

# MOUND



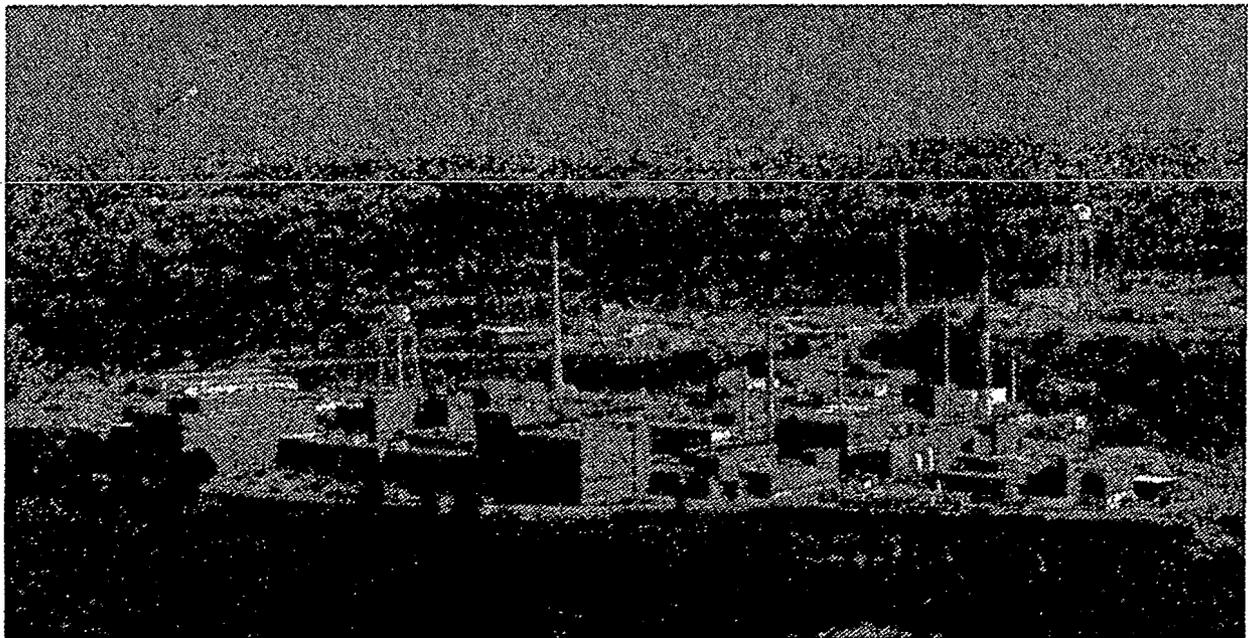
**Environmental  
Restoration  
Program**



# MOUND PLANT

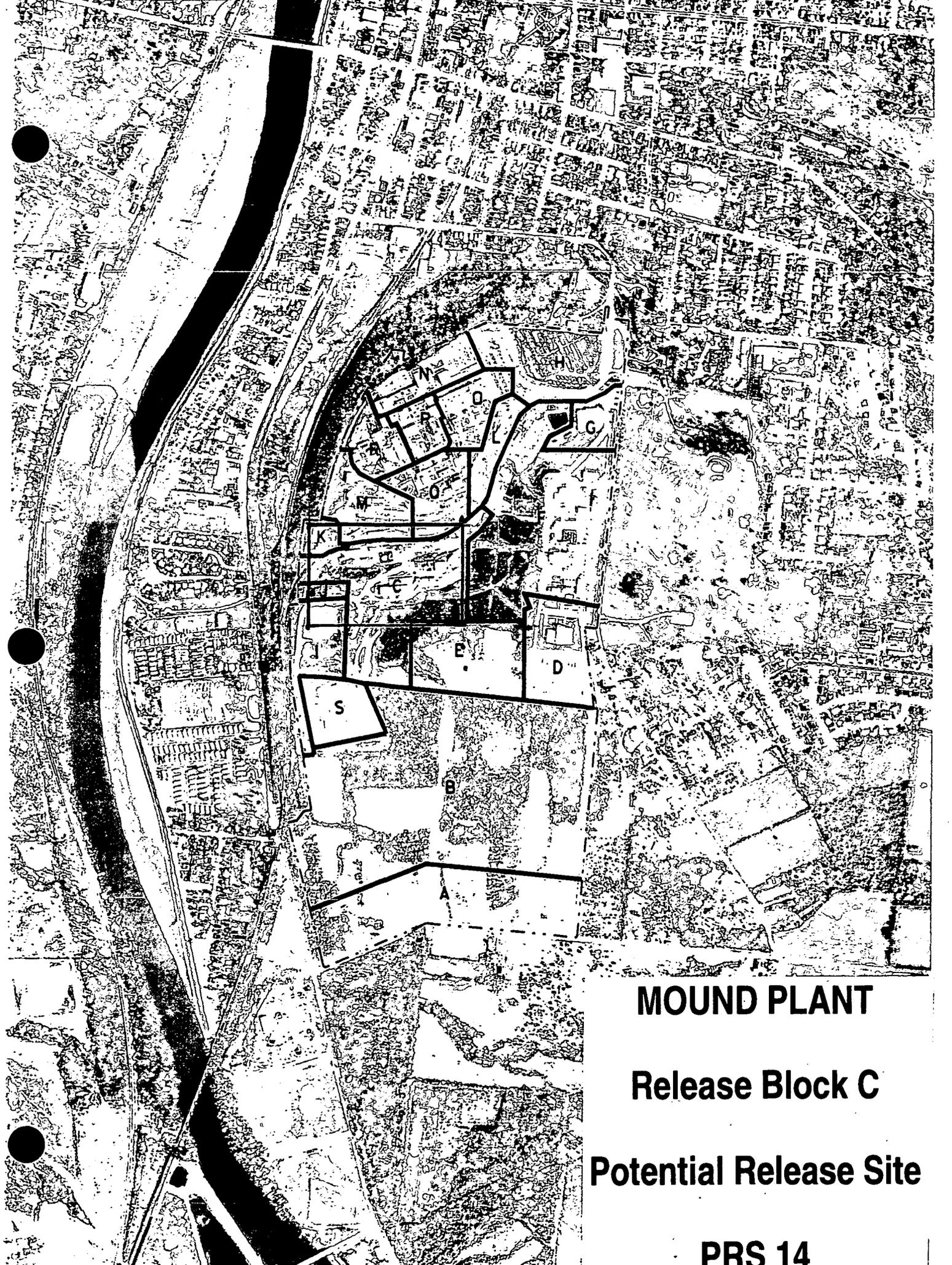
## Potential Release Site Package

### PRS # 14



PRS 14

REV	DESCRIPTION	DATE
0 <b>PUBLIC RELEASE</b>	Available for comment.	<b>May 8, 1996</b>
1 <b>FINAL</b>	Comment period expired: No comments. Recommendation page so annotated.	<b>Oct. 10, 1996</b>
2 <b>FINAL</b>	Signature page changed to show correct review period.	<b>Nov. 19, 1996</b>



**MOUND PLANT**

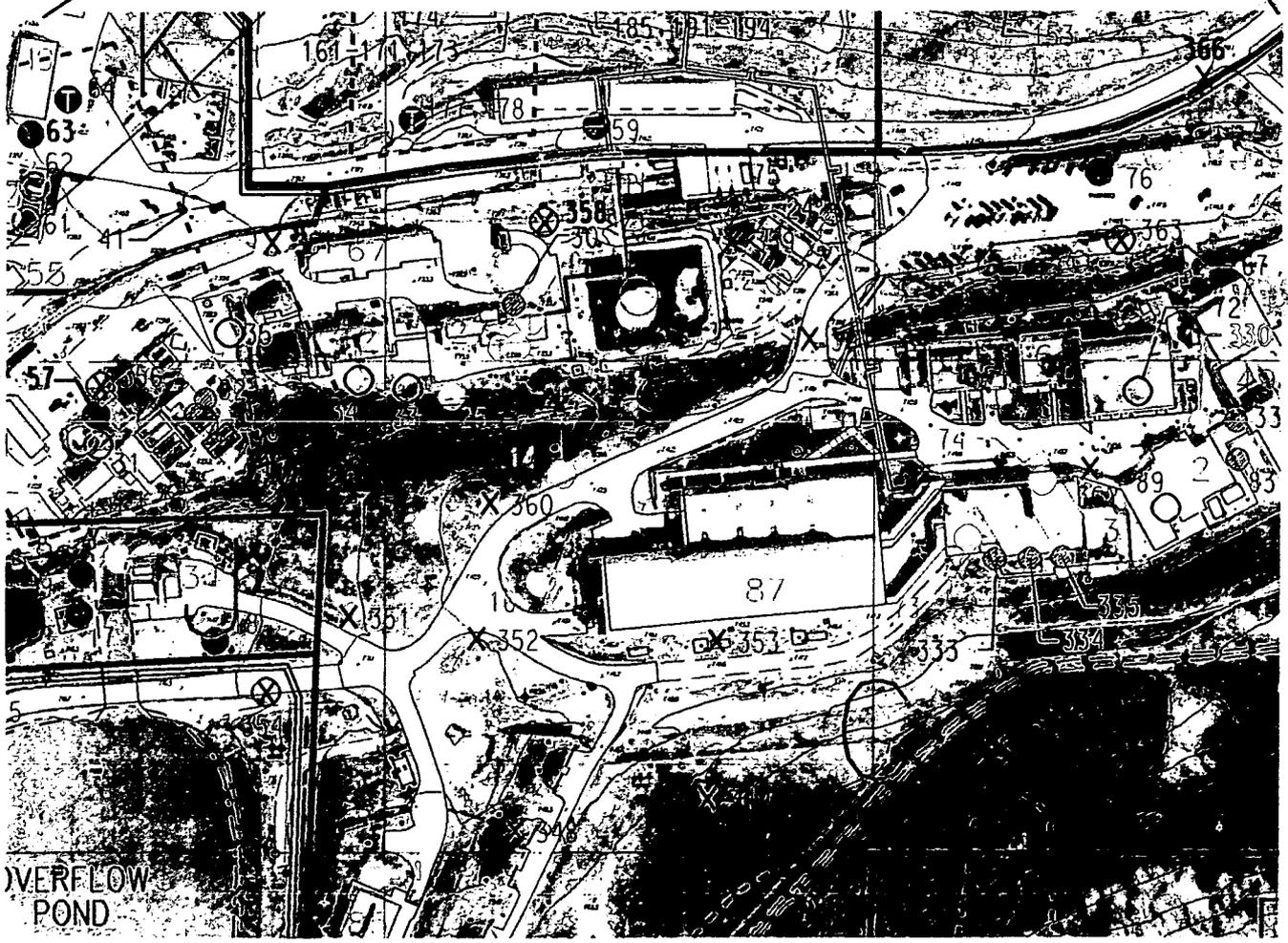
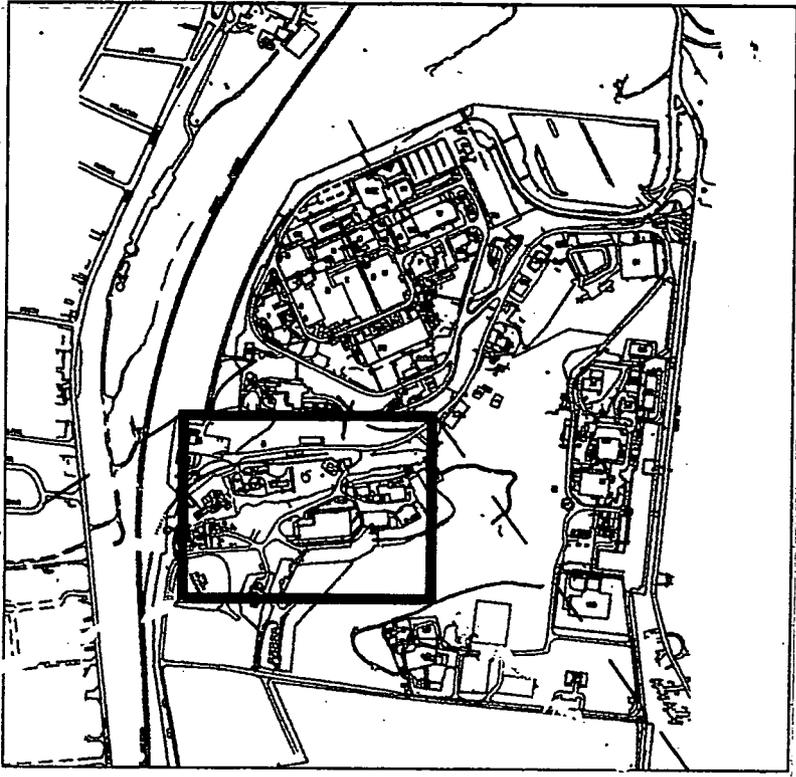
**Release Block C**

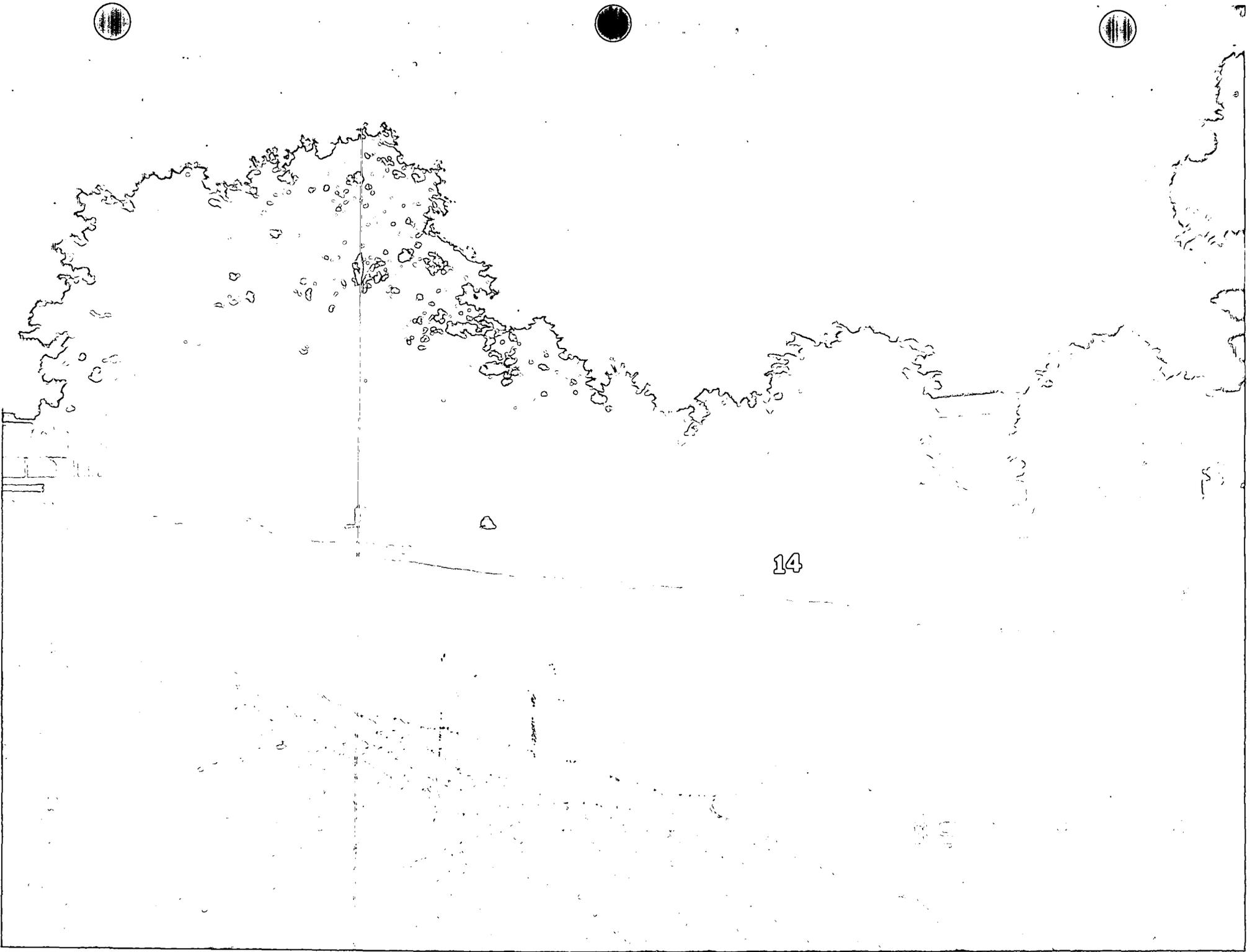
**Potential Release Site**

**PRS 14**



**MOUND PLANT**  
**Release Block C**  
**Potential Release Site**  
**PRS 14**





14

## PRS 14

### PRS HISTORY:

Potential Release Site (PRS) 14 was identified as a drum storage area (1976-1982) for staging chemical waste prior to off-site disposal. The type of chemicals suspected were volatile organic compounds (VOCs). The area was used to stage 55 gallon drums of waste chemicals. No radioactive generating processes are known to have occurred at the location of PRS 14.<sup>2</sup>

### CONTAMINATION:

Soil samples, as part of the OU3, Limited Field Investigations, were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAH), and inorganics. The results for VOCs indicate trichloroethene (TCE) and trichloroethane (1,1,2 TCA) at concentrations of 0.01 mg/kg each, which is below their respective guideline values (GV). SVOCs detected consisted of only bis(2-ethylexyl)phthalate at a concentration of 1.1 mg/kg which is below the GV of 215 mg/kg. All PAH compounds were detected below their respective GV except benzo(a)pyrene which was detected at a concentration of 1.2 mg/kg compared to the GV of 0.41 mg/kg. Pesticides/PCBs were not detected above GV. The only inorganic compound detected above background was magnesium at 46,000 mg/kg compared to a background value of 40,000 mg/kg.<sup>3</sup> During the Site Soil Gas Reconnaissance, sampling was not performed in the area of PRS 14.<sup>6</sup> During the OU5, Non-AOC investigation, relative soil gas sampling, using PETREX, was performed resulting with moderately high levels of total aromatic hydrocarbons.<sup>7</sup>

