within the table but no footnote exists. The table should be revised to incorporate the footnote.

Response: Agree. Footnote clarification is needed.  
 Action: Footnote "d" has been changed to footnote "c," with the appropriate textual description which has been added as follows: "0.5 times the PRG, to protect against multiple chemicals."

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: 10.6 Page #: 10-8 to 10-9 Line #: all Code: C  
 Original Comment #: 8  
 Comment: This section is totally unacceptable. The way the text is written, by concurring with the OU1 ROD the State of Ohio would essentially be waiving any NRD claims against the DOE. Please remove this section in its entirety.

Response: Comment Acknowledged. As previously addressed in comments associated with the Operable Unit 4 Record of Decision, it is DOE's position that the inclusion of this section is necessary and appropriate as it summarizes information presented in the OU1 FS/PP and is required to be analyzed as a potential impact under the NEPA statute. It is DOE's understanding that Ohio EPA's concern lies within the first paragraph text, which refers to securing the exclusion discussed in CERCLA Section 107 (f)(1).

DOE is committed to proactively soliciting input from all appropriate stakeholders (e.g., Natural Resource Trustees) to ensure that actions at the FEMP will be conducted in a manner protective of human health and the environment; and will avoid or mitigate natural resource impacts to the extent practicable.  
 Action: Page 10-8, line 17. Section 10.6 will remain as part of the OU1 Record of Decision, however, reference to securing the CERCLA Section 107 (f)(1) exclusion will be deleted. The first paragraph has been revised to read, "Natural resources and associated services would be permanently committed as a result of implementing the selected remedy. These commitments not only include the resources and land, but also the services they provide as well."

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: A.2 Page #: A-2-9 Line #: 23-27 Code: C  
 Original Comment #: 9  
 Comment: Update the response to Summary Comment 1d with regard to the current status of the waiver.

Response: Agree.

Action: Page A-2-9, lines 23-27. Lines 24, 25, 26, and 27 have been deleted. The response now reads: "An exemption request to DOE Order 5820.2A has been approved by DOE Headquarters, Office of Waste Management, so that Operable Unit 1 pit wastes can be disposed at a permitted commercial waste disposal facility."

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: A.2 Page #: A-2-16 Line #: 22-25 Code: C  
 Original Comment #: 10  
 Comment: The requirement for a new public comment period only occurs when a ROD Amendment is conducted. The section should be revised to delete discussion of the Explanation of Significant Difference, since an ESD would not be appropriate under this scenario.

Response: Agree.

Action: Page A-2-16, line 24. The following text has been deleted: "or Explanation of Significant Differences". The rest of the sentence remains intact.

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: A.2 Page #: A-2-17 Line #: 2-5 Code: C  
 Original Comment #: 11  
 Comment: The ROD should not discuss expectations with regard to another OU's remedy. The text should be revised to state what is factual (e.g., "the preferred alternative in the OU2 Proposed Plan...").

Response: Agree.

Action: Page A-2-17, line 2. The sentence has been changed to, "The preferred alternative in the Operable Unit 2 Proposed Plan includes designing and locating an on-site disposal facility that will be used for disposal of Operable Unit 2 materials that will remain at the FEMP."

Commenting Organization: Ohio EPA Commentor: OFFO  
Section #: A.2 Page #: A-2-36 Line #: Code: C  
Original Comment #: 12

Comment: It would seem DOE's response to comment #3e could be more committal. Ohio EPA believes it would be appropriate for DOE to at least commit to not storing loaded cars at Shandon yard. This would show a good faith effort on DOE's part to incorporate substantial public comments into the ROD.

Response: Comment Acknowledged. DOE acknowledges public concern with regard to storing loaded rail cars at the Shandon Switchyard. However, to commit to fine details of management of the railcars prior to detailed design may cause additional logistic problems and construction on site and off site that would in turn increase costs while not increasing safety. DOE, however, does acknowledge that the current state of evaluation and information concerning the Shandon Switchyard suggests that the use of that switchyard for long-term storage of loaded railcars is not a viable option. DOE has committed to keep the public involved in and informed of any decisions made regarding use of the Shandon Switchyard.

Action: No Action.

Commenting Organization: Ohio EPA Commentor: OFFO  
Section #: Appendix B Page #: Line #: Code: M  
Original Comment #: 13

Comment: DOE has failed to incorporate sufficient RCRA ARARs. The section should be revised to include RCRA ARARs and TBCs for hazardous waste treatment and HWMU closures. At a minimum hazardous waste will be generated from Waste Pit 4, which must undergo HWMU closure.

Response: Agree. Additional relevant and appropriate requirements include (1) HWMU post-closure requirements mandated by 40 CFR 264 Subpart G (40 CFR 264.117, OAC 3745-55-17, 40 CFR 264.119, and OAC 3475-55-19); (2) SWMU corrective action requirements mandated by 40 CFR Subpart S (40 CFR 264.552 and 40 CFR 264.553) and (3) HWMU closure requirements mandated by 40 CFR 264 Subpart G (OAC 3745-55-11 to OAC 3475-55-16).

Action: Appropriate citations have been added to Appendix B.

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: App-B, Table B-2 Page #: B-10 Line #: Code: C  
 Original Comment #: 14  
 Comment: The requirements under OAC 3745-17-07 are incorrectly cited. Discharges may not exceed 60% opacity for greater than 6 minutes.

Response: Agree. Visible particulate emissions from any stack may exceed 20 per cent opacity, as a six-minute average, for not more than six consecutive minutes in any 60 minutes, but shall not exceed 60 per cent opacity, as a six-minute average, at any time.

Action: The citation has been modified to reflect the statement made above.

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: App-B, Table B-2 Page #: B-10 Line #: Code: C  
 Original Comment #: 15  
 Comment: The citation for 40 CFR 61.92 should be revised to include 60.90 through 60.97. The additional sections define monitoring requirements.

Response: Comment Acknowledged. DOE cited 40 CFR Part 61, Subpart H - National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities in its entirety in Table 3. This citation includes all monitoring requirements mandated in 40 CFR 61.90 to 61.97.

Action: Table B-3, page B-25. The citation, "40 CFR 61.90 to 61.97" has been added to the table.

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: App-B, Table B-3 Page #: Line #: Code: C  
 Original Comment #: 16  
 Comment: An additional action specific ARAR should be 40 CFR 60.670 Subpart OOO. This ARAR addresses standards for the use of a crusher.  
 Response: Agree. 40 CFR 60.670 Subpart OOO should be considered as a relevant and appropriate requirement relating to the construction and operation of the crusher/dryer system.  
 Action: Text has been added to Table B-3.

Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: App-B, Table B-3 Page #: Line #: Code: C  
 Original Comment #: 17  
 Comment: An additional action specific ARAR should be OAC 3745.31-05(A)(3) which requires all new source employ Best Available Technology (BAT) for minimizing air emissions.  
 Response: Agree. BAT requirements mandated under OAC 3745-31-05(A)(3) are applicable.  
 Action: The citation for OAC 3745-31-05(A)(3) has been changed to reflect that it is an applicable requirement.

Commenting Organization: Ohio EPA Commentor: OFFO  
Section #: App-B, Table B-3 Page #: B-26 Line #: Code: C  
Original Comment #: 18

Comment: The standards referenced for OAC 3745-17-11 are only for sources existing prior to 1/1/74. For all new sources BAT applies and standards are developed upon BAT ability. Thus it is likely that emission standards may be substantially lower than those listed. DOE will be required to prove that scrubbers and condensers are BAT. It is possible DOE may be required to use fabric filters and an oxidizer to achieve BAT.

Response: Comment Acknowledged. New air contaminant sources are required to install BAT in accordance with OAC 3745-31-05(A)(3) and therefore, emissions from these sources will be substantially less than those cited. Based upon DOE's initial evaluation, we have determined BAT for both radiological and inorganic particulate emissions will consist of HEPA filtration with a designed control efficiency of 99.97 percent at 3 microns. The need for additional control equipment will be evaluated during the Remedial Design phase of the project. Additional information on how the substantive BAT requirements for the project will be met will be supplied with the RD and RA Workplans for OU1.

Action: Reference to OAC 3745-17-11 has been deleted.

Commenting Organization: Ohio EPA Commentor: OFFO  
Section #: App-B, Table B-3 Page #: B-26 Line #: Code: C  
Original Comment #: 19

Comment: With regard to OAC 3745-21-07(G)(2), it is current Ohio EPA policy to consider all VOCs to be photochemical reactive materials.

Response: Comment Acknowledged. DOE is aware it is current OEPA policy to consider all VOCs to be photochemical reactive materials. VOC emissions from the dryer system will be controlled in accordance with the requirements of the standard.

Action: Citations pertaining to OAC 3745-21-07(G)(2) have been changed to reflect that all VOCs are considered to be photochemical reactive materials. [Specific citations to be provided.]

**DECLARATION STATEMENT****SITE NAME AND LOCATION**

Fernald Environmental Management Project (FEMP) Site -- Operable Unit 1,  
Hamilton and Butler Counties, Ohio

**STATEMENT OF BASIS AND PURPOSE**

This decision document presents the selected remedial action for Operable Unit 1 of the FEMP site in Hamilton and Butler Counties, Ohio. Operable Unit 1 consists of Waste Pits 1 through 6, the Burn Pit, the Clearwell, and associated environmental media (excluding groundwater).

This remedial action was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (hereinafter jointly referred to as CERCLA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300.

U-7 In making this decision, the Department of Energy (DOE) integrated the National Environmental Policy Act (NEPA) values into the CERCLA remedial process. Through DOE's integration, the Feasibility Study and the Proposed Plan also comprised DOE's Environmental Assessment. However, it is not the intent of DOE to make a statement about the legal applicability of NEPA to CERCLA actions.

The decision is based on the information available in the administrative record for this site.

The State of Ohio concurs with the selected remedy.

**ASSESSMENT OF THE SITE**

Actual or threatened releases of hazardous substances from Operable Unit 1, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

The glacial overburden exposed at the surface has a relatively low permeability. Therefore, most of the precipitation that falls on it is lost to evaporation and surface water runoff. Heterogeneous and asymmetric pockets of silty sand and gravel within the glacial overburden contain zones of perched groundwater. Perched groundwater is separated from the underlying aquifer by the surrounding, relatively impermeable clay/silt components of the overburden. These low-permeable units behave as an aquitard that can store groundwater but transmit it slowly downward from one more porous saturated zone to another. Depth to perched groundwater at the FEMP site ranges from 0.3 to 4.5 meters (1 to 15 feet) below the land surface. This measurement can fluctuate seasonally by up to 3 meters (10 feet) at a single location. The highest water levels occur during the early spring and the lowest during the late fall. Based on the conceptual model for groundwater flow, perched groundwater is likely discharging westward to the bank of Paddys Run and southward in the east-west drainageway.

### 1.5 ECOLOGY

Ecological communities on the FEMP site consist of grazed and ungrazed pastures, two pine plantations, deciduous woodlands, riparian woodlands, and the "reclaimed flyash pile area." The reclaimed flyash area coincides approximately with the South Field and the inactive Flyash Pile, which is considered to be a distinct habitat due to the unique plant and animal species composition. A total of 47 species of trees and shrubs, 190 species of herbaceous plants, 22 mammal species, 98 bird species, 10 species of amphibians and reptiles, 19 species of fish, 47 families of benthic macroinvertebrates, and 132 families of terrestrial invertebrates inhabit the FEMP site.

Typical grasses found on the FEMP site are red fescue, Kentucky bluegrass, timothy, and red top. Herbs include teasel, red and white clovers, and goldenrod. The dominant tree species in the pine plantations are the white and Austrian pine, with an occasional Norway spruce. Common trees in the deciduous woodlands are white ash, American elm, shagbark hickory, and slippery elm. Dominant tree species in the riparian woodlands are eastern cottonwood, hackberry, American elm, and box elder. The reclaimed flyash pile area is dominated by American elm, eastern cottonwood, and black locust.

undertaken to characterize the physical, chemical, and radiological properties of the site. These programs are discussed in detail in Section 2 of the Final Remedial Investigation Report for Operable Unit 1 and itemized in Table 2-1 of that report.

In addition, operating records, waste inventories, drawings, other site documentation, and information obtained from long-time plant employees, were thoroughly reviewed to learn more about waste pit contents and to provide a basis for comparing the results of the sampling programs.

## O-4 2.3 OPERABLE UNIT 1 REGULATORY RESPONSE ACTIONS

### 2.3.1 Removal Actions

The Amended Consent Agreement also provided for the implementation of removal actions intended to address site conditions that pose an imminent threat to public health and welfare or the environment. These actions were initiated to accelerate cleanup activities prior to final remedial actions.

The following five removal actions have been conducted within Operable Unit 1:

- Removal Action No. 2: Waste Pit Area Runoff Control
- Removal Action No. 6: Control of Exposed Material in Pit 6
- Removal Action No. 11: Waste Pit 5 Experimental Treatment Facility
- Removal Action No. 18: Control of Exposed Material in Pit 5
- Removal Action No. 22: Waste Pit Area Containment Improvement

#### Removal Action No. 2: Waste Pit Area Runoff Control

This removal action can be broadly defined as management of radioactively-contaminated stormwater runoff from Operable Unit 1. Runoff from the concrete storage silos in Operable Unit 4 also was included in this removal action. The eight-phase removal action was completed in mid-1992. This removal action continues to provide runoff control and collection. The potentially contaminated storm water runoff is collected and pumped to the BioSurge Lagoon and the effluent treatment system before discharge to the Great Miami River. Thus, the potential for release of contaminants to the environment has been reduced.

the Waste Pit Area. The strategy consisted of a combination of written information and public workshops to solicit public input.

The first workshop was held December 7, 1993, to follow up on the October 1993 submittal of the Draft Remedial Investigation Report for Operable Unit 1 to EPA and Ohio Environmental Protection Agency (Ohio EPA). The workshop focused on these issues:

- What is in the waste pits?
- What are the contaminants, and where are they going?
- What are the cleanup options being considered?
- How can the public become involved in decision making?

The second informational workshop was held March 29, 1994, several weeks after the March 4, 1994 submittal of the Draft Feasibility Study and Proposed Plan for Operable Unit 1 to EPA and Ohio EPA. The topics addressed in this workshop included:

- How does DOE propose to clean up the waste pits and how did DOE arrive at its recommendation?
- What are the risks of this proposed action?
- How can the public become involved in decision making?

At the informational workshop held on March 29, 1994, members of the public focused their questions and concerns on transportation issues. Therefore, DOE offered a separate workshop on August 9, 1994, to address transportation issues. An advertisement to announce the workshop was published in the *Harrison Press* newspaper on August 3, 1994, and in the *Cincinnati Enquirer* and the *Journal News* newspapers on August 7, 1994. Additionally, flyers publicizing the August 9 workshop were mailed to approximately 300 members of the public listed on the Fernald mailing list. Topics addressed in the August 9 workshop included:

- What are the transportation alternatives?
- What are the routes and logistics?
- What emergency response/notification plans are in place?
- How can the public become involved in the decision-making?

At the August 9 workshop, stakeholders requested an opportunity to discuss their transportation concerns with representatives from CSX, a railway transport company. Therefore, a public availability session was held on August 16, 1994. Again, approximately 300 members of the public were mailed invitation letters.

O-5 In addition to the public workshops sponsored by the DOE, Ohio EPA held a local availability session on August 17, 1994. Members of the Fernald Citizens Task Force and representatives from the local citizens group, Fernald Residents for Environmental Safety and Health (FRESH) were invited to attend this session to ask questions about the proposed plan for the cleanup of Operable Unit 1. Representatives from EPA and Ohio EPA were available to answer questions and address concerns from approximately 12 people who attended the session. Announcements about this availability session were made at the prior public workshops sponsored by the DOE, the monthly FRESH meeting, and the monthly Fernald Citizens Task Force meeting.

