



EG+G-25-13-10-01-01
#9408010003

F-OU-5

FFTA

Department of Energy

Field Office, Albuquerque
Dayton Area Office
P.O. Box 66
Miamisburg, Ohio 45343-0066

RECEIVED
JUL 12 1994
AOS 8 7-1994

Mr. Brian Nickel
Ohio Environmental Protection Agency
401 E. Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Nickel:

Re: Operable Unit 5 Fire Fighting Training Area Site Action
Memorandum/Removal Site Evaluation Document.

Attached please find a modification to Table 2.1 of the subject document. The change establishes the Ohio Bureau of Underground Storage Tanks, in lieu of the OEPA, as the regulatory agency source for cleanup levels.

A copy of this letter will be attached to the issued Action Memorandum in order to document the change.

If you have any questions, please contact me at (513)865-3975.

Sincerely,

Arthur W. Kleinrath
ER CERCLA Program Manager

Enclosure

cc w/enclosure:
Diane Spencer, USEPA
M. A. Reker, MB
M. Williams, EG&G
A. Spessard, EG&G
W. A. Rummel, Geotech/MB

Table 2.1.

Building 34 Fire-Fighting Training Pits Sample Summary

Sample Location	Sample Number	Matrix	Date Sampled	Sample Interval (ft BGS)	Contaminant of Concern	Validated Result	Regulatory Action Levels	Regulatory Clean up Levels
MND33-0110	MND33-0110-0001	Soil	1/21/92	0.0-2.0	Thorium-234*	1.23 pCi/g	≥5.0 pCi/g (DOE)	<5 pCi/g
	MND33-0110-0002	Soil	1/21/92	3.0-7.0				
	MND33-0110-1002	Soil	1/21/92	3.0-7.0				
	MND33-0110-0003	Soil	1/21/92	8.0-10.0				
	MND33-0110-0004	Soil	1/22/92	13.0-15.0				
	MND33-0110-0005	Soil	1/22/92	17.0-19.0				
MND33-0111	MND33-0111-0001	Soil	1/22/92	0.0-2.0	Thorium-234*	1.03 pCi/g	≥5.0 pCi/g	<5 pCi/g (DOE)
	MND33-0111-0002	Soil	1/22/92	3.0-5.0	Extractable petroleum hydrocarbons as diesel fuel	38.1 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0111-0003	Soil	1/22/92	8.0-10.0				
MND33-0112	MND33-0112-0001	Soil	1/22/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel	498 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0112-0002	Soil	1/22/92	3.0-7.0		8.7 mg/kg		
	MND33-0112-0003	Soil	1/22/92	8.0-10.0	Extractable petroleum hydrocarbons as motor oil	66.5 mg/kg		
MND33-0113	MND33-0113-0001	Soil	1/27/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel	9.7 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0113-0002	Soil	1/27/92	3.0-5.0				
	MND33-0113-0003	Soil	1/27/92	9.0-11.0				
	MND33-0113-0004	Soil	1/27/92	13.0-15.0				
	MND33-0113-0005	Soil	1/27/92	15.0-17.0				
	MND33-0113-0006	Soil	1/27/92	17.0-20.0				
MND33-0119	No Samples Collected							
MND33-0120	No Samples Collected							
MND33-0121	No Samples Collected							
MND33-0140	MND33-0140-0001	Sediment	2/15/92	—	Thorium-234* Extractable petroleum hydrocarbons as diesel fuel	5.41 pCi/g 116,700 mg/kg	≥5.0 pCi/g (DOE) 105 mg/kg (BUSTR)	<5.0 pCi/g 40 mg/kg (BUSTR)

* Th-234 in secular equilibrium with U-238 and their activities, by definition, should be equal. The results can be interpreted as U-238.

- | | | | |
|--------|---|-------|--------------------------------|
| BGS | Below Ground Surface | SVOCs | Semivolatile Organic Compounds |
| BUSTR | Bureau of Underground Storage Tank Regulation | TAL | Target Analyte List |
| EPH | Extractable Petroleum Hydrocarbons | TCL | Target Compound List |
| ft | Feet | VOCs | Volatile Organic Compounds |
| P/PCBs | Pesticides/Polychlorinated Biphenyls | | |

EG&G-25-13-10-01-01
9408010003

F. ou 5
FFTA



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

March 22, 1994

REPLY TO THE ATTENTION OF:
HSRM-6J

Mr. Arthur Kleinrath
U.S. Department of Energy
Dayton Area Office
P.O. Box 66
Miamisburg, Ohio 45343

RE: U.S. DOE Mound Plant
Operable Unit 5: Fire Fighting Training Area Site
Action Memorandum/Removal Site Evaluation

Dear Mr. Kleinrath:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the above referenced document. U.S. EPA comments have been generated and are included with this correspondence. Of particular significance, is the lack of information contained in the action memorandum regarding potential air emissions when conducting the removal action.

Please feel free to call me at (312) 886-5867 if you have any questions regarding this correspondence.

Sincerely,

A handwritten signature in cursive script that reads "Diane M. Spencer".

Diane M. Spencer
Remedial Project Manager

cc: B. Nickel, OEPA
M. Williams, EG&G
B. Stanley, EG&G
A. Spesard, EG&G

U.S. DOE Mound Plant
Operable Unit 5, Fire Fighting Training Area Site
Action Memorandum/Removal Site Evaluation
January 1994

U.S. EPA Comments

General Comments

1. No objective(s) for the removal action has been included. Is the proposed removal to prevent a threat to the Buried Valley aquifer or will remediation be conducted until no further action is required in this particular area? The document does not address what level of contamination will remain after the removal action is completed. What is the target clean up level? Will this area require additional action as part of the long-term goal for Operable Unit 5?

Specific Comments

1. Section 2.3

Page 5, Paragraph 5

Several other potential release sites have been identified in the vicinity of the proposed removal action area. Have these areas been investigated? Information has not been included to verify that the Oil Burn Structure, Historical FFTA, or Aviation Fuel Storage Tank area should or should not be included in the determination of the extent of petroleum contamination. Table 2.2 indicates that elevated photoionization readings were observed at MND33-0110 and -0113.

2. Section 2.6

Page 9, Paragraph 2

The three-party Federal Facility Agreement for the Mound Plant was signed on July 15, 1993, but became effective on September 22, 1993.

3. Section 2.6.4

Page 17, paragraph 2

The final sentences of the paragraph refer to "free-phase petroleum" and "dissolved petroleum" present "below the water table" and "below 12 feet". No supporting ground water data has been included in the document. On what information is this statement based?

4. Section 5.1.2.1

Page 23, Paragraph 5

How will air emissions be monitored during removal of the free-phase petroleum? What control methods will be employed if air emissions exceed worker or nearest receptor exposure limits?

5. Section 5.1.2.2

Page 24, Paragraphs 2, 3, and 4

The static piles description fails to indicate if the piles will be open to the atmosphere, covered, or totally enclosed. This information is necessary for determining air emissions during soil excavation and bioremediation. As previously stated, how will air emissions be monitored?

6. Section 5.2

Page 27, Table 5.1

Were costs associated with the potential need to treatment exhaust gases, associated with the static piles, included in the cost estimate? The text states on page 24, that "if air treatment is required for exhaust gases, the cost of static piles increases substantially".

7. Section 5.3

Page 29, Paragraph 1

Phase II activities include the removal of sediment from the FFTA Pits. How will the contaminated sediments be handled? Due to thorium contamination the sediments must be managed separately from the contaminated soils.

8. Section 5.3

Page 29, Paragraph 2

What are the "removal objectives" which will be met? Are they the "Regulatory Clean up Levels" listed in Table 2.1 on page 11?

9. Section 5.5

Page 32, Table 5.4

No Federal ARARs, as stated in the associated text have been included in the table.

No air monitoring regulations have been cited, which are appropriate requirements for ex-situ bioremediation.



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

*Spesard
 Williams
 Nipp
 Artel
 OUS
 FFTA Removal*

F - OUS

FFTA

March 22, 1994

REPLY TO THE ATTENTION OF:
 HSRM-6J

Mr. Arthur Kleinrath
 U.S. Department of Energy
 Dayton Area Office
 P.O. Box 66
 Miamisburg, Ohio 45343

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 Operable Unit 5: Fire Fighting Training Area Site
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Please feel free to call me at (312) 886-5867 if you have any questions regarding this correspondence.

Sincerely,

Diane M. Spencer

Diane M. Spencer
 Remedial Project Manager

- cc: B. Nickel, OEPA
- M. Williams, EG&G
- B. Stanley, EG&G
- A. Spesard, EG&G

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

OF PAGES 3

To: <i>Art Kleinrath</i>	From: <i>Diane Spencer</i>
Dept./Agency	Phone # <i>312 886-5867</i>
Fax # <i>313 865-4219</i>	Fax # <i>312 393-5541</i>
NSN 7540-01-317-7368	5095-101 GENERAL SERVICES ADMINISTRATION

U.S. DOE Mound Plant
Operable Unit 5, Fire Fighting Training Area Site
Action Memorandum/Removal Site Evaluation
January 1994

U.S. EPA Comments

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No air monitoring regulations have been cited, which are appropriate requirements for ex-situ bioremediation.

 **EG&G MOUND APPLIED TECHNOLOGIES**

P.O. BOX 3000 MIAMISBURG, OHIO 45343-3000 • TEL (513) 865-4020

APR 13 1994

F - 045
FFTA

Mr. Arthur W. Kleinrath
Environmental Engineer
U. S. Department of Energy
Dayton Area Office
P.O. Box 66
Miamisburg, OH 45343

Dear Mr. Kleinrath:

EG&G 's Responses To U.S. EPA's Comments

I am requesting that the following letter be drafted to the U.S. EPA in order to formally transmit our recommended responses to their comments on the Action Memorandum for the FFTA removal action.

Diane Spencer
U.S. EPA
HSRM-6J
77 W. Jackson
Chicago, IL 60604

RE: U.S. EPA, Operable Unit 5: Fire Fighting Training Area Site
Action Memorandum/Removal Site Evaluation Comments, dated
March 22, 1994

Dear Ms. Spencer:

Attached is the information you requested as a result of your comments on the subject Action Memorandum/Removal Site Evaluation.

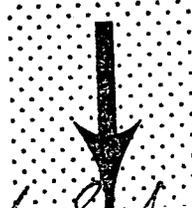
If you require additional information, please contact me at (513) 865-3597.

cc: w/attach.
Brian Nickel, OEPA
Monte Williams
Alan Spesard

Page 2

If you have any questions or modifications to the responses, please contact Alan Spesard of my staff at ext. 3859.

**SIGN
HERE**



Sincerely,

Monte Williams
Manager, ER/CERCLA

Approved:

Charles S. Friedman
Vice President
ER, WM & D&D

SAS/sdf
Attachment

**OPERABLE UNIT 5, FIRE FIGHTING TRAINING AREA SITE
RESPONSE TO USEPA COMMENTS
ACTION MEMORANDUM/REMOVAL SITE EVALUATION**

General Comments:

1. No objective(s) for the removal action has been included. Is the proposed removal to prevent a threat to the Buried Valley aquifer or will remediation be conducted until no further action is required in this particular area? The document does not address what level of contamination will remain after the removal action is completed. What is the target clean up level? Will this area require additional action as part of the long-term goal for Operable Unit 5?

The "removal objectives" are the "Regulatory Clean Up Levels" listed in Table 2.1 on page 11. The proposed removal action is to prevent possible petroleum hydrocarbon migration to the Buried Valley Aquifer, and will be conducted until no further action is required to address and mitigate surface and subsurface soil petroleum hydrocarbon contamination in this particular area. The Fire Fighting Training Area (FFTA) Site has target cleanup levels consistent with Ohio Environmental Protection Agency (OEPA) and the Ohio Division of State Fire Marshall Bureau of Underground Storage Tank Regulations (BUSTR) guidelines. The target cleanup levels are summarized in the following table.