Radiological sampling, as part of the Radiological Site Survey, resulted with both plutonium-238 (Pu-238) and thorium-232 (Th-232) below the Mound Plant As Low As Reasonably Achievable (ALARA) of 25 pCi/g and 5 pCi/g.<sup>5</sup> The OU5, Non-AOC investigation for radionuclides also resulted with values below the Mound Plant ALARA values.<sup>7</sup>

As part of the Operable Unit 9 groundwater sweeps investigation, groundwater was analyzed for organic compounds, inorganic compounds, and radionuclides. All compounds detected were below guideline values (GV) except lead which was detected at 17.2 ug/L compared to the GV of 15 ug/L.<sup>8</sup>

### READING ROOM REFERENCES:

- 1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, Final, December 1994. (pages 5-11)
- 2) OU9, Site Scoping Report: Volume 7 - Waste Management, Final, February 1993. (pages 12-14)
- 3) OU3, Miscellaneous Sites Limited Field Investigation Report, Volume I, Sections 1-6, Final, July 1993. (pages 15-25)

- 4) OU9, Site Scoping Report: Volume 6 - Photo History Report, Final, February 1992. (pages 26-29)
- 5) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, Final, June 1993. (pages 30-32)
- 6) Soil Gas Survey & Geophysical Investigations, Main Hill and SM/PP Hills Areas, Reconnaissance Sampling, February 1993. (pages 33-34)
- 7) OU5, Operational Area Phase I Investigation Non-AOC Field Report, Final, June 1995. (pages 35-41)
- 8) OU9, Hydrogeologic Investigation: Groundwater Sweeps Report, Technical Memorandum (Revision 1), April 1995. (pages 42-47)

**OTHER REFERENCES:**

- 9) Soil Screening Level Calculation - Soil Concentration That Pose No Calculated Threat to Groundwater, Alec Bray, April 1996. (pages 48-54)

**PREPARED BY:**

Gary L. Coons, Member of EG&G Technical Staff

**MOUND PLANT  
PRS 14  
FORMER WASTE STORAGE SITE - AREA C  
CHEMICAL DRUMS**

**RECOMMENDATION:**

Potential Release Site (PRS) 14 was suspected to contain Volatile Organic Compounds (VOCs) due to the historical use as a drum storage area for staging chemical waste prior to off-site disposal. Sampling results for VOCs indicate soil gas concentrations and soil analytical concentrations less than risk-based guideline values. In addition, no radiological processes are known to have occurred in the area of PRS 14. Radiological sampling results indicate plutonium-238 below the Mound As Low As Reasonably Achievable (ALARA) goal of 25 pCi/g and the 10<sup>-5</sup> Guideline Value of 55 pCi/g. Thorium-232 concentrations are below the regulatory standard of 5 pCi/g surface. All sampling results, including results from nearby monitoring wells, indicate that the drum staging activities did not adversely impact soil quality in the vicinity of PRS 14, therefore, NO FURTHER ASSESSMENT is recommended.

**CONCURRENCE:**

DOE/MB: Arthur W. Kleinrath 5/17/96  
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 5/18/96  
Timothy J. Fischer, Remedial Project Manager (date)

OHIO EPA: Brian K. Nickel 5/18/96  
Brian K. Nickel, Project Manager (date)

**SUMMARY OF COMMENTS AND RESPONSES:**

Comment period from 6/19/96 to 7/19/96 <sup>7/17/96</sup>

- No comments were received during the comment period.
- Comment responses can be found on page \_\_\_\_\_ of this package.

**REFERENCE MATERIAL**  
**PRS 14**

Environmental Restoration Program

**OPERABLE UNIT 9 SITE SCOPING REPORT:  
VOLUME 12 – SITE SUMMARY REPORT**

**MOUND PLANT  
MIAMISBURG, OHIO**

December 1994

**Final**

**U.S. Department of Energy  
Ohio Field Office**



**EG&G Mound Applied Technologies**

Description of History and Nature of Waste Handling						Hazardous Conditions and Incidents			Environmental Data		
No.	Site Name	Location	Status	Potential Hazardous Substances	Ref	Releases	Media	Ref	Analytes <sup>a</sup>	Results	Ref
11	Area 2, Thorium and Polonium-Contaminated Wastes (AKA Crusted Drums)	I-4 I-5	Historical	Polonium-210, thorium-contaminated drums, Polonium-210 contaminated sand and debris  Thorium sludge constituents, Plutonium-238	1, 4, 5, 18	Thorium and daughters	S	1, 4	14 2, 3, 4, 5, 6 10, 11, 14, 16	Table B.1 (Table III.1 in Ref. 6) Tables B.6, B.7, B.8 and B.9	6 24
12	Area B Drum Storage Area	I-5	Historical	Chemical wastes	4	None Suspected			2, 3, 4, 5, 6 10, 11, 14, 16	Tables B.6, B.7, B.8 and B.9	24
13	Wash Incinerator	J-5	Historical	Solid Waste	4	None Suspected			No Data		
14	Area C, Waste Storage Area (AKA Drum Staging Area and Chemical Waste Storage Area)	H-6	Historical	VOCs	4, 5, 7	Suspected, not confirmed	S	7	3, 4, 5, 6  14	Tables B.6, B.7, B.8, and B.9  RSS <sup>c</sup> Location S0518 (Appendix E in Ref. 6)	7 6
15	Area C, Lithium Burn Area (AKA Lithium Carbonate Disposal)	H-5	Historical	Lithium Hydride	4	Possible lithium residues, not confirmed	S	4, 7	2, 3, 4, 5, 6, 7, 8, 9, 10  14	Tables B.6, B.7, B.8, and B.9  RSS <sup>c</sup> Locations S0552 and S0553 (Appendix E in Ref. 6)	7 6
16	Area C, Past Hazardous Waste Storage Area (AKA old Building 72) see related site 345	H-6	Historical	Potential contaminants listed under Hazardous Waste Storage Area	4, 5, 18	Minor, historically remediated	S	18	4	Table B.6	18
17	Oil Burn Structure	H-5	Inactive	Aviation fuel, benzene, toluene, ethyl benzene, xylenes.	5, 7, 18	Confirmed EPH, dioxin/furans		7, 18	2, 3, 4, 5, 6, 7, 8, 9, 10	Tables B.6, B.7, B.8, and B.9	7
18	Building 34, Fire Fighting Training Facility Pits	H-5	Inactive	Diesel Fuel	5, 7, 18	Confirmed EPH		7, 18	3, 4, 5, 6, 7, 8, 9, 10  14	Tables B.6, B.7, B.8, and B.9  RSS Location S0556 (Appendix E in Ref. 6)	7 6
19	Building 34, Historical Firefighting Training Pit	H-5	Historical	Diesel Fuel		Suspected  Confirmed dioxin/furan	S, SW  S	10  7	2, 3, 4, 5, 6, 7, 8, 9	Tables B.6, B.7, B.8, and B.9	7

Table B.6 - Target Compound List - VOC (a,b)

SITE NAME	Acetone	2-Butanone	Toluene	Benzene	Ethyl Benzene	Xylenes	1,2-Dichloroethane	Methylene Chloride	Perchloroethylene	2-Hexanone	4-Methyl-2-Pentanone	Trichloroethane	1,1,2-Trichloroethane	Carbon Disulfide	1,1,1-Trichloroethane	Chloroform	Freon 11	Freon 113	1,1-Dichloroethane	Bromo-dichloromethane	Bromoform	Reference	
2. Miami-Erie Canal (south pond) (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.0	ND	ND	ND	ND	ND	ND	ND	15
3. Miami-Erie Canal (north canal) (d)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16
5. Miami-Erie Canal (south canal) (d)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16
9. G24		ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24
10. Historic Landfill			750	160	200	6100	6700	81				970			ND								24
11. Sanitary Sewer Line				2	2																		24
12. Area B, Drum Storage Area		1	7100	160	35	160	8600		1600			480											24
14. Area C, Waste Storage Area (AKA Drum Staging Area and Chemical Waste Storage Area)			0.016									.01			0.7		0.02	0.13					7

- (a) - All units reported in mg/Kg unless noted otherwise.
- (b) - No soil gas data results are presented.
- (c) - Unit of measure is ug/Kg.
- (d) - No volatile organic constituents were detected in the canal. See reference 16.
- (e) - Note deleted in revision.
- (f) - This site is the same as Site #19.
- (g) - Unit of measure in g/kg
- ND - Not detected.
- Blank - Not analyzed for.

- References:
- 7) DOE 1993c
  - 8) DOE 1992d
  - 15) Halford 1990
  - 16) DOE 1993e
  - 18) DOE 1992a
  - 22) DOE 1992i
  - 24) DOE 1994

Table B.7. Target Compound List - SVOC, P/PCB, PAH, and EPH (a)

SITE NAME	SVOC	Polycyclic Aromatic Hydrocarbons (PAH)											Pesticides, Polychlorinated Biphenyls						EPH & TPH		
		Bis(2-ethylhexyl)phthalate	Acenaphthene	Anthracene	Phenanthrene	Pyrene	Fluoranthene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(a)anthracene	Indeno(1,2,3-CD)pyrene	Chrysene	Benzo(g,h,i)perylene	PCBs	Chlordane	Endrin	Alpha,Beta,Delta,BHC (Lindane)	Dieldrin	4,4'-DDT, 4,4'-DDE	Extractable Petrol. Hydrocarbons	Total Petrol. Hydrocarbons
2. Miami-Erie Canal (south pond)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			16
3. Miami-Erie Canal (north canal) (b)	4.1	3.7	9.3	43	55	53	22	25	25	16	24	17	19	6.8	0.22	0.105	0.21	0.007			16
5. Miami-Erie Canal (south canal) (b)	1.1	1.0	0.81	6.3	6.8	7.0	2.0	2.8	2.8	1.8	2.5	2.2	0.34	0.021	0.034	0.004	0.011	0.013			16
9. Area 18, Site Sanitary Landfill Cover					120	120	140	190	90	71	95	44									24
10. Historic Landfill		1500		7400	7200	1200	2500	4000	3400	1200	2600	850									24
11. Area 2, Thorium and Polonium Wastes					39																24
12. Area B, Drum Storage Area					140	160	55	80	66		70										24
14. Area C, Waste Storage Area (AKA Drum Staging Area and Chemical Waste Storage Area)	1.1	ND	0.46	2.5	3.1	3.4	1.2	2.0	1.5	0.9	1.8	1.1	ND	ND	ND	ND	ND	ND			7
15. Area C, Lithium Burn Area (AKA Lithium Carbonate Disposal) (c)																					7
17. Oil Burn Structure	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	ND	ND	ND			7

(a) - All units are reported in mg/Kg unless noted otherwise.  
 (b) - Additional data on other analytes are available in reference 16.  
 (c) - This site is the same as Site #19.  
 (d) - Groundwater data. Unit of measure is mg/L.  
 (e) - Unit of measure is g/Kg

References:  
 7) DOE 1933c  
 8) DOE 1992d  
 15) Halford 1990  
 16) DOE 1993e  
 18) DOE 1992a  
 24) DOE 1994

MOUN09M9550F4.T88 09/27/94

Table B.8. Target Analyte List (TAL) - Inorganics<sup>(a)</sup>

SITE NAME		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chloride	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Nitrate	Nitrite	Silver	Thallium	Zinc	Cyanide	Lithium	Mercury	Vanadium	Reference
2.	Miami-Erie Canal (south pond)	ND	9.6	104	ND	ND	NA	18	NA	34	23	NA	22	NA	NA	4.8	ND	58.4	ND	NA	0.20	22	15
3.	Miami-Erie Canal (north canal) (b)	19.7	127	128	1.2	2.4	ND	145	14.3	143	248	928	31.2	ND	ND	11.8	0.8	323	ND	ND	0.76	33.1	16
5.	Miami-Erie Canal (south canal) (b)	37.3	12	178	1.4	1.8	ND	334	14.4	225	579	1430	33.9	ND	ND	16.9	1.4	255	ND	ND	0.74	48.9	16
9.	Area 18, Site Sanitary Landfill Cover	ND	8.8	51.9	.29	ND	9.3	9.1	6.3	14.6	10.3	389	14.9	3.3		3.9	ND	44	ND	11.1	ND	18	24
10.	Historic Landfill	3.8	6.1	104	.51	0.9	32.4	13.1	9.7	881	121	470	28.4	ND		ND	ND	1330	ND	17	2.7	23.7	24
11.	Area 2, Thorium and Polonium Wastes	ND	8	33.2	ND	.22	23.4	ND	ND	11.9	ND	289	ND	ND		ND	.29	ND	ND	16.2	.07	ND	24
12.	Area B, Drum Storage Area	ND	4.4	33.5	ND	.31	81.2	ND	ND	42.7	10.2	372	ND	ND		ND	ND	ND	ND	18.1	.06	ND	24
14.	Area C, Waste Storage Area (AKA Drum Staging Area and Chemical Waste Storage Area)	31.3	6.3	68.6	0.79	5.8		26.2	10.5	20.8	13.2	35.9	24.8			17	ND	62.5	0.14		ND	23.4	7
15.	Area C, Lithium Burn Area (AKA Lithium Carbonate Disposal) (c)																						7
17.	Oil Burn Structure	69	9	131	0.96	24.2		92.1	28	3,100	829	107	ND	ND	17.7	0.5313 .5	791.63 1	0.7579 1	29.1	ND	29	41.8	7

- (a) - All units are reported in mg/Kg unless otherwise noted.
- (b) - Additional data on other analytes are available in reference #19.
- (c) - this site is the same as Site #19.
- (d) - Groundwater data. Unit of measure is mg/L.

ND - Not detected.  
NA - Not analyzed for.

- References:
- 7) DOE 1993c
  - 8) DOE 1992d
  - 15) Halford 1990
  - 16) DOE 1993e
  - 18) DOE 1992a
  - 24) DOE 1994

Table B.9. Summary of Radiological Data<sup>(a,b)</sup>

Site Name	Radiological Contaminants														
	Potassium-40	Uranium-239	Uranium-238	Cesium-137	Thorium-Total	Tritium	Thorium-232	Cobalt-60	Radium-224, -226, -228	Radon-222	Americium-241	Actinium-227	Uranium-233, -234, -238	Bismuth-210m	Bismuth-207

- (a) - All units are reported in pCi/g unless otherwise noted.
- (b) - Blank spaces implies not sampled.
- (c) - Additional data on other analytes are available in reference 16.
- (d) - Groundwater data. Unit of measure is pCi/L.
- (e) - This site is the same as Site #19.
- (f) - Groundwater data. Unit of measure is nCi/L.

LDL - Lower Detection Limit.  
 ND - Not detected.  
 NA - Not analyzed for.  
 NR - No result reported.

- References:  
 6) DOE 1993d  
 7) DOE 1993c  
 11) Styron and Meyer 1981  
 13) DOE 1993d  
 18) DOE 1992a  
 24) DOE 1994

12. Area B, Drum Storage Area	11.5	.13	.5	ND		2.1	.41		.84				1.			24
14. Area C, Waste Storage Area (AKA Drum Staging Area and Chemical Waste Storage Area)	NA	NA	1.12	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7
15. Area C, Lithium Burn Area (AKA Lithium Carbonate Disposal) (e)	NA	NA	41.7	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7
17. Oil Burn Structure	19.3			0.163	1.38				1.13							7
Building 34, Fire Fighting Training Facility Pits	15.7		6.65		5.44	NA	NA	NA	0.901							7
Building 34, Historical Firefighting Training Pit	16.8				1.44				1.12							7

- 1 - Soil Gas Survey - Freon 11, Freon 113, Trans-1,2-Dichloroethylene, Cis-1,2-Dichloroethylene, 1,1,1-Trichloroethane, Perchloroethylene, Trichloroethylene, Toluene
- 2 - Gamma Spectroscopy - Thorium-228, -230, Cobalt-60, Cesium-137, Radium-224, -226, -228, Americium-241, Actinium-227, Bismuth-207, Bismuth-210m, Potassium-40
- 3 - Target Analyte List
- 4 - Target Compound List (VOC)
- 5 - Target Compound List (SVOC)
- 6 - Target Compound List (Pesticides/Polychlorinated Biphenyl)
- 7 - Dioxins/Furans
- 8 - Extractable Petroleum Hydrocarbons (EPH)/Total Petroleum Hydrocarbons (TPH)
- 9 - Lithium
- 10 - Nitrate/Nitrite
- 11 - Chloride
- 12 - Explosives
- 13 - Plutonium-238
- 14 - Plutonium-238, Thorium-232
- 15 - Cobalt-60, Cesium-137, Radium-226, Americium-241
- 16 - Tritium

#### Reference List

1. DOE 1986 "Phase I Installation Assessment Mound (DRAFT)."
2. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
3. DOE 1992c "Mound Plant Underground Storage Tank Program Plan & Regulatory Status Review (Final)."
4. DOE 1993a "Site Scoping Report: Volume 7 - Waste Management (Final)."
5. EPA 1988a "Preliminary Review/Visual Site Inspection for RCRA Facility Assessment of Mound Plant."
6. DOE 1993d "Operable Unit 9, Site Scoping Report: Volume 3 - Radiological Site Survey (Final)."
7. DOE 1993c "Operable Unit 3, Miscellaneous Sites Limited Field Investigation Report."
8. DOE 1992d "Reconnaissance Sampling Report Decontamination & Decommissioning Areas, OU6, (Final)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scoping Report: Volume 11 - Spills and Response Actions (Final)."
11. Styron and Meyer 1981 "Potable Water Standards Project: Final Report."
12. DOE 1993b "Reconnaissance Sampling Report - Soil Gas Survey & Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (Final)."
13. DOE 1993d "Operable Unit 9, Site Scoping Report: Volume 3 - Radiological Site Survey (Final)."
14. DOE 1991b "Main Hill Seeps, Operable Unit 2, On-Scene Coordinator Report for CERCLA Section 104 Remedial Action, West Powerhouse PCB Site."
15. Halford 1990 "Results of South Pond Sampling."
16. DOE 1993e "Operable Unit 4, Special Canal Sampling Report, Miami Erie Canal."
17. DOE 1990 "Preliminary Results of Reconnaissance Magnetic Survey of Mound Plant Areas 2, 6, 7, and C."
18. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
19. Rogers 1975 "Mound Laboratory Environmental Plutonium Study, 1974."
20. DOE 1992h "Ground Water and Seep Water Quality Data Report Through First Quarter, FY92."
21. Dames and Moore 1976 a, b "Potable Water Standards Project Mound Laboratory" and "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory."
22. DOE 1992i "Closure Report, Building 34 - Aviation Fuel Storage Tank."
23. DOE 1992j "Closure Report, Building 51 - Waste Storage Tank."
24. DOE 1994 "Operable Unit 1, Remedial Investigation Report."
25. EG&G 1994 "Active Underground Storage Tank Plan."