The Final Remedial Investigation Report for Operable Unit 1, the Final Feasibility Study for Operable Unit 1, and the Proposed Plan are available to the public in the Administrative Record locations at EPA Region V offices in Chicago and at the Public Environmental Information Center. The notice of availability for public inspection of the Draft Remedial Investigation Report for Operable Unit 1 was published October 20, 1993, in the *Cincinnati Enquirer*, the *Journal News*, and the *Harrison Press*. The Final Remedial Investigation Report for Operable Unit 1 was published in August 1994. The notice of availability for the Draft Feasibility Study and the Proposed Plan for Operable Unit 1 was published March 9, 1994, in the *Cincinnati Enquirer*, the *Journal News*, and the *Harrison Press*. The Final Proposed Plan was published in August 1994; the notice of availability was published August 10, 1994, in the *Cincinnati Enquirer*, the *Journal News* and the *Harrison Press*. The Final Feasibility Study for Operable Unit 1 was published in October 1994.

U-4 A 30-day public comment period was held from August 10, 1994, to September 8, 1994, inclusive. In addition, a public meeting was held on August 23, 1994. At this meeting, representatives from DOE, EPA and Ohio EPA answered questions about the remedial alternatives under consideration for Operable Unit 1. A response to comments received during this period is included in the

Responsiveness Summary, which is part of this Record of Decision. This decision document presents the selected remedial action for Operable Unit 1 at the Fernald Environmental Management Project in Fernald, Ohio, chosen in accordance with CERCLA and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan.

The Proposed Plan was submitted to the Tooele County, Utah, commissioners and to the State of Utah (the state where the representative permitted commercial disposal facility is located). The Proposed Plan also was distributed to the Nevada public including the State of Nevada and the local steering committee through the DOE Nevada organization. No comments were received.

U-7 pesticides and polychlorinated biphenyls (PCBs) in those samples within the boundaries of Operable  
Unit 1. These contaminants correspond to the characteristics of waste material contained in the  
adjacent waste pits. Pesticides and herbicides were used throughout the lifetime of the waste pits for  
insect control (principally those waste pits with surface water present, Waste Pits 5 and 6) and  
weed/grass control. Because of the pesticide and herbicide use, their presence in the waste pits was  
U-7 anticipated. One sample exhibited a high concentration of polyaromatic hydrocarbons (PAH).

Subsurface soil from four geologic zones was analyzed: (1) glacial overburden; (2) upper saturated  
sand and gravel layer; (3) lower saturated sand and gravel layer; and (4) the deep saturated sand and  
gravel layer. Principal radiological constituents found within the glacial overburden include uranium-  
238 and its progeny products (uranium-234, thorium-230, and radon-226). In the upper saturated  
sand and gravel layers, radionuclide activity concentrations were significantly lower than those found  
in the glacial overburden. One sample, obtained at a depth of 20.27 meters (66.5 feet), showed levels  
of uranium-234 and strontium-90 slightly above background (i.e., levels of a chemical or radionuclide  
found in areas near the FEMP not affected by the site). No radiological constituents exceeded  
background levels in samples from either the lower or deep saturated sand-and-gravel layer.

### 5.3.2 Groundwater

As previously indicated, groundwater, including perched water, is being investigated as part of  
Operable Unit 5. To provide an overview, however, a discussion of Operable Unit 1 groundwater  
contamination is presented here. Additional information can be found in Section 4 of the Final  
Remedial Investigation Report for Operable Unit 1 (DOE 1994b).

### Radionuclide Contamination

All Operable Unit 1 1000-series monitoring wells, which are screened within the glacial overburden  
(see Section 4.4 of the Final Remedial Investigation Report for Operable Unit 1 for well locations)  
showed elevated concentrations of uranium isotopes. RI/FS program samples indicate that the pattern  
of elevated uranium concentrations within Operable Unit 1 perched groundwater appears to be  
centered primarily in the vicinity of Waste Pit 1. An elevated uranium concentration was detected at

unwanted or adverse health effect at the exposure level considered and removes those chemicals not considered to be serious health threats to receptors.

U-7 Briefly, the on-site chemicals identified as those most likely to be present as a result of Fernald's production activities and subsequently identified by chemical analysis are called Constituents of Possible Concern (~~COPC~~). This list is further evaluated to determine those chemical toxins that are a possible risk to human health and the environment. Those chemicals on the list that are normally present in the environment, are produced as artifacts during chemical analysis, or are known not to produce unwanted toxic effects at the levels found on site, are removed from the list. This new list of chemicals is called contaminants of potential concern, known as CPCs. The Baseline Risk Assessment is performed based on this list of CPCs, and the resulting quantitative assessment reveals U-7 the ~~Constituents of Concern (COCs)~~.

Three categories of CPCs were found: radionuclides, inorganic chemicals and organic compounds. Most of the 13 radioactive CPCs retained were of the uranium and thorium decay series. Inorganic CPCs included silver, arsenic, lead, copper and cyanide. Organic chemicals retained in the CPC list include polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), dioxins, furans and various organic solvents used on-site. (Refer to Appendix E of the Final Remedial Investigation Report for Operable Unit 1 [DOE, 1994a], Section E.2 for a complete listing of CPCs.)

#### 6.1.2 Exposure Assessment

The exposure assessment identifies the sources and pathways of exposure and possible receptors under different land-use scenarios. First, sources of exposure, or source terms, were identified as being the waste pit materials in Waste Pits 1 through 6, the Burn Pit, and the Clearwell; surface water in Waste Pits 5 and 6 and the Clearwell; and surface soil within the Operable Unit 1 study area.

Two source term configurations were considered: the current and future source terms. The current source-term configuration considers the Waste Storage Area as it exists today.

pathway, the resultant value is the hazard index (HI). If the ratio of estimated intake to the acceptable intake is greater than one, the site-related intake is assumed to have a potential of inducing non-carcinogenic toxic effects.

#### 6.1.4 Risk Characterization Results

Summary results of the baseline risk assessment by land use are presented in this section. These results may be compared to the ranges of generally acceptable risk under CERCLA, which are an incremental lifetime cancer risk of one in one million ( $10^{-6}$ ) to one in ten thousand ( $10^{-4}$ ) or a Hazard Index equal to or less than one. Based on the baseline risk assessment results, chemicals that contribute an ILCR greater than one in one million ( $1 \times 10^{-6}$ ) or a hazard quotient greater than 0.1 were identified. These chemicals were designated as COCs for the Final Feasibility Study for Operable Unit 1 (1994c); they are presented in Table 6-9.

##### 6.1.4.1 Current Land Use

###### Current Land Use With Access Controls

Three of the hypothetical receptors listed in Tables 6-1 and 6-2, the groundskeeper, the off-property farmer, and the off-property child, were evaluated under the assumption that both active maintenance and access controls continue. The maximally exposed individual in this case is the groundskeeper, with ILCR approaching one in ten thousand ( $10^{-4}$ ) (Table 6-2). These risks are dominated by radiation exposures from isotopes of uranium, thorium, and radium in pit contents and surface soil. The hazard index of systemic toxic effects for the groundskeeper is less than one. Calculated risks to the off-property farmer are just over one in one million ( $10^{-6}$ ), while calculated risks to the resident child are well below one in one million ( $10^{-6}$ ). The HI for both the farmer and child are less than one, so no increase in impact of non-carcinogenic toxic effects is expected.

###### Current Land Use Without Access Controls

If access controls are relaxed, two additional hypothetical receptors are assumed to become plausible - the trespassing youth, and the off-property user of meat and milk. The greatest health effects are expected to occur to the off-property user of meat and milk products. Most of the total calculated risks to this receptor (about one in one thousand [ $10^{-3}$ ]) are from the uptake of PCBs by grazing

approximately 1.3 million cubic yards of cement-solidified waste. Remedial action components of drying within Alternative 4B which are identical to Alternative 4A include site preparation, excavation, drying and treatment, on-property disposal in an above-grade cell (the cell would be larger), site restoration, access control measures and monitoring. The on-site O&M cost for Alternative 4B is approximately \$280,796. O&M, including maintenance and repair, surveillance, and monitoring is estimated based on 30 years of O&M following remediation. O&M is included in the present worth value.

U-7 7.2.4 Alternative 5A - Removal, Treatment (Thermal Drying), and Off-Site Disposal at the Nevada Test Site (NTS)

Capital Cost	\$856,102,282
Present Worth (PW)	\$645,870,000
Months of Operation	60

U-7 Alternative 5A is identical to Alternative 4A except that the vitrification is eliminated and, instead of on-site disposal, off-site disposal will be at the ~~Nevada Test Site (NTS)~~. The NTS is a DOE-owned facility that currently accepts low-level radioactive waste from DOE facilities for disposal. It is located approximately 3,219 kilometers (2,000 miles) from the FEMP site in an arid environment far from any population centers. For this alternative, the excavation rate would be limited by the capacity of the dryers. It is estimated that active waste processing would require approximately 5 years.

Off-site disposal at the NTS involves drying and packaging the treated waste in sealed containers that comply with DOE and DOT requirements. The wastes would then be transported in accordance with all DOT requirements.

For this alternative, the waste would be processed and treated by thermal drying to meet the waste acceptance criteria for disposal at the NTS. The dried waste would be sampled prior to shipment. Based on available data in the Final Remedial Investigation Report for Operable Unit 1 and NTS

Alternative 5B is identical to Alternative 5A except that the treated waste would be shipped in bulk directly to a permitted commercial waste disposal facility. Under this alternative, the excavation and drying rate would be the same as Alternative 5A. At this rate, active waste processing would require approximately 5 years.

For this alternative, the waste would be processed and treated by thermal drying to meet the waste acceptance criteria of the disposal facility. Due to the heterogenous nature of the waste in the pits, size reduction, homogenization, and blending would be required for uniform drying. The dried waste would be sampled prior to being loaded into the rail cars. Any waste determined by sampling to be RCRA waste would be packaged separately and then shipped to the commercial disposal facility. Any RCRA characteristic wastes that are identified during WAC sampling could be treated such that they are no longer RCRA regulated, leaving only radiological concerns for the WAC. As a contingency, if any isolated pockets of waste are ready for disposal that do not meet the waste acceptance criteria of the permitted commercial waste disposal facility, it could be disposed at the NTS as long as it meets the NTS waste acceptance criteria. Such alternative disposal would be allowed for up to 10 percent of the total waste volume.

It is possible that localized areas of RCRA characteristic wastes for metals and/or volatile organics could be encountered during remediation and, therefore, not meet the NTS waste acceptance criteria. In the event RCRA characteristic wastes are encountered during waste acceptance criteria sampling, treatment options could be employed. Volatile organic compounds (VOCs) are removed from the waste through thermal desorption during drying and do not return. Simple modifications to the water treatment process, such as lime addition during the crushing phase of the process, would be undertaken to immobilize metals encountered. If a characteristic waste is treated such that it no longer demonstrates a hazardous characteristic, then it is no longer a RCRA hazardous waste. Therefore, any RCRA characteristic wastes that are identified during WAC sampling could be treated such that they are no longer RCRA-regulated, leaving only a radiological concern. Since the wastes of Operable Unit 1 are considered low-level radiological wastes that are acceptable for disposal at NTS, and since they can be treated for RCRA characteristics as noted above, it is anticipated that all waste could meet NTS waste acceptance criteria, if necessary.

- Environmentally significant releases from non-receiving units at Subtitle C treatment and storage facilities, and from all units at other-than-Subtitle C facilities, must also be addressed by a corrective action program prior to using any unit at the facility for the management of CERCLA wastes.

EPA makes the final determination as to whether potential receiving facilities can receive CERCLA waste, with the respective state in which the receiving facility is located, being an active participant in the decision-making process. In addition, the distinction between criteria for CERCLA wastes resulting from pre- and post-SARA decision documents has been removed.

Review of applicable DOT regulations (49 CFR Parts 171-173) indicates there are currently no provisions that would prohibit shipments of the Operable Unit 1 waste from the site to the NTS or a permitted commercial waste disposal facility using either trucks or rail. In addition, there are no known transit state or local regulations that would categorically prohibit waste shipment.

O-1 For Alternative 5B, which proposes off-site disposal at a permitted commercial waste disposal facility,  
O-6 it is noted that DOE Order 5820.2A currently prohibits use of commercial disposal facilities for disposal of low-level radioactive wastes of the type present in Operable Unit 1, but the order does have an exemption provision. An exemption request to DOE Order 5820.2A has been approved by DOE Headquarters, Office of Waste Management, so that Operable Unit 1 pit wastes can be disposed at a permitted commercial waste disposal facility (DOE 1994d).

In summary, the on-site disposal alternatives (4A and 4B) would require a waiver of the State of Ohio prohibition against disposal over a sole-source aquifer [OAC 3745-27-07(B)(5)]; this regulation is an ARAR. The administrative feasibility of the off-site disposal alternatives (5A and 5B) are moderately difficult because of the transportation of wastes through a number of states and municipalities. There is no administration involved with the No-Action Alternative.

**TABLE 9-2**  
**REMEDIATION LEVELS IN SURFACE SOILS**

Constituent of Concern	Expanded Trespasser HI = 1 PRG	Expanded Trespasser 10 <sup>-6</sup> ILCR PRG	Background (95 <sup>th</sup> percentile)	ARAR Target	Max. Detected Soil Concentration		Remediation Levels <sup>a</sup>	HI to Receptors from Remediation Levels Expanded Trespasser	Risk to Receptors from Remediation Level Expanded Trespasser <sup>b</sup>
					Surface	Sub surface			
<b>Radionuclides (pCi/g)</b>									
Cs-137 + 1 progeny	N/A	1.1	0.71	None	6	<0.2	1.8	N/A	1.6x10 <sup>-6</sup>
Th-230	N/A	900	2.0	None	972	3.5	902	N/A	1x10 <sup>-6</sup>
U-235	N/A	9.2	0.15	None	51	3.9	9.3	N/A	<1x10 <sup>-6</sup>
U-238 + 2 progeny	N/A	55	1.2	None	1500	104	56	N/A	1.9x10 <sup>-6</sup>
<b>Chemical (mg/kg)</b>									
Beryllium	130	2.1	0.6	None	0.77	NA	2.1	<0.01	2.5x10 <sup>-5</sup>
Uranium	380	N/A	3.6	None	2100	309	190 <sup>§</sup>	0.5	N/A

<sup>a</sup> This column is formatted in bold print for ease of reference only.

<sup>b</sup> Includes the direct radiation, soil ingestion, and inhalation pathways.

<sup>§</sup> 0.5 times the PRG to protect against multiple chemicals.

NA = Not Available.

N/A = Not Applicable.

SOURCE - Final Feasibility Study for Operable Unit 1 (DOE, 1994a)

Measures to minimize environmental impacts to on-property natural resources (e.g., wildlife and wildlife habitat, wetlands, floodplains, surface water, groundwater) have been identified in the Final Feasibility Study for Operable Unit 1 and the Proposed Plan and will be factored into the Remedial Design and Remedial Action. Operable Unit 1 remedial activities would not significantly impact floodplain areas at the FEMP. The implementation of engineering controls (e.g., expeditious backfilling, silt fences, and hay bales) will minimize indirect impacts such as runoff and sediment deposition to the floodplain. All physically disturbed areas of the floodplain would be regraded to near original contours, resulting in no change to flood elevations.

The temporary disturbance of on-property vegetation and wildlife habitat would result from excavation of pit waste and residual soil, utilization of the on-property borrow area, and construction of support facilities. Approximately 5.37 hectares (13.27 acres) of riparian habitat supporting potential habitat of threatened and endangered species and a wide variety of other flora and fauna would be impacted. Potential habitat of threatened and endangered species to be impacted include the Federally-endangered Indiana bat, and the state endangered slender fingergrass and mountain bindweed. Actual habitat of the state threatened Sloan's crayfish would also be impacted from increased sediment load into Paddys Run.