<i>Contaminant</i>	<i>OEPA/BUSTR Guideline Action Level</i>	<i>OEPA/BUSTR Guideline Cleanup Level</i>	<i>Analytical Method for Survey and Confirmatory Analysis</i>
<i>Benzene</i>	<i>0.006 ppm</i>	<i>0.006 ppm</i>	<i>SW 846, method 8240</i>
<i>Toluene</i>	<i>4.0 ppm</i>	<i>4.0 ppm</i>	<i>SW 846, method 8240</i>
<i>Ethylbenzene</i>	<i>6.0 ppm</i>	<i>6.0 ppm</i>	<i>SW 846, method 8240</i>
<i>Xylene</i>	<i>28.0 ppm</i>	<i>28.0 ppm</i>	<i>SW 846, method 8240</i>
<i>Total Petroleum Hydrocarbons</i>	<i>105 ppm</i>	<i>40 ppm</i>	<i>EPA 600/4-79-0207 method 418.1</i>

This removal is consistent with the long-term goals of Operable Unit 5. However, it is possible that this area may require additional action as part of the long-term goal for Operable Unit 5.

Specific Comments:

1. Section 2.3, page 5, paragraph 5. Several other potential release sites have been identified in the vicinity of the proposed removal action area. Have these areas been investigated? Information has not been included to verify that the Oil Burn Structure, Historical FFTA, or Aviation Fuel Storage Tank are should or should not be included in the determination of the extent of petroleum contamination. Table 2.2 indicates that elevated photoionization readings were observed at MND33-0110 and -0113.

The other areas that were identified as potential release sites either have been investigated or are currently under investigation as part of Mound's Environmental Restoration RI/FS Program. The following table summarizes actions proposed or taken.

Site Designation	Operable Unit	Approximate Location	Action
Area C, Lithium Burn Area	3	Approximately 100 Feet Northwest of FFTA Site	No Action
Oil Burn Structure	3	Approximately 100 Feet West-northwest of FFTA Site	Further Characterization
Historical FFTA	3	Approximately 150 Feet Northwest of FFTA Site	Further Characterization
Aviation Fuel Storage Tank	3	Approximately 75 Feet West of FFTA Site	Removed 1990
Plant Drainage Ditch	9	Approximately 75 Feet North of FFTA Site	Further Characterization
Overflow Pond	9	Approximately 75 Feet Southwest of FFTA Site	Further Characterization
Drilling Mud Drum Storage Area	5	Approximately 150 Feet Northwest of FFTA Site	No Action

The elevated readings in soil borings MND33-0110 and -0113 were reported in the "Letter Report on Preliminary Results, Building 34 Fire Fighting Training Pit Area," dated 11 February 1992. Of the six samples taken from 0 to 20 feet below ground surface (B.G.S.) at each boring, only one sample revealed detectable quantity of petroleum hydrocarbons. This sample, MND33-0113-0003 (9.0-11.0 feet B.G.S.) had a reportable petroleum hydrocarbon concentration of 9.7 ppm, below both the Site action level of 105 ppm and the Site clean up level of 40 ppm.

- Section 2.6, page 9, paragraph 2. The three-party Federal Facility Agreement for the Mound Plant was signed on July 15, 1993, but became effective on September 22, 1993.

Comment noted. Future documents will reference the date in which the three party Federal Facility Agreement became effective.

- Section 2.6.4, page 17, paragraph 2. The final sentences of the paragraph refer to "free-phase petroleum" and "dissolved petroleum" present "below the water table" and "below 12 feet." No supporting ground water data has been included in the document. On what information is this statement based?

This statement was based on visual field observations made during the OU-3 Limited Field Investigation conducted in January, 1992. The OU3 investigation is the basis for the AM/RSE.

During the subsequent GeoProbe water and soil investigation conducted in March 1994, it was noted that the saturated conditions are the result of perched water confined by a till layer and not the actual ground water table. Based on this recent data, no contaminated groundwater will be encountered.

4. Section 5.1.2.1, page 23, paragraph 5. How will air emissions be monitored during removal of the free-phase petroleum? What control methods will be employed if air emissions exceed worker or nearest receptor exposure limits?

No monitoring for air emissions would be conducted because the free-phase petroleum removal was to be conducted in a closed system without being exposed to the atmosphere. However, based on the March, 1994 GeoProbe investigation, no free-phase petroleum was encountered. Therefore, monitoring of air emissions will not be conducted and air emission controls are not required.

5. Section 5.1.2.2, page 24, paragraphs 2, 3, and 4. The static piles description fails to indicate if the piles will be open to the atmosphere, covered, or totally enclosed. This information is necessary for determining air emissions during soil excavation and bioremediation. As previously stated, how will air emissions be monitored?

The static piles will not be covered during bioremediation. Based on the volume of contaminated soil, concentrations of contaminants, process history, and direct air monitoring results conducted to date, those compounds of petroleum hydrocarbons which volatilize most readily were detected at either very low levels, or were below method detection limits. Based on this information, it is assumed that air emissions will therefore be minimal. However, direct air monitoring instrumentation (e.g. photoionization and organic vapor detectors) will be utilized to monitor worker exposure limits in accordance with the site-specific Health and Safety Plan.

6. Section 5.2, page 27, Table 5.1. Were costs associated with the potential need to treatment exhaust gases, associated with the static piles, included in the cost estimate? The text states on page 24, that "if air treatment is required for exhaust gases, the cost of static piles increases substantially".

No, the costs associated with the potential need to treat exhaust gases was not included in the cost estimate.

However, as indicated in the response to Comment No. 5, air emissions are expected to be minimal and below regulatory levels requiring air emission controls. Discussions are currently underway with the Ohio Regional Air Pollution Control Agency and OEPA to explore various worst-case scenarios which may require air emissions controls, and will be implemented if deemed necessary. In addition, EG&G Mound will provide to OEPA all information and data to meet the substantive requirements of the Permit To Operate an air emission source.

7. Section 5.3, page 29, paragraph 1. Phase II activities include the removal of sediment from the FFTA Pits. How will the contaminated sediments be handled? Due to thorium contamination the sediments must be managed separately from the contaminated soils.

Results from the Geoprobe investigation have revealed that the sediments in each of the FFTA

Pits do not have Thorium-234 activity above 5 Pci/g and, therefore, do not have to be managed separately.

8. Section 5.3, page 29, paragraph 2. What are the "removal objectives" which will be met? Are they the "Regulatory Clean Up Levels" listed in Table 2.1 on page 11?

Yes, the "removal objectives" are the "Regulatory Clean Up Levels" listed in Table 2.1 on page 11. See response to Comment No. 1.

9. Section 5.5, page 32, Table 5.4. No Federal ARARs, as stated in the associated text have been included in the table. No air monitoring regulations have been cited, which are appropriate requirements for ex-situ bioremediation.

This Removal Action will comply with the ARARs cited for Operable Unit 5, as stated in the OU5, RI/FS Work Plan (DOE 1993) and with the substantive requirement of the specific regulations as set forth in the Ohio Administrative Code, listed below:

<i>Section 3745-15</i>	<i>General Provision for Air Pollution Control</i>
<i>Section 3745-31</i>	<i>Permits To Install New Sources</i>
<i>Section 3745-35</i>	<i>Permit To Install and Variances</i>



Department of Energy
Albuquerque Operations Office
Dayton Area Office
P.O. Box 66
Miamisburg, Ohio 45343-0066

F-045

FETA

APR 21 1994

RECEIVED

APR 26 1994

Ans'd.....

Diane Spencer
U. S. Environmental Protection Agency
HSRM-6J
77 W. Jackson
Chicago, IL 60604

Dear Ms. Spencer:

Enclosed is the information you requested regarding U. S. EPA, Operable Unit 5: Fire Fighting Training Area Site Action Memorandum/Removal Site Evaluation Comments, dated March 22, 1994.

If you require additional information, please contact Art Kleinrath at (513) 865-3597.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael A. Reker".

Michael A. Reker
Chief, Environmental Branch

cc w/enclosure:
Brian Nickel, OEPA
Monte Williams, EG&G
Alan Spesard, EG&G

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RESPONSE TO USEPA COMMENTS
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<i>Total Petroleum Hydrocarbons</i>	<i>105 ppm</i>	<i>40 ppm</i>	<i>EPA 600/4-79-0207 method 418.1</i>

This removal is consistent with the long-term goals of Operable Unit 5. However, it is possible that this area may require additional action as part of the long-term goal for Operable Unit 5.

Specific Comments:

1. Section 2.3, page 5, paragraph 5. Several other potential release sites have been identified in the vicinity of the proposed removal action area. Have these areas been investigated? Information has not been included to verify that the Oil Burn Structure, Historical FFTA, or Aviation Fuel Storage Tank are should or should not be included in the determination of the extent of petroleum contamination. Table 2.2 indicates that elevated photoionization readings were observed at MND33-0110 and -0113.

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During the subsequent GeoProbe water and soil investigation conducted in March 1994, it was noted that the saturated conditions are the result of perched water confined by a till layer and not the actual ground water table. Based on this recent data, no contaminated groundwater will be encountered.

4. Section 5.1.2.1, page 23, paragraph 5. How will air emissions be monitored during removal of the free-phase petroleum? What control methods will be employed if air emissions exceed worker or nearest receptor exposure limits?

No monitoring for air emissions would be conducted because the free-phase petroleum removal was to be conducted in a closed system without being exposed to the atmosphere. However, based on the March, 1994 GeoProbe investigation, no free-phase petroleum was encountered. Therefore, monitoring of air emissions will not be conducted and air emission controls are not required.

5. Section 5.1.2.2, page 24, paragraphs 2, 3, and 4. The static piles description fails to indicate if the piles will be open to the atmosphere, covered, or totally enclosed. This information is necessary for determining air emissions during soil excavation and bioremediation. As previously stated, how will air emissions be monitored?

The static piles will not be covered during bioremediation. Based on the volume of contaminated soil, concentrations of contaminants, process history, and direct air monitoring results conducted to date, those compounds of petroleum hydrocarbons which volatilize most readily were detected at either very low levels, or were below method detection limits. Based on this information, it is assumed that air emissions will therefore be minimal. However, direct air monitoring instrumentation (e.g. photoionization and organic vapor detectors) will be utilized to monitor worker exposure limits in accordance with the site-specific Health and Safety Plan.

6. Section 5.2, page 27, Table 5.1. Were costs associated with the potential need to treatment exhaust gases, associated with the static piles, included in the cost estimate? The text states on page 24, that "if air treatment is required for exhaust gases, the cost of static piles increases substantially".

No, the costs associated with the potential need to treat exhaust gases was not included in the cost estimate.

However, as indicated in the response to Comment No. 5, air emissions are expected to be minimal and below regulatory levels requiring air emission controls. Discussions are currently underway with the Ohio Regional Air Pollution Control Agency and OEPA to explore various worst-case scenarios which may require air emissions controls, and will be implemented if deemed necessary. In addition, EG&G Mound will provide to OEPA all information and data to meet the substantive requirements of the Permit To Operate an air emission source.

7. Section 5.3, page 29, paragraph 1. Phase II activities include the removal of sediment from the FFTA Pits. How will the contaminated sediments be handled? Due to thorium contamination the sediments must be managed separately from the contaminated soils.

Results from the Geoprobe investigation have revealed that the sediments in each of the FFTA

Pits do not have Thorium-234 activity above 5 Pci/g and, therefore, do not have to be managed separately.

8. Section 5.3, page 29, paragraph 2. What are the "removal objectives" which will be met? Are they the "Regulatory Clean Up Levels" listed in Table 2.1 on page 11?

Yes, the "removal objectives" are the "Regulatory Clean Up Levels" listed in Table 2.1 on page 11. See response to Comment No. 1.

9. Section 5.5, page 32, Table 5.4. No Federal ARARs, as stated in the associated text have been included in the table. No air monitoring regulations have been cited, which are appropriate requirements for ex-situ bioremediation.