**ENVIRONMENTAL RESTORATION PROGRAM**

**OPERABLE UNIT 9  
SITE SCOPING REPORT:  
VOLUME 7 - WASTE MANAGEMENT**

**MOUND PLANT  
MIAMISBURG, OHIO**

**February 1993**

**DEPARTMENT OF ENERGY  
ALBUQUERQUE FIELD OFFICE**

**ENVIRONMENTAL RESTORATION PROGRAM  
EG&G MOUND APPLIED TECHNOLOGIES**

**FINAL**

concurrently (Vaughters 1991). The chemical waste staging activities in Area B were moved to the chemical waste storage area in 1976 to allow the construction of the overflow pond and site sanitary landfill.

#### 5.3.11. Chemical Waste Storage Area (Historical)

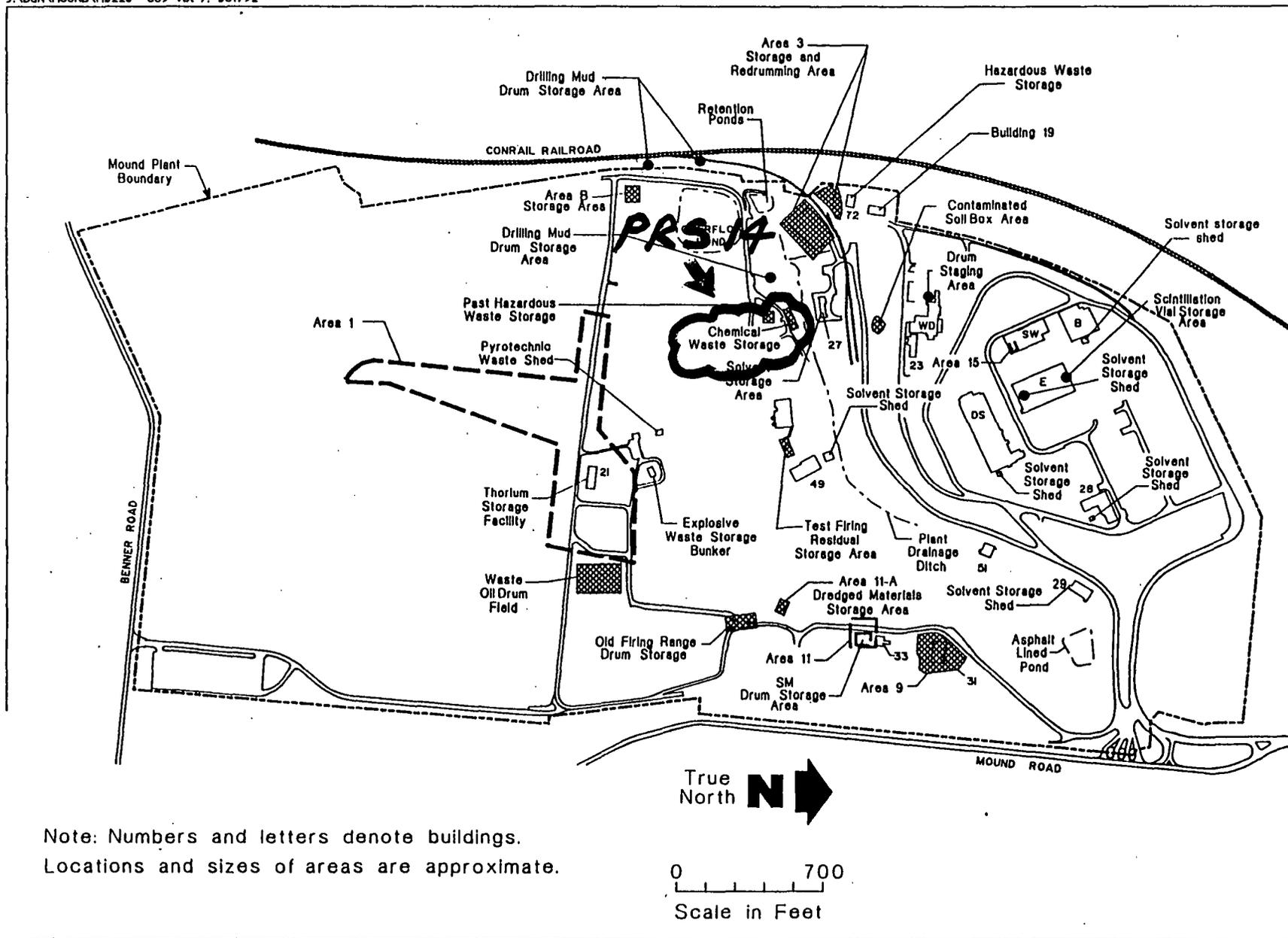
The chemical waste storage area was in the central part of Mound along the southern margin of the lower reach of the plant drainage ditch (Figure 5.1). This area was used to stage hazardous chemical wastes before they were shipped off-plant for disposal. The area replaced the Area B drum storage area in 1976 and was itself replaced by the construction of the past hazardous waste storage area structure (old Building 72) in 1982. The old Building 72 was constructed adjacent to the chemical waste storage area.

The area appears from photographs to have been located along the access road and was probably about 50 ft wide by 200 ft long. The location and extent of this storage area are graphically displayed in the Site Scoping Report: Volume 6 - Photo History (DOE 1992c).

It is unknown whether the drums stored in the area were stored on the ground or were elevated. The drainage in the area probably did not allow water to pond as it had in the old firing range drum storage area, so the drums may have been placed directly on the ground. In all probability, the types and quantities of wastes were similar to those stored at the past hazardous waste storage area and the waste oil drum field.

#### ~~5.3.12. Waste Oil Drum Field Area (Historical)~~

~~The waste oil drum field area is an inactive unit located approximately 250 yards southeast of the open burn area and due west of Building 100, in the southern portion of Mound (Figure 5.1). It was used for temporary drum storage between the decommissioning of the past hazardous waste storage area in 1986 and start-up of the hazardous waste storage area (Building 72). It was closed during the last quarter of 1986. Approximately 200 drums were observed in an open field east of the burn area in August 1986. Half the drums were marked as containing waste oil, and the remainder were identified as plating shop waste, explosive/solvent waste, herbicides, mixed laboratory chemicals, photographic waste, batteries, kitchen grease, epoxy resins, ethylene glycol, scintillation vials (less than 50  $\mu\text{Ci/L}$ ), and other chemical wastes (EPA 1988). The drums were removed from this area shortly after August 1986. The area was approximately 50 ft by 100 ft (DOE 1992g), and the 55-gallon drums were stored on skids above the soil. During an August 1986 inspection, it was found that the drum area showed evidence of leakage from waste oil drums, a~~



Note: Numbers and letters denote buildings.  
Locations and sizes of areas are approximate.

Figure 5.1 Waste storage areas.

ENVIRONMENTAL RESTORATION PROGRAM

**OPERABLE UNIT 3 — MISCELLANEOUS SITES  
LIMITED FIELD INVESTIGATION REPORT  
VOLUME I  
SECTIONS 1-6**

**MOUND PLANT  
MIAMISBURG, OHIO**

July 1993

DEPARTMENT OF ENERGY

ENVIRONMENTAL RESTORATION PROGRAM  
EG&G MOUND APPLIED TECHNOLOGIES

**FINAL  
(REVISION 0)**

- ~~Concrete blocks~~
- ~~Nonmetallic~~
- ~~Metal post~~
- ~~Several pieces of metal rebar~~

## 2.17. AREA C DRUM STAGING AREA

### 2.17.1. Site History

#### 2.17.1.1. Description of the Area C Drum Staging Area

Area C is located in the Mound Plant lower central valley (Figure 1.3). Located east of Area C is the former location of Old Building 72, a past hazardous waste staging area. When Old Building 72 was in service, a drum staging area existed to the northwest of the building. This historical drum staging area is adjacent to the northeast corner of Area C. Monitor well 0151 is located southwest of the drum staging area.

#### 2.17.1.2. Potential Area Contaminants

During closure activities, VOC-contaminated soils were identified and removed from the vicinity of Old Building 72. The volume and nature of the wastes stored in the drums held in the staging area are not documented. There are no records that contaminants have been released into soils in the drum staging area. Details concerning closure activities for the historical hazardous waste storage area are found in the Operable Unit 9 Site Scoping Report, Volume 7, Waste Management (DOE 1991g).

### 2.17.2. Field Investigation Procedures

The objectives of sampling at the Area C Drum Staging Area are to investigate the presence or non-presence of contamination in the soils at the site. The Area C Drum Staging Area sampling activities included soil sampling by hollow stem auger drilling techniques using 3-inch split spoon samplers. Soil sample collection was conducted by WESTON representatives on 22 and 23 November 1991. Samples were sent to IT Laboratories for chemical analysis.

Soil samples were collected at two locations as shown in Figure 2.17. One borehole was on the east end of the historical drum staging area, and the second borehole was located on the southwest corner of the historical drum staging area. The soils and overburden in the historical drum staging area consists of a gray, gravelly, clayey, sandy silt to a depth of 10.0 ft BGS. Groundwater was not encountered during drilling of the boreholes at this location. A summary of samples collected at each borehole location, including

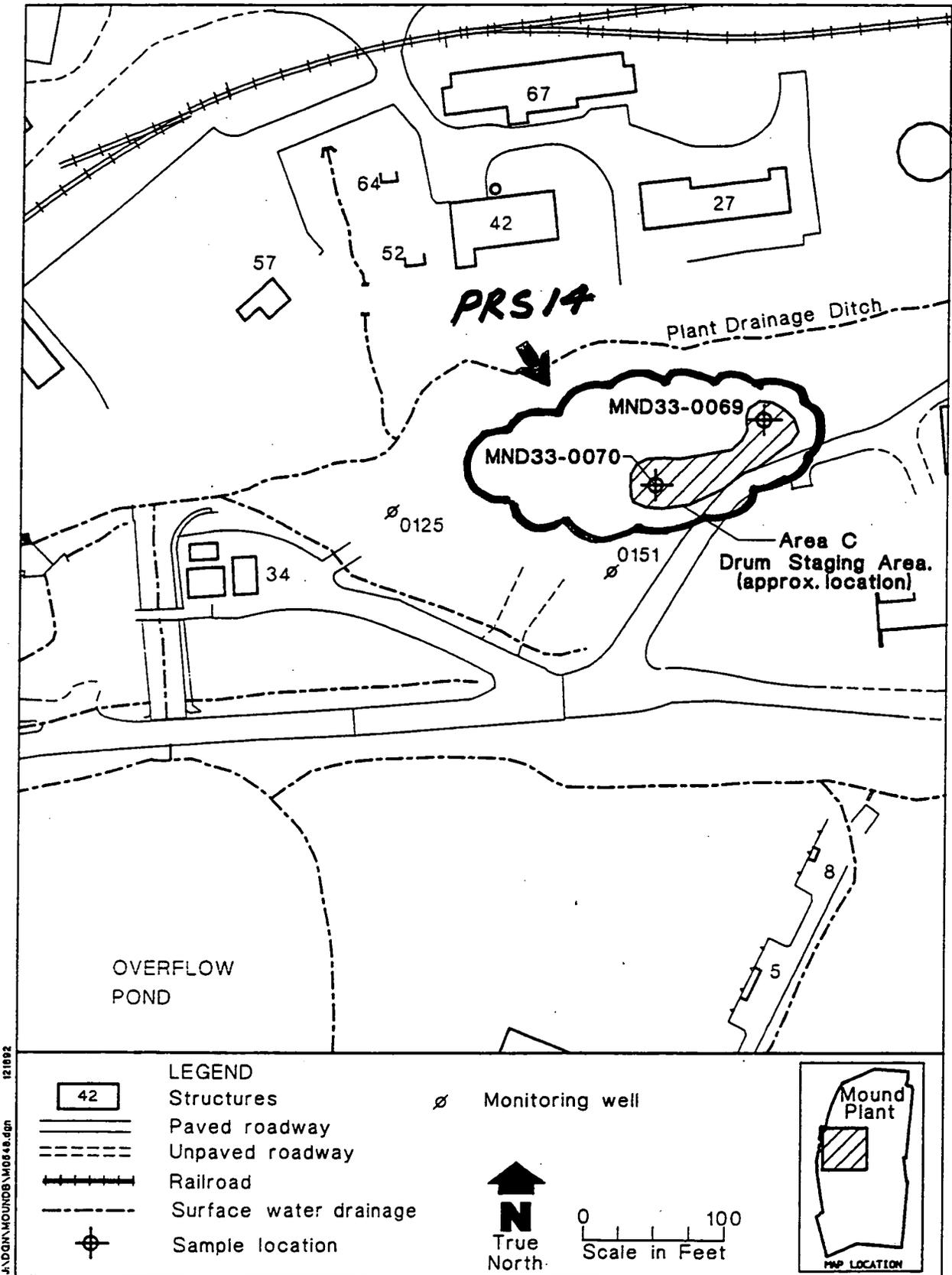


Figure 2.17. Area C Drum Staging Area soil sample locations.

sample identification number, sampling depth interval, date sampled, and requested analytical parameters, is presented in Table II.16.

Every effort was made to comply with approved sampling protocol; however, some deviations were necessary in order to obtain the required sample. A summary of deviations from approved sampling protocol is presented below:

- The specific locations of soil borings 0069 and 0070, as documented in the OU 3 Work Plan, were moved based on the findings of the OU 9 Volume 6 Photo History Report (DOE 1991c). Soil boring 0069 was moved approximately 50 ft northeast of the original location and soil boring 0070 was moved approximately 20 ft east of the original location.
- There were no samples collected at the 15.0- or 20.0-ft BGS interval (in compliance with the Work Plan), because the HNu and OVA readings were less than 1.0 unit above background during screening of the 7.5- to 10.0-ft BGS sample interval.

The following is a summary of deviations from approved protocols for each applicable sample collected at Area C Drum Staging Area:

- MND33-0069-0001 — Interval 0.0 to 0.5 ft BGS. Three surface split spoon samples were necessary to obtain the required sample volume.
- MND33-0069-0002 — Interval 3.0 to 7.0 ft BGS. The 5.0- to 7.0-ft BGS split spoon was needed, in addition to the 3.0- to 7.0-ft BGS sample, to obtain the required sample volume.
- MND33-0070-0001 — Interval 0.0 to 0.5 ft BGS. Four surface split spoon samples were necessary to obtain the required sample volume.
- MND33-0070-0002 — Interval 3.0 to 7.0 ft BGS. The 5.0- to 7.0-ft BGS split spoon was needed, in addition to the 3.0- to 7.0-ft BGS sample, to obtain the required sample volume.

## ~~2.18 AREA H PYROTECHNIC WASTE DISPOSAL AREA~~

### ~~2.18.1 Site History~~

#### ~~2.18.1.1 Description of the Area H Pyrotechnic Waste Disposal Area~~

~~Area H encompasses four sites used for disposal processes for pyrotechnic and explosive wastes and is located near Building 63 in the southwestern portion of SM/PP Hill at Mound Plant (Figure 1.3). The Area H Pyrotechnic Waste Disposal Area was formerly used for disposal of pyrotechnic materials in solution (RFA 1988). The area is reported to be adjacent to the southern fence line of /~~

### 3.17. AREA C DRUM STAGING AREA

The Area C Drum Staging Area was located northwest of Old Building 72. The volume and nature of the wastes stored in the staging area is not documented. Soil sampling was conducted in this area to assess whether hazardous materials have been released through spills or leaks from drums. A summary of the site history and the field investigation procedures is presented in subsection 2.17.

Eight soil samples were collected from two locations (MND33-0069 and MND33-0070) within the historical drum staging area and were analyzed for TCL VOCs, SVOCs, P/PCBs; and TAL inorganics. The validated analytical results for all analytes detected above laboratory reporting limits for each sample are presented in Table III.20.

#### 3.17.1. Volatile Organic Compounds

Two of the eight soil samples analyzed contained detectable concentrations of VOCs. TCE was detected in samples MND33-0070-0002 and -0003 at a maximum concentration of 0.01 mG/Kg. 1,1,2-TCA was detected in sample MND33-0070-0002 at a concentration of 0.01 mG/Kg. The concentrations of both of these VOCs are below their respective PRGs. Because of the low concentrations of these compounds, they are not considered to reflect an impact to site soil quality.

#### 3.17.2. Semivolatile Organic Compounds

SVOCs were detected above laboratory reporting limits in four of eight samples from the Area C Drum Staging Area. Bis(2-ethylhexyl)phthalate was detected in three of the four samples from location MND33-0069 at concentrations up to 1.1 mG/Kg. Since the detected concentrations of this compound were below the PRG, the presence of bis(2-ethylhexyl)phthalate is not considered to reflect an impact to site soils.

Ten PAH compounds were detected at surface soil sample MND33-0070-0001. Concentrations of anthracene, fluoranthene, benzo(g,h,i)perylene, chrysene, and phenanthrene were detected at levels below their respective PRGs. Five of the 10 PAH compounds; benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-CD)pyrene, and pyrene, were detected in surface soil sample MND33-0070-0001 at concentrations slightly above their respective PRGs. No other SVOC compounds were detected in other surface or subsurface soil samples analyzed from the Area C Drum Staging Area.