Impacts to biotic resources from Operable Unit 1 Remedial Action activities would be offset by implementing mitigative measures in consultation with appropriate Federal and State agencies. The riparian habitat could be restored by planting riparian tree species such as sycamores and cottonwoods upon completion of remedial activities. ~~Shagbark hickories, which provide optional roosting habitat for the Indiana bats, would also be planted.~~ Shrub species could also be planted in the Operable Unit 1 area to assist in the secondary successional process and wildlife boxes could be installed to re-establish mammal and bird populations. To mitigate the loss of Indiana bat habitat, snags (transplanted dead trees) could be placed along Paddys Run, upstream of the Waste Storage Area. Slender fingergrass and mountain bindweed could be relocated to suitable habitat elsewhere in the State of Ohio.

U-1

source aquifer by EPA under the provisions of the Safe Drinking Water Act. A release from Operable Unit 1 wastes could have significant impacts on this valuable resource.

- The third factor is the fact that, at the NTS and at the representative permitted commercial waste disposal facility, there are no usable groundwater resources, surface water resources or residences within many miles of the disposal location. Because of these factors, the potential impacts of a release at the NTS or the representative permitted commercial waste disposal facility are considered to be less significant than for a similar scenario with on-site disposal. This statement considers the presence of the sole-source Great Miami Aquifer beneath the FEMP and the relatively large number of potential human and ecological receptors in the vicinity of the FEMP. It is also noted that, due to area demographics, there is a greater long-term potential for intrusion into an on-site disposal cell. In the future event that facility institutional controls broke down, the FEMP would be attractive for various uses, including agriculture. This is not the case for the potential off-site disposal locations.

The selected alternative, with disposal at a permitted commercial disposal facility, has a slight cost advantage compared to cement solidification and on-site disposal. As stated above, there is a larger cost advantage compared to vitrification and on-site disposal and also compared to disposal at NTS. Cost is the major difference between the off-site disposal alternatives. It is the cost advantage of disposal at a permitted commercial facility which led to the identification of the selected alternative over use of NTS.

Short-term effectiveness of the action alternatives was approximately equal so this criterion did not factor into the remedy selection significantly. Reduction of mobility, toxicity, and volume through treatment is actually greater for the alternatives involving vitrification and cement solidification. This

<sup>1</sup> Since the Operable Unit 1 Feasibility Study/Proposed Plan have been approved by the U.S. EPA, there have been other efforts at the FEMP to site an on-site disposal cell. OEPA indicated that the maximum on-site disposal facility Waste Acceptance Criteria for U-238 should be a maximum of 360 picoCuries per gram (for Operable Unit 2 material), as presented in the Operable Unit 2 Feasibility Study and as discussed in the OEPA letter dated December 13, 1994. The average U-238 activity for all Operable Unit 1 waste pits exceeds this limit, in some cases by an order of magnitude or more. Thus, the higher concentrations of U-238 in Operable Unit 1 waste material render Operable Unit 1 waste unacceptable for disposal in an on-site disposal cell (as compared to on site contaminated soils and structural material). It is noted, however, that soils beneath the waste that meet the on-site Waste Acceptance Criteria may be disposed of on site.

advantage was offset, however, by the advantages of the selected alternative relative to  
implementability, long-term effectiveness and permanence and cost.

1  
2  
3  
4  
5  
6  
7

The State of Ohio concurs with this selected alternative, thus satisfying the requirements for state  
acceptance. As discussed in Section 3, the community has been informed of progress and involved in  
decisions affecting the selection of the selected alternative. Community comments indicate the  
community believes the remedy should be implemented. Most public comments received focused on

implementation of the remedy, not selection. Only two comments questioned the selection. All comments received during the public comment period are provided and responded to in the Responsiveness Summary (Appendix A).

#### 10.5 PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

The selected remedy utilizes treatment by thermal drying as a principal element. As discussed above, this treatment satisfies several objectives. It has the potential to achieve a slight waste volume reduction by removal of excess interstitial pore water. This remedy also reduces the potential of contaminant migration from a disposal facility by removing contaminated leachate that would otherwise be available for migration. The treatment thermally desorbs volatile organic contaminants present in the waste and, thereby, reduces the toxicity of the wastes themselves. Finally, thermal drying facilitates more efficient waste handling through the remedial process and facilitates meeting disposal facility waste acceptance criteria.

#### 10.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

O-8 Natural resources and associated services would be permanently committed as a result of implementing the selected remedy. ~~These commitments not only include the resources and land, but the services they provide as well. remedial alternatives discussed in Section 4 of the Final Feasibility Study for Operable Unit 1. The commitments of land are summarized below. These commitments not only include the land itself, but the natural resources and services provided by the resources, such as endangered species habitat. Documentation of these irreversible and irretrievable commitments of resources is made in order to secure the exclusion granted in CERCLA, Section 107 (f)(1), for impacts associated with the Operable Unit 1 remedial activities.~~

Implementing the selected remedy would permanently commit 4.7 hectares (11.6 acres) of land at the representative permitted commercial disposal facility for disposal.

Approximately 5.37 hectares (13.2 acres) of riparian habitat and associated species along Paddys Run at the FEMP property would be permanently disturbed during excavation and regrading activities. An example of mitigation activities that could restore the riparian habitat includes planting native riparian

## REFERENCES

National Council on Radiation Protection and Measurements (NCRP), August 31, 1991, "Some Aspects of Strontium Radiobiology," NCRP Report No. 110, National Council on Radiation Protection and Measurement, Bethesda, MD.

Paustenbach, D.J., 1989, "The Risk Assessment of Environmental Hazards," p. 95, John Wiley & Sons, New York, NY.

U.S. Department of Energy, 1992, "Risk Assessment Work Plan Addendum," prepared for Remedial Investigation and Feasibility Study, Fernald Environmental Management Project, DOE, Fernald Field Office, Fernald, OH.

U.S. Department of Energy, 1993, "Site-Wide Characterization Report, FEMP, Fernald, Ohio, Remedial Investigation and Feasibility Study, Draft," DOE, Fernald Field Office, Fernald, OH.

U.S. Department of Energy, 1994a, "Final Feasibility Study for Operable Unit 1," Fernald Environmental Management Project, DOE, Fernald Field Office, Fernald, OH.

U.S. Department of Energy, 1994b, "Final Remedial Investigation Report for Operable Unit 1," Fernald Environmental Management Project, DOE, Fernald Field Office, Fernald, OH.

U.S. Department of Energy, 1994c, "Final Proposed Plan for Operable Unit 1," Fernald Environmental Management Project, DOE, Fernald Field Office, Fernald, OH.

O-1 U.S. Department of Energy, 1994d, Memorandum from Jill E. Lytle, Deputy Assistant Secretary for  
O-6 Waste Management, to John E. Baublitz, Acting Deputy Assistant Secretary for Environmental  
Restoration, Subject: Approval for disposal of Fernald low-level radioactive waste from Operable  
Unit 1 at a commercial disposal facility, dated November 8, 1994.

U.S. Environmental Protection Agency, 1989, "Risk Assessment Guidance for Superfund: Human Health Manual, Part A, Interim Final," EPA/540/1-89/002, EPA, Office of Emergency and Remedial Response, Washington, DC.

U.S. Environmental Protection Agency, 1992a, "Guidance on Preparing Superfund Decision Documents, Preliminary Draft," U.S. EPA, Office of Emergency and Remedial Response, Washington, DC.

U.S. Environmental Protection Agency, 1992b, "Health Effects Assessment Summary Tables, Annual Update FY 1993," including Suppl. A, March 1993, prepared by the Environmental Criteria and Assessment Office, Cincinnati, OH, for the Office of Emergency and Remedial Response, Washington, DC.

U.S. Environmental Protection Agency, 1993, "Integrated Risk Information System (IRIS)" computer database, EPA, Washington, DC.

Protection Agency; the contingency plan, and any potential inconveniences to local residents and on-site employees resulting from remedial activities.

### SPECIFIC COMMENTS

Irene Lewis: Verbal Comments, Public Meeting Transcript, page 80, line 24, and page 81, lines 1-8

*"I think these are some of the things that we really want to look at is how did you come to this decision, and that's throughout here. So my comment is that I would like to see more specifics go into this plan. You know, a law is one thing, how it's implemented is another.*

*I would like to see the implementation steps spelled out. How you're going to do this."*

---

### SUMMARY COMMENT #1d

### Exemption from DOE Order 5820.2A

Members of the public and the Ohio Environmental Protection Agency expressed concern that DOE's Proposed Plan for Operable Unit 1 identified a commercial disposal facility as part of the Preferred Alternative; yet, DOE Order 5820.2A does not allow for disposal of DOE waste at a commercial disposal facility.

### DOE RESPONSE #1d

O-1 ~~The DOE Fernald Area Office has requested a waiver of DOE Order 5820.2A requirements related~~  
O-9 ~~to use of a non-DOE disposal facility. The request was submitted to the DOE Headquarters (DOE-HQ) Office of Waste Management on May 31, 1994. This request is under DOE HQ review and when approved, an exemption will be issued by the Deputy Assistant Secretary for Waste Management. The DOE Fernald Area Office anticipates an exemption prior to signature of the ROD.~~

~~An exemption request to DOE Order 5820.2A has been approved by DOE Headquarters, Office of Waste Management, so that Operable Unit 1 pit wastes can be disposed at a permitted commercial waste disposal facility.~~

**SPECIFIC COMMENTS #1d**

Lisa Crawford; Written Comments

*\*With regard to DOE developing a Proposed Plan calling for disposal of the O.U.1 waste at a commercial facility and yet DOE has yet not addressed the issue of DOE Order 5380.2A [sic]. We understand that a waiver of this order has been requested,*

1  
2  
3  
4  
5

*but that DOE headquarters has not yet acted on it. This issue needs to be resolved and written in stone prior to the finalizing of the Operable Unit 1 ROD.*"

Pamela Dunn: Written Comments

*"The preferred alternative is for disposal at a commercial facility. What is the status of the request for a waiver to DOE Order 5280.2A [sic] which prohibits disposal at a commercial facility?"*

Ohio EPA: Written Comments, dated August 24, 1994

*"Ohio EPA is concerned that DOE has developed a Proposed Plan calling for disposal of the OUI waste at a commercial facility, yet DOE Order 5280.2A [sic] precludes disposal at a commercial facility. Ohio EPA understands that a waiver of this Order has been requested, but DOE Headquarters has failed to act upon it. DOE HQ must address the need for a waiver of this Order. Ohio EPA expressed concerns with DOE's failure to address this issue during the development of the OU3 Interim Record of Decision and Proposed Plan. At that time DOE committed to addressing issues precluding disposal at Envirocare within OUI. To date DOE has not met this commitment. Ohio EPA believes that DOE must complete the waiver of this Order and address other issues precluding disposal at Envirocare prior to finalizing the OUI ROD. The need for DOE to take action on its own waiver is especially relevant considering DOE is asking USEPA to waive Ohio's Solid Waste Siting Criteria for on-site disposal of other operable unit wastes. Ohio EPA's support of such a waiver could only be considered once DOE has fulfilled the commitment to waiving 5280.2A [sic]."*

---

**SUMMARY COMMENT #1e**

**Alternate Remedial Strategy**

One commentor suggested dividing Operable Unit 1 into two units. The commentor felt that doing so would support two different remedial strategies: one strategy for more highly radioactive wastes and another strategy for less radioactive/hazardous waste. The commentor thought this division could reduce the need for material to be placed in an off-site disposal facility.

**DOE RESPONSE #1e**

U-9

The Operable Unit 2 Feasibility Study (which O EPA has conditionally approved), indicated that the maximum acceptable Waste Acceptance Criteria for uranium-238 would be 360 pCi/g (Letter from

Thomas A. Schneider, Ohio EPA to Gary Stegner, DOE, dated December 13, 1994). As reported in the Operable Unit 1 Remedial Investigation Report, the average uranium-238 concentration in Waste Pit 1 is 3900 pCi/g; for Waste Pit 3, 978 pCi/g; and for Waste Pit 5, 809 pCi/g. Using the proposed uranium-238 Waste Acceptance Criterion as a guide, it is clear this number is less than the average uranium-238 concentrations found in the waste pits.

It is also important to consider that state acceptance of disposal of waste materials from the pits on site would require an exemption from OEPA or a waiver from U.S. EPA of the regulation that prohibits disposal facilities located above sole-source aquifers. As discussed in Comment #1b, Ohio has indicated that it would not support such a waiver for Operable Unit 1 waste pit material.

On-site disposal of portions of waste would still result in a large volume of material over the Great Miami Aquifer, which could be adversely impacted in the long term in the event of releases. No such concern exists at the representative permitted commercial disposal facility, where there is no usable groundwater resource and no surface water or nearby residential populations. Moreover, the disposal facility lies within a 10 mile x 10 mile area specifically zoned by the State of Utah for waste disposal. This permit has been publicly reviewed. Thus, to the extent that Operable Unit 1 meets the waste acceptance criteria of that facility, the public has already agreed with the determination that that site would be used to dispose of low-level radioactive wastes. Accordingly, the certainty that long-term protectiveness will be maintained is greater for the Selected Remedy than for alternatives in which all or a portion of the wastes are disposed on site.

As discussed in DOE's response to Comment 1b, the implementability of vitrification is adversely impacted by the extreme heterogeneity of the waste pit contents, which makes operational control of waste processing very difficult. The preference for off-site disposal for all Operable Unit 1 wastes was not based on a conclusion that vitrification would not be effective, but rather that the uncertainties associated with vitrification and on-site disposal are greater than the uncertainties associated with the Preferred Alternative. This statement applies to all Operable Unit 1 waste. It is again emphasized that DOE's concern with vitrification is very specific to the extremely heterogeneous Operable Unit 1 wastes. It is also noted that the State of Ohio prohibition on

construction of hazardous waste landfill facilities over a sole-source aquifer would still apply if only a  
portion of the wastes were to be disposed on site. While the State of Ohio has indicated that they  
believe on-site disposal of some FEMP wastes may be appropriate, they have consistently maintained  
that all Operable Unit 1 wastes should be disposed off site.

1  
2  
3  
4  
5

---

**SUMMARY COMMENT #1g****Cost Estimates in the Operable Unit 1 Feasibility Study**

One commentator expressed concern that the Operable Unit 1 Feasibility Study cost estimates were biased in such a way that advanced technologies other than drying would not appear as attractive and would be screened out of the selection process unfairly.

**DOE RESPONSE #1g**

U-11 Within the Operable Unit 1 Feasibility Study for Operable Unit 1, DOE evaluated advanced technologies for potential selection (see Sections 2 and 3). Vitrification, an example of an advanced technology, was evaluated extensively within the Feasibility Study, particularly within Chapter 4. A detailed cost analysis of all elements in each alternative is presented in Appendix E of the Operable Unit 1 Feasibility Study. The estimates in the Operable Unit 1 Feasibility Study for Vitrification were not based on pilot-scale vitrification runs, none has been performed for the Operable Unit 1 waste. In addition, the data used to support the estimate were obtained from a 1992 Conceptual Design Report for the Remediation of Waste Pit Area, Removal, Treatment, and On-site Disposal prepared for FERMCO by Ralph M. Parsons, Corporation, as well as from catalog data, verbal vendor quotations, current contract and FERMCO labor rates, conventional cost estimating guides, and generic unit costs.

Vitrification of Operable Unit 1 waste was not eliminated out solely on the basis of cost. DOE has implemented and is implementing treatability studies to support feasibility studies for Operable Units 1, 4, and 5. In all cases, the appropriate technology came out of the screening.