This Removal Action will comply with the ARARs cited for Operable Unit 5, as stated in the OU5, RI/FS Work Plan (DOE 1993) and with the substantive requirement of the specific regulations as set forth in the Ohio Administrative Code, listed below:

<i>Section 3745-15</i>	<i>General Provision for Air Pollution Control</i>
<i>Section 3745-31</i>	<i>Permits To Install New Sources</i>
<i>Section 3745-35</i>	<i>Permit To Install and Variances</i>



EG&G MOUND APPLIED TECHNOLOGIES

P.O. BOX 3000 MIAMISBURG, OHIO 45343-3000 • TEL (513) 865-4020

F-045
FFTA

JUN 13 1994

Mr. Arthur W. Kleinrath
Environmental Engineer
U. S. Department of Energy
Dayton Area Office
P.O. Box 66
Miamisburg, OH 45343

Dear Mr. Kleinrath:

RE: Operable Unit 5: Fire Fighting Training Area Site Action
Memorandum/Removal Site Evaluation Document.

I am requesting that the following letter be drafted to the OEPA in order to formally transmit our response to their comment during the May 18th Federal Facilities Agreement (FFA) meeting.

OEPA stated, during that meeting, that "the cleanup levels of Extractable Petroleum Hydrocarbons (EPH) are not regulated by OEPA", and therefore an amendment to the FFTA Action Memorandum was requested:

Brian Nickel
Ohio EPA
401 E. Fifth St.
Dayton, OH 45402-2911

Dear Mr. Nickel:

RE: Operable Unit 5: Fire Fighting Training Area Site Action
Memorandum/Removal Site Evaluation Document.

This letter is to inform you that a modification to Table 2.1 of the subject document is required. It should reference the Ohio Bureau of Underground Storage Tanks (BUSTR), not the OEPA, as the regulatory agency for which cleanup levels are being used.

This letter will be attached to the issued Action Memorandum in order to document the change.

If you require additional information, please contact me at (513) 865-3597.

cc w/attach:

Diane Spencer, USEPA
Monte Williams, EG&G
Alan Spesard, EG&G

If you have any questions or modification to the responses, please contact Alan Spesard of my staff at (513) 865-3859.

Very truly yours,



Monte Williams
Manager, ER/CERCLA

Approved: CS Friedman / ROF 6/13/94
Charles S. Friedman
Vice President
ER, WM & D&D

MAW/sdf

cc: Alan Spesard

ENVIRONMENTAL RESTORATION PROGRAM

ACTION MEMORANDUM/REMOVAL SITE EVALUATION

**OPERABLE UNIT 5
FIRE FIGHTING TRAINING AREA SITE**

**MOUND PLANT
MIAMISBURG, OHIO**

January 1994

PREPARED BY:

**Roy F. Weston, Inc.
11840-D Kempersprings Drive
Cincinnati, Ohio 45240**

and

**EG&G Mound Applied Technologies
P.O. Box 3000
Miamisburg, Ohio 45343-3000**

for the

**U.S. DEPARTMENT OF ENERGY
Under Contract
No. DE-AC04-88DP43495**

FINAL

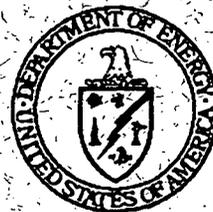


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ACRONYMS

AM	Action Memorandum
ARARs	applicable or relevant and appropriate requirements
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOE	Department of Energy
ER	Environmental Restoration
FFTA	Fire Fighting Training Area
IDM	Investigation Derived Material
IT	International Technologies
MAT	Mound Applied Technologies
MCL	Maximum Contaminant Limit
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Priority List
NPT	American taper pipe screw thread
OEPA	Ohio Environmental Protection Agency
O&M	Operation and Maintenance
OU	Operable Unit
OSC	On-Scene Coordinator
ppb	parts per billion
ppm	parts per million
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Discussion
RSE	Removal Site Evaluation
SARA	Superfund Amendments and Reauthorization Act
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
WESTON	Roy F. Weston, Inc.

ACKNOWLEDGEMENTS

This report was prepared by Roy F. Weston, Inc. (WESTON) for EG&G Mound Applied Technologies under Basic Ordering Agreement 24251. The principal author of this document is Mr. Andrew Fandozzi. Senior review was provided by Mr. John Thorsen, Ms. Sally Bartz, Mr. John Price, and Mr. Gordon Horn of WESTON.

SUBJECT: Documentation of a Removal Action at the Mound Plant Building 34 Fire Fighting Training Area.

FROM: Arthur Kleinrath, Remedial Project Manager/On-Scene Coordinator, Mound Plant, U.S. Department of Energy

TO: Administrative Record

1.0. PURPOSE

This Removal Site Evaluation (RSE) was performed in accordance with the National Oil and Hazardous Substances Contingency Plan (NCP), 40 CRP Part 300 and has identified a threat to human health, welfare, and the environment at the Fire Fighting Training Area (FFTA) due to the presence of petroleum hydrocarbons, a hazardous substance as defined by the Mound Plant Federal Facilities Agreement (FFA) (Docket No. OH 890:008 984), in surface sediments, subsurface soils and groundwater. The area of concern is located in a recharge area of the Buried Valley Aquifer which supplies the Mound Plant water supply. The Mound Plant water system is defined as a non-transient, non-community water supply under the Safe Drinking Water Act.

The Department of Energy (DOE) is the designated lead agency under the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA) and removal actions at the Mound Plant are implemented as non-Fund Federal lead actions. DOE provides the On-Scene Coordinator (OSC). As a non-Fund Federal lead, removal actions are not subject to United States Environmental Protection Agency (USEPA) limitations on the OSC (\$50,000 authority) and are not subject to NCP limitations on removal actions (i.e. \$2,000,000 in cost and 12 months in duration).

For Superfund removal actions the Action Memorandum (AM) serves as a funding request. Because this is a non-Fund Federal lead removal action the AM does not serve that purpose. This AM has been completed to document the RSE and to document the comparative analysis of alternatives.

2.0. SITE CONDITION AND BACKGROUND

2.1. SITE DESCRIPTION

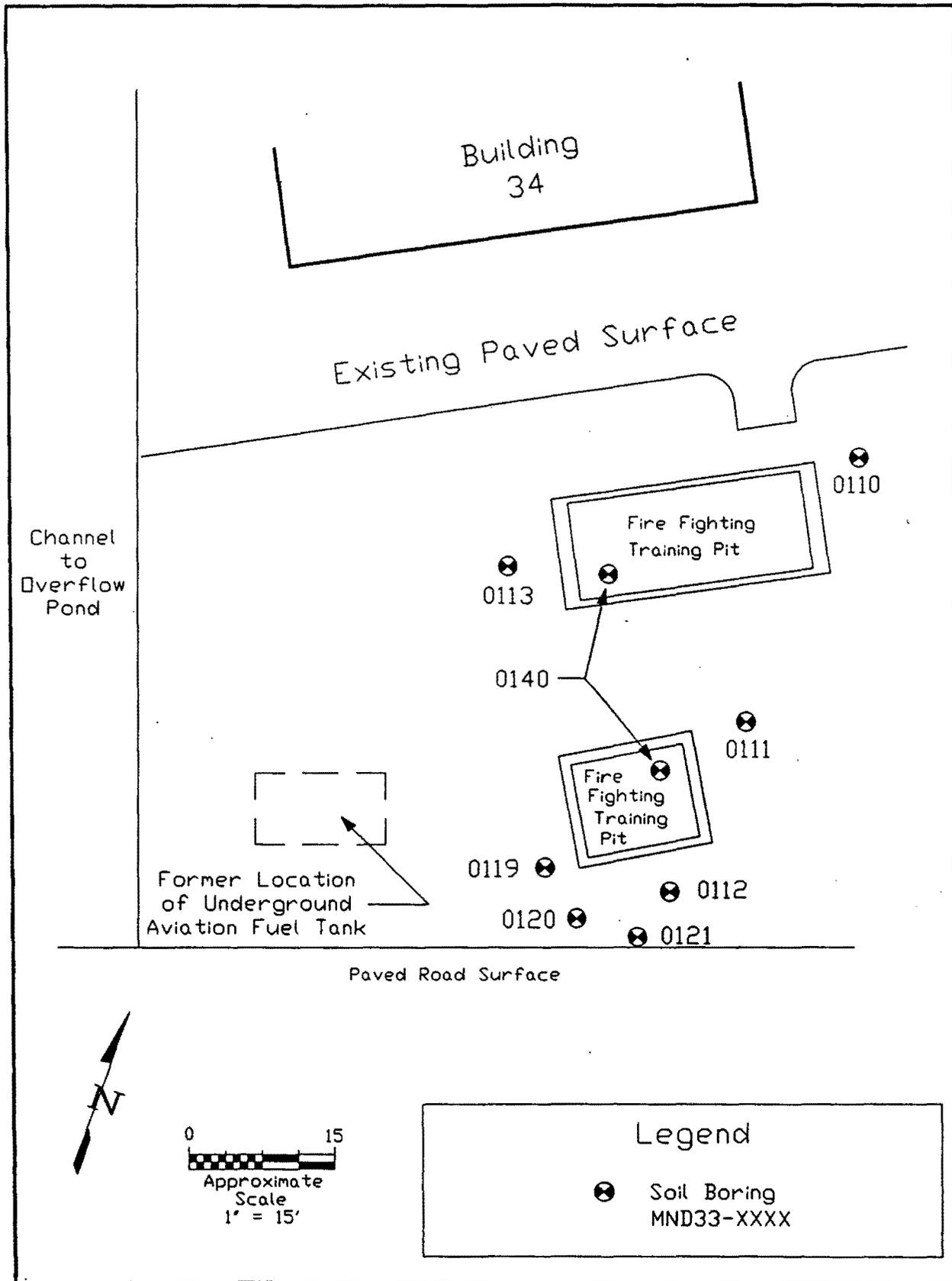
The FFTA includes two concrete containment structures (pits) used for fire-fighting training purposes. In the past, fire-fighting training operations were conducted using three to five gallons of diesel fuel pumped through an underground line into the pit to create a fire. The fires were extinguished with water from a nearby hydrant. The operation period of the fire-fighting training pits is not well documented, but based on interviews reportedly occurred between 1978 and 1989. The primary contaminants of concern are petroleum hydrocarbons.

RSE investigation results show that a free-phase petroleum substance was observed at the water table within soil boring MND33-0112 at a sample interval from approximately 10 to 12 feet below ground surface. This soil boring is located south and adjacent to the southernmost FFTA pit (Figure 2.1). Laboratory analytical results indicated that low levels (5.6 to 120 parts per billion (ppb)) of benzene, toluene, ethylbenzene, and xylene (BTEX) were detected within the 8 to 10 foot soil sample interval at boring MND33-0112. The same soil interval had shown extractable hydrocarbon concentrations of 62 parts per million (ppm) reported as diesel fuel and 2,800 ppm reported as motor oil.

The Buried Valley Aquifer provides potable water supplies through small residential wells and the Mound Plant well field, as well as providing industrial supplies for the Dayton Power and Light Hutching Power Station. Because of this usage and the aquifer characteristics, parts of the Buried Valley Aquifer have been designated a sole-source aquifer. The aquifer has been classified as a Class 1 aquifer by the USEPA to assist in groundwater protection on July 8, 1988 (53 Federal Register 25670).

A regional classification of an aquifer in advance of specific management decisions is called an "anticipatory classification" (EPA 1988a). It is possible that on a local scale, in the immediate vicinity of the Mound Plant, the Buried Valley Aquifer could be evaluated as a Class II A aquifer, using USEPA criteria. However, the designation as a sole source aquifer, Class I, is an applicable or relevant and appropriate requirement (ARAR) that shall be used to evaluate this removal action.