The isolated occurrence of PAH compounds at concentrations slightly above PRGs in one surface soil sample at the site may be a result of runoff from nearby asphalt surfaces, and does not reflect an impact to site soil quality.

#### **3.17.3. Pesticides and Polychlorinated Biphenyls**

P/PCBs were not detected in concentrations above laboratory reporting limits in any of the samples analyzed from the Area C Drum Staging Area.

#### **3.17.4. TAL Inorganics**

Inorganic compounds were not detected in soil samples from the Area C Drum Staging Area at concentrations above PRGs or proposed action levels.

#### **3.17.5. Summary**

The analytical results for samples collected from the Area C Drum Staging Area indicate that drum staging activities have not adversely impacted soil quality in the vicinity of the site. As a result of these findings, no further action involving site characterization or soil remediation at the Area C Drum Staging Area is recommended.

TABLE III.20  
 AREA C DRUM STAGING AREA  
 Location: MND33-0069  
 Summary of analytical data  
 for analyte concentrations  
 above reporting limits  
 Report Date: 03/05/93

Parameter	Sample Id	Matrix	Units of Measure	Laboratory Reporting Limit	Validated Result (1)	Data Validation Qualifier	PRG	Run Type
ALUMINUM, TOTAL	0001	S	mG/Kg	6.	5710.		7.8E+05	I
ALUMINUM, TOTAL	0002	S	mG/Kg	6.	4260.		7.8E+05	I
ALUMINUM, TOTAL	0003	S	mG/Kg	6.	4160.		7.8E+05	I
ALUMINUM, TOTAL	1001	S	mG/Kg	6.	5400.		7.8E+05	I
ANTIMONY, TOTAL	0001	S	mG/Kg	3.	18.3	J	1.1E+02	I
ANTIMONY, TOTAL	0002	S	mG/Kg	3.	23.9	J	1.1E+02	I
ANTIMONY, TOTAL	0003	S	mG/Kg	3.	31.3	J	1.1E+02	I
ANTIMONY, TOTAL	1001	S	mG/Kg	3.	18.0	J	1.1E+02	I
ARSENIC, TOTAL	0001	S	mG/Kg	.2	4.5	J	2.1E+03	I
ARSENIC, TOTAL	0002	S	mG/Kg	.2	3.6	J	2.1E+03	I
ARSENIC, TOTAL	0003	S	mG/Kg	.2	3.9	J	2.1E+03	I
ARSENIC, TOTAL	1001	S	mG/Kg	.2	6.3	J	2.1E+03	I
BARIUM, TOTAL	0001	S	mG/Kg	.2	50.3		1.9E+04	I
BARIUM, TOTAL	0002	S	mG/Kg	.2	34.1		1.9E+04	I
BARIUM, TOTAL	0003	S	mG/Kg	.2	29.4		1.9E+04	I
BARIUM, TOTAL	1001	S	mG/Kg	.2	46.9		1.9E+04	I
BERYLLIUM	0001	S	mG/Kg	.2	.79		1.5E-01	I
BERYLLIUM	0002	S	mG/Kg	.2	.71		1.5E-01	I
BERYLLIUM	0003	S	mG/Kg	.2	.69		1.5E-01	I
BERYLLIUM	1001	S	mG/Kg	.2	.73		1.5E-01	I
BIS(2-ETHYLHEXYL)PHTHALATE	0001	S	mG/Kg	0.41	0.82	J	4.6E+01	I
BIS(2-ETHYLHEXYL)PHTHALATE	0003	S	mG/Kg	0.35	0.56	J	4.6E+01	I
BIS(2-ETHYLHEXYL)PHTHALATE	1001	S	mG/Kg	0.41	1.1	J	4.6E+01	I
CADMIUM, TOTAL	0001	S	mG/Kg	.2	3.3		1.4E+02	I
CADMIUM, TOTAL	0002	S	mG/Kg	.2	3.9		1.4E+02	I
CADMIUM, TOTAL	0003	S	mG/Kg	.2	5.3		1.4E+02	I
CADMIUM, TOTAL	1001	S	mG/Kg	.2	2.8		1.4E+02	I
CALCIUM, TOTAL	0001	S	mG/Kg	2.	132000.		NA	I
CALCIUM, TOTAL	0002	S	mG/Kg	2.	84600.		NA	I
CALCIUM, TOTAL	0003	S	mG/Kg	2.	103000.		NA	I
CALCIUM, TOTAL	1001	S	mG/Kg	2.	101000.		NA	I
CHROMIUM, TOTAL	0001	S	mG/Kg	1.	26.1		1.4E+03	I
CHROMIUM, TOTAL	0002	S	mG/Kg	1.	22.6		1.4E+03	I
CHROMIUM, TOTAL	0003	S	mG/Kg	1.	23.3		1.4E+03	I
CHROMIUM, TOTAL	1001	S	mG/Kg	1.	24.3		1.4E+03	I
COBALT, TOTAL	0001	S	mG/Kg	1.	6.9		3.9E+01	I
COBALT, TOTAL	0002	S	mG/Kg	1.	8.8		3.9E+01	I
COBALT, TOTAL	0003	S	mG/Kg	1.	9.		3.9E+01	I
COBALT, TOTAL	1001	S	mG/Kg	1.	7.4		3.9E+01	I
COPPER, TOTAL	0001	S	mG/Kg	1.	15.6		1.0E+04	I
COPPER, TOTAL	0002	S	mG/Kg	1.	16.4		1.0E+04	I
COPPER, TOTAL	0003	S	mG/Kg	1.	16.9		1.0E+04	I
COPPER, TOTAL	1001	S	mG/Kg	1.	16.5		1.0E+04	I
CYANIDE	1001	S	mG/Kg	.1	0.12	J	5.4E+03	I

PRG - Preliminary Remediation Goals (Risk Based)  
 J - The associated value is an estimated quantity  
 I - Initial Analysis  
 S - Soil  
 mG/Kg - Milligrams per Kilogram  
 (1) - This includes laboratory results that were not qualified from data validation, but were accepted by data validators

General  
 Chemistry

TABLE III.20  
 AREA C DRUM STAGING AREA  
 Location: MND33-0070  
 Summary of analytical data  
 for analyte concentrations  
 above reporting limits  
 Report Date: 03/05/93

Parameter	Sample Id	Matrix	Units of Measure	Laboratory Reporting Limit	Validated Result (1)	Data Validation Qualifier	PRG	Run Type
COBALT, TOTAL	0002	S	mG/Kg	.01	10.4		3.9E+01	I
COBALT, TOTAL	0003	S	mG/Kg	.01	8.		3.9E+01	I
COBALT, TOTAL	1002	S	mG/Kg	.01	10.5		3.9E+01	I
COPPER, TOTAL	0001	S	mG/Kg	.01	16.		1.0E+04	I
COPPER, TOTAL	0002	S	mG/Kg	.01	20.8		1.0E+04	I
COPPER, TOTAL	0003	S	mG/Kg	.01	16.4		1.0E+04	I
COPPER, TOTAL	1002	S	mG/Kg	.01	20.6		1.0E+04	I
CYANIDE	0001	S	mG/Kg	.1	0.14	J	5.4E+03	I
CYANIDE	0002	S	mG/Kg	.1	.12	J	5.4E+03	I
CYANIDE	1002	S	mG/Kg	.1	0.11	J	5.4E+03	I
FLUORANTHENE	0001	S	mG/Kg	0.38	3.4	J	1.1E+04	I
INDENO(1,2,3-CD)PYRENE	0001	S	mG/Kg	0.38	0.9	J	3.8E-01	I
IRON, TOTAL	0001	S	mG/Kg	.01	10400.		NA	I
IRON, TOTAL	0002	S	mG/Kg	.01	10700.		NA	I
IRON, TOTAL	0003	S	mG/Kg	.01	9270.		NA	I
IRON, TOTAL	1002	S	mG/Kg	.01	12300.		NA	I
LEAD, TOTAL	0001	S	mG/Kg	.002	12.8	J	5.3E+01	I
LEAD, TOTAL	0002	S	mG/Kg	.002	6.0	J	5.3E+01	I
LEAD, TOTAL	0003	S	mG/Kg	.002	5.9	J	5.3E+01	I
LEAD, TOTAL	1002	S	mG/Kg	.002	6.9	J	5.3E+01	I
MAGNESIUM, TOTAL	0001	S	mG/Kg	.05	28300.	J	NA	I
MAGNESIUM, TOTAL	0002	S	mG/Kg	.05	44100.	J	NA	I
MAGNESIUM, TOTAL	0003	S	mG/Kg	.05	36900.	J	NA	I
MAGNESIUM, TOTAL	1002	S	mG/Kg	.05	33000.	J	NA	I
MANGANESE, TOTAL	0001	S	mG/Kg	.002	259.	J	2.7E+04	I
MANGANESE, TOTAL	0002	S	mG/Kg	.002	290.	J	2.7E+04	I
MANGANESE, TOTAL	0003	S	mG/Kg	.002	224.	J	2.7E+04	I
MANGANESE, TOTAL	1002	S	mG/Kg	.002	359.	J	2.7E+04	I
NICKEL, TOTAL	0001	S	mG/Kg	.02	17.8		5.4E+03	I
NICKEL, TOTAL	0002	S	mG/Kg	.02	23.9		5.4E+03	I
NICKEL, TOTAL	0003	S	mG/Kg	.02	19.4		5.4E+03	I
NICKEL, TOTAL	1002	S	mG/Kg	.02	24.6		5.4E+03	I
PHENANTHRENE	0001	S	mG/Kg	0.38	2.5	J	7.8E+03	I
POTASSIUM, TOTAL	0001	S	mG/Kg	.1	836.		NA	I
POTASSIUM, TOTAL	0002	S	mG/Kg	.1	562.		NA	I
POTASSIUM, TOTAL	0003	S	mG/Kg	.1	556.		NA	I
POTASSIUM, TOTAL	1002	S	mG/Kg	.1	800.		NA	I
PYRENE	0001	S	mG/Kg	0.38	3.1	J	1.1E+00	I
SILVER, TOTAL	0001	S	mG/Kg	.01	15.2	J	1.4E+03	I
SILVER, TOTAL	0002	S	mG/Kg	.01	16.0	J	1.4E+03	I
SILVER, TOTAL	0003	S	mG/Kg	.01	15.3	J	1.4E+03	I
SILVER, TOTAL	1002	S	mG/Kg	.01	17.0	J	1.4E+03	I

PRG - Preliminary Remediation Goals (Risk Based)  
 J - The associated value is an estimated quantity  
 I - Initial Analysis  
 S - Soil  
 mG/Kg - Milligrams per Kilogram  
 (1) - This includes laboratory results that were not qualified from data validation, but were accepted by data validators

General  
 Chemistry

TABLE III.20  
 AREA C DRUM STAGING AREA  
 Location: AHD33-0069  
 Summary of analytical data  
 for analyte concentrations  
 above reporting limits  
 Report Date: 03/05/93

Parameter	Sample Id	Matrix	Units of Measure	Laboratory Reporting Limit	Validated Result (1)	Data Validation Qualifier	PRG	Run Type
IRON, TOTAL	0001	S	mG/Kg	1.	8870.		NA	I
IRON, TOTAL	0002	S	mG/Kg	1.	13300.		NA	I
IRON, TOTAL	0003	S	mG/Kg	1.	12000.		NA	I
IRON, TOTAL	1001	S	mG/Kg	1.	10000.		NA	I
LEAD, TOTAL	0001	S	mG/Kg	.2	12.6	J	5.3E+01	I
LEAD, TOTAL	0002	S	mG/Kg	.2	6.9	J	5.3E+01	I
LEAD, TOTAL	0003	S	mG/Kg	.2	6.5	J	5.3E+01	I
LEAD, TOTAL	1001	S	mG/Kg	.2	13.2	J	5.3E+01	I
MAGNESIUM, TOTAL	0001	S	mG/Kg	5.	24600.	J	NA	I
MAGNESIUM, TOTAL	0002	S	mG/Kg	5.	32600.	J	NA	I
MAGNESIUM, TOTAL	0003	S	mG/Kg	5.	46000.	J	NA	I
MAGNESIUM, TOTAL	1001	S	mG/Kg	5.	23400.	J	NA	I
MANGANESE, TOTAL	0001	S	mG/Kg	.2	356.	J	2.7E+04	I
MANGANESE, TOTAL	0002	S	mG/Kg	.2	304.	J	2.7E+04	I
MANGANESE, TOTAL	0003	S	mG/Kg	.2	254.	J	2.7E+04	I
MANGANESE, TOTAL	1001	S	mG/Kg	.2	336.	J	2.7E+04	I
NICKEL, TOTAL	0001	S	mG/Kg	2.	15.8		5.4E+03	I
NICKEL, TOTAL	0002	S	mG/Kg	2.	20.2		5.4E+03	I
NICKEL, TOTAL	0003	S	mG/Kg	2.	22.5		5.4E+03	I
NICKEL, TOTAL	1001	S	mG/Kg	2.	17.3		5.4E+03	I
POTASSIUM, TOTAL	0001	S	mG/Kg	10.	619.		NA	I
POTASSIUM, TOTAL	0002	S	mG/Kg	10.	487.		NA	I
POTASSIUM, TOTAL	0003	S	mG/Kg	10.	587.		NA	I
POTASSIUM, TOTAL	1001	S	mG/Kg	10.	703.		NA	I
SILVER, TOTAL	0001	S	mG/Kg	1.	16.2	J	1.4E+03	I
SILVER, TOTAL	0002	S	mG/Kg	1.	13.0	J	1.4E+03	I
SILVER, TOTAL	0003	S	mG/Kg	1.	14.3	J	1.4E+03	I
SILVER, TOTAL	1001	S	mG/Kg	1.	14.6	J	1.4E+03	I
SODIUM, TOTAL	0001	S	mG/Kg	10.	255.		NA	I
SODIUM, TOTAL	0002	S	mG/Kg	10.	212.		NA	I
SODIUM, TOTAL	0003	S	mG/Kg	10.	222.		NA	I
SODIUM, TOTAL	1001	S	mG/Kg	10.	272.		NA	I
VANADIUM, TOTAL	0001	S	mG/Kg	1.	21.9		1.9E+03	I
VANADIUM, TOTAL	0002	S	mG/Kg	1.	22.5		1.9E+03	I
VANADIUM, TOTAL	0003	S	mG/Kg	1.	22.3		1.9E+03	I
VANADIUM, TOTAL	1001	S	mG/Kg	1.	21.		1.9E+03	I
ZINC, TOTAL	0001	S	mG/Kg	.5	35.2	J	5.4E+04	I
ZINC, TOTAL	0002	S	mG/Kg	.5	34.4	J	5.4E+04	I
ZINC, TOTAL	0003	S	mG/Kg	.5	36.1	J	5.4E+04	I
ZINC, TOTAL	1001	S	mG/Kg	.5	40.1	J	5.4E+04	I

- PRG - Preliminary Remediation Goals (Risk Based)
- J - The associated value is an estimated quantity
- I - Initial Analysis
- S - Soil
- mG/Kg - Milligrams per Kilogram
- (1) - This includes laboratory results that were not qualified from data validation, but were accepted by data validators

**General  
Chemistry**

TABLE III.20  
 AREA C DRUM STAGING AREA  
 Location: MND33-0070  
 Summary of analytical data  
 for analyte concentrations  
 above reporting limits  
 Report Date: 03/05/93

Parameter	Sample Id	Matrix	Units of Measure	Laboratory Reporting Limit	Validated Result (1)	Data Validation Qualifier	PRG	Run Type
1,1,2-TRICHLOROETHANE	0002	S	mG/Kg	0.006	0.01	J	1.1E+01	I
ALUMINUM, TOTAL	0001	S	mG/Kg	.06	4430.		7.8E+05	I
ALUMINUM, TOTAL	0002	S	mG/Kg	.06	3880.		7.8E+05	I
ALUMINUM, TOTAL	0003	S	mG/Kg	.06	3220.		7.8E+05	I
ALUMINUM, TOTAL	1002	S	mG/Kg	.06	4730.		7.8E+05	I
ANTHRACENE	0001	S	mG/Kg	0.38	0.46	J	8.1E+04	I
ANTIMONY, TOTAL	0001	S	mG/Kg	.03	21.6	J	1.1E+02	I
ANTIMONY, TOTAL	0002	S	mG/Kg	.03	30.7	J	1.1E+02	I
ANTIMONY, TOTAL	0003	S	mG/Kg	.03	27.3	J	1.1E+02	I
ANTIMONY, TOTAL	1002	S	mG/Kg	.03	26.3	J	1.1E+02	I
ARSENIC, TOTAL	0001	S	mG/Kg	.002	3.1	J	2.1E+03	I
ARSENIC, TOTAL	0002	S	mG/Kg	.002	5.8	J	2.1E+03	I
ARSENIC, TOTAL	0003	S	mG/Kg	.002	4.6	J	2.1E+03	I
ARSENIC, TOTAL	1002	S	mG/Kg	.002	4.2	J	2.1E+03	I
BARIUM, TOTAL	0001	S	mG/Kg	.002	66.6		1.9E+04	I
BARIUM, TOTAL	0002	S	mG/Kg	.002	29.7		1.9E+04	I
BARIUM, TOTAL	0003	S	mG/Kg	.002	41.4		1.9E+04	I
BARIUM, TOTAL	1002	S	mG/Kg	.002	31.6		1.9E+04	I
BENZO(A)ANTHRACENE	0001	S	mG/Kg	0.38	1.5	J	6.0E-01	I
BENZO(A)PYRENE	0001	S	mG/Kg	0.38	1.2	J	8.8E-02	I
BENZO(B)FLUORANTHENE	0001	S	mG/Kg	0.38	2.	J	6.4E-01	I
BENZO(G,H,I)PERYLENE	0001	S	mG/Kg	0.38	1.1	J	4.0E+00	I
BERYLLIUM	0001	S	mG/Kg	.002	.61		1.5E-01	I
BERYLLIUM	0002	S	mG/Kg	.002	.63		1.5E-01	I
BERYLLIUM	0003	S	mG/Kg	.002	.56		1.5E-01	I
BERYLLIUM	1002	S	mG/Kg	.002	.69		1.5E-01	I
CADMIUM, TOTAL	0001	S	mG/Kg	.002	3.7		1.4E+02	I
CADMIUM, TOTAL	0002	S	mG/Kg	.002	5.8		1.4E+02	I
CADMIUM, TOTAL	0003	S	mG/Kg	.002	4.8		1.4E+02	I
CADMIUM, TOTAL	1002	S	mG/Kg	.002	5.2		1.4E+02	I
CALCIUM, TOTAL	0001	S	mG/Kg	.02	109000.		NA	I
CALCIUM, TOTAL	0002	S	mG/Kg	.02	107000.		NA	I
CALCIUM, TOTAL	0003	S	mG/Kg	.02	106000.		NA	I
CALCIUM, TOTAL	1002	S	mG/Kg	.02	139000.		NA	I
CHROMIUM, TOTAL	0001	S	mG/Kg	.01	23.6		1.4E+03	I
CHROMIUM, TOTAL	0002	S	mG/Kg	.01	24.5		1.4E+03	I
CHROMIUM, TOTAL	0003	S	mG/Kg	.01	22.7		1.4E+03	I
CHROMIUM, TOTAL	1002	S	mG/Kg	.01	26.2		1.4E+03	I
CHRYSENE	0001	S	mG/Kg	0.38	1.9	J	2.0E+01	I
COBALT, TOTAL	0001	S	mG/Kg	.01	7.5		3.9E+01	I