Cost estimators and engineers responsible for the conceptual design were aware of the vitrification demonstration facilities considered for use and operating at DOE's Savannah River, Hanford, West Valley, and Oak Ridge sites. Treatability studies considering vitrification were performed as an adjunct to the Operable Unit 1 Feasibility Study process and a report of the results are attached to the Feasibility Study (see Appendix C of the Feasibility Study). However, a full-scale facility for

vitrification of radioactive wastes similar to those of Operable Unit 1 has not yet been constructed. 1  
Thus, there is no comparable base of operating and design data on which to base conceptual designs 2  
and associated cost estimates; the Operable Unit 1 Feasibility Study cost estimates are necessarily 3  
heavily based on the judgement and experience of the engineers and cost estimating staff. 4

All of the Feasibility Study cost estimates, including those for the use of vitrification at Operable 5  
Unit 1, were extensively reviewed by DOE and the Environmental Protection Agency. One reason 6  
7

that the cost of vitrification appears to be high is that size reduction and waste drying are required before vitrification can proceed.

Cost estimates in the Operable Unit 1 Feasibility Study are used to eliminate remedial alternatives that are significantly more expensive than competing alternatives, but do not offer commensurate performance or health protectiveness. Estimates in the Operable Unit 1 Feasibility Study are considered to be order-of-magnitude, because of the uncertainties in the information used to develop the estimates. Specifically, the cost estimates were developed with an intended accuracy range of -30/+50 percent as prescribed by the Environmental Protection Agency guidance. DOE believes that the cost estimates in the Operable Unit 1 Feasibility Study fall within this range of accuracy and thereby are appropriate for their intended use.

Finally, an analysis of the implementability of vitrification for the (approximately) 640,000 cubic yards of (in place) waste requiring remediation within Operable Unit 1 was made (see the analysis for Alternative 4A). When evaluating each alternative against the criteria prescribed by Environmental Protection Agency guidance, the Preferred Alternative (waste drying and off-site disposal at a permitted commercial disposal facility) was determined to be effective at reducing risks to potential receptors and determined to be technically implementable for the expenditure required.

U-10 Soil washing was not retained for detailed analysis for Operable Unit 1. A discussion of soil washing is included in Subsection 2.4.6.4 of the Operable Unit 1 Feasibility Study, under the subheading, Chemical Treatment Technologies.

#### SPECIFIC COMMENTS #1g

##### William Lewis Jr.; Written Comments

*"FERMCO has steadfastly maintained the position of not using advanced technologies for remediation. The cost and time estimates for this construction type of remediation were crafted to make other technologies look less attractive. These estimates, as well as the engineering back up, should be challenged and closely evaluated as to adequacy, validity, and fairness..."*

*...Technologies such as soil washing and vitrification offer significant volume reductions, durable waste forms, and significantly reduced containerization, transportation, and disposal costs (not to mention a reduced risk for exposure during an accident scenario). These savings have not been fairly evaluated or publicized. Cost estimates used in the OUI FS for vitrification do not appear to be anywhere near realistic. Were these estimates based on actual pilot scale vitrification runs? If not, what type of data were used to develop these estimates, and how old was the data?"*

1  
2  
3  
4  
5  
6  
7

**SUMMARY COMMENT #1h****On-Site Disposal Issues**

Although the Preferred Alternative does not include on-site disposal, portions of some comments referred to the possibility of on-site disposal of Operable Unit 1 wastes. In the event the Preferred Alternative could not be implemented, the commentors did not want on-site disposal of Operable Unit 1 pit material to be considered and expressed the need to review alternative plans. Another commentor inquired about possible integration of a single on-site disposal cell versus a disposal cell for each operable unit. Commentors were generally opposed to on-site disposal of Operable Unit 1 waste and opposed to a waiver of the State of Ohio prohibition against siting a waste disposal facility over the sole-source drinking water aquifer which underlies the FEMP.

**DOE RESPONSE #1h**

DOE acknowledges the commentors' opposition to on-site disposal alternatives and to waiving the prohibitions against siting a hazardous waste facility over a sole-source drinking water aquifer for disposal of Operable Unit 1 waste.

In the unlikely event new information that could adversely affect implementation of the Preferred Alternative is discovered after the Operable Unit 1 Record of Decision is approved, another alternative could be selected. Changing the current Operable Unit 1 Preferred Alternative would be considered a fundamental change under the National Contingency Plan. When a fundamental change is proposed, the lead agency (in this case, DOE) is required to develop a Record of Decision Amendment or ~~Explanation of Significant Differences~~ and to hold a new public comment period and prepare a new Responsiveness Summary.

The Selected Remedy does not include provisions for on-site disposal of the Operable Unit 1 pit waste material, itself. The Operable Unit 1 Feasibility Study evaluated alternatives that include on-site disposal, specifically an on-site cell for disposal of pit waste, as a component of the remedial action. The on-site disposal cell considered in the Operable Unit 1 Feasibility Study was for Operable Unit 1 only. This was because of uncertainties associated with mixing materials from other operable units

O-11 and the need to provide a uniform basis of comparison among alternatives in the Operable Unit 1  
 Feasibility Study. ~~It is currently expected that Operable Unit 2 will design and locate the actual~~  
~~disposal cell that will be used for disposal of materials that will remain at the FEMP. The preferred~~  
~~alternative in the Operable Unit 2 Proposed Plan includes designing and locating an on-site disposal~~  
~~facility that will be used for disposal of Operable Unit 2 materials that will remain at the FEMP.~~  
 This on-site cell, however, will not include pit waste materials from Operable Unit 1. Some residual  
 soils could be disposed of in this cell, as described in the Preferred Alternative.

**SPECIFIC COMMENTS #1h**

Darryl Huff; Verbal Comments, Public Meeting Transcript, page 72, line 24, and page 73, lines 1-7

*"For example, what would happen if those unknown waste pit materials failed Envirocare's acceptance requirements and the Nevada Test Site had previously closed it's [sic] doors to incoming waste? Finalizing an alternative plan would require public acceptance, but there is no mechanism for that that the public can see in writing."*

Vicky Dastillung; Written Comments

*"If for some reason the 5b alternative can't be executed, the public needs to be able to comment on a new plan. In particular, I am opposed to on-site disposal of this OU's waste and I would not like to see EPA grant a waiver for it. The Great Miami aquifer has already been contaminated with FEMP wastes. Our drinking water quality is too valuable a resource to be at risk from OU 1 waste."*

Pamela Dunn; Written Comments

*"The alternatives listed with on-site disposal discuss the design and engineering of an on-site disposal cell. Is this cell in addition to or an expansion of the disposal cell planned for OU 2?"*

---

**SUMMARY COMMENT #1i                      Conflict of Interest**

One commentator was concerned about conflict of interest situations between teaming partners supporting FERMC0 and the representative permitted commercial waste disposal facility.

6539

FEMP-OU1ROD-2 DRAFT FINAL  
January 26, 1995

**DOE RESPONSE #1i**

DOE is not aware of any individual or team member within the FERMCO team with specific interests in, or current contracts with, the representative permitted commercial disposal facility.

1  
2  
3  
4

**TABLE B-1  
LOCATION-SPECIFIC ARARS  
(APPLICABLE REQUIREMENTS; RELEVANT AND APPROPRIATE REQUIREMENTS)**

Applicable Requirements	Attainments
<p><u>16 USC 1531 et. seq., and 50 CFR 17.21, 17.31, 17.61, 17.71, 17.94, 50 CFR 402, and Endangered Species Act</u></p> <p>All federal agencies must ensure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the constituent elements essential to the conservation of a listed species within a defined critical habitat. Additional requirements apply if it is determined that a proposed activity could adversely affect these species or their habitat.</p>	<p>In 1994, updated surveys at the FBMP determined the presence of summer habitat for the federally-listed endangered Indiana bat along Paddys Run including areas adjacent to Operable Unit 1. This area is not critical habitat. Consultation with U.S. Fish and Wildlife Service will determine restorative measures that may need to be taken during and after remedial actions. If any endangered or threatened species are encountered, the additional requirements of the referenced regulation would be applicable.</p>
<p><u>ORC 1531.25, 1518.02, and 1501: 18-1, Ohio Endangered Species Regulations</u></p> <p>No person shall take or possess any native species of wild animal, or any eggs, or offspring thereof, that is endangered with state-wide extinction.</p>	<p>Updated surveys in 1993-94 found state-listed threatened Sloan's crayfish populations in sections of Paddys Run, including sections directly adjacent to Operable Unit 1 area. Appropriate mitigation will be utilized during and after remedial activities to minimize any impacts from runoff and siltation.</p>
<p><u>16 USC 66 et seq., Fish and Wildlife Coordination Act</u></p> <p>Requires consultation with other state agencies for any activities which might affect any body of water for the purpose of conserving fish and wildlife resources.</p>	<p>Remedial actions at Operable Unit 1 may have the potential to affect wildlife and fish in Paddys Run and the Great Miami River. Consultation with state agencies will be conducted prior to commencing remedial activities.</p>
<p><u>16 USC 469, Archaeological and Historic Preservation Act</u></p> <p>Requires preservation of artifacts and data associated with archaeological finds.</p>	<p>Historical data and artifacts are not expected to be discovered or destroyed during remedial activities at Operable Unit 1. Nevertheless, the requirements of the law are applicable.</p>

TABLE A-1  
(Continued)

Applicable Requirements	Attainments
<p><u>16 USC 470 et seq., National Historic Preservation Act</u> DOE must take into account the effect of an undertaking on historic properties and accord the Advisory Council on Historic Preservation a reasonable opportunity to comment. Historic properties are described as any prehistoric or historic district, building, site, structure, or object included in, or eligible for inclusion in the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. Historic properties that are substantially altered or demolished must be recorded for future use and reference.</p>	<p>Areas adjacent to Operable Unit 1 boundaries will be surveyed pursuant to the programmatic agreement by the DOE, the Advisory Council on Historic Preservation, and the Ohio Historic Preservation Office. The programmatic agreement will stipulate what actions are required for compliance with the National Historic Preservation Act. Historic sites listed or eligible for listing in the <i>National Register of Historic Places</i> are not present within Operable Unit 1 nor is it expected that any will be. Nevertheless, the requirements of the law are applicable.</p>
<p><u>16 USC 470 (aa), 470 (ff), Archaeological Resources Protection Act</u> Requires permit for removal of any archaeological resources from federal lands.</p>	<p>Operable Unit 1 is located on federal land. Although archeological resources are not expected on the site, the requirements of the law remain applicable to Operable Unit 1 remedial activities.</p>
<p><u>16 USC 431-433 and USC 461-467, Antiquities Act and Historic Sites Act</u> Requires that no person may appropriate, excavate, injure or destroy any historical or prehistoric ruin or monument or any object or antiquity situated or controlled by the government of the United States without an applicable permit. Also requires the identification and preservation of cultural resources on federal lands.</p>	<p>Although Operable Unit 1 is not expected to contain cultural resources or natural landmarks of significance, it is located on federal land and the law is applicable should any cultural resources be discovered during remedial actions on site.</p>
<p><u>25 USC 3001, Native American Graves Protection and Repatriation Act</u> Provides for return of human remains and cultural objects from Native American graves to affiliated tribes.</p>	<p>Although Operable Unit 1 does not contain known American Indian burial grounds, this law would apply should graves and human remains be discovered during excavation of the waste pits or construction of a disposal cell.</p>
<p><u>42 USC 1996, American Indian Religious Freedom Act</u> Provides for tribal access by native peoples to grave sites and sites of cultural, symbolic, or religious significance.</p>	<p>Although no sites of this nature have been identified at Operable Unit 1, the law is applicable to federal lands and activities. Provisions will be included in the Remedial Action Work Plan to comply with the law should any sites be unexpectedly encountered.</p>

TABLE A-1  
(Continued)

Applicable Requirements	Attainments
<p><u>Executive Order 11593, Protection and Enhancement of Cultural Environment.</u> Requires an inventory of site for potential historic places for eligibility in the <i>National Register of Historic Places</i>.</p>	<p>The requirement is applicable to activities at Operable Unit 1. An updated inventory will be completed prior to remedial action.</p>
<p><u>Executive Order 11990, Protection of Wetlands</u> This order requires that Federal agencies take action to avoid adversely impacting wetlands wherever possible, to minimize wetlands destruction, to preserve the values of wetlands, and to prescribe procedures to implement the policies and procedures of the Executive Order.</p>	<p>The remedial activities taking place at the FEMP qualify as a Federal agency action. Wetlands identification efforts indicate the presence of wetlands within and adjacent to the Operable Unit 1 boundary. The order is codified at 10 CFR 1022 (see below).</p>
<p><u>Executive Order 11988, Floodplain Management</u> This order requires Federal agencies undertaking actions within a floodplain to evaluate the potential the action has for adverse impact on the floodplain. If it is determined that adverse impacts could occur, the effects of the action must be minimized to the extent practical.</p>	<p>The remedial activities taking place at the FEMP qualify as a Federal agency action. Operable Unit 1 is in the immediate vicinity of the Paddys Run Floodplain. At a minimum, the requirement to evaluate effects of the remedial action on the floodplain should be considered. Preliminary engineering efforts indicate that remedial action can be undertaken while minimizing impacts to the floodplain.</p>
<p><u>10 CFR 1022, Protection of Wetlands and Floodplain Management</u> 10 CFR 1022 contains the DOE regulation implementing Executive Order 11990. 40 CFR 6, Appendix A describes EPA's policy for complying with Executive Order 11990</p>	<p>The remedial activities taking place at the FEMP qualify as a Federal agency action. Wetlands identification efforts indicate the presence of wetlands within the Operable Unit 1 boundary and others in the immediate vicinity of Operable Unit 1. Surveys have identified small areas of emergent wetlands associated with the tributaries and ditches of Paddys Run. The remedial activities relative to wetlands will be handled through the U.S. Corps of Engineers Nationwide Permit Program where possible. When not covered by a Nationwide Permit, the action will meet requirements mandated by individual permits per 33 CFR 323.  The floodplains of Paddys Run also fall within the boundaries of Operable Unit 1. Preliminary engineering indicates that remedial action can be implemented while minimizing floodplain impacts.</p>

**TABLE A-1  
(Continued)**

Applicable Requirements	Attainments
<p><u>33 CFR 330, Nationwide Permit Program (33 CFR 323 and OAC 3745-32)</u></p> <p>The U. S. Corps of Engineers can issue a Nationwide Permit as a general permit for certain classes of actions that involve dredge or fill activities in wetlands or navigable waters. Discharges into wetlands may require a wetland delineation.</p>	<p>Waste will be excavated from the waste pits at Operable Unit 1. The waste will be handled, treated by drying, and transported on-site before being transported for disposal off site. These activities may require dredge and fill and construction operations that impact jurisdictional wetlands on site.</p> <p>Nationwide Permit #38 applies to the class of dredge and fill operations associated with the cleanup of hazardous and toxic waste. If remedial activities exceed the limitations for a Nationwide Permit, an individual permit for the dredge and fill activities may be sought.</p>
<p><u>40 CFR 6, Appendix A</u></p> <p>Must take action to avoid adverse impacts to wetlands. Minimize potential harm and preserve and enhance wetlands.</p>	<p>Surveys have identified small amounts of wetlands within the Operable Unit 1 boundaries. Larger wetland tracts are in the general vicinity of Operable Unit 1. CERCLA requires that the lead agency in a CERCLA action consult with agencies expert in determining the impact on wetlands. The Corps of Engineers has jurisdictional authority over characteristic wetlands. Remedial design will minimize impacts to wetlands. Any unavoidable impacts will be undertaken in accordance with 33 CFR 323 or 330.</p>
<p><u>40 CFR 6.302</u></p> <p>Must protect fish and wildlife from activities affecting streams or rivers. Contact Fish and Wildlife Service to assure protection.</p>	<p>CERCLA requires consultation with other expert agencies when remedial activities are off-site; when actions are on-site, consultations are recommended but not required. Through consultation with the Fish and Wildlife Services, DOE will determine the substantive requirements of 40 CFR 6.302 that apply to Operable Unit 1. 40 CFR 6.302 is an ARAR to remedial actions at Operable Unit 1 because they may potentially impact Paddys Run or other tributaries of the Great Miami River.</p>

