

# MOUND



**Environmental  
Restoration  
Program**

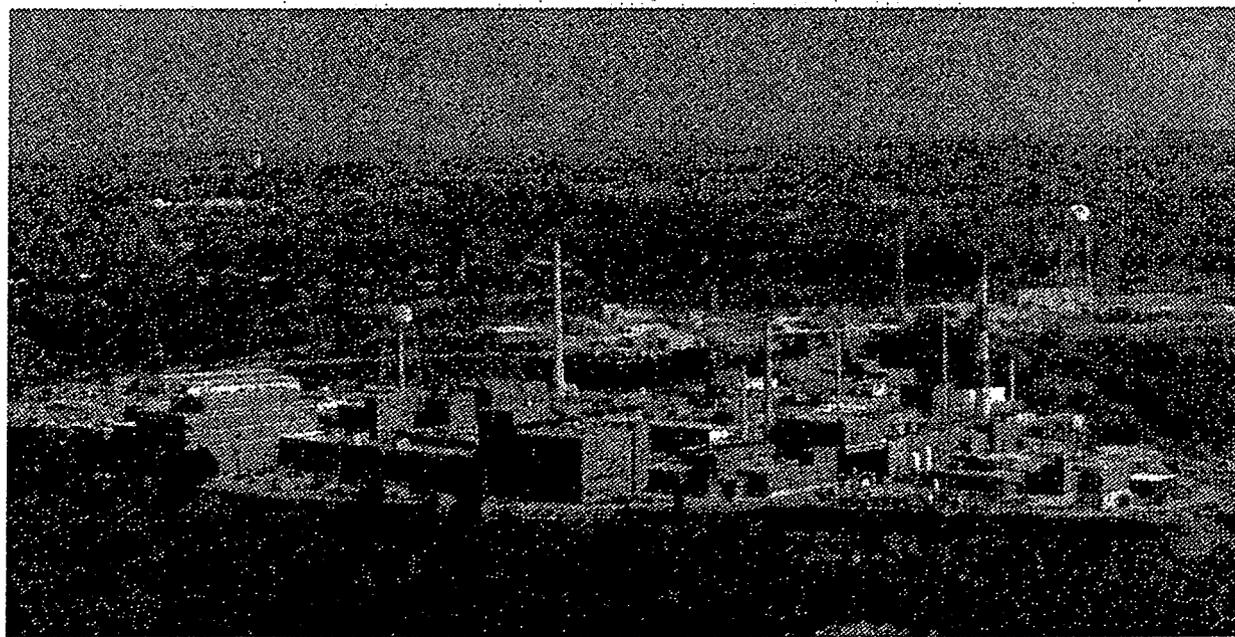


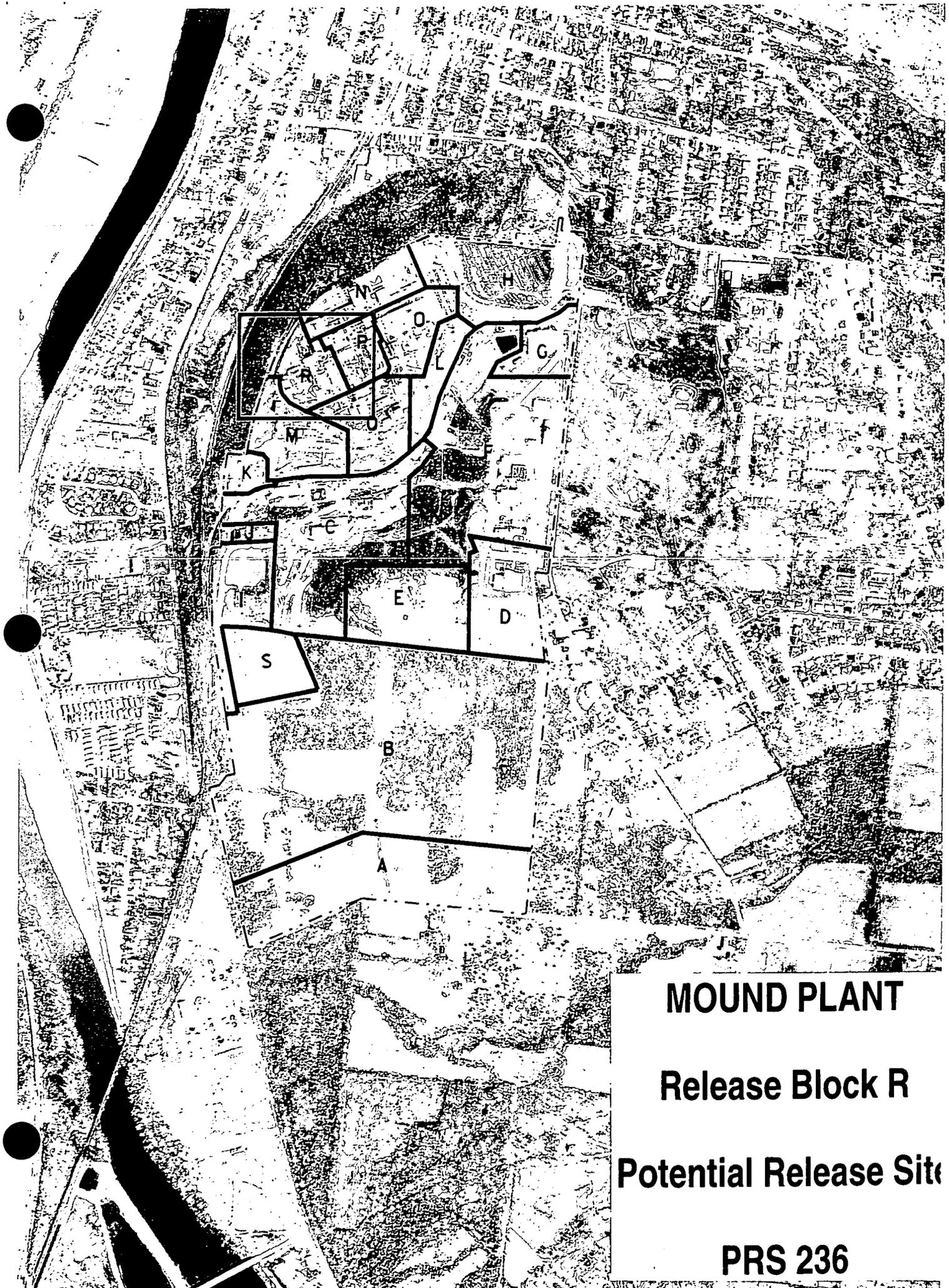
**OhioEPA**

# MOUND PLANT