PRG - Preliminary Remediation Goals (Risk Based)  
 J - The associated value is an estimated quantity  
 I - Initial Analysis  
 S - Soil  
 mG/Kg - Milligrams per Kilogram  
 (1) - This includes laboratory results that were not qualified from data validation, but were accepted by data validators

General  
 Chemistry



TABLE III.20  
**AREA C DRUM STAGING AREA**  
 Location: MND33-0070  
 Summary of analytical data  
 for analyte concentrations  
 above reporting limits  
 Report Date: 03/05/93

Parameter	Sample Id	Matrix	Units of Measure	Laboratory Reporting Limit	Validated Result (1)	Data Validation Qualifier	PRG	Run Type
SODIUM, TOTAL	0001	S	mG/Kg	.1	205.		NA	I
SODIUM, TOTAL	0002	S	mG/Kg	.1	219.		NA	I
SODIUM, TOTAL	0003	S	mG/Kg	.1	160.		NA	I
SODIUM, TOTAL	1002	S	mG/Kg	.1	215.		NA	I
TRICHLOROETHENE	0002	S	mG/Kg	0.006	0.01	J	5.8E+01	I
TRICHLOROETHENE	0003	S	mG/Kg	0.006	0.009		5.8E+01	I
VANADIUM, TOTAL	0001	S	mG/Kg	.01	19.		1.9E+03	I
VANADIUM, TOTAL	0002	S	mG/Kg	.01	22.1		1.9E+03	I
VANADIUM, TOTAL	0003	S	mG/Kg	.01	19.5		1.9E+03	I
VANADIUM, TOTAL	1002	S	mG/Kg	.01	23.4		1.9E+03	I
ZINC, TOTAL	0001	S	mG/Kg	.005	62.5	J	5.4E+04	I
ZINC, TOTAL	0002	S	mG/Kg	.005	32.9	J	5.4E+04	I
ZINC, TOTAL	0003	S	mG/Kg	.005	29.0	J	5.4E+04	I
ZINC, TOTAL	1002	S	mG/Kg	.005	33.6	J	5.4E+04	I

- PRG - Preliminary Remediation Goals (Risk Based)
- J - The associated value is an estimated quantity
- I - Initial Analysis
- S - Soil
- mG/Kg - Milligrams per Kilogram
- (1) - This includes laboratory results that were not qualified from data validation, but were accepted by data validators

**General  
Chemistry**

Environmental Restoration Program

**OPERABLE UNIT 9,  
SITE SCOPING REPORT  
VOLUME 6 - PHOTO HISTORY REPORT**

**MOUND PLANT  
MIAMISBURG, OHIO**

**February 1992**

**FINAL**

**Department of Energy  
Albuquerque Field Office**

Environmental Restoration Program  
Technical Support Office  
Los Alamos National Laboratory



Building 34 is established in the clearing south of the drainage in the 1968 photograph (Figure 4.11). The large cleared surface to the east in the 1964 photograph now appears smaller in areal extent and includes areas of disturbance or vegetation near the center. Farther to the west of the cleared surface holding Building 34 is an area of disturbed soil, possibly on a slope, bordering a small, semi-circular, flat, cleared surface. The straight, upslope edge of the semicircle is backed by a linear east-west excavation, possibly in the form of a retaining wall. A small circular depression is visible on the northwestern edge of this cleared surface. Three areas of disturbed soil lie to the north of the main road (Figure 4.11). Former storage areas to the north of the drainage ditch appear to be cleared. Building 27 is established by 1968. A new drum storage area is located to the northwest of Building 27 at a road intersection. The large drum storage area evident in the 1964 aerial photograph south of the railroad, is cleared and its surface expanded. No containers are evident. It is bordered on the south by a disturbed surface and slope and is cut on the west by a short drainage channel.

In 1973, a second building is present to the east of Building 34 (Figure 4.12). The western end of the surface has been cleared and contains some stored material or possibly a small structure. Farther to the west, the area that appeared as a small, flat, cleared surface in the 1968 photograph is heavily vegetated and may have been sloped to meet the retaining wall, which is no longer visible. The clearing on the slope to the east of Building 34 shows major disturbance and possible debris. To the northwest of this feature is a short trench lying just off the road. North of the drainage ditch, a formal parking lot has been established on the site of the large drum storage area evident in the 1964 photograph. This lot is bordered by a cleared, disturbed surface.

In the 1975 photograph, a weir and dam or outfall structures on the lower reach of the plant drainage ditch are evident (Figure 4.13). The clearing that includes Building 34 appears formally established. Two smaller clearings to the west of the Building 34 complex and east of the dam, contain disturbed surfaces with the lower of the two containing some debris. A larger disturbed area to the east of Building 34 shows surface discoloration and a linear pattern that may indicate initial incision of west-flowing drainages. A storage area bordered on the south by a disturbed surface is evident south of Building 27 and the plant drainage ditch. North of the drainage ditch, tributary drainages appear to have been established that flow south of the disturbed surface bordering the parking lot south of the railroad tracks. A debris pile is situated at the southern edge of this surface. Building 18 was constructed by 1975. Some type of storage area is apparent south of Building 19.

By 1979, retention basins have been constructed on the lower reach of the drainage ditch (Figure 4.14). The cleared area to the east of Building 34 is heavily vegetated but does show evidence of former disturbance. It is now bordered on three sides by a dirt road. Two storage areas are located to the northeast of this cleared area (south of the Building 27 and the drainage ditch). Drums and other materials



are evident. North of the drainage ditch, the cleared surface southwest of the parking lot in the 1975 photograph is still present, as is the pile of materials visible in the 1975 photograph on its southern edge. Short drainages flow south from this surface. Disturbed soils are evident near the present location of Building 94, possibly in preparation for construction. Considerable construction that is not mapped has taken place north of the drainage ditch (Figure 4.14).

In 1981 photographs, the area of the hillslope east of Building 34 has been graded and planted, or naturally re-vegetated (Figure 4.15). A small area of former disturbance is still evident here. Storage areas (south of Building 27 and the drainage ditch) are still in active use. The cleared surface and pile north of the drainage ditch remain evident.

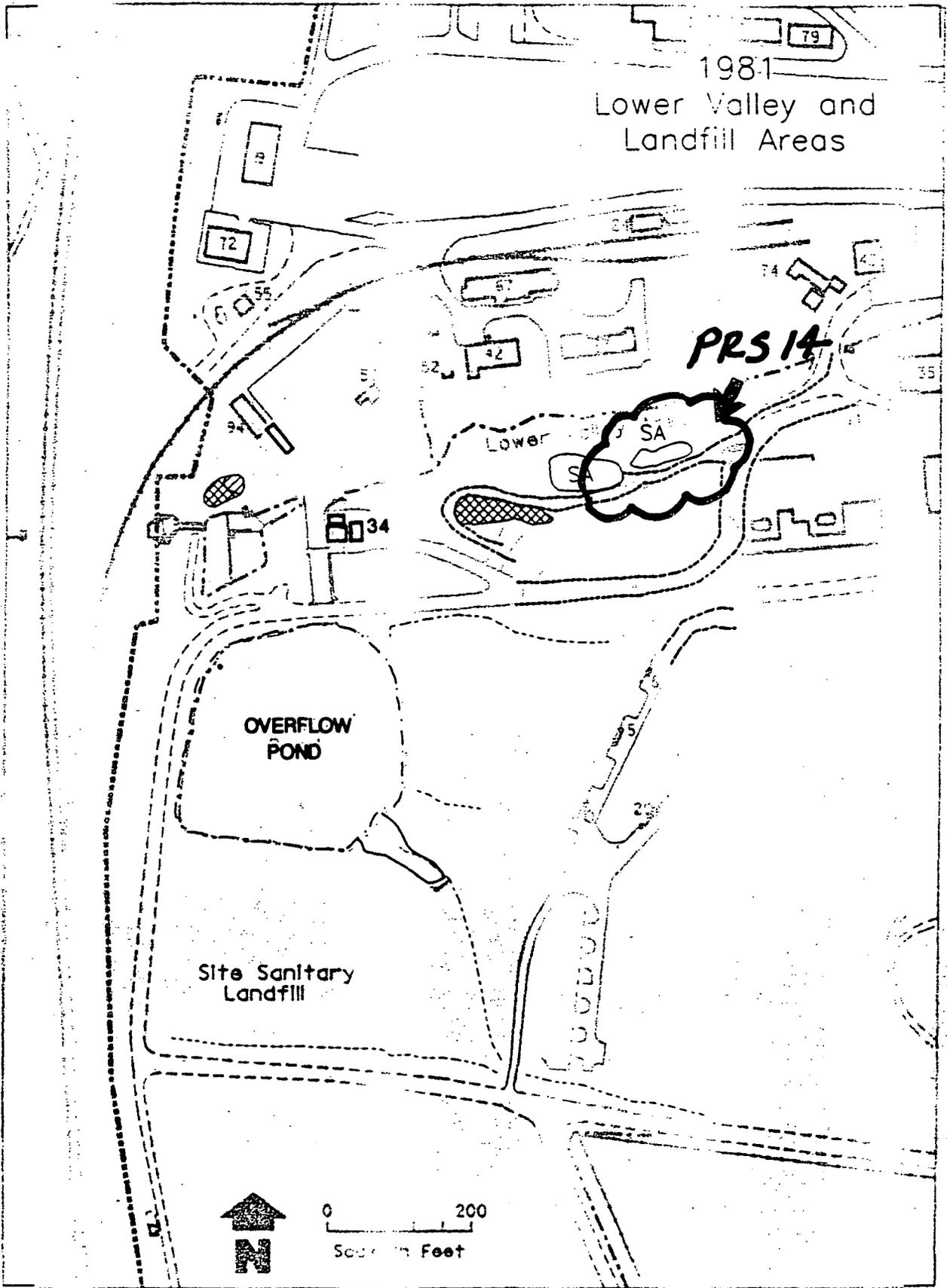


Figure 4.15. Interpretive map of Southern Study Area - 1981.

Environmental Restoration Program

**OPERABLE UNIT 9, SITE SCOPING REPORT  
VOLUME 3 - RADIOLOGICAL SITE SURVEY**

**MOUND PLANT  
MIAMISBURG, OHIO**

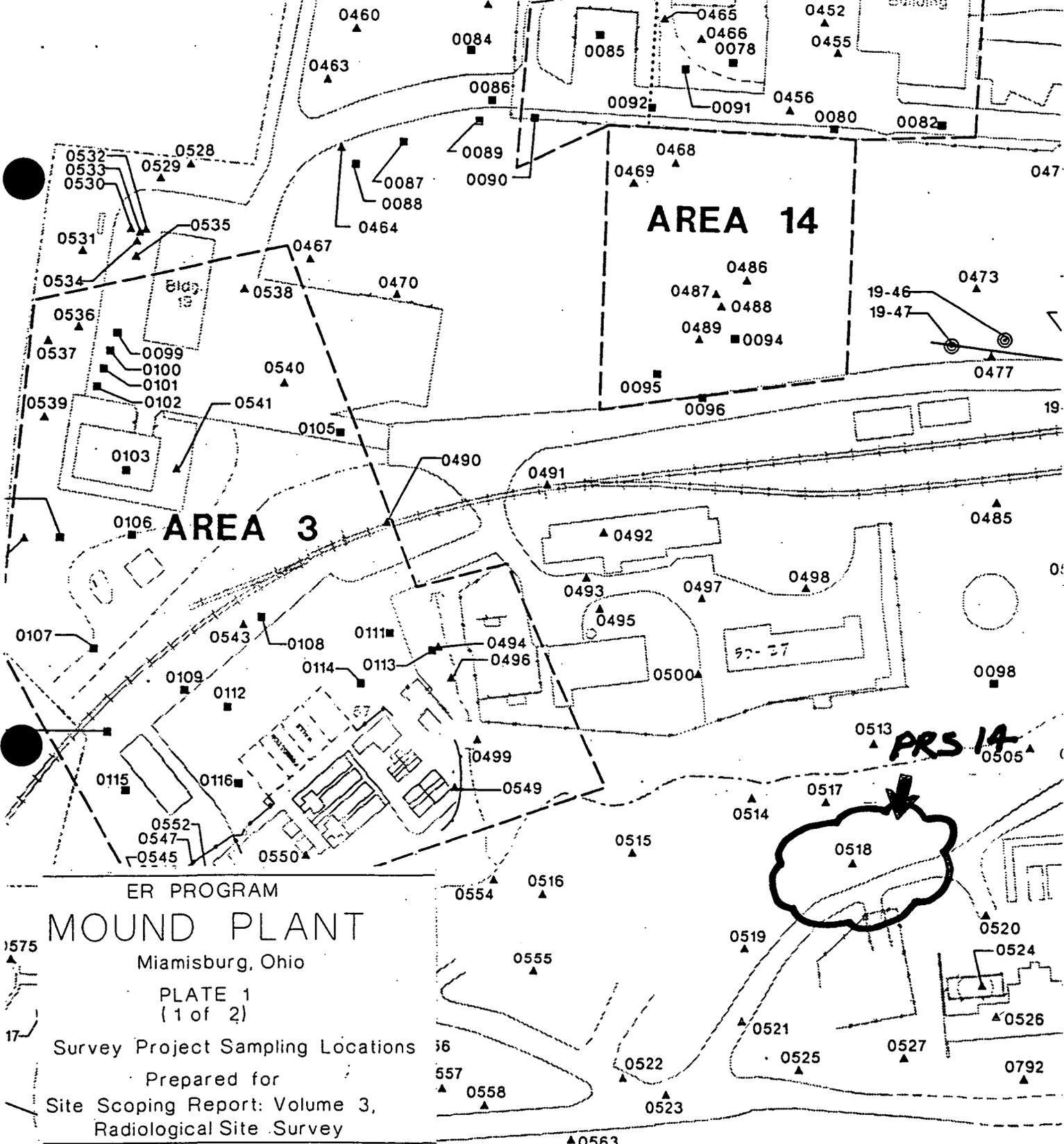
June 1993

**FINAL**

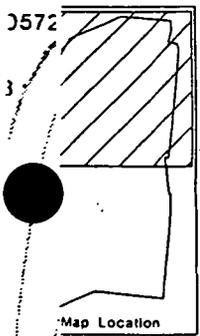
**Department of Energy  
Albuquerque Field Office**

Environmental Restoration Program  
EG&G Mound Applied Technologies





ER PROGRAM  
**MOUND PLANT**  
 Miamisburg, Ohio  
 PLATE 1  
 (1 of 2)  
 Survey Project Sampling Locations  
 Prepared for  
 Site Scoping Report: Volume 3,  
 Radiological Site Survey



- Legend
- Structure
  - Paved road
  - Dirt road
  - Water
  - Mound Plant Boundary
  - Surface Location
  - Core Location
  - Potential Release Site
  - Elevated Activity
  - Sampling Location for Verification Survey of Former WTS Pipeline

0858

0812

0811

0813

0810

0809

0808

0807

0567

0566

0558

0562

0557

0554

0555

0516

0515

0514

0517

0518

0519

0522

0523

0525

0521

0527

0792

0526

0524

0520

0505

**PRS 14**

0098

0485

19-

0473

19-46

19-47

**AREA 14**

**AREA 3**

047

0082

0080

0456

0091

0092

0085

0084

0463

0460

0452

0455

0466

0078

0086

0089

0090

0464

0470

0538

0540

0541

0105

0103

0106

0107

0537

0536

0534

0531

0532

0533

0530

0535

0539

0099

0100

0101

0102

0543

0108

0111

0113

0114

0109

0112

0115

0116

0552

0547

0545

0550

0499

0549

0554

0555

0558

0562

0567

0808

0811

0812

0492

0493

0495

0494

0496

0499

0549

0515

0516

0555

0522

0523

0563

0564

0565

0566

0568

0807

0808

0813

0468

0469

0486

0487

0488

0489

0095

0096

0491

0492

0493

0495

0494

0496

0499

0549

0515

0516

0555

0522

0523

0563

0564

0565

0566

0568

0807

0808

0813

0452

0455

0456

0486

0487

0488

0489

0095

0096

0491

0492

0493

0495

0494

0496

0499

0549

0515

0516

0555

0522

0523

0563

0564

0565

0566

0568

0807

0808

0813

19-46

19-47

19-

0485

0098

0513

0517

0518

0519

0521

0525

0527

0793

0794

0799

0799

0799

0799

0799

0799

0473

0477

0485

0098

0513

0517

0518

0519

0521

0525

0527

0793

0794

0799

0799

0799

0799

0799

0799

Map Location <sup>a</sup>	Coordinates		MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium <sup>b</sup> (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
S0508	2575	3430	5882	07-84	0	2.83 <sup>c</sup>	b					
S0509	2575	3680	5885	07-84	0	2.24	b					
S0510	2625	3580	2990	10-83	0	0.13 <sup>c</sup>	b	0.19				
S0511	2625	3730	2991	10-83	0	0.89	b	1.52				
S0512	2675	3380	2988	10-83	0	0.03	b					
S0457	2675	3405	2989	10-83	0	0.25 <sup>c</sup>	b					
C0098	2470	3760	7755	10-84	90	0.16	b					
			7756	10-84	180	0.02	b					
S0513	2475	3860	5888	07-84	0	4.57	b					
S0514	2475	3960	5896	07-84	0	0.17	b					
S0515	2475	4060	5895	07-84	0	0.26	b					
S0516	2475	4135	5894	07-84	0	1.31	b					
S0517	2500	3910	5897	07-84	0	1.43	b					
S0518	2550	3910	5898	07-84	0	1.12	b					
S0519	2575	4010	2689	09-83	0	7.28 <sup>c</sup>	b					
S0520	2625	3835	2688	09-83	0	0.03	b					

<sup>a</sup>C denotes core location and S denotes surface sample location on Plate 1.