**TABLE A-1  
 (Continued)**

Relevant and Appropriate Requirements	Attainment
<p><u>Clean Water Act § 404 and 33 CFR 321</u></p> <p>Provides standards for discharge of dredged fill material to navigable waters and wetlands. CWA Section 401 states water quality certifications required for activities that constitute the discharge of dredged or fill material into wetlands or waters of the U.S.</p>	<p>CWA 404 and 33 CFR 321 are relevant and appropriate to the selected remedy for Operable Unit 1 with regard to discharge of dredged fill material into navigable waters. No navigable waters are found on-site; however, material such as soil, debris and old fill material may be excavated from the waste pits at Operable Unit 1 and discarded in an on-site landfill or shipped off-site. These activities must comply with the requirements of the CWA protecting surface waters of the State of Ohio; the water quality standards promulgated by the State of Ohio are found in OAC 3745-1 and are promulgated in compliance with the Federal Clean Water Act, 33 U.S.C. Section 1251, <u>et seq.</u></p> <p>Remedial activities involving the discharge of dredge or fill material in wetlands or water of the U.S. will be conducted in accordance with the substantive requirements of 33 CFR 323 and 330 and OAC 3745-32.</p>

**TABLE B-2**  
**CHEMICAL-SPECIFIC ARARS**  
**(APPLICABLE REQUIREMENTS; RELEVANT AND APPROPRIATE REQUIREMENTS; TBCs)**

Media	Applicable Requirements	Attainment
<p>Chemicals Discharged to Surface Water</p>	<p><u>OAC 3745-1 Ohio Water Quality Standards</u> It is the purpose of these Water Quality Standards to establish minimum water quality requirements for all surface waters of the State, thereby protecting public health and welfare; and to enhance, improve, and maintain water quality as provided under the laws of the State of Ohio, and ORC 6111.041, the Federal Clean Water Act, 33 U.S.C. Section 1251 <i>et seq.</i> Whenever two or more use designations apply to the same surface water, the more stringent criteria of each use designation will apply.</p>	<p>These general water quality criteria are applicable to all surface waters in the State of Ohio and no actions are excluded. SWQL are promulgated under the laws of the state of Ohio pursuant to Section 6111.041 of the ORC. State Water Quality Standards consist of designated uses for water and criteria for pollutants set at levels that are protective of those uses. State Water Quality Standards are regulatory requirements, and permit limits are established to ensure that the State use designations and criteria are met. Water Quality criteria do not apply where criteria are exceeded due to natural conditions alone. This exception does not in any way preclude abatement of human-induced nonpoint source pollution. These water quality standards do not apply to streams when the flow is less than the seven-day, ten-year, low-flow value or other critical low-flow values dependent on low-flow augmentation or point source augmentation.</p>

TABLE A-2  
(Continued)

Media	Applicable Requirements	Attainment
Chemicals Discharged to Surface Water	<p>OAC 3745-01-04 <u>Criteria Applicable to All Waters</u></p> <p>The following general water quality criteria shall apply to all surface waters of the State including mixing zones. To every extent practical and possible as determined by the director, these waters shall be:</p> <p>(A) Free from suspended solids or other substances that enter the waters as a result of human activity and that will settle to form putrescent or otherwise objectionable sludge deposits, or that will adversely affect aquatic life;</p> <p>(B) Free from floating debris, oil, scum and other floating materials entering the waters as a result of human activity in amounts sufficient to be unsightly or cause degradation;</p> <p>(C) Free from materials entering the waters as a result of human activity producing color, odor or other conditions in such a degree as to create a nuisance;</p> <p>(D) Free from substances entering the waters as a result of human activity in concentrations that are toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone;</p> <p>(E) Free from nutrients entering the waters as a result of human activity in concentrations that create nuisance growths of aquatic weeds and algae.</p>	<p>These general water quality criteria are applicable to all surface waters in the State of Ohio and no actions are excluded. The criteria are promulgated under Revised Code Chapter 119.</p> <p>State Water Quality Standards consist of designated uses for water and criteria for pollutants set at levels that are protective of those uses. State Water Quality Standards are regulatory requirements, and permit limits are established to ensure that the State use designations and criteria are met.</p> <p>These general water quality criteria are applicable for discharges and actions impacting Paddys Run and the Clearwell because the discharges are to the Great Miami River.</p> <p>Water Quality criteria do not apply where criteria are exceeded due to natural conditions alone. This exception does not in any way preclude abatement of human-induced nonpoint source pollution.</p> <p>These water quality standards do not apply to streams when the flow is less than the seven-day, ten-year, low-flow value of other critical low-flow values dependent on low-flow augmentation or point source augmentation.</p>

TABLE A-2  
 (Continued)

Media	Applicable Requirements	Attainment
<p>Chemicals Discharged to Surface Water</p>	<p><u>OAC 3745-1-07, Table 7-1 Numerical and Narrative Criteria for Aquatic Life Habitat and Water Supply Use Designation</u></p> <p>Surface Waters in the State of Ohio must comply with the maximum concentrations of each contaminant of concern listed in Table 1-5 and 1-6 in Attachment I for inside and outside the mixing zones of the receiving water to protect warm water aquatic habitats.</p>	<p>The water quality criteria for specific pollutants are ARARs to remedial actions at OU1 because the pollutants have been identified as chemicals of concern at the site and routes of entry or discharge of pollutants to State surface waters have been identified. For example, the Clearwell currently discharges water to the FEMP WWTS which discharges to the Great Miami River.</p> <p>The Great Miami River and Paddys Run have been designated warm water aquatic habitats. Thus the warm water habitat criteria are ARARs when discharges of pollutants to these streams are involved.</p>
<p>Chemicals Discharged to Surface Water</p>	<p><u>OAC 3745-1-07, Table 7-10, Outside Mixing Zone Maximum Criteria for Water Hardness Dependent Parameters in Warm Water Habitats</u></p> <p>Table 1-7 in Attachment I contains the numerical limits on cadmium, copper, chromium, lead, and silver.</p>	<p>The water quality criteria for specific pollutants are applicable to remedial actions at OU1 because the pollutants have been identified as chemicals of concern at the site and routes of entry or discharge of pollutants to State surface waters have been identified. For example, the Clearwell currently discharges water to the FEMP WWTS which discharges to the Great Miami River.</p> <p>The Great Miami River and Paddys Run have been designated warm water aquatic habitats. Thus the warm water habitat criteria are applicable when discharges of pollutants to these streams are involved.</p>

TABLE A-2  
(Continued)

Media	Applicable Requirements	Attainment
Chemicals Discharged to Surface Waters	<p>OAC 3745-1-07, Table 7-11 <u>Outside Mixing Zone 30-Day Average Criteria for Water Hardness Dependent Parameters in Warm Water Habitats</u></p> <p>Table 1-8 in Attachment I contains the average numerical limits for cadmium, copper, chromium, lead, and silver.</p>	<p>The water quality criteria for specific pollutants are applicable to remedial actions at OUI because the pollutants have been identified as chemicals of concern at the site and routes of entry or discharge of pollutants to State surface waters have been identified. For example, the Clearwell currently discharges water to the FEMP WWTS which discharges to the Great Miami River.</p> <p>The Great Miami River and Paddys Run have been designated warm water aquatic habitats. Thus the warm water habitat criteria apply when discharges of pollutants to these streams are involved.</p>
Chemicals Discharged to Surface Waters	<p>OAC Table 7-12 <u>Inside Mixing Zone Maximum Criteria for Water Hardness Dependent Criteria in Warm Water Habitats</u></p> <p>Table 1-8 in Attachment I contains numerical limits for cadmium, copper, chromium, lead, and silver.</p>	<p>The water quality criteria for specific pollutants are ARARs to remedial actions at OUI because the pollutants have been identified as chemicals of concern at the site and routes of entry or discharge of pollutants to State surface waters have been identified. For example, the Clearwell currently discharges water to the FEMP WWTS which discharges to the Great Miami River.</p> <p>The Great Miami River and Paddys Run have been designated warm water aquatic habitats. Thus the warm water habitat criteria apply when discharges of pollutants to these streams are involved.</p>
Chemicals Discharged to Surface Waters	<p>OAC 3745-1-07 <u>Outside Mixing Zone Maximum Criteria for pH dependent Parameters in warm water Aquatic Habitats</u></p> <p>Table 1-10 in Attachment I contains the numerical limits for pentachlorophenol.</p> <p>OAC 3745-1-07 <u>Inside the Mixing Zone Maximum Criteria for pH dependent Parameters in warm water Aquatic Habitats</u></p> <p>Table 1-11 in Attachment I contains the numerical limits for pentachlorophenol.</p>	<p>The water quality criteria for specific pollutants are applicable to remedial actions at OUI because the pollutants have been identified as chemicals of concern at the site and routes of entry or discharge of pollutants to State surface waters have been identified. For example, the Clearwell currently discharges water to the FEMP WWTS which discharges to the Great Miami River.</p> <p>The Great Miami River and Paddys Run have been designated warm water aquatic habitats. Thus the warm water habitat criteria apply when discharges of pollutants to these streams are involved.</p>

TABLE A-2  
(Continued)

Media	Applicable Requirements	Attainment
Chemicals Discharged to Surface Water	<p>OAC 3745-1-07 <u>Lower Miami River Temperature Criteria in Fahrenheit and degrees (Celsius)</u></p> <p>Table I-12 in Attachment I contains the acceptable monthly temperatures for water discharged to the Lower Great Miami River.</p>	<p>The water quality criteria for temperature in warm water aquatic habitats may be applicable if remedial actions at OU1 result in discharges of water at temperatures that would impact the maximum or average monthly temperatures in Paddys Run or the Great Miami River.</p>
Particulates in Air	<p>OAC 3745-17-07 <u>Ohio Ambient Air Quality Standards</u></p> <p>Visible particulate emissions from any stack may exceed twenty per cent opacity, as a six minute average, for not more than six consecutive minutes in any sixty minutes, but shall not exceed sixty per cent opacity, as a six minute average, at any time.</p>	<p>The State standard for particulate emissions is an ARAR because it places a time limit on particulate emissions that may work in tandem with the Federal annual average. There is the potential that a chosen alternative at the site would contribute particulates to the air.</p>
Radionuclides in Air	<p>40 CFR 61.92 EPA Regulations on National Emission Standards for Hazardous Air Pollutants (<del>40 CFR 61.90 to 61.97</del>)</p> <p>Limit airborne radionuclide emissions from the entire site to 10 mreem per person (general public). NESHAPS for emissions other than radon from DOE facilities. Monitoring requirements for individual sources with an EDE of more than 0.1 mreem/yr are found at 40 CFR 61.93(b).</p>	<p>40 CFR 61.92 is applicable to remedial actions taken at OU1 because radionuclides have been identified as chemicals of concern at OU1 and may be released to the air as a result of actions taken at the site.</p>

TABLE A-2  
 (Continued)

Media	Relevant and Appropriate Requirements	Attainment														
Chemicals in Drinking Water	<p>40 CFR 141.51 Federal Maximum Contaminant Level Goals for Inorganic Chemicals</p> <table border="1"> <thead> <tr> <th>Chemical</th> <th>MCLG (mg/L)</th> </tr> </thead> <tbody> <tr> <td>Arsenic</td> <td>0.05</td> </tr> <tr> <td>Barium</td> <td>2</td> </tr> <tr> <td>Cadmium</td> <td>0.005</td> </tr> <tr> <td>Chromium</td> <td>0.1</td> </tr> <tr> <td>Copper and Compounds</td> <td>1.3</td> </tr> <tr> <td>Thallium</td> <td>0.0005</td> </tr> </tbody> </table>	Chemical	MCLG (mg/L)	Arsenic	0.05	Barium	2	Cadmium	0.005	Chromium	0.1	Copper and Compounds	1.3	Thallium	0.0005	<p>The MCLGs for inorganic chemicals in 40 CFR 141.51 are not applicable to remedial actions at OU1 because they are not enforceable standards or levels of control. Also, there are no drinking water systems on the site to be directly impacted by remedial actions.</p> <p>The MCLGs at 40 CFR 141.51 are relevant and appropriate to remedial actions at OU1 because remedial actions could potentially contribute contaminants to surface and/or groundwater that may be used for drinking water. Specifically, the Great Miami Aquifer is beneath the site and has been identified as a sole-source aquifer. In addition, OU1 may contribute contaminants to tributaries of the Great Miami River.</p> <p>Section 121(d)(2)(A) of CERCLA requires on-site remedial actions to obtain MCLGs under the SDWA where they are relevant and appropriate. Under the NCP, EPA requires that MCLGs set at levels above zero be obtained during a CERCLA cleanup where they are relevant and appropriate.</p> <p>Note: The MCL listed in 40 CFR 141.62 is in almost every case the same as the MCLG. If the MCL is less stringent than or equal to the goal, the goal becomes the standard and the MCL is no longer an ARAR.</p>
Chemical	MCLG (mg/L)															
Arsenic	0.05															
Barium	2															
Cadmium	0.005															
Chromium	0.1															
Copper and Compounds	1.3															
Thallium	0.0005															

TABLE A-2  
(Continued)

Media	Relevant and Appropriate Requirements	Attainment
Radionuclides in Drinking Water	<p>40 CFR 141.15 <u>National Primary Drinking Water Standards, Maximum Contaminant Levels for Radium-226, Radium-228, and Gross Alpha Particle Radioactivity in Community Water Systems</u></p> <p>OAC 3745-81-15 <u>Ohio Drinking Water Regulations, Maximum Contaminant Levels for Radium-226, Radium-228, and Gross Alpha Particle Radioactivity in Community Water Systems</u></p> <p>Maximum contaminant levels for radioactivity in community water systems are set as follows:</p> <ul style="list-style-type: none"> <li>• 5 Pci/L of combined radium-226 and radium-228</li> <li>• 15 Pci/L of gross alpha particle activity (including radium-226, but excluding radon and uranium)</li> </ul>	<p>This requirement is not applicable to activities at OUI because there are no community drinking water systems involved in this remediation.</p> <p>The requirement is an ARAR to remedial action because several radionuclides were found in elevated concentrations on-site. Radionuclides in this operable unit could be released such that the radioactive materials in the waste could contribute to radioactivity in potential water supplies.</p> <p>This requirement becomes less relevant to OUI because it excludes radon and uranium. Most of the studies performed at the site have identified uranium as the principal contaminant in surface water and sediment. Ra-226 is not widespread, nor is it found in as elevated concentrations as U-238. However, other radionuclides such as U-234, Th-230, and Tc-99 were found in elevated concentrations in several areas.</p>
Radionuclides in Drinking Water	<p>40 CFR 141.16 <u>National Primary Drinking Water Standards, Maximum Contaminant Levels for Beta Particulate and Photoradioactivity from Man-made Radionuclides in Community Water Systems</u></p> <p>OAC 3745-81-16 <u>Ohio Drinking Water Regulation, Maximum Contaminant Levels</u></p> <p>The average annual concentration of beta particle and photon (i.e., gamma) radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 mrem/yr.</p>	<p>This requirement is not applicable to activities at OUI because there are no community drinking water systems involved in remediation.</p> <p>The requirement is an ARAR to remedial action because several radionuclides were found in elevated concentrations on-site. Radionuclides in this operable unit could be released such that the radioactive materials in the waste could contribute to radioactivity in community water systems.</p>