Figure 2.1.
Fire Fighting Training Area-Soil Boring Locations



Because of the designation of the Buried Valley Aquifer as a sole-source aquifer, DOE was requested to inform the USEPA Office of Groundwater of any projects that may contaminate the aquifer, prior to commitment of funds. Exceptions to this notification were projects that qualify as categorical exclusions under DOE environmental regulations. A removal at the FFTA would be considered for notification but is exempted because the DOE has internally initiated a Categorical Exclusion in compliance with the National Environmental Policy Act (NEPA).

The characterization of the hydrogeology of the Mound Plant is currently in progress as part of a Remedial Investigation/Feasibility Study (RI/FS). The boundaries of the Buried Valley Aquifer will be defined, as part of that characterization. The FFTA may overlie the aquifer, at a minimum it lies over an area that recharges the Buried Valley Aquifer.

2.2. REMOVAL SITE EVALUATION

A Removal Site Evaluation is incorporated into this AM/RSE.

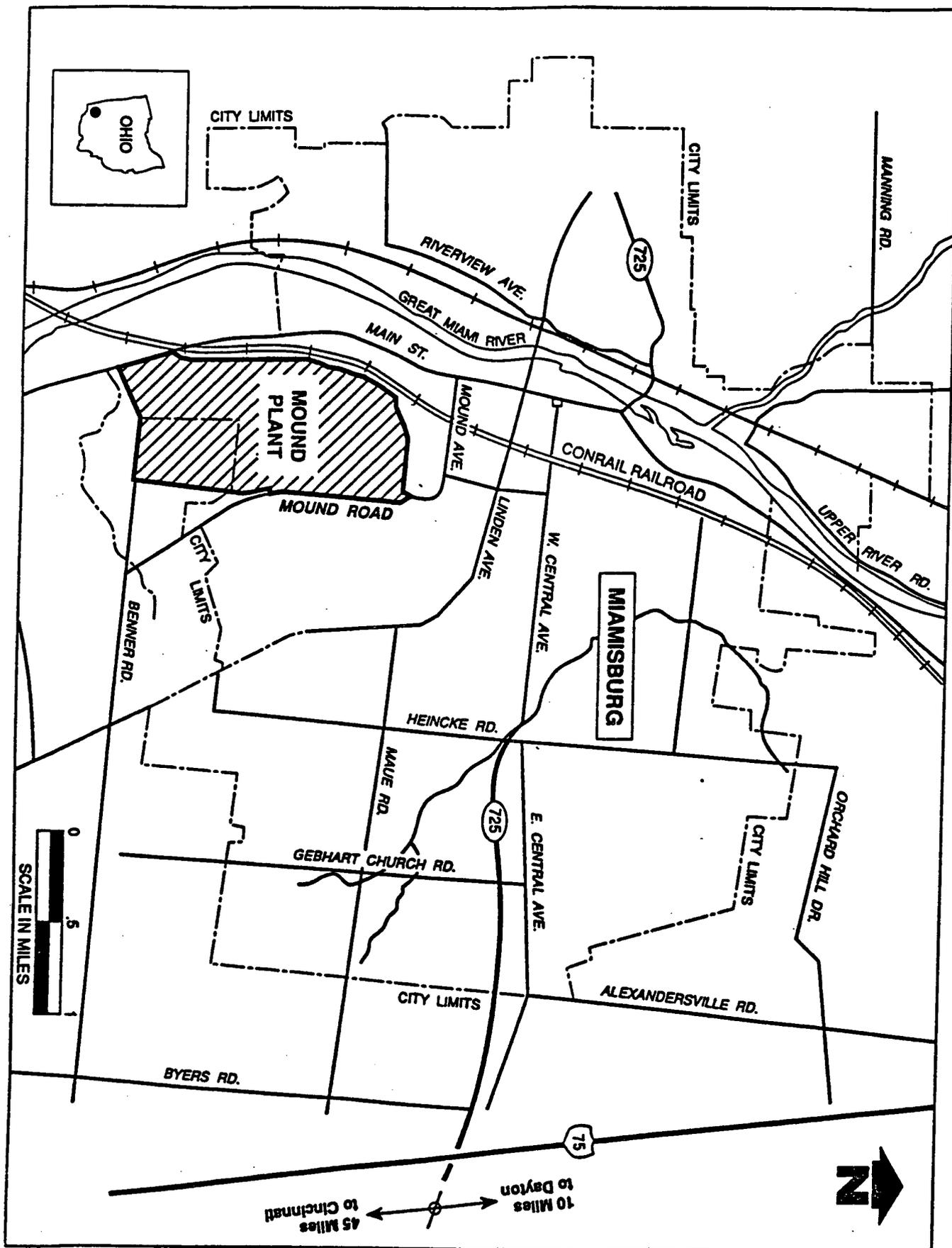
2.3. PHYSICAL LOCATION

The Mound Plant is a 306-acre site on the border of the city of Miamisburg in Montgomery County, Ohio (Figure 2.2.). The site is approximately 10 miles south-southwest of Dayton and 45 miles north of Cincinnati.

The FFTA is one of 325 potential release sites identified at the Mound Plant (DOE 1993a). Other potential release sites in the vicinity of the FFTA are (DOE 1993a):

- (a) Area C, Lithium Burn Area, approximately 100 feet to the northwest,
- (b) Oil Burn Structure, approximately 100 feet to the west-northwest,
- (c) Historical FFTA, approximately 150 feet to the northwest,
- (d) Aviation Fuel Storage Tank, related to the Oil Burn Structure and removed in November 1990 (DOE 1992),
- (e) Plant Drainage Ditch, approximately 150 feet to the north,
- (f) Overflow Pond (storm-water retention pond), approximately 75 feet southwest,
- (g) Drilling Mud Drum Storage Area (1 of 3 locations), approximately 150 feet northeast.

Figure 2.2.
Physical Location of the Mound Plant



Of these only (c) and (d) are expected to have contaminants similar to the FFTA.

The FFTA is located in the west-central portion of the Mound Plant and occupies an area of approximately one-sixth of an acre with exterior dimensions of seventy feet in the north-south direction and one-hundred feet in the east-west direction. It is bounded by Building 34 to the north-northeast, the Overflow Pond to the southwest, the Test-Fire Area to the east and the Overflow Pond spillway to the west (Figure 2.3).

2.4. RELEASE INTO THE ENVIRONMENT

A release into the environment occurred during training exercises at the FFTA. The fire-fighting training operations were conducted using three to five gallons of diesel fuel pumped through an underground line into the pit areas to create a fire. The fire was extinguished with water from a nearby hydrant. Due to cracks in the floor of the FFTA Pits, undetermined amounts of pure petroleum hydrocarbon product and residues from incomplete combustion of the diesel fuel were released into the soils. These releases are expected to have occurred between 1978 and 1989.

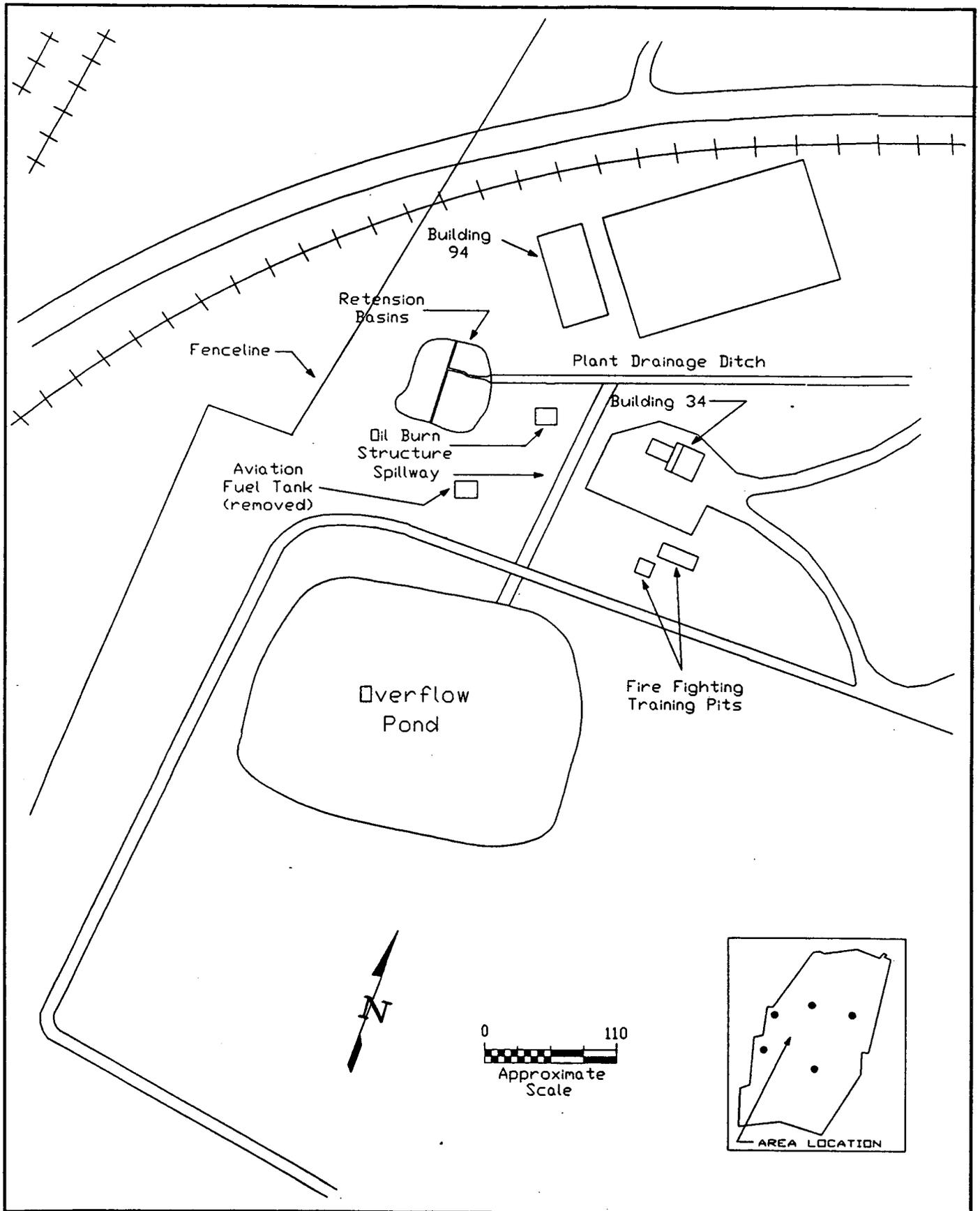
2.5. NATIONAL PRIORITIES LIST STATUS/FEDERAL FACILITIES AGREEMENT

The USEPA placed the Mound Plant in Miamisburg, Ohio on the National Priorities List (NPL), as listed in 40 CFR Part 300, Appendix B, by publication in the Federal Register on November 21, 1989.

A Federal Facilities Agreement under Section 120 was executed between DOE, USEPA Region V and Ohio Environmental Protection Agency (OEPA) on July 15, 1993 (USEPA Administrative Docket No. OH 890:008 984). The general purposes of this agreement are to:

- Ensure that the environmental impacts associated with past and present activities at the site are thoroughly investigated and appropriate remedial action taken as necessary to protect the public health, welfare, and the environment.
- Establish a procedural framework and schedule for developing, implementing, maintaining, and monitoring appropriate response actions at the site in accordance with CERCLA, Superfund Amendments and Reauthorization Act (SARA), the NCP, Superfund guidance and policy, Resource Conservation and Recovery Act (RCRA) guidance and policy, and,
- Facilitate cooperation, exchange of information, and participation of the parties in such actions.

Figure 2.3.
Fire Fighting Training Area Overview



2.6. SITE ACTIONS TO DATE

The DOE has prepared this RSE under authority delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section 40 CFR 300.410 of the NCP. This RSE provides an assessment of the FFTA as a potential source for exposure of the general population to petroleum hydrocarbon contaminants by route of the Buried Valley Aquifer. As such, it shall provide a basis for the need for a removal action to mitigate petroleum hydrocarbon migration into the aquifer. The NCP defines "removal action" as "...the appropriate extent of action to be taken in response to a given release..." [40 CFR 300.415 (A)(F)].