<sup>b</sup>Thorium results of  $\leq 2$  pCi/g are listed as "b".

<sup>c</sup>Verification sample analyzed for QA/QC.

<sup>d</sup>No MRC ID assigned because *in situ* gamma spectrometry was performed for thorium-232.

<sup>e</sup>Gamma results could not be confirmed using the gamma spectroscopy printout given in this appendix.

<sup>f</sup>The depth for this sample was given as "SS". For mapping purposes (Plates 1 and 5), this is assumed to be a surface sample.

<sup>g</sup>Sample results were given isotopically for this sample and included 0.99 pCi/g thorium-228; 321 pCi/g thorium-230; and 1.5 pCi/g thorium-232, for a total of 323.5 pCi/g.

## GAMMA SPECTROSCOPY

ENVIRONMENTAL RESTORATION PROGRAM

SOIL GAS SURVEY AND GEOPHYSICAL INVESTIGATIONS  
MAIN HILL AND SM/PP HILL AREAS  
RECONNAISSANCE SAMPLING

MOUND PLANT  
MIAMISBURG, OHIO

February 1993

DEPARTMENT OF ENERGY  
ALBUQUERQUE OFFICE

ENVIRONMENTAL RESTORATION PROGRAM  
EG&G MOUND APPLIED TECHNOLOGIES

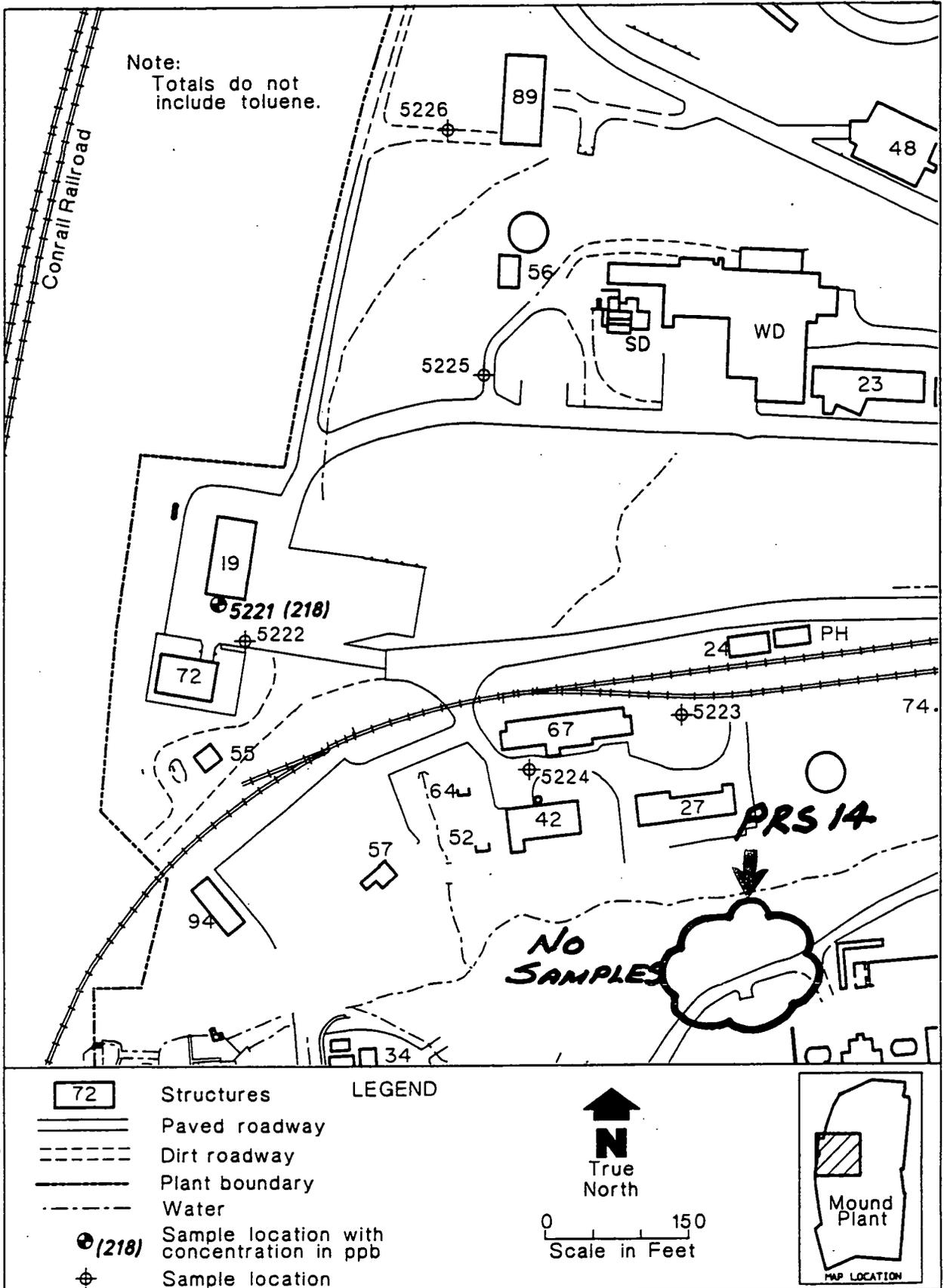


Figure 2.42. Total VOCs detection map for southwest of Main Hill.

Environmental Restoration Program

**OPERABLE UNIT 5  
OPERATIONAL AREA PHASE I INVESTIGATION  
NON-AOC FIELD REPORT**

**MOUND PLANT  
MIAMISBURG, OHIO**

**VOLUME II - APPENDICES A-G**

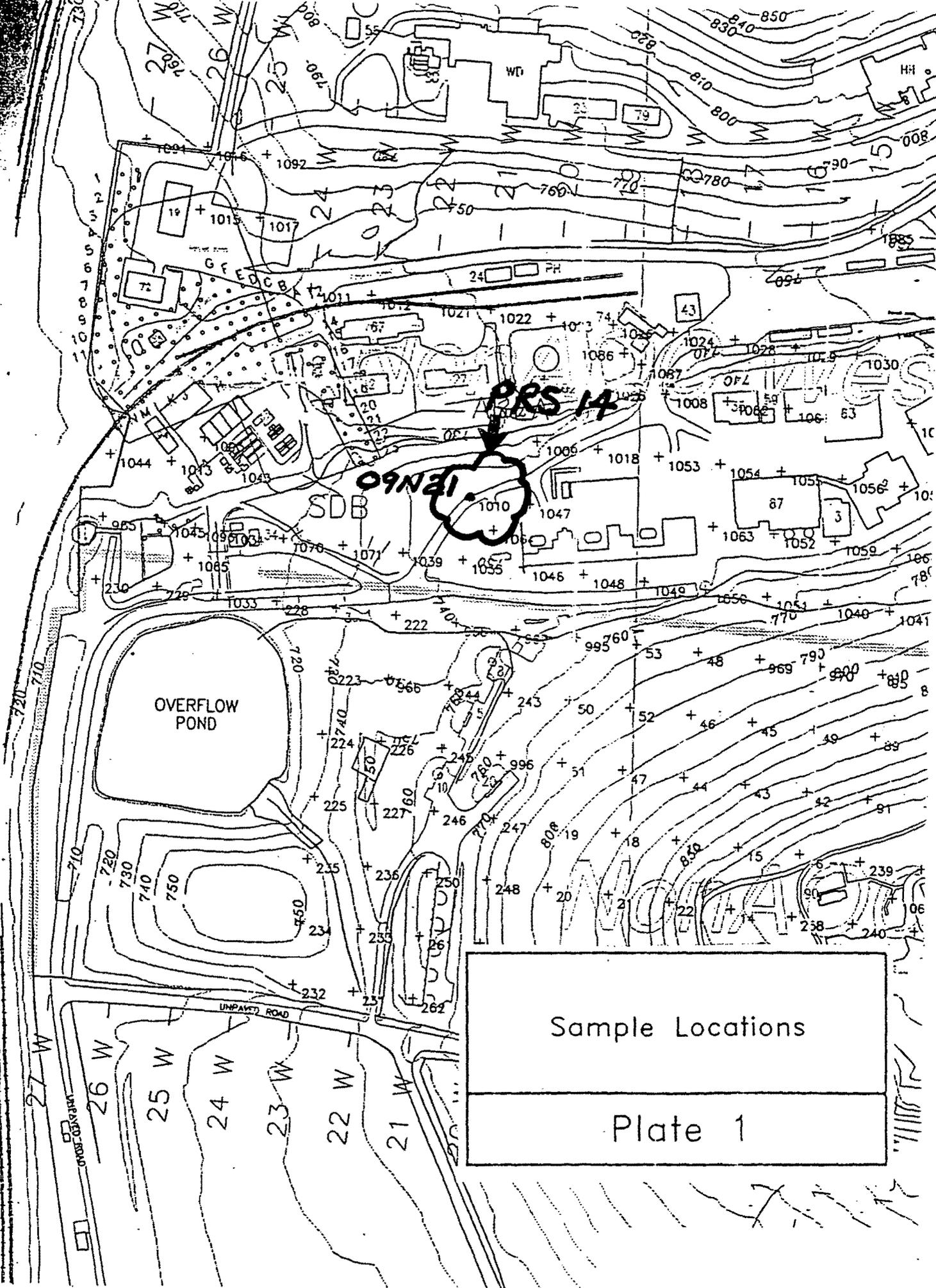
June 1995

Final (Revision 0)

U.S. Department of Energy  
Ohio Field Office



EG&G Mound Applied Technologies



Sample Locations

Plate 1

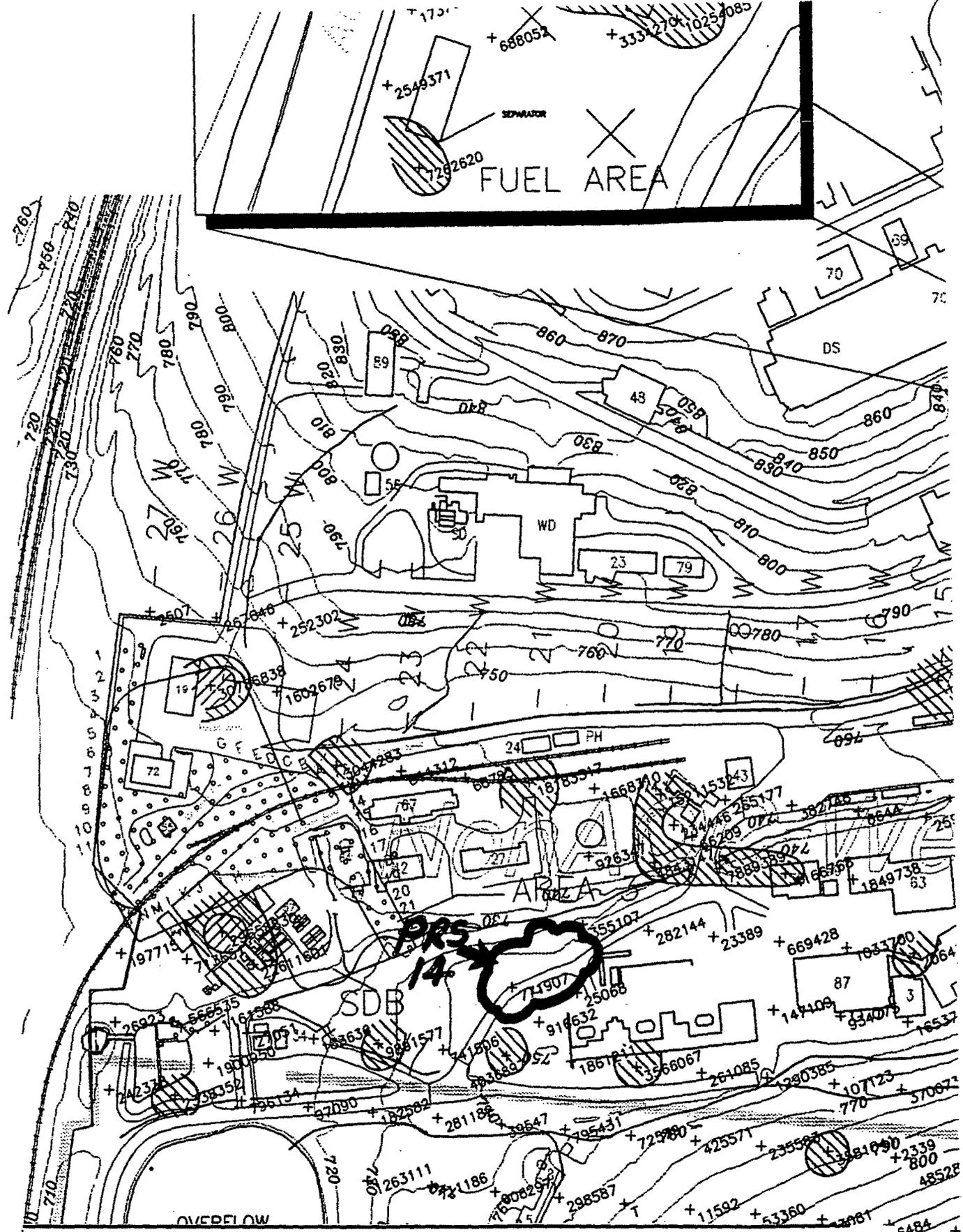
APPENDIX D

RADIOLOGICAL DATA (FIDLER SURVEY MOUND SOIL SCREENING FACILITY DATA) FOR NON-AOC POINTS

SMPID	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
09N10	213.2	90	13.13	10.0	NC	25	b	0.9	a
09N11	213.2	70	13.13	4.5	NC	8	a	0.9	a
09N12	213.2	140	13.13	9.0	NC	18	a	1.2	a
09N13	213.2	140	13.13	9.0	NC	7	a	1.5	a
09N14	130	110	6.5	6.0	NC	14	a	0.8	a
09N15	130	105	6.5	6.0	NC	7	a	0.8	a
09N16	130	60	6.5	4.5	NC	11	a	0.6	a
09N17	130	80	6.5	4.5	NC	2	a	1.1	a
09N18	130	80	6.5	4.5	NC	NC		NC	
09N19	130	70	6.5	4.0	NC	NC		NC	
09N20	130	75	6.5	4.5	NC	NR		NR	
09N21	157.3	95	8.45	4.0	NC	NR		NR	
09N22	117.0	80	8.71	6.0	NC	NC		NC	
09N25	157.3	50	8.45	4.0	NC	WIPE	c	WIPE	c
09N26	157.3	80	8.45	4.0	NC	NR		NR	
09N27	143	100	6.63	7.5	NC	13	a	0.6	a
10N01	253.5	180	12.48	9.5	NC	4	a	1	a
10N02	122.2	100	5.59	4.0	NC	WIPE	c	WIPE	c
10N03	130	90	6.5	5.0	NC	WIPE	c	WIPE	c
10N04	130	80	6.5	3.0	NC	1	a	0	a
10N05	122.2	85	5.59	5.0	NC	11	a	0.9	a
10N10	213.2	70	13.13	8.5	NC	12	a	0.8	a
10N11	213.2	110	13.13	6.5	NC	2	a	0.6	a
10N12	213.2	90	13.13	9.5	NC	21	a	1.1	a
10N13	130	115	6.5	5.5	NC	4	a	0.9	a
10N14	130	50	6.5	4.5	NC	0	a	0	a
10N15	130	85	6.5	5.0	NC	0	a	0.6	a
10N16	130	60	6.5	4.0	NC	WIPE	c	WIPE	c
10N17	130	80	6.5	6.0	NC	0	a	0	a





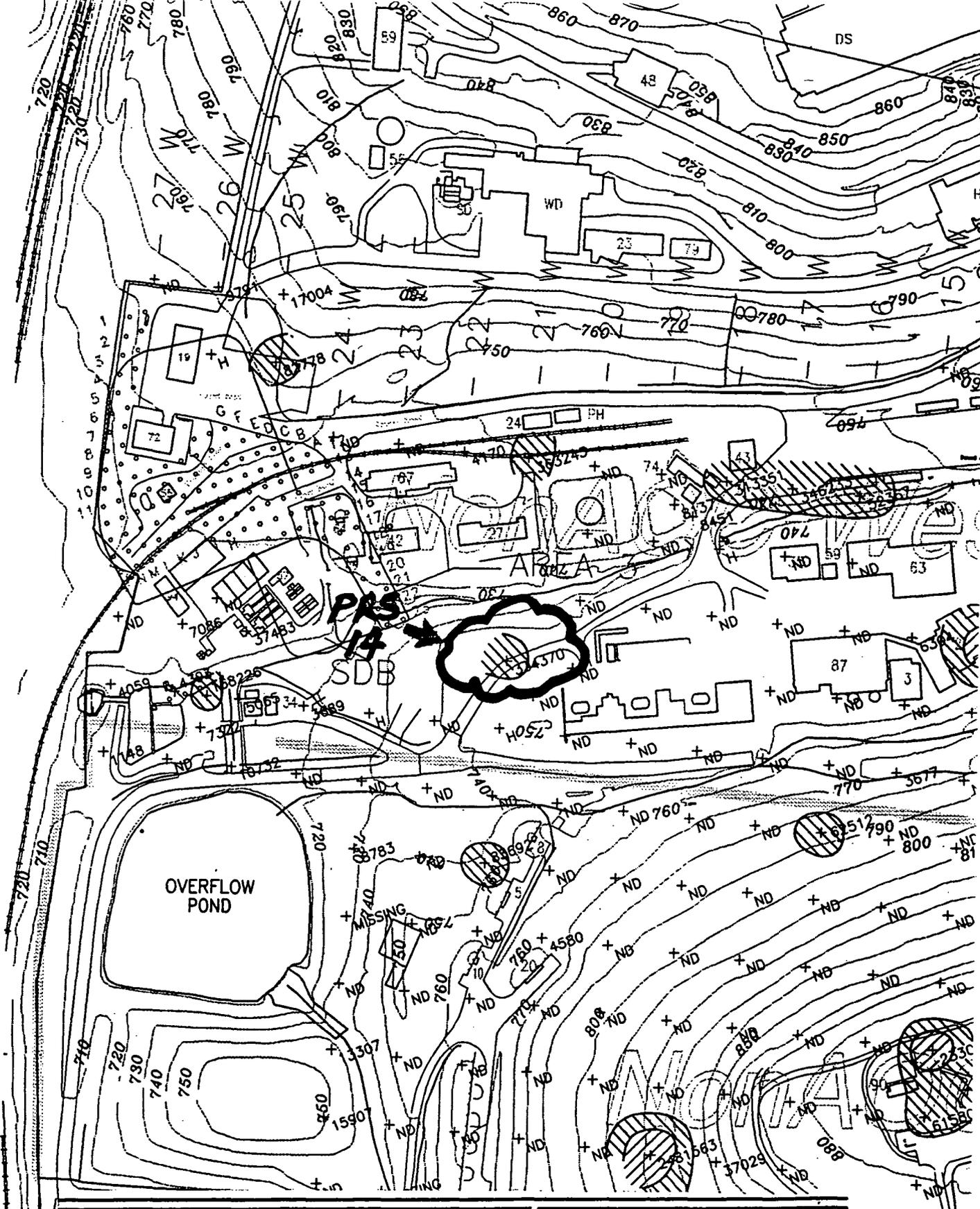


Features:

- + PETREX Sample Location
- T Denotes interference by terpenes; see text.