TABLE A-2  
(Continued)

Media	Relevant and Appropriate Requirements	Attainment								
Chemicals in Drinking Water	<p>40 CFR 141.50 Federal Maximum Contaminant Level Goals (MCLG) for Organic Chemicals</p> <table border="1"> <thead> <tr> <th data-bbox="435 436 467 831">Chemical</th> <th data-bbox="435 831 467 1728">MCLG (mg/L)</th> </tr> </thead> <tbody> <tr> <td data-bbox="467 436 500 831">Polychlorinated Biphenyls (PCB)</td> <td data-bbox="467 831 500 1728">0.0005</td> </tr> <tr> <td data-bbox="500 436 532 831">Tetrachloroethylene</td> <td data-bbox="500 831 532 1728">0.005</td> </tr> <tr> <td data-bbox="532 436 565 831">Vinyl Chloride</td> <td data-bbox="532 831 565 1728">0.002</td> </tr> </tbody> </table>	Chemical	MCLG (mg/L)	Polychlorinated Biphenyls (PCB)	0.0005	Tetrachloroethylene	0.005	Vinyl Chloride	0.002	<p>The MCLGs for organic chemicals set in 40 CFR 141.50 are not applicable to remedial actions at OU1 because they are not enforceable standards and because there are no drinking water systems on the site directly impacted by remedial actions.</p> <p>There are, however, surface waters, and groundwater that could potentially be used for drinking water. The Great Miami Aquifer lies below the site and tributaries of the Great Miami River may have received contaminants from OU1 or could receive contaminants as a result of remedial action.</p> <p>Section 121(d)(2)(A) of CERCLA requires on-site remedial actions to attain MCLGs under the SDWA where they are relevant and appropriate. Under the NCP, EPA requires that MCLGs set at levels above zero be attained during a CERCLA cleanup where they are relevant and appropriate.</p> <p>For the chemicals listed (Contaminants of Concern at OU1), and because there is a potential that remedial actions at OU1 may contaminate potential drinking water sources, the MCLGs at 40 CFR 141.50 are ARARs.</p> <p>Note: The MCL listed in 40 CFR 141.61 for these chemicals have been removed from the ARARs table when the MCLG was more stringent than or equal to the MCL. If the MCLG is relevant and appropriate, the MCL no longer is. However, for most of the chemicals, the MCL and MCLG are the same.</p>
Chemical	MCLG (mg/L)									
Polychlorinated Biphenyls (PCB)	0.0005									
Tetrachloroethylene	0.005									
Vinyl Chloride	0.002									

TABLE A-2  
(Continued)

Media	Relevant and Appropriate Requirements	Attainment
Radionuclides in Drinking Water	<p><u>OAC 3745-81-16 Ohio Drinking Water Regulations, Maximum Contaminant Levels for Beta Particle and Photon Radioactivity from Man-made Radionuclides in Community Water Systems</u></p> <p>Except for Tritium and Strontium, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2-liter per day drinking water intake using the 168-hr data listed in "Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure", NBS Handbook 69 as amended August 1963, U.S. Department of Commerce.</p> <p>If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 mrem/year.</p> <p>The average concentration of Tritium assumed to produce a total body or organ dose of 4 mrem/year is 20,000 pCi per liter.</p> <p>The average concentration of Strontium-90 assumed to produce a total body or organ dose of 4 mrem/year is 8 pCi/liter.</p>	<p>This requirement is not applicable to activities at OUI because there are no community drinking water systems involved in remediation.</p> <p>The requirement is an ARAR because Strontium-90 has been identified as a potential contaminant of concern due to its presence in OUI.</p>

TABLE A-2  
(Continued)

Media	Relevant and Appropriate Requirements	Attainment																																				
<p>Inorganic Chemicals in Drinking Water</p>	<p>40 CFR 141.62 <u>National Primary Drinking Water Standards, Maximum Contaminant Levels for Inorganic Chemicals</u></p> <p>OAC 3745-81-11 <u>Ohio Drinking Water Regulations, Maximum Contaminant Levels for Inorganic Chemicals</u></p> <p>Pursuant to 40 CFR 141.62, MCLs for Inorganic Contaminants in community, non-transient non-community, and transient non-community drinking water systems, the following MCLs are relevant and appropriate to groundwater at Operable Unit 1:</p> <table border="1" data-bbox="673 871 1023 1323"> <thead> <tr> <th>Chemical</th> <th>MCL (mg/L)</th> <th>Ohio (mg/L)</th> </tr> </thead> <tbody> <tr> <td>Antimony</td> <td>0.006</td> <td></td> </tr> <tr> <td>Arsenic</td> <td>0.05</td> <td></td> </tr> <tr> <td>Barium</td> <td>2.00</td> <td>1.00</td> </tr> <tr> <td>Beryllium</td> <td>0.004</td> <td></td> </tr> <tr> <td>Cadmium</td> <td>0.005</td> <td></td> </tr> <tr> <td>Chromium</td> <td>0.1</td> <td>0.05</td> </tr> <tr> <td>Cyanide</td> <td>0.2</td> <td></td> </tr> <tr> <td>Mercury</td> <td>0.002</td> <td></td> </tr> <tr> <td>Nickel</td> <td>0.1</td> <td></td> </tr> <tr> <td>Selenium</td> <td>0.01</td> <td></td> </tr> <tr> <td>Silver</td> <td>0.05</td> <td></td> </tr> </tbody> </table>	Chemical	MCL (mg/L)	Ohio (mg/L)	Antimony	0.006		Arsenic	0.05		Barium	2.00	1.00	Beryllium	0.004		Cadmium	0.005		Chromium	0.1	0.05	Cyanide	0.2		Mercury	0.002		Nickel	0.1		Selenium	0.01		Silver	0.05		<p>Neither the Federal or State requirement is applicable because water at OU1 is not distributed to a public water system (as defined in 40 CFR 141).</p> <p>The Federal requirement is relevant and appropriate to protecting potential drinking water sources from the contaminants found in the operable unit.</p> <p>There is evidence that inorganic contaminants are present. Results of inorganic chemical analyses show that pit residues contain elevated concentrations of aluminum, calcium, iron, and magnesium. Other inorganics present in the samples included: arsenic, barium, cadmium, and lead.</p> <p>A possibility exists that contaminants may leach or migrate into the underlying Great Miami Aquifer which has been designated a sole source aquifer in Ohio (53 FR 15876 and 53 FR 25670). Any contaminants infiltrating into the Great Miami Aquifer near the waste storage area would flow easterly toward the Great Miami River and Southwestern Ohio Water Company. Contaminants entering the aquifer near the outfall ditch would flow south toward the village of Fernald.</p> <p>State regulation OAC 3745-81-11 is only an ARAR for OU1 for barium, and chromium because in these cases State MCLs are more stringent than the Federal MCLs.</p>
Chemical	MCL (mg/L)	Ohio (mg/L)																																				
Antimony	0.006																																					
Arsenic	0.05																																					
Barium	2.00	1.00																																				
Beryllium	0.004																																					
Cadmium	0.005																																					
Chromium	0.1	0.05																																				
Cyanide	0.2																																					
Mercury	0.002																																					
Nickel	0.1																																					
Selenium	0.01																																					
Silver	0.05																																					
	<p>Pursuant to 40 CFR 141.80, Control of Copper and Lead, the action level is exceeded for copper at 1.3 mg/L and the action level for lead is exceeded at 0.015 mg/L. Thus, although the standards are not MCLs, the action levels for copper and lead have been added as a relevant and appropriate regulatory requirement for drinking water.</p> <table border="1" data-bbox="1429 1848 1526 1974"> <thead> <tr> <th>Chemical</th> <th>Action Level (mg/L)</th> </tr> </thead> <tbody> <tr> <td>Copper</td> <td>1.3 mg/L</td> </tr> <tr> <td>Lead</td> <td>0.015 mg/L</td> </tr> </tbody> </table>	Chemical	Action Level (mg/L)	Copper	1.3 mg/L	Lead	0.015 mg/L																															
Chemical	Action Level (mg/L)																																					
Copper	1.3 mg/L																																					
Lead	0.015 mg/L																																					



TABLE A-2  
(Continued)

Media	Relevant and Appropriate Requirements	Attainment
Uranium	<p>40 CFR 192.12 Standards for Uranium Mill Tailings</p> <p>Remedial Actions shall be conducted so as to provide reasonable assurance that as a result of residual radioactive materials from any designated processing site:</p> <p>a) The concentration of radium-226 in land averaged over any area of 100 square meters shall not exceed the background level by more than</p> <ol style="list-style-type: none"> <li>1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and</li> <li>2) 15 pCi/g, averaged over 15 cm thick layers of soil more than 15 cm below the surface.</li> </ol>	<p>40 CFR 192.12 is relevant and appropriate for remedial actions at OU1 because much of the waste contained in the waste pits at OU1 contain material similar to the uranium mill tailings and thorium mill tailings regulated by the standard.</p> <p>Pit 1 contains 114,000 lbs of uranium Pit 2 contains 2,653,000 lbs of uranium and 880 lbs of thorium Pit 3 contains 284,000 lbs of uranium and 880 lbs of thorium Pit 4 contains 6.6 million lbs of uranium and 136,000 lbs of thorium Pit 5 contains 111,000 lbs of uranium and 37,000 lbs of thorium</p> <p>The purpose of 40 CFR 192 includes providing for long-term stabilization and isolation of residual radioactive material and control of exposure to radioactive material. This purpose is compatible with the purpose of remedial action at OU1.</p>
Gamma	<p>40 CFR 192.12 Standards for Uranium Mill Tailings</p> <p>Remedial Actions shall be conducted so that the level of gamma radiation shall not exceed the background level by more than 20 microroentgens/hour.</p>	<p>40 CFR 192.12 is relevant and appropriate to remedial actions at OU1 because much of the waste contained in the waste pits at OU1 is similar to the uranium mill tailings and thorium mill tailings regulated by the standard.</p> <p>The purpose of 40 CFR 192 includes providing for long-term stabilization and isolation of residual radioactive material and control of exposure to radioactive material. This purpose is compatible with the purpose of remedial action at OU1.</p>
Ra-226 + 5 daughters Ra-228 + daughter Th-230 Th-232	<p>40 CFR 192.32 40 CFR 192.41</p> <p>Limit releases of radon from uranium and thorium by-product materials to the atmosphere so as not to exceed an average release rate of 20 picoCuries per square meter per second.</p>	<p>40 CFR 192.32 and 40 CFR 192.41 are relevant and appropriate to remedial actions at OU1 because uranium and thorium are contaminants of concern at OU1 and may be released to the atmosphere.</p>

TABLE A-2  
(Continued)

Media	To-be-Considered	Attainment										
	<p>Proposed MCLs from 'Drinking Water Regulations and Health Advisories' by the Office of Water, U.S. EPA, Washington, D.C., May 1993.</p> <table border="1"> <thead> <tr> <th>Chemical</th> <th>MCL (mg/L)</th> </tr> </thead> <tbody> <tr> <td>Benzo(a)anthracene</td> <td>0.0001</td> </tr> <tr> <td>Benzo(b)fluoranthene</td> <td>0.0002</td> </tr> <tr> <td>Chrysene</td> <td>0.0002</td> </tr> <tr> <td>Indeno(1,2,3-c,d)pyrene</td> <td>0.0004</td> </tr> </tbody> </table>	Chemical	MCL (mg/L)	Benzo(a)anthracene	0.0001	Benzo(b)fluoranthene	0.0002	Chrysene	0.0002	Indeno(1,2,3-c,d)pyrene	0.0004	<p>The proposed regulations are not ARARs for Operable Unit 1 because they are not promulgated at this time. However, the proposed limits can be used to establish cleanup levels for the site in the absence of promulgated federal and state regulations. The listed chemicals have been found to be present at Operable Unit 1 during the Remedial Investigation.</p>
Chemical	MCL (mg/L)											
Benzo(a)anthracene	0.0001											
Benzo(b)fluoranthene	0.0002											
Chrysene	0.0002											
Indeno(1,2,3-c,d)pyrene	0.0004											
<p>Radionuclides in Drinking Water</p>	<p>DOE Order 5400.5, Chapter II, Section 1.d. Radiation Protection of the Public and Environment</p> <p>Provide a level of protection for persons consuming water from a public drinking water supply operated by the DOE so that persons consuming water from the supply shall not receive an effective dose equivalent greater than 4 mrem in a year.</p> <p>For multiple radionuclides, the sum of the effective dose equivalents from the radionuclides (excluding radium-226, radium-228, and radon) shall not exceed 4 mrem in a year from drinking water.</p>	<p>The DOE Order 5400.5 is not promulgated; thus, it is not an ARAR. It is, however, to-be-considered guidance.</p> <p>Note: The guidance duplicates and supplements the State of Ohio regulations OAC 3745-81-16 and the Federal regulations at 40 CFR 141.16.</p>										

TABLE A-2  
 (Continued)

Media	To-be-Considered	Attainment
<p>Radionuclides in Surface or Groundwater</p>	<p>DOE Order 5400.5 <u>Radiation Protection of the Public and the Environment</u></p> <p>The derived concentration guides contained in this order are based on the intake of water contaminated with the radionuclide of concern in concentrations that would result in a committed dose equivalent of 100 mrem for the radionuclide taken in during one year.</p> <p>Derived concentration guides are not release limits. The guides are used by DOE to screen waste streams for application of best available technologies for bringing annual averages of a contaminant below the derived concentration guide.</p>	<p>DOE Orders are not ARARs because they are not promulgated. Because they document policy, responsibilities, procedures, and/or standards specifically at DOE facilities, they should be considered when setting cleanup standards for radionuclides, particularly if they give guidance where none is available in promulgated form.</p> <p>The Derived Concentration Guides are relevant to OU1 because radioactive material is involved in the cleanup of OU1 and because there is evidence of contamination (uranium) in the surface water and sediments in the immediate vicinity of the waste pits. Although the derived concentration guides presented in DOE Order 5400.5 apply to liquid process waste streams, it is appropriate that these guides be considered during cleanup at OU1 because of the possibility of releasing liquid radioactive material to surface waters during remedial action.</p>

TABLE A-2  
(Continued)

Media	To-be-Considered	Attainment
<p>Radionuclides in Natural Waterways (Aquatic Species)</p>	<p>DOE Order 5400.5 <u>Radiation Protection of the Public and the Environment</u></p> <p>To prevent buildup of radionuclide concentrations in sediment, liquid process waste streams containing radioactive material in settle-able solids may be released to natural waterways if the concentration of radioactive material in the solids present in the waste stream do not exceed 5 pCi/g above background levels of settle-able solids of alpha-emitting radionuclides or 50 pCi/g above background level of settle-able solids for beta-gamma-emitting radionuclides.</p> <p>To protect native animal aquatic organisms, the absorbed dose to these organisms shall not exceed 1 rad per day from exposure to the radioactive material in liquid wastes discharged to material waterways.</p>	<p>DOE Orders are not ARARs because they are not promulgated. However, they document and direct policy, responsibilities, and procedures and/or standards specifically at DOE facilities and should be considered when setting cleanup standards for radionuclides at a DOE facility. DOE Orders should be considered if the standards give guidance where none exists in promulgated form.</p> <p>The concentration limits on radioactive solids in liquid waste streams and on radioactive materials in liquid waste streams discharged to material waterways is relevant to cleanup actions at OU1 because of the presence of uranium in concentrations above background levels in surface water and sediment samples taken from Pits 5 and 6, the Clearwell, Paddys Run, and the drainage paths in the immediate vicinity of the waste pits.</p> <p>There is a possibility that remedial action at OU1 will contribute to radioactivity in the surface water and sediments of natural waterways in the vicinity of the Fernaid site. Thus, although DOE Order 5400.4 refers to contributions of radioactive materials from process waste streams discharged to streams, runoff from OU1 that contributes radionuclides to natural streams is similar enough to the circumstances of active waste discharge that cleanup activities at OU1 should take into consideration the limits set forth in the Order.</p>