The Mound Plant initiated a CERCLA program in 1984. Currently this effort is guided by a FFA between the USEPA, OEPA and DOE that became effective July 15, 1993. The CERCLA program is assessing and evaluating the current risks, as necessary, for over 325 potential release sites. These potential release sites have been grouped into various operable units (OUs).

The Operable Unit 3 (OU-3) Limited Field Investigation Report consisted of a preliminary investigation which included several Building 34 sites. This preliminary investigation evaluated the need for further characterization and proposed the disposition of these sites.

Prior to the establishment of the FFTA, an aviation fuel tank was located approximately sixty-five feet south of Building 34 and twenty feet west of where the 10 feet by 10 feet fire-fighting training pit is now located. The aviation fuel tank was subsequently relocated to the west, across the Overflow Pond spillway, when construction of the fire-fighting training pits occurred.

The fire-fighting training pits consist of two concrete pits; one approximately 10 by 10 feet by 1 foot deep, and the second approximately 10 by 20 by 2 feet deep. These pits were used to conduct fire-fighting training operations for Mound Plant personnel. Black residue and sediment have been observed in both the larger and smaller pits. Rainwater has only been observed in the larger pit. The concrete slab floors in both pits are cracked and broken in various locations, and partially covered with sediment. Black-stained soils were observed around both of the pits.

The OU-3 Limited Field Investigation Report included information concerning the FFTA as a possible site where cleanup of depleted uranium has occurred. Based on this information, surface and near-surface soil samples and sediment samples were analyzed via gamma spectroscopy at IT Laboratories. The samples

were analyzed by gamma spectroscopy to detect cesium-137; potassium-40; radium-224, -226, and -228; and thorium-234, a daughter of uranium-238. The analysis of thorium-234 was conducted to detect any traces of depleted uranium. The results indicate that the greatest levels of radioactive contamination are located in the sediment within the fire training pits. The activity of the sediment sample was 5.41 pico Curies per gram (pCi/g) of thorium-234. A analytical summary of samples from the FFTA with concentrations above the preliminary remediation goals is presented in Table 2.1.

2.6.1. Potential Petroleum Hydrocarbon Contamination

In past operation, diesel fuel was pumped from a 500-gallon above ground storage tank through a 3/4 inch American taper pipe screw thread (NPT) underground line to the fire-fighting training pits to create demonstration fires. This storage tank was located approximately fifty feet east of the 10 by 10 foot fire-fighting training pit. The construction of the fire-fighting training pits and relocation of the storage tank and associated underground piping occurred around 1977. The training area was in use from 1978 until 1989. Approximately 300 gallons of diesel fuel were used in the training pits per year at a rate of three to five gallons per demonstration. BTEX are minor components of diesel fuel. No known materials regulated under RCRA were stored, handled or used at the FFTA.

Table 2.1.

Building 34 Fire-Fighting Training Pits Sample Summary

Sample Location	Sample Number	Matrix	Date Sampled	Sample Interval (ft BGS)	Contaminant of Concern	Validated Result	Regulatory Action Levels	Regulatory Clean up Levels
MND33-0110	MND33-0110-0001	Soil	1/21/92	0.0-2.0	Thorium-234*	1.23 pCi/g	≥5.0 pCi/g (DOE)	<5 pCi/g
	MND33-0110-0002	Soil	1/21/92	3.0-7.0				
	MND33-0110-1002	Soil	1/21/92	3.0-7.0				
	MND33-0110-0003	Soil	1/21/92	8.0-10.0				
	MND33-0110-0004	Soil	1/22/92	13.0-15.0				
	MND33-0110-0005	Soil	1/22/92	17.0-19.0				
MND33-0111	MND33-0111-0001	Soil	1/22/92	0.0-2.0	Thorium-234* Extractable petroleum hydrocarbons as diesel fuel	1.03 pCi/g	≥5.0 pCi/g	<5 pCi/g (DOE)
	MND33-0111-0002	Soil	1/22/92	3.0-5.0		38.1 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0111-0003	Soil	1/22/92	8.0-10.0				
MND33-0112	MND33-0112-0001	Soil	1/22/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel	498 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0112-0002	Soil	1/22/92	3.0-7.0		8.7 mg/kg		
	MND33-0112-0003	Soil	1/22/92	8.0-10.0	Extractable petroleum hydrocarbons as motor oil	66.5 mg/kg		
						2800 mg/kg		
MND33-0113	MND33-0113-0001	Soil	1/27/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel	9.7 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0113-0002	Soil	1/27/92	3.0-5.0				
	MND33-0113-0003	Soil	1/27/92	9.0-11.0				
	MND33-0113-0004	Soil	1/27/92	13.0-15.0				
	MND33-0113-0005	Soil	1/27/92	15.0-17.0				
	MND33-0113-0006	Soil	1/27/92	17.0-20.0				
MND33-0119	No Samples Collected							
MND33-0120	No Samples Collected							
MND33-0121	No Samples Collected							
MND33-0140	MND33-0140-0001	Sediment	2/15/92	—	Thorium-234* Extractable petroleum hydrocarbons as diesel fuel	5.41 pCi/g 116,700 mg/kg	≥5.0 pCi/g (DOE) 105 mg/kg (BUSTR)	<5.0 pCi/g 40 mg/kg (BUSTR)

* Th-234 in secular equilibrium with U-238 and their activities, by definition, should be equal. The results can be interpreted as U-238.

- | | | | |
|--------|---|-------|--------------------------------|
| BGS | Below Ground Surface | SVOCs | Semivolatile Organic Compounds |
| BUSTR | Bureau of Underground Storage Tank Regulation | TAL | Target Analyte List |
| EPH | Extractable Petroleum Hydrocarbons | TCL | Target Compound List |
| ft | Feet | VOCs | Volatile Organic Compounds |
| P/PCBs | Pesticides/Polychlorinated Biphenyls | | |



Department of Energy
Field Office, Albuquerque
Dayton Area Office
P.O. Box 66
Miamisburg, Ohio 45343-0066

JUL 7 1994

Mr. Brian Nickel
Ohio Environmental Protection Agency
401 E. Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Nickel:

Re: Operable Unit 5 Fire Fighting Training Area Site Action
Memorandum/Removal Site Evaluation Document.

Attached please find a modification to Table 2.1 of the subject document. The change establishes the Ohio Bureau of Underground Storage Tanks, in lieu of the OEPA, as the regulatory agency source for cleanup levels.

A copy of this letter will be attached to the issued Action Memorandum in order to document the change.

If you have any questions, please contact me at (513)865-3975.

Sincerely,

Arthur W. Kleinrath
ER CERCLA Program Manager

Enclosure

cc w/enclosure:
Diane Spencer, USEPA
M. A. Reker, MB
M. Williams, EG&G
A. Spessard, EG&G
W. A. Rummel, Geotech/MB

Table 2.1.

Building 34 Fire-Fighting Training Pits Sample Summary

Sample Location	Sample Number	Matrix	Date Sampled	Sample Interval (ft BGS)	Contaminate of Concern	Validated Result	Regulatory Action Levels	Regulatory Clean up Levels
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	MND33-0110-0002	Soil	1/21/92	3.0-7.0				
	MND33-0110-1002	Soil	1/21/92	3.0-7.0				
	MND33-0110-0003	Soil	1/21/92	8.0-10.0				
	MND33-0110-0004	Soil	1/22/92	13.0-15.0				
	MND33-0110-0005	Soil	1/22/92	17.0-19.0				
MND33-0111	MND33-0111-0001	Soil	1/22/92	0.0-2.0	Thorium-234* Extractable petroleum hydrocarbons as diesel fuel	1.03 pCi/g	≥5.0 pCi/g (DOE) 105 mg/kg (BUSTR)	<5 pCi/g (DOE) 40 mg/kg (BUSTR)
	MND33-0111-0002	Soil	1/22/92	3.0-5.0		38.1 mg/kg		
	MND33-0111-0003	Soil	1/22/92	8.0-10.0				
MND33-0112	MND33-0112-0001	Soil	1/22/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel Extractable petroleum hydrocarbons as motor oil	498 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0112-0002	Soil	1/22/92	3.0-7.0		8.7 mg/kg		
	MND33-0112-0003	Soil	1/22/92	8.0-10.0		66.5 mg/kg 2800 mg/kg		
MND33-0113	MND33-0113-0001	Soil	1/27/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel	9.7 mg/kg	105 mg/kg (BUSTR)	40 mg/kg (BUSTR)
	MND33-0113-0002	Soil	1/27/92	3.0-5.0				
	MND33-0113-0003	Soil	1/27/92	9.0-11.0				
	MND33-0113-0004	Soil	1/27/92	13.0-15.0				
	MND33-0113-0005	Soil	1/27/92	15.0-17.0				
	MND33-0113-0006	Soil	1/27/92	17.0-20.0				
MND33-0119	No Samples Collected							
MND33-0120	No Samples Collected							
MND33-0121	No Samples Collected							
MND33-0140	MND33-0140-0001	Sediment	2/15/92	—	Thorium-234* Extractable petroleum hydrocarbons as diesel fuel	5.41 pCi/g 116,700 mg/kg	≥5.0 pCi/g (DOE) 105 mg/kg (BUSTR)	<5.0 pCi/g (DOE) 40 mg/kg (BUSTR)

* Th-234 in secular equilibrium with U-238 and their activities, by definition, should be equal. The results can be interpreted as U-238.

BGS Below Ground Surface
 BUSTR Bureau of Underground Storage Tank Regulation
 EPH Extractable Petroleum Hydrocarbons
 ft Feet
 P/PCBs Pesticides/Polychlorinated Biphenyls

SVOCs Semivolatile Organic Compounds
 TAL Target Analyte List
 TCL Target Compound List
 VOCs Volatile Organic Compounds

Table 2.1.

Building 34 Fire-Fighting Training Pits Sample Summary

Sample Location	Sample Number	Matrix	Date Sampled	Sample Interval (ft BGS)	Contaminate of Concern	Validated Result	Regulatory Action Levels	Regulatory Clean up Levels
MND33-0110	MND33-0110-0001	Soil	1/21/92	0.0-2.0	Thorium-234*	1.23 pCi/g	≥5.0 pCi/g (DOE)	<5 pCi/g
	MND33-0110-0002	Soil	1/21/92	3.0-7.0				
	MND33-0110-1002	Soil	1/21/92	3.0-7.0				
	MND33-0110-0003	Soil	1/21/92	8.0-10.0				
	MND33-0110-0004	Soil	1/22/92	13.0-15.0				
	MND33-0110-0005	Soil	1/22/92	17.0-19.0				
MND33-0111	MND33-0111-0001	Soil	1/22/92	0.0-2.0	Thorium-234* Extractable petroleum hydrocarbons as diesel fuel	1.03 pCi/g 38.1 mg/kg	≥5.0 pCi/g 105 mg/kg (OEPA MCL)	<5 pCi/g (DOE) 40 mg/kg (OEPA)
	MND33-0111-0002	Soil	1/22/92	3.0-5.0				
	MND33-0111-0003	Soil	1/22/92	8.0-10.0				
MND33-0112	MND33-0112-0001	Soil	1/22/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel	498 mg/kg 8.7 mg/kg 66.5 mg/kg	105 mg/kg (OEPA MCL)	40 mg/kg (OEPA)
	MND33-0112-0002	Soil	1/22/92	3.0-7.0				
	MND33-0112-0003	Soil	1/22/92	8.0-10.0				
					Extractable petroleum hydrocarbons as motor oil	2800 mg/kg		
MND33-0113	MND33-0113-0001	Soil	1/27/92	0.0-2.0	Extractable petroleum hydrocarbons as diesel fuel	9.7 mg/kg	105 mg/kg (OEPA MCL)	40 mg/kg (OEPA)
	MND33-0113-0002	Soil	1/27/92	3.0-5.0				
	MND33-0113-0003	Soil	1/27/92	9.0-11.0				
	MND33-0113-0004	Soil	1/27/92	13.0-15.0				
	MND33-0113-0005	Soil	1/27/92	15.0-17.0				
	MND33-0113-0006	Soil	1/27/92	17.0-20.0				
MND33-0119	No Samples Collected							
MND33-0120	No Samples Collected							
MND33-0121	No Samples Collected							
MND33-0140	MND33-0140-0001	Sediment	2/15/92	—	Thorium-234* Extractable petroleum hydrocarbons as diesel fuel	5.41 pCi/g 116,700 mg/kg	≥5.0 pCi/g (DOE) 105 mg/kg (OEPA MCL)	<5.0 pCi/g 40 mg/kg (OEPA)

* Th-234 is in secular equilibrium with U-238 and their activities, by definition, should be equal. The results can be interpreted as U-238.