Relative Response  
 Total C5-C11  
 Petroleum Hydrocarbons

Plate 4



Features:  
 + PETREX Sample Location  
 ND Not Detected  
 H Denotes interference by petroleum hydrocarbons; see text.

Relative Response  
 Total Halogenated  
 Hydrocarbons

Plate 5

Environmental Restoration Program

# Operable Unit 9 Hydrogeologic Investigation: Groundwater Sweeps Report

**MOUND PLANT  
MIAMISBURG, OHIO**

April 1995

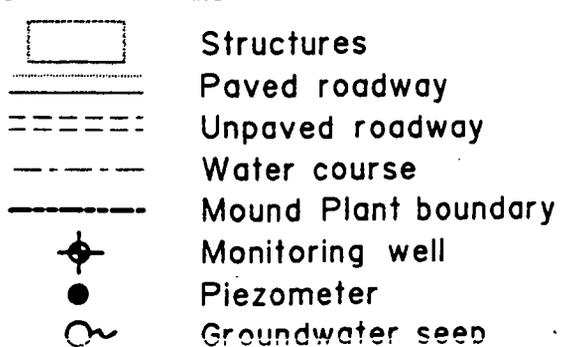
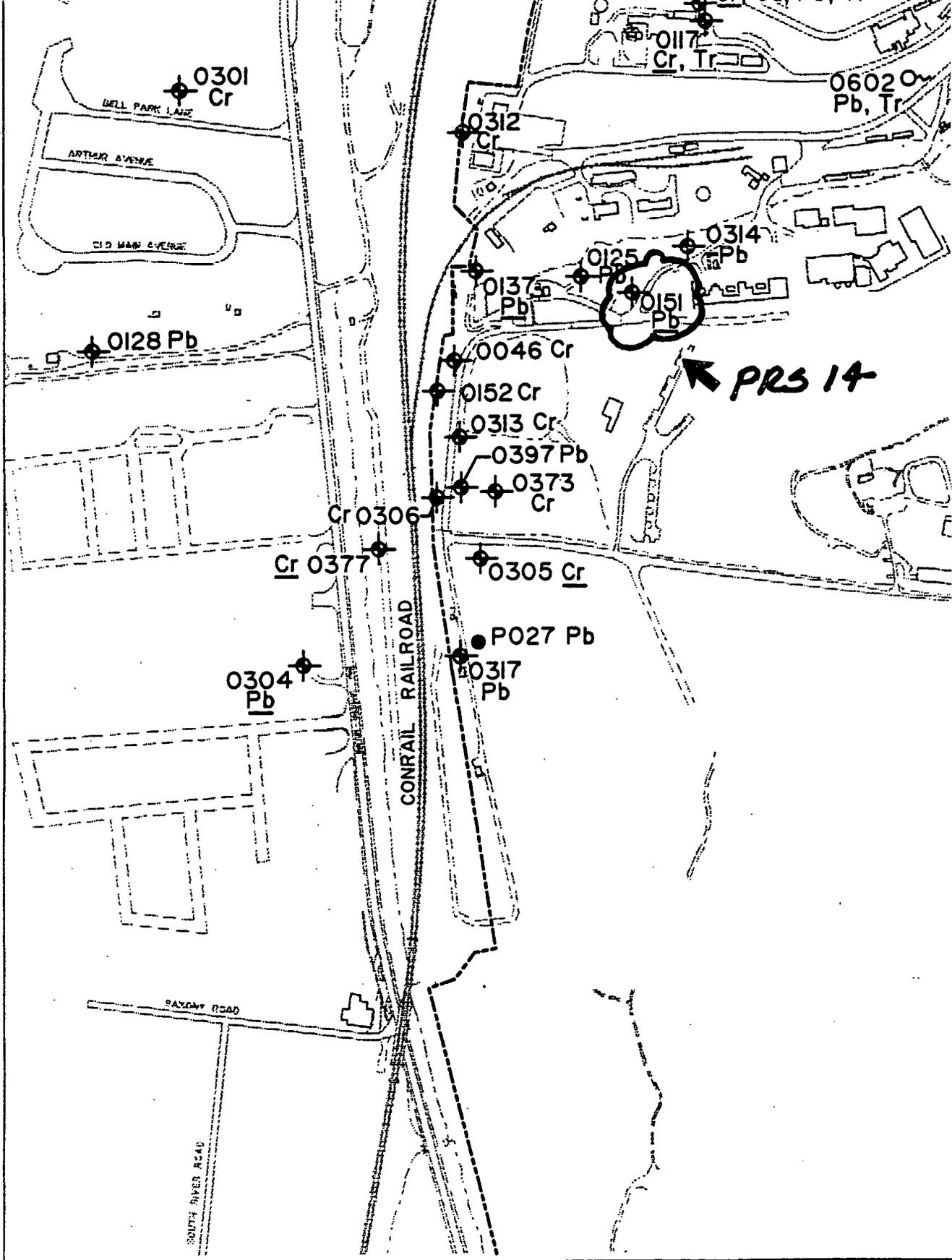
**Technical Memorandum  
(Revision 1)**

**U.S. Department of Energy  
Ohio Field Office**

EG&G Mound Applied Technologies



**Figure 3.1. Detections of Metals Above Maximum Contaminant Levels**



**LEGEND**

Table C.1. Detections Above Maximum Contaminant Levels

Parameter ( $\mu\text{g/L}$ ) <sup>a</sup>	Location	Log Date	Result	MCL
1,2-cis-Dichloroethene	0370-0001	09/24/93	190.	70
	0370-1001	03/08/94	J 480.	70
	P015-0001	03/25/94	120.	70
Arsenic, total	0335-0001	04/01/94	58.0	50
Cadmium, total	0120-0001	10/14/93	J 13.1	5
Chloroethene (vinyl chloride)	P015-0001	03/25/94	17.	2
Chromium, soluble	0312-0001	04/13/94	8950.	100
	0373-0001	03/16/94	115.	100
Chromium, total	0115-0001	10/12/93	J 6060.	100
	0115-0001	03/22/94	2950.	100
	0117-0001	10/13/93	J 2870.	100
	0117-0001	04/14/94	J 2980.	100
	0120-0001	10/14/93	J 15100.	100
	0120-0001	04/14/94	J 2600.	100
	0152-0001	09/12/93	J 374.	100
	0301-0001	09/24/93	104.	100
	0305-0001	09/11/93	J 494.	100
	0305-0001	03/10/94	273.	100
	0306-0001	09/11/93	122.	100
	0312-0001	09/24/93	8190.	100
	0313-0001	09/13/93	258.	100
	0313-0001	03/17/94	820.	100
	0327-0001	09/27/93	J 177.	100
	0373-0001	03/16/94	228.	100
	0377-0001	09/26/93	174.	100
	0377-1001	09/26/93	191.	100
	0377-0001	03/28/94	415.	100
	0379-0001	03/15/94	104.	100
0388-0001	03/28/94	J 171.	100	
Lead, soluble	0128-1001	09/24/93	J 43.9	15
	0304-0001	04/05/94	23.7	15
	0382-0001	03/17/94	40.4	15
Lead, total	0046-0001	10/13/93	J 15.8	15
	0120-0001	10/14/93	J 26.4	15
	0125-0001	09/24/93	J 17.8	15
	0128-1001	04/04/94	J 44.4	15
	0137-0001	09/27/93	23.8	15
	0137-0001	03/28/94	18.4	15
	0151-0001	10/15/93	17.2	15
	0304-0001	09/16/93	J 43.0	15
	0304-0001	04/05/94	J 51.0	15
	0314-0001	03/16/94	J 22.4	15
0317-1001	03/16/94	J 24.4	15	



GROUNDWATER QUALITY DATA BY LOCATION  
 SITE: SWP99 GROUNDWATER SWEEPS  
 LOCATION: 0151 44-1  
 NORTH COORDINATE: 597273.77 FT  
 EAST COORDINATE: 1495544.31 FT  
 03/08/94 TO 04/14/94  
 REPORT DATE: 04/03/95

FORMATION OF COMPLETION: CLAYEY SAND OR CLAYEY GRAVELLY SAND (SC)  
 HYDRAULIC FLOW RELATIONSHIP: ON SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	LAB VALUE	PVI	VALIDATED VALUE	RUN TYPE
ALUMINUM, SOLUBLE	03/21/94	0001	UG/L		1850.		1850.	I
ALUMINUM, TOTAL	03/17/94	0001	UG/L		4430.		4430.	I
ANTIMONY, SOLUBLE	03/21/94	0001	UG/L	B	2.1		2.1	I
ARSENIC, SOLUBLE	03/21/94	0001	UG/L	B	2.1	J	2.1	I
BARIUM, SOLUBLE	03/21/94	0001	UG/L	B	48.8		48.8	I
BARIUM, TOTAL	03/17/94	0001	UG/L	B	69.7	J	69.7	I
BISMUTH, SOLUBLE	03/21/94	0001	UG/L	B	35.8		35.8	I
CALCIUM, SOLUBLE	03/21/94	0001	UG/L		76000.		76000.	I
CALCIUM, TOTAL	03/17/94	0001	UG/L		90500.		90500.	I
CHLORIDE	03/17/94	0001	MG/L		8.8		8.8	I
CHROMIUM, SOLUBLE	03/21/94	0001	UG/L	B	7.9		7.9	I
CHROMIUM, TOTAL	03/17/94	0001	UG/L		14.7		14.7	I
COPPER, SOLUBLE	03/21/94	0001	UG/L	B	6.3		6.3	I
COPPER, TOTAL	03/17/94	0001	UG/L	B	17.0		17.0	I
FLUORIDE	03/17/94	0001	MG/L		1.7		1.7	I
IRON, SOLUBLE	03/21/94	0001	UG/L		3210.		3210.	I
IRON, TOTAL	03/17/94	0001	UG/L		8040.	J	8040.	I
LEAD, SOLUBLE	03/21/94	0001	UG/L	B	2.6		2.6	I
LEAD, TOTAL	03/17/94	0001	UG/L		6.1	J	6.1	I
LITHIUM, SOLUBLE	03/21/94	0001	UG/L	B	25.5		25.5	I
MAGNESIUM, SOLUBLE	03/21/94	0001	UG/L		39500.		39500.	I
MAGNESIUM, TOTAL	03/17/94	0001	UG/L		44100.	J	44100.	I
MANGANESE, SOLUBLE	03/21/94	0001	UG/L		55.2	J	55.2	I
MANGANESE, TOTAL	03/17/94	0001	UG/L		125.	J	125.	I
MOLYBDENUM	03/17/94	0001	UG/L		26.6		26.6	I
MOLYBDENUM, SOLUBLE	03/21/94	0001	UG/L		22.2		22.2	I
NICKEL, SOLUBLE	03/21/94	0001	UG/L	B	7.4		7.4	I
NICKEL, TOTAL	03/17/94	0001	UG/L	B	13.5		13.5	I
NITRATE NITRITE	03/17/94	0001	MG/L		0.040		0.040	I

PARAMETER VALUE INDICATOR (PVI): U - LESS THAN DETECTION LIMIT

GROUNDWATER QUALITY DATA BY LOCATION  
 SITE: SVP99 GROUNDWATER SWEEPS  
 LOCATION: 0151 44-1  
 NORTH COORDINATE: 597273.77 FT  
 EAST COORDINATE: 1495544.31 FT  
 03/08/94 TO 04/14/94  
 REPORT DATE: 04/03/95

FORMATION OF COMPLETION: CLAYEY SAND OR CLAYEY GRAVELLY SAND (SC)  
 HYDRAULIC FLOW RELATIONSHIP: ON SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	LAB VALUE	PVI	VALIDATED VALUE	RUN TYPE
PLUTONIUM-238	03/17/94	0001	PCI/L		0.012		0.012	I
POTASSIUM, SOLUBLE	03/21/94	0001	UG/L	B	2030.		2030.	I
POTASSIUM, TOTAL	03/17/94	0001	UG/L	B	2870.		2870.	I
RADIUM-226	03/17/94	0001	PCI/L		1.52		1.52	I
SODIUM, SOLUBLE	03/21/94	0001	UG/L		10000.		10000.	I
SODIUM, TOTAL	03/17/94	0001	UG/L		9590.	J	9590.	I
SULFATE	03/17/94	0001	MG/L		92.4		92.4	I
THORIUM-228	03/17/94	0001	PCI/L		0.080		0.080	I
THORIUM-230	03/17/94	0001	PCI/L		0.094	J	0.094	I
THORIUM-232	03/17/94	0001	PCI/L		0.021		0.021	I
TOTAL DISSOLVED SOLIDS	03/17/94	0001	MG/L		437.		437.	I
TOTAL KJELDAHL NITROGEN	03/17/94	0001	MG/L		1.4		1.4	I
TOTAL ORGANIC CARBON	03/17/94	0001	MG/L		1.1		1.1	I
TOTAL PHOSPHATE	03/17/94	0001	MG/L		0.23		0.23	I
TOTAL SUSPENDED SOLIDS	03/17/94	0001	MG/L		12.0		12.0	I
TRITIUM	03/17/94	0001	PCI/L		600.		600.	I
URANIUM-234	03/17/94	0001	PCI/L		2.27		2.27	I
URANIUM-235	03/17/94	0001	PCI/L		0.133		0.133	I
URANIUM-238	03/17/94	0001	PCI/L		1.71		1.71	I
VANADIUM, SOLUBLE	03/21/94	0001	UG/L	B	4.5		4.5	I
VANADIUM, TOTAL	03/17/94	0001	UG/L	B	9.4		9.4	I
ZINC, SOLUBLE	03/21/94	0001	UG/L		8.5		8.5	I
ZINC, TOTAL	03/17/94	0001	UG/L		25.8		25.8	I

PARAMETER VALUE INDICATOR (PVI): U - LESS THAN DETECTION LIMIT

GROUNDWATER QUALITY DATA BY LOCATION  
 SITE: SWP98 GROUNDWATER SWEEPS  
 LOCATION: 0151 44-1  
 NORTH COORDINATE: 597273.77 FT  
 EAST COORDINATE: 1495544.31 FT  
 09/10/93 TO 10/15/93  
 REPORT DATE: 04/03/95



FORMATION OF COMPLETION: CLAYEY SAND OR CLAYEY GRAVELLY SAND (SC)  
 HYDRAULIC FLOW RELATIONSHIP: ON SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	LAB VALUE	PVI	VALIDATED VALUE	RUN TYPE
ALUMINUM, SOLUBLE	10/15/93	0001	UG/L	B	14.6	J	14.6	I
ALUMINUM, TOTAL	10/15/93	0001	UG/L		5710.	J	5710.	I
ANTIMONY, SOLUBLE	10/15/93	0001	UG/L		10.6		10.6	I
ARSENIC, TOTAL	10/15/93	0001	UG/L	B	6.6		6.6	I
BARIIUM, SOLUBLE	10/15/93	0001	UG/L	B	54.7		54.7	I
BARIIUM, TOTAL	10/15/93	0001	UG/L	B	81.7		81.7	I
BERYLLIUM, TOTAL	10/15/93	0001	UG/L		0.38		0.38	I
BISMUTH, TOTAL	10/15/93	0001	UG/L	B	39.4		39.4	I
CALCIUM, SOLUBLE	10/15/93	0001	UG/L		99800.		99800.	I
CALCIUM, TOTAL	10/15/93	0001	UG/L		116000.		116000.	I
CHROMIUM, SOLUBLE	10/15/93	0001	UG/L	B	1.6	J	1.6	I
CHROMIUM, TOTAL	10/15/93	0001	UG/L		20.0	J	20.0	I
COBALT, TOTAL	10/15/93	0001	UG/L	B	5.8		5.8	I
COPPER, TOTAL	10/15/93	0001	UG/L	B	18.7		18.7	I
IRON, SOLUBLE	10/15/93	0001	UG/L	B	34.6	J	34.6	I
IRON, TOTAL	10/15/93	0001	UG/L		10700.	J	10700.	I
LEAD, TOTAL	10/15/93	0001	UG/L		17.2		17.2	I
MAGNESIUM, SOLUBLE	10/15/93	0001	UG/L		44700.		44700.	I
MAGNESIUM, TOTAL	10/15/93	0001	UG/L		49100.		49100.	I
MANGANESE, SOLUBLE	10/15/93	0001	UG/L	B	1.0		1.0	I
MANGANESE, TOTAL	10/15/93	0001	UG/L		184.		184.	I
MOLYBDENUM	10/15/93	0001	UG/L	B	16.1		16.1	I
NICKEL, SOLUBLE	10/15/93	0001	UG/L	B	6.0		6.0	I
NICKEL, TOTAL	10/15/93	0001	UG/L	B	18.6		18.6	I
POTASSIUM, SOLUBLE	10/15/93	0001	UG/L	B	126.	J	126.	I
POTASSIUM, TOTAL	10/15/93	0001	UG/L	B	1930.	J	1930.	I
SODIUM, SOLUBLE	10/15/93	0001	UG/L		9170.		9170.	I
SODIUM, TOTAL	10/15/93	0001	UG/L		8280.		8280.	I
TRITIUM	10/15/93	0001	PCI/L		498.		498.	I

PARAMETER VALUE INDICATOR (PVI): U - LESS THAN DETECTION LIMIT

# **SOIL SCREENING LEVEL CALCULATIONS**

## **Soil concentrations that pose no calculated threat to groundwater**

### **REFERENCES**

Schairbaum, J.R. and Frost, J.P. 1988. "The Hydrology of Sicamore Farm - A Preliminary Report." Center for Ground water Management, Wright State University. September 20, 1988.