TABLE A-2  
(Continued)

Media	To-be-Considered	Attainment
Radionuclides	<p><u>DOE Order 5400.5 Radiation Protection of the Public and Environment</u></p> <p>DOE Order 5400.5 sets desired concentration guides (DCG) for radioactive emissions to air resulting from DOE activities. The DCG values for internal exposure are based on a committed dose equivalent of 100 mrem for the radionuclides taken into the body during one year. The DCGs comply with 40 CFR Part 61, Subpart H criterion of 10 mrem/year effective dose equivalent. Compliance is demonstrated using AIRDOS/RADDISK models as described by EPA.</p> <p>The DCGs are not release limits. They are one step in the process of controlling releases. DOE uses the guides to screen waste streams for application of best available technologies. If the concentration of a contaminant is above the DCG, the best available technology is applied to bring the annual averages of the contaminant below the DCG at the point of discharge. See Attachment I, Table I-21.</p>	<p>The guidance presented in DOE Order 5400.5 is not applicable or relevant and appropriate to remedial actions at OUI because it is not promulgated. However, it should be considered because DOE orders set policy and procedures at DOE facilities and in this particular case provides guidance on how to control releases in such a way that the regulatory limits are met. Radionuclides are contaminants of concern at OUI.</p>
Radionuclides	<p><u>DOE Order 5400.5</u></p> <p>The DCGs are given for different lung retention classes (noted as D, W, or Y, where D equals a removal half-time of 0.5 days, W equals a removal half-time of 50 days, and Y equals a removal half-time of 500 days). The derived concentration guides can be found in Table I-21 in Attachment I.</p>	<p>The guidance presented in DOE Order 5400.5 is not applicable or relevant and appropriate requirement because it is not promulgated. However, it should be considered because DOE orders set policy and procedures at DOE facilities and in this particular case provides guidance on how to control releases in such a way that the regulatory limits are met. Radionuclides are contaminants of concern at OUI.</p>



TABLE A-2  
(Continued)

Media	To-be-Considered	Attainment
<p>PCBs in Soil</p>	<p><u>40 CFR 761.125</u> Requirements for PCB Spill Cleanup</p> <p>PCBs at concentrations greater than 50 ppm are subject to decontamination TSCA requirements in 40 CFR 761.120(b).</p> <p>PCB containers containing non-liquid PCBs, such as contaminated soil, rags, and debris designated for disposal may be stored temporarily (up to 30 days from the date of removal) in an area that does not comply with the storage building requirements at 40 CFR 761.65 (b).</p> <p><u>40 CFR 761.125(c)</u></p> <p>Soils in non-restricted access areas contaminated by a PCB spill will be decontaminated to 10ppm PCB by weight, provided that the soil is excavated to a minimum depth of 10 inches. The excavated soils will be replaced with clean soils, i.e., containing 21ppm PCB, and the spill site will be restored (e.g., replacement of turf) [40 CFR 761.125(c)(4)(v)]. For soils in restricted access areas, decontaminate to 25ppm PCB by weight [40 CFR 761.125(c)(3)(v)].</p>	<p>Concentrations of PCBs at OUI are expected to be less than 50 ppm. This regulation would then be considered guidance to be considered.</p>
<p>Cs-137 + daughter Np-237 + daughter Pu-238 Pu-239/240 Ru-106 Sr-90 + daughter Tc-99 Th-228 + 7 daughters U-234 U-235 + daughter U-238 + daughters</p>	<p><u>DOE Order 5400.5</u></p> <p>Residual plus natural dose limit for public exposure to residual radioactive material are 100 mrem effective dose equivalent per year.</p> <p>Guidelines for residual concentrations of radionuclides in soil shall be derived from the basic dose limits by means of an environment pathway analysis using specific property data where available. Procedures for these derivations are given in DOE/CH-8901.</p> <p>Residual concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 square meters.</p> <p>Control and Stabilization and Administrative Control features shall be designed to provide to the extent reasonably achievable, an effective life of 50 years with a minimum life of at least 25 years.</p> <p>Groundwater shall be protected in accordance with legally applicable Federal and State standards.</p>	<p>DOE Order 5400.5 presents DOE limits on residual radionuclides in soil without specifying their source. The order should be considered during the remediation of OUI because the radionuclides listed are contaminants of concern at OUI and may be released to the environment during remediation or after closure.</p>

TABLE A-2  
(Continued)

Media	To-be-Considered	Attainment
<p>Ra-226 + 5 daughters Ra-228 + daughter Th-230 Th-232</p>	<p><u>DOE Order 5400.5</u> Residual plus natural dose limit for public use exposure to residual radioactive material are 100 mrem effective dose equivalent per year. Guidelines for residual concentrations are 5 pCi/g, averaged over the first 15 cm of soil below the surface; and 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.</p>	<p>Remedial actions at OU1 may result in residual radioactivity in waste or soil. DOE Order 5400.5 issues limits for residual dose and concentrations for radionuclides of concern at OU1.</p>

TABLE B-3  
ACTION-SPECIFIC ARARS  
(APPLICABLE REQUIREMENTS; RELEVANT AND APPROPRIATE REQUIREMENTS; TBCs)

Applicable Requirements	Attainment
<p><u>40 CFR Part 61, Subpart H (40 CFR 61.90 to 61.97)</u></p> <p>Emissions of other radionuclides at DOE facilities are limited to a 10 mrem/yr annual dose. The rule also contains specific regulatory procedures for EPA approvals and reporting requirements.</p>	<p>Any contribution by the remediation selected for Operable Unit 1 to the overall dose for the entire site must not result in exceedance of the standard.</p> <p>The engineering practices that will be implemented for controlling air emissions and fugitive dust for excavation, drying, and handling of waste will ensure compliance with this requirement.</p>
<p><u>40 CFR Part 61, Subpart Q</u></p> <p>Emission of radon-222 from DOE facilities is limited to 20 pCi/m<sup>3</sup>/s on an annual average.</p>	<p>The FEMP has been specifically identified as a regulated entity in the regulations based on the history of releases at this facility. The engineering practices that will be implemented for controlling air emissions and fugitive dust for excavation, drying, and handling of waste will ensure compliance with this requirement.</p>
<p><u>40 CFR 122.26 (OAC 3745-38) Discharge of Storm Water Runoff</u></p> <p>Storm water runoff from landfills, construction sites, and industrial activities must be monitored and controlled. A Storm Water Pollution Prevention Plan (SWPPP) is required for construction activities which result in a total land disturbance of 5 or more acres.</p>	<p>Required of all industrial waste sites and construction sites of greater than 5 acres that discharge storm water runoff to the waters of the United States. The substantive requirements of a SWPPP will be met prior to disturbance of the area.</p>
<p><u>ORC 3734.02(H) Digging Where Hazardous or Solid Waste was Located</u></p> <p>Filling, grading, excavating, building, drilling, or mining on land where hazardous waste or solid waste facility was operated is prohibited without prior approval from the Director of the Ohio EPA.</p>	<p>State concurrence of the RI/FS-PP and Record of Decision will meet the requirement of this regulation.</p>
<p><u>OAC 3745-9-10 Ohio Water Well Standards</u></p> <p>Abandonment of Test Holes and Wells</p>	<p>Upon completion of testing, a test hole or well shall be either completely filled with grout or such material as will prevent contaminants from entering groundwater.</p>

TABLE A-3  
(Continued)

Applicable Requirements	Attainment
<p><u>OAC 3745-15-07(A) Ohio Air Pollution Control Regulations</u> Describes forms of air pollution nuisances and prohibits their emission or escape.</p>	<p>Both excavation and waste treatment processes have the potential to generate prohibited fugitive emissions, including smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, or odors in such a manner or in such amounts as to endanger health, safety, or welfare.  Fugitive and blowing dust carrying contamination would be controlled on active excavation faces and spoil piles by wetting, fogging, or misting. Dust from inactive excavation faces would be controlled with plastic, applied foam, shotcrete, or paving. Crushing and drying activities would take place in enclosures.</p>
<p><u>OAC 3745-17-08 Control of Fugitive Dust</u> Requires the minimization or elimination of visible emissions of fugitive dust generated during grading, loading, or construction operations and other practices which emit fugitive dust.</p>	<p>The implementation of remedial action alternatives will require the movement of dirt and other material likely to result in fugitive dust emissions.  Fugitive and blowing dust carrying contamination would be controlled on active excavation faces and spoil piles by wetting, fogging, or misting. Dust from inactive excavation faces would be controlled with plastic, applied foam, shotcrete, or paving. Crushing and drying activities would take place in enclosures.</p>
<p><u>OAC 3745-21-02(C) and OAC 3745-21-03(D)</u> Ambient air quality standards and guidelines and methods of ambient air quality measurements (for non-methane hydrocarbons).  Mean ambient concentration of non-methane hydrocarbons not to exceed 160 µg/cubic meters (0.24 ppm as carbon) between 6 and 9 a.m.; methods for determining ambient concentration of non-methane hydrocarbons.</p>	<p>During drying, hydrocarbon soil contaminants may be evolved with the steam. An uncontrolled release could lead to violations of this standard. Therefore, process off-gases will be treated through a condenser and a scrubber during drying.</p>
<p><u>OAC 3745-21-07 (G)(2) Control of emissions of organic material from stationary sources.</u> Emissions of photochemical reactive material from processes, including drying, not to exceed 40 lbs/day, with a peak of 8 lbs/hour.</p>	<p>Data from the Operable Unit 1 Remedial Investigation Report indicate that VOCs do not need to be controlled because of their low concentrations. However, off-gases will be treated through a condenser and scrubber during drying. Although the concentration of organic material in the pit waste is expected to be low, the volume of the waste to be treated could result in sufficient emissions for this standard to be violated if emissions are uncontrolled. (It is current OEPA policy to consider all VOCs to be photochemical reactive materials.)</p>
<p><u>OAC 3745-21-05(A)(3) Permit to Install</u> The director shall issue a permit to install if he determines that the installation or modification and operation of the air contaminant source will employ the best available technology.</p>	<p>Although an administrative Permit to Install is not required for alternatives involving treatment, the substantive requirements of this section must be met by employing Best Available Technology for treating particulate and off-gas emissions.</p>

TABLE A-3  
(Continued)

Applicable Requirements	Attainment
<p><u>10 CFR 1021.2</u> DOE actions must be subjected to NEPA evaluation as outlined by CEQ regulations in 40 CFR 1500-1508.</p>	<p>This requirement is applicable because the FEMP is a DOE facility, and this requirement requires NEPA evaluation for specific actions at DOE facilities. On June 13, 1994, the DOE issued a revised policy statement on NEPA. The new policy allows DOE, at CERCLA sites, to rely on the CERCLA process to satisfy the procedural aspects of NEPA. NEPA values have been incorporated into the Final Operable Unit 1 Feasibility Study Report.</p>

TABLE A-3  
(Continued)

Relevant and Appropriate Requirements	Attainment
<p><u>40 CFR 61.670 Subpart OOO</u> Stack emissions from affected facilities shall not:</p> <ul style="list-style-type: none"> <li>• Contain particulate matter in excess of 0.05 g/dscm, or</li> <li>• Exhibit greater than 7 percent opacity, unless the stack emissions are discharged from an affected facility using a wet scrubbing control device.</li> </ul>	<p>These standards are relevant and appropriate to OUI remedial activities since they specify requirements for crusher and conveyor systems. The standards will be considered when determining BAT requirements for these systems in accordance with OAC 3745-31-05(A)(3).</p>
<p><u>40 CFR 125.100 and 125.104 Discharge of Treatment System Effluent</u> <u>Best Management Practices</u> Development and implement a BMP program to prevent the release of toxic or hazardous pollutants to waters of the U.S. Development and implementation of a sitewide BMP Program is also required as a condition of the FEMP NPDES Permit.</p>	<p>All of the proposed actions have the potential for releases and runoff from the operable unit. The requirement is not applicable because BMP under the NPDES permit program applies only to ancillary facilities of manufacturing units that might have releases of toxic or hazardous pollutants. The purpose of the BMP program is relevant and appropriate to prevent releases from spills or runoff during the implementation of remedial actions. The FEMP has an approved Best Management Practices Plan.</p>
<p><u>40 CFR 241 Subpart B (OAC 3745-27) RCRA Subtitle D On-Property Solid Nonhazardous Waste Management Facilities</u> Design standards are presented in the following citations: <u>241.200-2, 241.201-2, 241.202-2, 241.203-2, 241.204-2, 241.205-2, 241.206-2, 241.207-2, 241.208-2, 241.209-2, and 241.210-2.</u></p>	<p>Solid, nonhazardous wastes generated as a result of remediation must be managed in accordance with Federal and State regulations. However, the selected remedy involves off-site shipment of Operable Unit 1 pit wastes. On-site facility design requirements do not apply to this remedy.</p>
<p><u>40 CFR 262.11 (OAC 3745-52-11) Hazardous Waste Determinations</u> Any generator of waste must determine whether or not the waste is hazardous.</p>	<p>These procedures are established to determine whether wastes are subject to the requirements of RCRA. These procedures are relevant and appropriate to determine whether Operable Unit 1 pit wastes exhibit the characteristics of hazardous waste, or are otherwise similar to RCRA hazardous waste. Characterization of the treated material will be conducted prior to off-site shipment. Characterization will be based on process knowledge of the waste generated (as documented in the Operable Unit 1 Remedial Investigation Report) and through sampling of waste after treatment.</p>

TABLE A-3  
(Continued)

Relevant and Appropriate Requirements	Attainment
<p>Closure 40 CFR 264, Subpart G (OAC 3745-55-11-16)</p> <p>Operator must close facility in a manner that:</p> <ul style="list-style-type: none"> <li>• Minimizes the need for further maintenance</li> <li>• Minimizes post-closure escape of hazardous constituents</li> <li>• Complies with specific unit type closure requirements</li> </ul>	<p>These requirements are relevant and appropriate because the residues are sufficiently similar to hazardous waste and some remedial alternatives might require closure as outlined in this standard.</p>
<p>40 CFR 264.1030 - 264.1036, Subpart AA Air Emission Standards for Process Vents</p>	<p>No regulations have been promulgated for process vents associated with vitrification; however, 40 CFR 264.1030 - 0136 may be relevant and appropriate but not applicable to air emission standards for process vents associated with vitrification.</p>
<p>Post-Closure 40 CFR 264 Subpart G 40 CFR 264.117 (OAC 3745-55-17) 40 CFR 264.119 (OAC 3745-55-19)</p> <p>Post-closure care and use of property for a period as necessary to protect human health and the environment, including:</p> <ul style="list-style-type: none"> <li>• Access controls</li> <li>• Monitoring</li> </ul> <p>Post-closure notices must include deed notation/lease restriction.</p>	<p>These requirements are relevant and appropriate because the residues are sufficiently similar to hazardous waste and some remedial alternatives might leave residues in place.</p>
<p>Corrective Action for SWMUs 40 CFR Subpart S 40 CFR 264.552-553</p> <p>Corrective Action Management Units (CAMUs) might be designed at the site as areas where remediation wastes (solid, hazardous, or contaminated media and debris) might be placed during the process of remediation.</p> <p>Temporary units (TUs) consisting of tanks and container storage units might be used to store and treat hazardous waste during the process of corrective action.</p>	<p>During the process of remediation, waste materials might require temporary management in containment buildings, temporary units, stockpiles, or other land-based units for the purpose of staging, treating or disposing of the material. All of the material generated from remediation of OUI are considered remediation wastes. Some of the waste material might exhibit a RCRA characteristic, or otherwise be sufficiently similar to hazardous waste to make this requirement relevant and appropriate.</p>