BGS Below Ground Surface
 EPH Extractable Petroleum Hydrocarbons
 ft Feet
 P/PCBs Pesticides/Polychlorinated Biphenyls

SVOCs Semivolatile Organic Compounds
 TAL Target Analyte List
 TCL Target Compound List
 VOCs Volatile Organic Compounds

Environmental soil gas samples were collected as part of the Area B Operable Unit 1 (OU-1) Investigation. The soil gas samples were collected near Building 34: one at station 31, near the fire-fighting training pits, and one at station 30, near the former aviation fuel tank. The samples were analyzed for trichloroethylene (TCE), 1, 2 - transdichloroethene, chloroethane, toluene, benzene, and ethylbenzene. At station 30, toluene was detected at a concentration of 0.34 $\mu\text{g/l}$; and at station 31, benzene and toluene were found at concentrations of 0.07 $\mu\text{g/l}$ and 0.14 $\mu\text{g/l}$, respectively.

Investigation activities conducted under the OU-3 Miscellaneous Sites Limited Field Investigation at the Building 34 Fire Fighting Training pits occurred in January 1992. Four soil borings (MND033-0110 through 0113) were completed at this area. Soil samples were collected for laboratory analysis at various intervals at each boring location and field measurements were collected for soils from each 2-foot depth interval. The total boring depth ranged between 10 and 20 feet below ground surface.

A flame ionization detector and photoionization detector were used for direct field screening of the soil borings. Because of elevated readings, two of the four borings (MND33-0110 and -0113) required additional subsurface soil samples to be collected from a depth of approximately 20 feet below ground surface. The results of the field instrument screening at each depth interval at each of the borings are presented in Table 2.2. Field instrument readings of subsurface soils at soil boring MND33-0112 were only slightly elevated above background levels; however, an oily substance was observed below the top of the water table in the 8 to 10 foot interval below ground surface and in the 10 to 12 foot interval below ground surface.

Subsurface soil lithology at the FFTA is generally characterized as a silty sand from ground surface to approximately 8 feet below ground surface. Soil below 8 feet is generally characterized by a poorly sorted, gravelly, silty clay consistency of approximately 10 percent gravel, 25 percent sand, and 65 percent clay. Groundwater in the area seems to be relatively shallow with saturated soil conditions apparent at boring 0112 at a depth of 7 to 8 feet below ground surface. Due to the observation of petroleum contamination at soil boring MND33-0112, three additional boreholes (MND33-0119, 0120, and 0121) were completed in proximity to soil boring MND33-0112 in order to delineate the extent of possible subsurface contamination.

Results of the field instrument readings collected at each subsurface interval at soil borings 0119, 0120, and 0121 are presented in Table 2.2. These results show slightly elevated readings in subsurface soils at borings 0120 and 0121; however, a petroleum-like substance was not observed in any of the soils from the three borings.

Table 2.2 - Results of Field Screening

Soil Boring Number	Sample Depth (feet below ground surface)	Photoionization Detector Readings (units above background)	Flame Ionization Detector Readings (units above background)
MND33-0110	0-2	0.5	2.8
	3-5	240	0.8
	5-7	110	0.8
	8-10	1000	0.0
	11-13	170	0.0
	13-15	0.0	0.0
	15-17	0.0	0.0
	17-19	0.0	0.0
MND33-0111	0-2	8.8	2.8
	3-5	0.0	1.8
	5-7	0.0	1.8
	8-10	0.0	1.5
MND33-0112	0-2	0.4	2.0
	3-5	1.2	7.4
	5-7	2.8	1.8
	8-10	4.0	1.5
	10-12	4.0	1.5
MND33-0113	0-2	1.5	0.0
	3-5	0.0	0.0
	5-7	0.0	1.0
	7-9	0.0	0.8
	9-11	1.0	7.0
	11-13	6.0	6.8
	13-15	0.0	5.0
	15-17	0.0	2.0
	17-19	0.0	1.0
	19-20	0.0	1.2

Table 2.2 - Results of Field Screening (Continued)

Soil Boring Number	Sample Depth (feet below ground surface)	Photoionization Detector Readings (units above background)	Flame Ionization Detector Readings (units above background)
MND33-0119	0-2	0.2	0.0
	2-4	0.0	0.0
	4-6	0.0	0.0
	6-8	0.0	0.0
	8-10	3.0	1.0
	10-12	0.0	0.0
MND33-0120	0-2	0.0	0.0
	2-4	4.4	0.0
	4-6	2.0	7.5
	6-8	3.0	4.5
	8-10	1.0	2.0
	10-12	10.0	8.8
	12-14	15.0	8.2
MND33-0121	0-2	14.0	2.2
	2-4	4.0	3.0
	4-6	2.4	3.0
	6-8	0.8	1.0
	8-10	7.0	3.4
	10-12	5.0	4.0

2.6.2. Evaluation By Public Health Agencies

No evaluation has been formally conducted by any State or local health agency.

2.6.3. Evaluation Of Potential Exposure and Determination Of The Need For A Removal

The NCP includes eight factors that shall be considered in determining the appropriateness of a removal action (40 CFR 300.415(b)(2)). These criteria as applied to the contamination of the vadose zone and below the water table are:

Criteria	Response
(i) "...potential exposure to nearby human populations..."	None - contamination is below the surface and excavation is strictly controlled and monitored by Mound digging permits system;
(i) "... (potential exposure) to animals..."	None - contamination in the vadose zone and below the water table is not expected to be exposed to animals on site;
(i) "... (potential exposure) to the food chain..."	None
(ii) "Actual or potential contamination of drinking water supplies..."	Contamination is in a groundwater system that feeds to the Buried Valley Aquifer which has been classified as Class 1 by the USEPA to assist in groundwater protection and also to Mound Plant production water wells, in the long term, there may be potential contamination;
(iii) "Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;"	None - not applicable
(iv) "High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;"	None - Contamination is not near surface, surface migration is unlikely under current land use controls;
(v) "Weather conditions that may cause hazardous substances to migrate or be released;"	None - not applicable
(vi) "Threat of fire or explosion;"	None

Criteria	Response
(vii) "The availability of other appropriate federal or state response mechanisms to respond to the release;"	There are no state mechanisms, no non-DOE mechanisms (DOE is the designated lead agency under CERCLA) and no other DOE programs are an appropriate response;
(viii) "Other situations or factors that may pose threats to public health or welfare or the environment;"	The DOE is currently evaluating alternative land uses for the Mound Plant, including commercial uses. Although currently undetermined, land development for commercial uses could include the vicinity of the FFTA. If so, the presence of contamination could hinder development and would be detrimental to the public welfare;

Because there is (a) potential contamination of drinking water supplies, (b) no other appropriate federal or state response mechanism, and (c) the presence of contamination constitutes a situation potentially a threat to the public welfare, a removal action is appropriate.

The same criteria have been applied to the surface soils and sediments in the fire-fighting training pit:

Criteria	Response
(i) "...potential exposure to nearby human populations..."	Sediments are above ground; untrained workers should not be exposed but inadvertent exposure is possible;
(i) "...(potential exposure) to animals..."	Because contamination is at the surface there is a potential exposure to animals;
(i) "...(potential exposure) to the food chain..."	Possible but unlikely at this location, due to its current land use controls;
(ii) "Actual or potential contamination of drinking water supplies..."	The petroleum hydrocarbon contamination overlies a groundwater system that feeds to the Buried Valley Aquifer, which has been classified as Class 1 by the USEPA to assist in groundwater protection and also to the Mound Plant production water wells, in the long term there is potential contamination through leaching and migration;
(iii) "Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;"	None - not applicable

Criteria	Response
(iv) "High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;"	Contamination is at the surface. During storm events the existing stormwater control system is inadequate and uncontrolled stormwater may be discharged offsite. This event occurs several times each year. Thus, there is a potential for surface contaminant migration offsite.
(v) "Weather conditions that may cause hazardous substances to migrate or be released;"	Contamination is at the surface. During storm events the existing stormwater control system is inadequate and uncontrolled stormwater may be discharged offsite. This event occurs several times each year. Thus, there is a potential for surface contaminant migration offsite.
(vi) "Threat of fire or explosion;"	None
(vii) "The availability of other appropriate federal or state response mechanisms to respond to the release;"	There are no state mechanisms, no non-DOE mechanisms (DOE is the designated lead agency under CERCLA) and no other DOE programs are an appropriate response.
(viii) "Other situations or factors that may pose threats to public health or welfare or the environment;"	The DOE is currently evaluating alternative land uses for the Mound Plant, including commercial uses. Although currently undetermined, land development for commercial uses could include the vicinity of the FFTA. If so, the presence of contamination could hinder development and would be detrimental to the public welfare.

Based on several criteria above, a removal action is appropriate for the surface soils and sediments in the fire fighting training pit.

2.6.4. Quantities and Types of Substances Present

The area requiring soil remediation is expected to be confined to the southernmost FFTA pit and immediately to the south. The contamination is related primarily to petroleum hydrocarbons, although thorium-234 is also present in slightly elevated levels in both the sediments and soils. The volume of contaminated material above the water table is estimated to be 20 feet wide by 30 feet long by 10 feet deep. In the vadose zone, petroleum vapors occupy interstitial space between soil particles, and the particles themselves have absorbed some petroleum constituents. The volume of contaminated soil below the water table is estimated to be 20 feet wide by 30 feet long by 5 feet deep. Free-phase petroleum (consisting mostly of motor oil) lies below the water table to a depth of 12 feet. Below 12 feet, only small amounts of dissolved petroleum constituents are present.

The total estimated volume of contaminated soil requiring remediation is 333 cubic yards.

A limited Field Investigation to facilitate RI/FS scoping was previously completed. This investigation included sampling conducted in January of 1992, when concentrations of extractable petroleum hydrocarbons reported as diesel fuel ranged from 38.1 ppm to 498 ppm at surface soils (0-2 feet). Extractable petroleum hydrocarbons reported as motor oil were detected at 2800 ppm at 8 to 10 feet below ground surface. A composite sediment sample was collected from the two FFTA pits showed extractable petroleum hydrocarbons reported as diesel fuel at a concentration of 116,700 ppm and thorium-234 with an activity of 5.41 pCi/g.

The results of sampling and analysis from those monitoring wells closest to the FFTA are as follows:

- Well 0125, approximately 100 feet to the northeast, had no reported organic contaminants,
- Well 0315 approximately 200 feet to the west-northwest, was sampled once in March 1993 (DOE 1993b). The analysis showed tetrachloroethane at a concentration of 3.60 ppb and a trichloroethane at a concentration of 7.20 ppb;
- Well 0379, approximately 175 feet to the west-southwest, was sampled once in March 1993 (DOE 1993b). The analysis showed an estimated concentration of 4.6 ppb of tetrachloroethane and a trichloroethane at a concentration of 2.8 ppb;
- Well 0380 approximately 75 feet to the southeast (DOE 1993b) had no reported organic contaminants.