DOE. 1994. "Operable Unit 9, Hydrogeologic Investigation: Bedrock Report." U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. January, 1994.

USEPA. 1994. "Technical Background Document for soil Screening Guidance - Review Draft." U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA/540/R-94/106 December, 1994

### Soil Screening Level (10m source, 0.01 hydraulic gradient, 100m from receptor)

A Soil Screening Level (SSL) is the level of contamination that can exist in soil that does not adversely affect the quality of groundwater at a potential drinking water source such as the Buried Valley Aquifer (BVA).

Soil Screening Calculations are used to determine if a PRS may adversely affect ground water quality due to leaching of organic soil contaminants. These equations conservatively calculate the effects of soil leaching and ground water mixing at a particular PRS. The input parameters represent conditions at the PRS. MCLs are assumed to be protective of ground water that will be used as a drinking water source. Note that the distance a PRS lies from a potential drinking water receptor (BVA) generally controls the amount of ground water mixing.

NOTE: Once the equation calculates a mixing zone depth (d) that is equal to the aquifer thickness (da), no additional mixing or dilution takes place. This is the maximum attenuation that the Soil Screening Level Equation calculates. All distances to a potential receptor greater than the distance that first causes the mixing zone depth to equal the aquifer thickness creates no additional attenuation. For this reason, the tables are only reproduced until (d) is equal to the aquifer thickness, which in the case of the Mound Plant Bedrock is 15 m.

Parameters for soil leaching calculation:			
Definition	Parameter	Main Hilltop soil	Units
source length parallel to ground water flow	L	10	m
aquifer thickness (DOE 1994)	da	15	m
hydraulic conductivity (DOE 1994)	K	52	m/y
hydraulic gradient at the source	i	0.01	m/m
horizontal distance to receptor	xr	100	m
infiltration rate (Schairbaum & Frost 1988)	in	0.15	m/y
soil-water partition coefficient (Koc * foc for organic chemicals)	Kd	chemical specific	L/kg
saturated porosity	Ow	0.15	
air filled porosity	Oa	0.28	
Henry's Law constant * 41 (0 for metals and radionuclides)	H	chemical specific	
dry soil bulk density	B	1.6	kg/L
soil organic carbon/water partition coefficient	Koc	chemical specific	L/kg
fraction organic carbon in soil (DOE Mound Plant Data Base)	foc	0.02	
mixing zone depth	d	15	m
dilution factor (used to multiply the target concentration)	df=	6.20	

**Mixing Zone Depth Calculation**

<b>MIXING ZONE DEPTH (d)</b> $d = (0.0112(L+xr)^2)^{0.5} + da\{1 - \exp[-(L+xr)/Kida]\}$	(Equation 3)
<b>DILUTION FACTOR (df)</b> $df = 1 + Kid/inL$	(Equation 4)

**SOIL SCREENING LEVEL CALCULATION**

$SSL = Cw\{Kd + (Ow + (OaH))/B\}$	(Equation 1)
$Kd = Koc * foc$	(Equation 2)

**INPUT PARAMETER DEFINITION**

MCL	mg/L			
Cw	mg/L	target soil leachate. Acceptable water conc. * df		
Kd	L/kg	soil-water partition coefficient		
Ow		saturated porosity		
Oa		air filled porosity		
H		Henry's Law constant * 41 to make dimensionless		
B	kg/L	dry soil bulk density		
Koc	L/kg	soil organic carbon/water partition coefficient		
foc	g/g	fraction organic carbon in soil		

CHEMICAL NAME	H	Koc L/kg	foc	Kd L/kg	MCL mg/L	10-6 GV mg/L	Acceptable Concentration	Cw mg/L	SSL mg/kg
Acenaphthene	7.54E-03	5846	0.02	116.92			0	0.00	--
Acetone	1.18E-03	0.46	0.02	0.0092		3.6	3.6	22.32	2.30
Aldrin	4.22E-03	94623	0.02	1892.46			0	0.00	--
Anthracene	4.55E-03	18162	0.02	363.24	0.007		0.007	0.04	15.77
Arochlor 1016		147410	0.02	2948.2			0	0.00	--
Arochlor 1254		892520	0.02	17850.4		0.00073	0.00073	0.00	80.79
Arochlor 1260		4425557	0.02	88511.14		0.000011	0.000011	0.00	6.04
Benzene	2.24E-01	66	0.02	1.32	0.005		0.005	0.03	0.05
Benzo(a)anthracene	1.48E-04	272847	0.02	5456.94	0.007		0.007	0.04	236.84
Benzo(b)flouranthene	2.53E-04	882588	0.02	17651.76	0.007		0.007	0.04	766.09
Benzoic Acid	1.37E-05		0.02			140	140	868.00	81.38
Benzo(a)pyrene	3.43E-05	749569	0.02	14991.38	0.0002		0.0002	0.00	18.59
Bis(2-chlorethyl)ether	8.77E-04	76	0.02	1.52			0	0.00	--
Bis(2-ethylhexyl)phthalate	3.43E-04	94361	0.02	1887.22			0	0.00	--
Bomodichloromethane	1.30E-01	54	0.02	1.08	0.08		0.08	0.50	0.59
Bromoform	2.52E-02	97	0.02	1.94	0.08		0.08	0.50	1.01
Butanol	3.50E-04	5	0.02	0.1			0	0.00	--
Butyl benzyl phthalate	7.83E-05	15975	0.02	319.5		7.3	7.3	45.26	14464.81
Carbazole	8.12E-05	2441	0.02	48.82			0	0.00	--
Carbon disulfide	5.21E-01	52	0.02	1.04		0.033	0.033	0.20	0.25
Carbon tetrachloride	1.18E+00	187	0.02	3.74	0.005		0.005	0.03	0.13
Chlordane	2.73E-03	61155	0.02	1223.1	0.002		0.002	0.01	15.17
p-Chloroaniline	4.80E-05	41	0.02	0.82			0	0.00	--
Chlorobenzene	1.79E-01	213	0.02	4.26			0	0.00	--
Chlorodibromomethane	1.02E-01	72	0.02	1.44	0.08		0.08	0.50	0.77
Chloroform	1.65E-01	47	0.02	0.94	0.08		0.08	0.50	0.53
2-Chlorphenol	6.81E-04		0.02				0	0.00	--
Chysene	4.96E-05	312425	0.02	6248.5		0.0046	0.0046	0.03	178.21
DDD	2.03E-04	84937	0.02	1698.74			0	0.00	--
DDE	5.08E-03	108469	0.02	2169.38		0.00017	0.00017	0.00	2.29
DDT	2.20E-03	77577	0.02	1551.54		0.001	0.001	0.01	9.62
Dibenzo(a,h)anthracene	4.59E-07	1914389	0.02	38287.78			0	0.00	--
Di-n-butyl phthalate	5.86E-05	16851	0.02	337.02		3	3	18.60	6270.32
1,2-Dichlorobenzene (o)	8.61E-02	693	0.02	13.86	0.6		0.6	3.72	51.96
1,2-Dichlorobenzene (p)	1.15E-01	653	0.02	13.06	0.075		0.075	0.47	6.13

CHEMICAL NAME	H	Koc L/kg	foc	Kd L/kg	MCL mg/L	10-6 GV mg/L	Acceptable Concentration	Cw mg/L	SSL mg/kg
3,3-Dichlorobenzidene	8.53E-07	2441	0.02	48.82			0	0.00	--
1,1-Dichloroethane	2.36E-01	35	0.02	0.7		1.1	1.1	6.82	5.70
1,2-Dichloroethane	5.25E-02	20	0.02	0.4	0.005		0.005	0.03	0.02
1,1-Dichloroethylene	1.04E+01	64	0.02	1.28	0.007		0.007	0.04	0.14
cis-1,2 Dichloroethylene	1.85E-01	29	0.02	0.58	0.07		0.07	0.43	0.31
trans-1,2-Dichloroethylene	2.29E-01	50	0.02	1	0.1		0.1	0.62	0.70
1,2-Dichloropropane	1.15E-01	59	0.02	1.18	0.005		0.005	0.03	0.04
1,3-Dichloropropene	1.21E-01	33	0.02	0.66			0	0.00	--
2,4-Dichlorophenol	9.76E-06		0.02				0	0.00	--
Dieldrin	1.09E-04	18388	0.02	367.76		0.0018	0.0018	0.01	4.11
Diethyl phthalate	2.24E-05	152	0.02	3.04			0	0.00	--
2,4-Dimethylphenol	1.33E-04		0.02				0	0.00	--
Dimethyl phthalate	2.37E-05	32	0.02	0.64			0	0.00	--
2,4-Dinitrophenol	1.98E-07		0.02				0	0.00	--
2,4-Dinitrotolulene	6.03E-06	51	0.02	1.02			0	0.00	--
2,6-Dinitrotolulene	5.33E-06	42	0.02	0.84			0	0.00	--
Di-n-octyl phthalate	3.14E-05	9.8E+08	0.02	19601631		0.73	0.73	4.53	88716980.61
Endosulfan	9.47E-04	738	0.02	14.76			0	0.00	--
Endrin	4.88E-05	9335	0.02	186.7	0.002		0.002	0.01	2.32
Ethylbenzene	3.18E-01	388	0.02	7.76	0.7		0.7	4.34	34.33
Fluoranthene	3.83E-04	72025	0.02	1440.5		0.87	0.87	5.39	7770.56
Fluorene	2.99E-03	9226	0.02	184.52			0	0.00	--
Heptachlor	2.41E-02	11651	0.02	233.02	0.0004		0.0004	0.00	0.58
Heptachlor epoxide	3.40E-04	7236	0.02	144.72	0.0002		0.0002	0.00	0.18
Hexachlorobenzene	2.19E-02	27996	0.02	559.92	0.001		0.001	0.01	3.47
Hexachloro-1,3-butadiene	9.80E-01	6992	0.02	139.84			0	0.00	--
alpha-HCH (alpha-BHC)	2.78E-04	1310	0.02	26.2			0	0.00	--
beta-HCH (beta-BHC)	1.42E-05	1392	0.02	27.84		0.000047	0.000047	0.00	0.01
gamma-HCH (lindane)	1.39E-04	1085	0.02	21.7	0.0002		0.0002	0.00	0.03
Hexachlorocyclopentadien	7.05E-01	9589	0.02	191.78	0.05		0.05	0.31	59.52
Hexachloroethane	1.48E-01	1829	0.02	36.58			0	0.00	--
Indeno(1,2,3-c,d)pyrene	1.99E-07	4364700	0.02	87294		0.000026	0.000026	0.00	14.07
Isophorone	2.54E-04	30	0.02	0.6		7.2	7.2	44.64	30.97
Mercury	4.67E-01		0.02		0.002		0.002	0.01	0.00

CHEMICAL NAME	H	Koc L/kg	foc	Kd L/kg	MCL mg/L	10-6 GV mg/L	Acceptable Concentration	Cw mg/L	SSL mg/kg
Methoxychlor	2.60E-04	77936	0.02	1558.72	0.04		0.04	0.25	386.59
Methyl bromide	5.82E-01	11	0.02	0.22			0	0.00	--
Methyl chloride	1.85E+00	7	0.02	0.14			0	0.00	--
Methylene chloride	9.72E-02	13	0.02	0.26			0	0.00	--
2-Methylphenol	6.72E-05		0.02				0	0.00	--
Napthalene	1.98E-02	1549	0.02	30.98			0	0.00	--
Nitrobenzene	8.45E-04		0.02				0	0.00	--
N-Nitrosodiphenylamine	2.86E-02	327	0.02	6.54			0	0.00	--
N-Nitrosodi-n-propylamine	1.70E-03	17	0.02	0.34			0	0.00	--
Pentachlorobenzene		13274	0.02	265.48			0	0.00	--
Pentachlorophenol	5.82E-04		0.02		0.001		0.001	0.01	0.00
Phenol	2.44E-05		0.02			22	22	136.40	12.79
Pyrene	3.39E-04	59865	0.02	1197.3		0.68	0.68	4.22	5048.21
Styrene	1.37E-01	573	0.02	11.46	0.1		0.1	0.62	7.18
1,1,2,2-Tetrachloroethane	1.53E-02	104	0.02	2.08			0	0.00	--
Tetrachloroethylene	7.09E-01	139	0.02	2.78	0.005		0.005	0.03	0.09
Toluene	2.52E-01	171	0.02	3.42	1		1	6.20	22.06
Toxaphene	1.38E-04	501	0.02	10.02	0.003		0.003	0.02	0.19
1,2,4-Trichlorobenzene	1.07E-01	1840	0.02	36.8	0.07		0.07	0.43	16.02
1,1,1-Trichloroethane	7.63E-01	110	0.02	2.2	0.2		0.2	1.24	3.01
1,1,2-Trichloroethane	4.10E-02	61	0.02	1.22	0.005		0.005	0.03	0.04
Trichloroethylene	4.35E-01	112	0.02	2.24	0.005		0.005	0.03	0.07
2,4,5-Trichlorophenol	1.80E-04		0.02				0	0.00	--
2,4,6-Trichlorophenol	1.66E-04		0.02				0	0.00	--
Vinyl acetate	2.26E-02	5	0.02	0.1			0	0.00	--
Vinyl chloride	3.45E+00	11	0.02	0.22	0.002		0.002	0.01	0.01
Xylenes (total)	2.48E-01	381	0.02	7.62	10		10	62.00	480.94
<b>Inorganics</b>									
Antimony			0.02		0.006		0.006	0.04	0.00
Arsenic			0.02	29	0.05		0.05	0.31	9.02
Barium			0.02	1.4	2		2	12.40	18.52
Beryllium			0.02	4600	0.004		0.004	0.02	114.08
Bromate			0.02		0.01		0.01	0.06	0.01
Cadmium			0.02	120	0.005		0.005	0.03	3.72
Chloramine			0.02		4		4	24.80	2.33

CHEMICAL NAME	H	Koc	foc	Kd	MCL	10-6 GV	Acceptable	Cw	SSL
		L/kg		L/kg	mg/L	mg/L	Concentration	mg/L	mg/kg
Chlorine			0.02		4		4	24.80	2.33
Chlorine Dioxide			0.02		0.8		0.8	4.96	0.47
Chromium (total)			0.02	19	0.1		0.1	0.62	11.84
Copper			0.02	10000					
Cyanide			0.02		0.2		0.2	1.24	0.12
Fluoride			0.02		4		4	24.80	2.33
Mercury			0.02	145	0.002		0.002	0.01	1.80
Nickel			0.02	21	0.1		0.1	0.62	13.08
Nitrate			0.02		10		10	62.00	5.81
Nitrite			0.02		1		1	6.20	0.58
Selenium			0.02	5	0.05		0.05	0.31	1.58
Sulfate			0.02		500		500	3100.00	290.63
Zinc			0.02	420					
Thallium			0.02	71	0.002		0.002	0.01	0.88
<b>Radionuclides</b>					<b>pCi/L</b>	<b>pCi/L</b>	<b>pCi/L</b>		
Radium 226					20		20	124.00	11.63
Radon					300		300	1860.00	174.38
Tritium				1	20,000		20000	124000.00	135625.00
Actinium 227						0.076	0.076	0.47	0.04
Americium 241						0.15	0.15	0.93	0.09
Bismuth 207						9.4	9.4	58.28	5.46
Cesium 137						1.5	1.5	9.30	0.87
Cobalt 60						2.5	2.5	15.50	1.45
Plutonium 238				100000		0.16	0.16	0.99	99200.09
Plutonium 239				100000		0.15	0.15	0.93	93000.09
Plutonium 240				100000		0.15	0.15	0.93	93000.09
Strontium 90						0.85	0.85	5.27	0.49
Thorium 228						0.21	0.21	1.30	0.12
Thorium 230						1.3	1.3	8.06	0.76
Thorium 232						1.5	1.5	9.30	0.87