TABLE A-3  
(Continued)

To-be-Considered	Attainment
<p><u>DOE Order 5400.1 @ p. iv - 1</u></p> <p>Since each DOE facility is unique, the need and level of effort for monitoring programs shall be determined by the appropriate field organization on a case-by-case basis.</p>	<p>Operable Unit 1 is part of a DOE facility and is subject to these orders. Monitoring programs implemented at the facility will be based on appropriate requirements identified through the ARARs analysis as well as DOE Orders.</p>
<p><u>DOE Order 5400.1 @ iv - 9, 10</u></p> <p>Groundwater that is or could be affected by DOE activities shall be monitored to determine and document the effects of operations on groundwater quality and quantity and to demonstrate compliance with DOE requirements and applicable Federal, State, and local laws and regulations.</p>	<p>Site-specific characteristics determine monitoring needs. For sites with multiple groundwater pollutant sources, extensive groundwater pollution or other unique site problems, groundwater monitoring programs could require more extensive information than those specified in 40 CFR Parts 264 and 265. Monitoring for radionuclides shall be in accordance with DOE Orders in the 5400 series dealing with radiation protection of the public and the environment. Remediation of groundwater at the facility and related monitoring will be managed under Operable Unit 5.</p>
<p><u>DOE Order 5820.2A @ 1 Radioactive Waste Management</u> <u>DOE 5820.2A III.3h Management of Low-Level Waste, Long-Term Storage</u></p> <p>Radioactive and mixed wastes shall be managed in a manner that assures protection of the health and safety of the public, DOE and contractor employees, and the environment.</p> <p>5820.2A III.3h requires achieving performance objectives of DOE. 5820.2A III.3a requires records and documentation be kept for storage of low-level waste and permits the storage of waste until disposal by approved methods.</p>	<p>The generation, treatment, storage, transportation, and/or disposal of radioactive wastes, and the other pollutants or hazardous substances they contain, will be accomplished in a manner that minimizes the generation of such waste across program office functions and complies with all applicable Federal, State and local environmental, safety, and health laws and regulations, and DOE requirements.</p>

TABLE A-2  
 (Continued)

Media	To-be-Considered	Attainment
Ra-226 + 5 daughters Ra-228 + daughter Th-230 Th-232	<p><u>DOE Order 5400.5</u></p> <p>Residual plus natural dose limit for public use exposure to residual radioactive material are 100 mreem effective dose equivalent per year.</p> <p>Guidelines for residual concentrations are 5 pCi/g, averaged over the first 15 cm of soil below the surface; and 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.</p>	<p>Remedial actions at OUI may result in residual radioactivity in waste or soil. DOE Order 5400.5 issues limits for residual dose and concentrations for radionuclides of concern at OUI.</p>

**TABLE B-3**  
**ACTION-SPECIFIC ARARS**  
**(APPLICABLE REQUIREMENTS; RELEVANT AND APPROPRIATE REQUIREMENTS; TBCs)**

Applicable Requirements	Attainment
<p><u>40 CFR Part 61, Subpart I (40 CFR 61.90 to 61.97)</u></p> <p>Emissions of other radionuclides at DOE facilities are limited to a 10 mrem/yr annual dose. The rule also contains specific regulatory procedures for EPA approvals and reporting requirements.</p>	<p>Any contribution by the remediation selected for Operable Unit 1 to the overall dose for the entire site must not result in exceedance of the standard.</p> <p>The engineering practices that will be implemented for controlling air emissions and fugitive dust for excavation, drying, and handling of waste will ensure compliance with this requirement.</p>
<p><u>40 CFR Part 61, Subpart Q</u></p> <p>Emission of radon-222 from DOE facilities is limited to 20 pCi/m<sup>2</sup>/s on an annual average.</p>	<p>The FEMP has been specifically identified as a regulated entity in the regulations based on the history of releases at this facility. The engineering practices that will be implemented for controlling air emissions and fugitive dust for excavation, drying, and handling of waste will ensure compliance with this requirement.</p>
<p><u>40 CFR 122.26 (OAC 3745-38) Discharge of Storm Water Runoff</u></p> <p>Storm water runoff from landfills, construction sites, and industrial activities must be monitored and controlled. A Storm Water Pollution Prevention Plan (SWPPP) is required for construction activities which result in a total land disturbance of 5 or more acres.</p>	<p>Required of all industrial waste sites and construction sites of greater than 5 acres that discharge storm water runoff to the waters of the United States. The substantive requirements of a SWPPP will be met prior to disturbance of the area.</p>
<p><u>ORC 3734.02(H) Digging Where Hazardous or Solid Waste was Located</u></p> <p>Filling, grading, excavating, building, drilling, or mining on land where hazardous waste or solid waste facility was operated is prohibited without prior approval from the Director of the Ohio EPA.</p>	<p>State concurrence of the R/FS-PP and Record of Decision will meet the requirement of this regulation.</p>
<p><u>OAC 3745-9-10 Ohio Water Well Standards</u></p> <p>Abandonment of Test Holes and Wells</p>	<p>Upon completion of testing, a test hole or well shall be either completely filled with grout or such material as will prevent contaminants from entering groundwater.</p>

TABLE A-3  
(Continued)

Applicable Requirements	Attainment
<p><u>OAC 3745-15-07(A) Ohio Air Pollution Control Regulations</u> Describes forms of air pollution nuisances and prohibits their emission or escape.</p>	<p>Both excavation and waste treatment processes have the potential to generate prohibited fugitive emissions, including smoke, ashes, dust, grime, acids, fumes, gases, vapors, or odors in such a manner or in such amounts as to endanger health, safety, or welfare.</p> <p>Fugitive and blowing dust carrying contamination would be controlled on active excavation faces and spoil piles by wetting, fogging, or misting. Dust from inactive excavation faces would be controlled with plastic, applied foam, shotcrete, or paving. Crushing and drying activities would take place in enclosures.</p>
<p><u>OAC 3745-17-08 Control of Fugitive Dust</u> Requires the minimization or elimination of visible emissions of fugitive dust generated during grading, loading, or construction operations and other practices which emit fugitive dust.</p>	<p>The implementation of remedial action alternatives will require the movement of dirt and other material likely to result in fugitive dust emissions.</p> <p>Fugitive and blowing dust carrying contamination would be controlled on active excavation faces and spoil piles by wetting, fogging, or misting. Dust from inactive excavation faces would be controlled with plastic, applied foam, shotcrete, or paving. Crushing and drying activities would take place in enclosures.</p>
<p><u>OAC 3745-21-02(C) and OAC 3745-21-03(D)</u> Ambient air quality standards and guidelines and methods of ambient air quality measurements (for non-methane hydrocarbons).  Mean ambient concentration of non-methane hydrocarbons not to exceed 160 µg/cubic meters (0.24 ppm as carbon) between 6 and 9 a.m.; methods for determining ambient concentration of non-methane hydrocarbons.</p>	<p>During drying, hydrocarbon soil contaminants may be evolved with the steam. An uncontrolled release could lead to violations of this standard. Therefore, process off-gases will be treated through a condenser and a scrubber during drying.</p>
<p><u>OAC 3745-21-07 (G)(2) Control of emissions of organic material from stationary sources.</u> Emissions of photochemical reactive material from processes, including drying, not to exceed 40 lbs/day, with a peak of 8 lbs/hour.</p>	<p>Data from the Operable Unit 1 Remedial Investigation Report indicate that VOCs do not need to be controlled because of their low concentrations. However, off-gases will be treated through a condenser and scrubber during drying. Although the concentration of organic material in the pit waste is expected to be low, the volume of the waste to be treated could result in sufficient emissions for this standard to be violated if emissions are uncontrolled. (It is current OEPA policy to consider all VOCs to be photochemical reactive materials.)</p>
<p><u>OAC 3745-31-05(A)(3) Permit to Install</u> The director shall issue a permit to install if he determines that the installation or modification and operation of the air contaminant source will employ the best available technology.</p>	<p>Although an administrative Permit to Install is not required for alternatives involving Best treatment, the substantive requirements of this section must be met by employing Best Available Technology for treating particulate and off-gas emissions.</p>

TABLE A-3  
 (Continued)

Applicable Requirements	Attainment
<p><u>10 CFR 1021.2</u>                      DOE actions must be subjected to NEPA evaluation as outlined by CEQ regulations in 40 CFR 1500-1508.</p>	<p>This requirement is applicable because the FEMP is a DOE facility, and this requirement requires NEPA evaluation for specific actions at DOE facilities. On June 13, 1994, the DOE issued a revised policy statement on NEPA. The new policy allows DOE, at CERCLA sites, to rely on the CERCLA process to satisfy the procedural aspects of NEPA. NEPA values have been incorporated into the Final Operable Unit 1 Feasibility Study Report.</p>

TABLE A-3  
(Continued)

Relevant and Appropriate Requirements	Attainment
<p>40 CFR 61.670 Subpart OOO Stack emissions from affected facilities shall not:</p> <ul style="list-style-type: none"> <li>Contain particulate matter in excess of 0.05 g/dscm, or</li> <li>Exhibit greater than 7 percent opacity, unless the stack emissions are discharged from an affected facility using a wet scrubbing control device.</li> </ul>	<p>These standards are relevant and appropriate to OU1 remedial activities since they specify requirements for crusher and conveyor systems. The standards will be considered when determining BAT requirements for these systems in accordance with OAC 3745-31-05(A)(3).</p>
<p>40 CFR 125.100 and 125.104 Discharge of Treatment System Effluent Best Management Practices Development and implement a BMP program to prevent the release of toxic or hazardous pollutants to waters of the U.S. Development and implementation of a site-wide BMP Program is also required as a condition of the FEMP NPDES Permit.</p>	<p>All of the proposed actions have the potential for releases and runoff from the operable unit. The requirement is not applicable because BMP under the NPDES permit program applies only to ancillary facilities of manufacturing units that might have releases of toxic or hazardous pollutants. The purpose of the BMP program is relevant and appropriate to prevent releases from spills or runoff during the implementation of remedial actions. The FEMP has an approved Best Management Practices Plan.</p>
<p>40 CFR 241 Subpart B (OAC 3745-27) RCRA Subtitle D On-Property Solid Nonhazardous Waste Management Facilities Design standards are presented in the following citations: 241.200-2, 241.201-2, 241.202-2, 241.203-2, 241.204-2, 241.205-2, 241.206-2, 241.207-2, 241.208-2, 241.209-2, and 241.210-2.</p>	<p>Solid, nonhazardous wastes generated as a result of remediation must be managed in accordance with Federal and State regulations. However, the selected remedy involves off-site shipment of Operable Unit 1 pit wastes. On-site facility design requirements do not apply to this remedy.</p>
<p>40 CFR 262.11 (OAC 3745-52-11) Hazardous Waste Determinations Any generator of waste must determine whether or not the waste is hazardous.</p>	<p>These procedures are established to determine whether wastes are subject to the requirements of RCRA. These procedures are relevant and appropriate to determine whether Operable Unit 1 pit wastes exhibit the characteristics of hazardous waste, or are otherwise similar to RCRA hazardous waste. Characterization of the treated material will be conducted prior to off-site shipment. Characterization will be based on process knowledge of the waste generated (as documented in the Operable Unit 1 Remedial Investigation Report) and through sampling of waste after treatment.</p>

TABLE A-3  
(Continued)

Relevant and Appropriate Requirements	Attainment
<p><u>Closure 40 CFR 264, Subpart G (OAC 3745-55-01-16)</u> Operator must close facility in a manner that:</p> <ul style="list-style-type: none"> <li>• Minimizes the need for further maintenance</li> <li>• Minimizes post-closure escape of hazardous constituents</li> <li>• Complies with specific unit-type closure requirements</li> </ul>	<p>These requirements are relevant and appropriate because the residues are sufficiently similar to hazardous waste and some remedial alternatives might require closure as outlined in this standard.</p>
<p><u>40 CFR 264.1030 - 264.1036, Subpart AA Air Emission Standards for Process Vents</u></p>	<p>No regulations have been promulgated for process vents associated with vitrification; however, 40 CFR 264.1030 - 0136 may be relevant and appropriate but not applicable to air emission standards for process vents associated with vitrification.</p>
<p><u>Post-Closure 40 CFR 264 Subpart G</u> <u>40 CFR 264.117</u> <u>(OAC 3745-55-17)</u> <u>40 CFR 264.119</u> <u>(OAC 3745-55-19)</u></p> <p>Post-closure care and use of property for a period as necessary to protect human health and the environment including:</p> <ul style="list-style-type: none"> <li>• Access controls</li> <li>• Monitoring</li> </ul> <p>Post-closure notices must include deed notation/use restriction.</p>	<p>These requirements are relevant and appropriate because the residues are sufficiently similar to hazardous waste and some remedial alternatives might leave residues in place.</p>
<p><u>Corrective Action for SWMUs</u> <u>40 CFR Subpart S</u> <u>40 CFR 264.552, 553</u></p> <p>Corrective Action Management Units (CAMUs) might be designed at the site as areas where remediation wastes (solid, hazardous, or contaminated media and debris) might be placed during the process of remediation.</p> <p>Temporary units (TUs) consisting of tanks and container storage units might be used to store and treat hazardous waste during the process of corrective action.</p>	<p>During the process of remediation, waste materials might require temporary management in containment buildings, temporary units, stockpiles, or other land based units for the purpose of staging, treating or disposing of the material. All of the material generated from remediation of OU1 are considered remediation wastes. Some of the waste material might exhibit a RCRA characteristic, or otherwise be sufficiently similar to hazardous waste to make this requirement relevant and appropriate.</p>

TABLE A-3  
(Continued)

To-be-Considered	Attainment
<p><u>DOE Order 5400.1 @ p. iv - 1</u> Since each DOE facility is unique, the need and level of effort for monitoring programs shall be determined by the appropriate field organization on a case-by-case basis.</p>	<p>Operable Unit 1 is part of a DOE facility and is subject to these orders. Monitoring programs implemented at the facility will be based on appropriate requirements identified through the ARARs analysis as well as DOE Orders.</p>
<p><u>DOE Order 5400.1 @ iv - 9, 10</u> Groundwater that is or could be affected by DOE activities shall be monitored to determine and document the effects of operations on groundwater quality and quantity and to demonstrate compliance with DOE requirements and applicable Federal, State, and local laws and regulations.</p>	<p>Site-specific characteristics determine monitoring needs. For sites with multiple groundwater pollutant sources, extensive groundwater pollution or other unique site problems, groundwater monitoring programs could require more extensive information than those specified in 40 CFR Parts 264 and 265. Monitoring for radionuclides shall be in accordance with DOE Orders in the 5400 series dealing with radiation protection of the public and the environment. Remediation of groundwater at the facility and related monitoring will be managed under Operable Unit 5.</p>
<p><u>DOE Order 5820.2A @ 1 Radioactive Waste Management</u> <u>DOE 5820.2A III.3h Management of Low-Level Waste, Long-Term Storage</u> Radioactive and mixed wastes shall be managed in a manner that assures protection of the health and safety of the public, DOE and contractor employees, and the environment.</p> <p>5820.2A III.3h requires achieving performance objectives of DOE. 5820.2A III.3a requires records and documentation be kept for storage of low-level waste and permits the storage of waste until disposal by approved methods.</p>	<p>The generation, treatment, storage, transportation, and/or disposal of radioactive wastes, and the other pollutants or hazardous substances they contain, will be accomplished in a manner that minimizes the generation of such waste across program office functions and complies with all applicable Federal, State and local environmental, safety, and health laws and regulations, and DOE requirements.</p>