The expected contaminants from the FFTA would be BTEX; the reported contaminants for these wells are not BTEX and it is concluded that groundwater contamination from the FFTA is limited in extent.

3.0. THREAT TO PUBLIC HEALTH OR WELFARE OF THE ENVIRONMENT

Section 300.415 of the NCP (40 CFR 300.415) lists the factors to be considered in determining the appropriateness of a Removal Action. Paragraphs (b) (2) (i), (ii), (v) and (viii) of Section 300.415 directly apply as follows to the conditions at the FFTA Site:

300.415 (b) (2) (i) "Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants."

Sediments are above ground; access is unrestricted to untrained plant personnel and inadvertent exposure is possible. There is a potential exposure to animals within the boundaries of the Mound Plant fence line.

300.415 (b) (2) (ii) "Actual or potential contamination of drinking water supplies or sensitive ecosystem."

Contamination is in a groundwater system that feeds to the Buried Valley Aquifer which has been classified as Class 1 by the USEPA. The aquifer also supplies Mound Plant production water wells. There exists a potential for contamination to this aquifer.

300.415 (b) (2) (iv) "High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate."

300.415 (b) (2) (v) "Weather conditions that may cause hazardous substances to migrate or be released;"

During storm events the existing stormwater control system is inadequate and uncontrolled stormwater may be discharged offsite. This event occurs several times each year. Thus, there is a potential for surface contaminant migration offsite. In past years Mound has experienced some excursions from their NPDES permit when the overflow pond is full and stormwater retention is not possible. This indicates that migration in surface water would be possible during larger storm events.

300.415 (b) (2) (viii) "Other situations or factors that may pose threats to public health or welfare or the environment."

The DOE is currently evaluating alternative land uses for the Mound Plant, including commercial uses. Although currently undetermined, land development for commercial uses could include the vicinity of the fire fighting training area. If so, the presence of contamination could hinder development and would be detrimental to the public welfare.

4.0. ENDANGERMENT DETERMINATION

All Action Memos must contain an Endangerment Determination (US EPA 1990). Actual or threatened releases of pollutants and contaminants from this site, if not addressed by implementing the response action selected in this AM, may present an imminent and substantial endangerment to public health or welfare or the environment. Petroleum hydrocarbons contain hazardous substances which are known to have a carcinogenic risk associated with them and are known to have an adverse affect on human health. This determination is based on the existing petroleum hydrocarbons contamination and the possibility of migration of contamination into the Buried Valley Aquifer.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

AMs for Fund Federal-lead sites include a discussion of costs because expenditure of Superfund money must be authorized for removals to occur. Because this is a non-Fund Federal lead, authorization of Superfund money is not required. Conceptual cost estimates have been included in the discussion of the remediation options.

5.1. REMEDIATION OPTIONS

5.1.1. Remediation Overview

The FFTA Site Remediation involves the remediation of petroleum hydrocarbon contaminated soils and groundwater. This contamination was detected through the soil sampling and analyses conducted at the FFTA as part of the OU-3 Limited Field Investigation. During the investigation, a free-phase petroleum substance was observed at the water table within soil boring MND33-0112 at a sample interval from approximately 10 to 12 feet below ground surface. This soil boring is located south and adjacent to the southernmost FFTA. Laboratory analytical results indicated that low levels (5.6 to 120 ppb) of BTEX were found within the 8 to 10-foot soil sample interval at boring MND33-0112. The same soil interval had shown extractable hydrocarbon concentrations of 62 ppm for diesel fuel and 2,800 ppm for motor oil. There were no detections of purgeable hydrocarbons.

In response to the observation of petroleum substance in MND33-0112, three additional soil borings were drilled to define the lateral and vertical extent of the petroleum contaminants (borings identified as MND33-0119 through 0121). Petroleum substances were not readily observed at the water table for the three soil borings; however, field screening indicated possible volatile organic compounds present within subsurface soil sample intervals at borings MND33-0120 and 0121. Analytical results indicate that the lateral and vertical extent of petroleum contamination is limited at the southernmost pit area, the smaller of the two FFTAs. The investigations to date have not, however, fully defined the extent of the contamination. The affected soils may extend beyond the area sampled.

Based on the current understanding of petroleum contamination at the southernmost pit area, and site conditions, the following media will require remediation:

- Vadose (Unsaturated) and Capillary Fringe Zone -- Interstitial (i.e., between soil particles) petroleum contaminants, and contaminants adhering to soil particles. Petroleum contaminants occurring in a soil vapor phase.
- Water Table -- Free-phase petroleum contaminants floating on the water table interface.
- Saturated Zone -- Dissolved petroleum contaminants within the groundwater and contaminants adhering to soil particles.

For the purposes of project scoping, it was assumed that the area requiring remediation is confined to the FFTAs as defined by the OU-3 Limited Field Investigation Report. The volume of contaminated unsaturated material within the treatment area is assumed to be approximately 20 x 30 x 10 feet (approximately 222 cubic yards). For saturated soils, the assumed volume is based on an area 20 x 30 x 5 feet, (111 cubic yards). It is also assumed that other previously detected trace contaminants, including dioxin/furan isomers, are not at levels high enough to impact the cleanup of this area.

Based on the foregoing discussion, the initial step towards overall remediation would involve the immediate removal of free-phase petroleum contaminants. As indicated above, a limited soil/groundwater study is recommended to ensure successful remedial planning, design, and implementation. Based on the current understanding of the small FFTA impact, the following remedial technologies will be considered: ex-situ biological remediation, in-situ biological remediation, off-site disposal, and administrative controls.

5.1.2. Option 1 - Ex-situ biological remediation

Ex-situ biological remediation would require the following tasks:

- Free-phase petroleum extraction with a treatment using an oil/water separator excavation of surface soils and excavation of saturated soils combined with a multipoint dewatering system.
- Excavation of contaminated soils into two static piles (mixed and non-mixed wastes).
- Static pile biological treatment of contaminated soils with the introduction of nutrients.

5.1.2.1. Remedial Technology for the Water Table - Free-Phase Petroleum Extraction

Free-phase petroleum floating on the water table acts as a continual source for dissolved and possibly gaseous petroleum contaminants. Active extraction of the free-phase petroleum should significantly expedite the remediation process. The removal of free-phase material will be the initial step towards overall remediation. A groundwater extraction well will create a cone of groundwater depression, which will attract

any free product that may be present. A skimmer pump at the water table will remove the floating product and pump the product to a oil/water separator and finally to a storage tank to await final disposal. The separated water will be placed into drums or tanks to be disposed of with other Investigation Derived Material (IDM).

5.1.2.2. Remedial Technology for the Contaminated Soils

Static piles provide an opportunity to clean up the soil quickly in a small space without any off-site transport. By avoiding aqueous suspensions such as are used in bioslurries and soil washing, static piles simplify materials handling. The simplified process train results in lower costs than other remedial technologies. Because of the ability to treat TPH and the low cost of implementation, static piles emerge as a preferred technology.

The construction of static piles begins with building an impermeable base and collection systems for air and water. Once those are in place, excavated petroleum-contaminated material is put into a pile. Based on which microbial growth factors are missing from the soil, necessary factors are added to the pile. The typical missing factors are oxygen, nitrogen, and phosphorous nutrients. Nitrogen and phosphorous can be added with commercial fertilizer. Oxygen can be added by drawing air through the pile and into a perforated pipe. A less common missing factor is microbial life but that also can be added with an inoculum. Another potential additive is a bulking material such as wood chips. This would decrease the density of the soil and increase the air flow. Moisture is carefully monitored and water is added occasionally to maintain optimal moisture. During operation of the system, the microbes convert the TPH into carbon dioxide and water.

One drawback of using a static pile for remediation is the energy intensiveness of the process. The blowers that maintain ventilation are electrically driven, and operate continuously for the duration of treatment. Potentially, air may be introduced passively without the use of blowers. If air treatment is required for exhaust gasses, the cost of static piles increases substantially.

5.1.3. Option 2 - In-situ bioremediation

In-situ bioremediation would involve the following tasks:

- Free-phase petroleum extraction with a treatment using an oil/water separator.

- Bioventing within vadose and capillary fringe zone.
- In-situ biological treatment of saturated zone, combined with sparging for introduction of oxygen.

Assuming a successful pilot test, the above-mentioned remedial technologies would effectively remove and biodegrade the contaminants in each medium. The remedial cleanup below the water table will likely be advantageous because minimal soil/groundwater removal, treatment, and disposal is required. However, disposal of a small amount of free-phase petroleum contaminants will likely be necessary. A brief discussion of each remedial technology is provided below. If pilot testing indicates that the clay content of the soil is too high for the passage of bubbles, alternatives to sparging would need to be explored.

5.1.3.1. Remedial Technology for the Vadose and Capillary Fringe Zone - Bioventing

Bioventing is considered to be the most effective remedial technology for the in-situ treatment of the vadose and capillary fringe zones. This technology induces a modest, continuous vapor flow through the zones at low flow rates. The bioventing technology also incorporates the addition of nutrients into the contaminated soils via an injection gallery. In bioventing, the petroleum constituents are converted first to cell mass. Oxygen and nitrogen are necessary for aerobic bio-oxidation of petroleum hydrocarbons by indigenous micro-organisms. Phosphorous is also needed, but in smaller quantities. Typically, the single greatest limiting factor on aerobic metabolism in the subsurface is oxygen. Based on the known chemical reactions that occur in the soil, 1 pound of petroleum hydrocarbon exerts a demand of 4 pounds of oxygen. The petroleum contaminants serve as nutrition for the increased bacterial micro-organism population. As petroleum contaminant levels decrease, so would micro-organism populations. The light petroleum constituents of gasoline are both volatile and biodegradable. The heavy alkanes found in diesel products and motor oil are known to be readily biodegradable.

5.1.3.2. Remedial Technologies for Saturated Zone - In-Situ Biological Treatment with Sparging

In-situ biological treatment of saturated soils introduces nutrients and oxygen into the aquifer. In-situ biological remediation is known to be effective in reducing diesel fuel and oil contaminant levels within saturated soil zones. As discussed for remediation of the vadose zone, the indigenous micro-organisms are generally capable of using the diesel fuel constituents as food or energy source for metabolism. The limiting factors on the micro-organism's growth in the saturated zone are typically oxygen and nutrients. Oxygen will be supplied to the saturated zone by sparging. Nutrients will be supplied through an aqueous solution

of commercial grade agricultural fertilizer, which can be introduced to the saturated zone via sparging and/or extraction wells. The oxygen and nutrient levels will be increased such that the indigenous micro-organisms will flourish, thereby creating the demand for nutrition. As explained above, the petroleum contaminants concentrations will decline (i.e., biodegrade) as the micro-organism population increases. Once the petroleum contaminant levels decrease, so will the micro-organism population.

Sparging involves the introduction of clean air into the saturated zone through an array of injection wells. Sparging raises the dissolved oxygen content of the water. The injected air creates bubbles that would migrate upward through the saturated soil medium, and ultimately into the vadose zone. Vapor extraction wells in the unsaturated zone remove the vapor phase contaminants. For lightweight hydrocarbons, sparging facilitates desorption of the contaminants from soil particles, so that the contaminants will enter the bubbles. For heavier weight hydrocarbons, such as diesel fuel, partitioning to the vapor phase is less pronounced. As molecular weight increases, the tendency to volatilize decreases. For motor oil and increasing molecular weight compounds, the tendency to volatilize is negligible. The sparging technology alone will not completely remove the contaminants in the saturated zone; therefore it will be conducted in combination with in-situ biological groundwater treatment, with the intention of expediting the cleanup process. The free-phase petroleum would be removed similarly to the method described for ex-situ biological treatment.

5.1.4. Option 3 - Off-site Disposal

Off-site disposal would require:

- Free-phase petroleum extraction with an oil/water separator combined with a multi-point dewatering system.
- Sample and analyze for disposal parameters
- Excavation, transportation, and disposal of contaminated soil at a licensed facility that is currently in compliance with Federal and state RCRA requirements.

5.1.5. Option 4 - Administrative Controls

This technology does not prevail on its own merits, but is a requirement under CERCLA to considerate it when evaluating the need for a removal. This response action provides a baseline against which other approaches can be measured.

The administrative controls alternative could include physical controls (fencing, capping, flooding/drainage controls and warning signs) to prevent accidental intrusion by humans and animals and to prevent physical dispersion of the contamination. Administrative controls could increase the stability and safety of the site until the investigation of Operable Unit 5 RI/FS was completed, a ROD was prepared, and a final remedy was implemented. However, administrative controls as described would not prevent migration of contamination already in the groundwater or potentially migrating to the groundwater.

5.2 ESTIMATED COSTS

A conceptual level cost estimate for the four removal options and a comparative analysis addressing Implementability and effectiveness is presented in the following table.

Table 5.1. gives estimates for the cost to implement each of the four options described previously. The costs represent a conceptual level understanding of the project and are accurate from -30 percent to +50 percent.

Table 5.1. - Removal Options Estimated Cost

Option	-30%	Cost (Estimated)	+50%
Ex-Situ Biological Remediation	\$175,000	\$250,000	\$375,000
In-Situ Bioremediation	\$280,000	\$400,000	\$600,000
Off-Site Disposal	\$84,000	\$120,000	\$180,000
Administrative Controls	\$39,000	\$55,000	\$83,000

Option 2, In-situ Bioremediation has the highest cost and may be subject to the greatest potential for cost variation. Because the remediation is being performed in-situ, there is less control and a greater number of variables in the remediation process. Additional costs may be incurred to further characterize underground conditions and are not included in the table.

Table 5.2. represents a ranking of the four options based on cost, implementability, and effectiveness. The table assumes that the three criteria are equally weighted. The most favorable ranking is a 4, and the least favorable ranking is a 1. The sum of the rankings gives an overall total ranking.

Table 5.2. - Removal Options Ranking

Option	Cost	Implementability	Effectiveness	Total
Ex-Situ Biological Remediation	2	3	4	9
In-Situ Bioremediation	1	1	3	5
Off-Site Disposal	3	2	2	7
Administrative Controls	4	4	1	9

The ranking based on cost was previously discussed. In terms of implementability, Off-site Disposal, though technically simple, was down-rated due to potential difficulty in locating a disposal site. In-situ Bioremediation had the lowest implementability rating since it requires the highest level of technology to implement.

Ex-situ and In-situ Remediation are relatively equal in effectiveness; however, In-situ was down-rated because of less control over potential variables. Off-site Disposal effectively removes the contamination from the site, but is rated lower because of the continued potential of owner liability for the contaminants in the disposal site landfill.

Ex-situ Bioremediation and Administrative Controls tie for the highest aggregate ranking. Because the decision to conduct a removal has been made, Administrative Controls are presented for comparison only and Ex-situ Bioremediation is the preferred option.

5.3. PROPOSED ACTIONS

Option 1 is the preferred action on the basis of effectiveness, implementability and cost. The proposed action uses an ex-situ bioremediation technology with static piles for remediation of the petroleum hydrocarbon contaminated soils. The proposed action can be separated into four phases of activity.

Phase I

- Conduct an investigation by obtaining soil and water samples from the surface, subgrade and sub-watersheds of groundwater to define the extent of contamination.
- Investigate the hydrologic conditions of the site in order to determine the appropriate depth and location of the free-phase petroleum extraction pumps and dewatering points.
- Install free product removal system.

Phase II

- Install the impermeable base, collection system for air and water, and the oil/water separator.
- Remove sediment from the FFTA Pits.
- Remove the concrete pits after conducting scarifying operations to remove any petroleum hydrocarbons that may have adhered to the surface of the concrete.
- Excavate contaminated soil and placement onto its treatment base.

Phase III

- Soil Sampling of the static pile at predetermined process milestones.
- Construct, operate and maintain treatment option to ensure that removal objectives are being met. This includes the addition of oxygen, nitrogen, phosphorous, and microbial life if necessary.

Phase IV

- Ultimate disposition of contaminants (discharge/dispose)
- Site closure.

The project estimated schedule for these four phases is shown in Table 5.3., Project Timeline.

Table 5.3.
Project Timeline

Estimated Week Start Date:	10 Jan 94	17 Jan 94	21 Feb 94	21 Mar 94	18 Apr 94	16 May 94	13 Jun 94	11 Jul 94	8 Aug 94	5 Sep 94	3 Oct 94	31 Oct 94	28 Nov 94	26 Dec 94												
TASK NAME	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
Approval of Action Memo																										
Develop Work Plan																										
Field Sampling																										
Installation and O & M of Oil/Water Separator and O & M of Water System																										
Excavation and O & M Ex-Situ Bioremediation																										
Backfilling Operations																										
Ultimate Disposition of Contaminants & Site Closure																										

5.4. CONTRIBUTION TO REMEDIAL PERFORMANCE

The FFTA is located within Mound Plant Operable Unit 5, which includes 52 potential release sites (DOE 1993a) and covers more than half of the Mound Plant. A work plan has been written for Operable Unit 5 and provides a plan for a multiple year RI/FS. It is anticipated that the RI/FS will lead to a Record of Discussion (ROD) and that the 52 potential release sites will include sites recommended for no further action and sites with similar contamination. The final remedy for the FFTA will probably include consolidation with sites with similar characteristics or several of the sites in the vicinity of Building 34. For cost effectiveness, the final remedy would be executed concurrently for the aggregated sites.

The proposed Remedial Action (RA) is consistent with the Operable Unit 5 remedial objectives and accepted removal practices and is expected to abate the threats to meet the NCP removal criteria and mitigate the threat posed to the public health and welfare and the environment.

5.5. COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The proposed removal actions set forth in this memorandum will comply with all Federal and state ARARs to the extent practical considering the exigencies of the situation. A summary of these ARARs is presented in Table 5.4.

Table 5.4.

Ohio Administrative Code ARARs

Admin. Code Section	Title or Subject of Regulation	Description of Regulation	Application of Regulation	ARAR Type
3745-81-12	Maximum Contaminant Levels for Organic Chemicals	Presents MCLS for Organics	Pertains to any site which has contaminated ground or surface water that is either being used, or has the potential for use, as a drinking water source. The TPH action level is established in the interim final policy at 105 ppm. The clean up level for TPH in which the state regards the past treatment residuals as non-regulatory materials is 40 PPM.	Chemical
3745-57-91	Monitoring, inspecting, Analyzing, ... For Misc. Units.	Requires that monitoring, analysis, inspection, response, reporting and corrective action be conducted as necessary at miscellaneous units to assure that human health and the environment are protected.	Pertains to any alternative that incorporates treatment, storage, or disposal of hazardous wastes in miscellaneous units.	Action
3745-56-71	Land Treatment Program	A land treatment program must be designed to ensure that hazardous constituents placed in or on the treatment zone are degraded, transformed or immobilized within the treatment zone.	Pertains to any site at which hazardous wastes will be treated or disposed in land treatment units.	Action
3745-56-72	Land Treatment Demonstration	Prior to the actual land treatment program, a demonstration (field or laboratory tests) must be conducted.	Pertains to any site at which hazardous wastes will be treated or disposed in land treatment units.	Action
3745-56-73	Land Treatment Design and Operating Requirements	A land treatment unit must be designed, constructed, operated and maintained to maximize degradation, transformation and immobilization of hazardous constituents in the treatment zone.	Pertains to any site at which hazardous wastes will be treated or disposed in land treatment units.	Action
3745-56-54	Monitoring & Inspection of Waste Piles	Waste Piles must be monitored during construction or installation and operation.	Pertains to any site at which hazardous waste will be either stored or treated in waste piles.	Action
3745-56-78	Land Treatment Unsaturated Zone Monitoring	An unsaturated zone monitoring program must be established for all land treatment units. The requirements of this program are presented by this rule.	Pertains to any site at which hazardous wastes will be treated or disposed in land treatment units.	Action Chemical
3745-57-01	Environmental Performance Standards; Land-Based Units	Specifies location, design, construction, operation, maintenance and closure requirements for landfills, waste piles, surface impoundments and underground injection wells.	Pertains to all sites that either have or will have at least one of the following units on-site: Landfills, waste piles, surface impoundments, land treatment facilities, and underground injection wells (this includes existing land-based areas of contamination).	Action

**Table 5.4.
Ohio Administrative Code ARARs (Continued)**

Admin. Code Section	Title or Subject of Regulation	Description of Regulation	Application of Regulation	ARAR Type
3745-57-91	Environmental Performance Standards for Misc. Units	Establishes location, design, construction, operation, maintenance and closure requirements for miscellaneous units used to treat, store, or dispose of hazardous wastes.	Pertains to any alternative that incorporates treatment, storage or disposal hazardous wastes in miscellaneous units.	Action Chemical
3745-56-80	Land Treatment Closure & Post-Closure Care	Establishes closure and post-closure requirements for land treatment units.	Pertains to any site at which hazardous wastes will be treated or disposed in land treatment units.	Action
3745-56-58	Closure & Post-Closure Care for Waste Piles	Specifies closure and post-closure care requirements for waste piles	Pertains to any site at which hazardous waste will be either stored or treated in waste piles.	Action
3745-55-14	Disposal/Decon of Equipment, Structures & Soils	Requires that all contaminated equipment, structures and soils be properly disposed of or decontaminated. Removal of hazardous wastes or constituents from a unit may constitute generation of hazardous wastes.	Pertains to any site at which hazardous waste is to be treated, stored or disposed (or has been treated, stored or disposed).	Action

6.0. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED

A delay in action or no action at this Site would increase the probability of contamination migration into the Buried Valley Aquifer. This aquifer has been designated as a sole-source aquifer and classified by the USEPA as Class I to assist in groundwater protection.

7.0. OUTSTANDING POLICY ISSUES

The DOE is currently evaluating alternative land uses for the Mound Plant, including commercial uses. Although currently undetermined, land development for commercial uses could include the vicinity of the FFTA. If so, the presence of contamination could hinder development and would be detrimental to the public welfare.

8.0. ENFORCEMENT

The DOE is the designated lead agency under CERCLA and is required by the FFA to ensure that the environmental impacts associated with past and present activities at the site are thoroughly investigated and the appropriate removal/remedial action taken as necessary to protect the public health, welfare, and the environment.

9.0. RECOMMENDATION

This decision document represents the selected removal action for the FFTA Site, located on the Mound Plant NPL Site in Miamisburg, Ohio, developed in accordance with CERCLA as amended by SARA, and consistent with the NCP. This decision is based on the administrative record for the site.

Because conditions at the FFTA Site meet the NCP criteria (40 CFR 300.415) for a removal action, I recommend initiation of response actions because of the nature of the threat described herein.

APPROVED Arthur Wm. Kleinrath DATE 2/18/94
Arthur Wm. Kleinrath, DOE DAO, On-Scene Coordinator

DISAPPROVED _____ DATE _____
Arthur Wm. Kleinrath, DOE DAO, On-Scene Coordinator

10.0. REFERENCES

- Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Health and Safety Plan, Draft (Revision 3) - U.S. DOE, October 1991.
- Operable Unit 3, Miscellaneous Sites, Limited Field Investigation Report, Final Draft, Revision 2, June 1993.
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- USEPA, 1988. Letter from Charles H. Sutfin, Director, Water Division, USEPA Region 5, to J. A. Morley,
Area Manager, US Department of Energy Dayton Area Office. Letter dated 14 July 1988 regarding
classification of the Buried Valley aquifer as a sole source aquifer.
- USEPA, 1990. Superfund Removal Procedures Action Memorandum Guidance, EPA/540/P-90/004,
Office of Solid Waste and Emergency Response, December 1990.