## Potential Release Site Package

### PRS # 236





**MOUND PLANT**

**Release Block R**

**Potential Release Site**

**PRS 236**

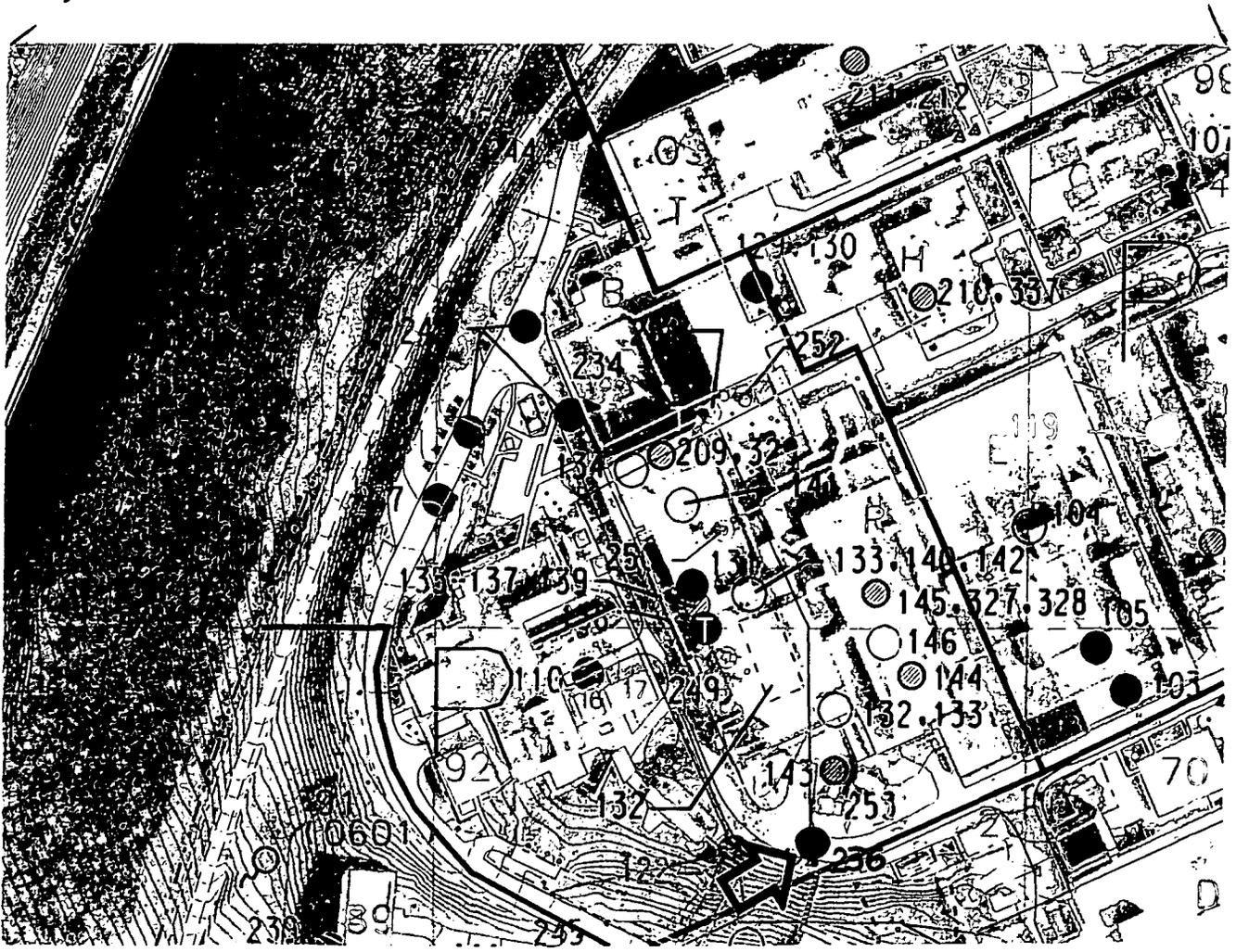
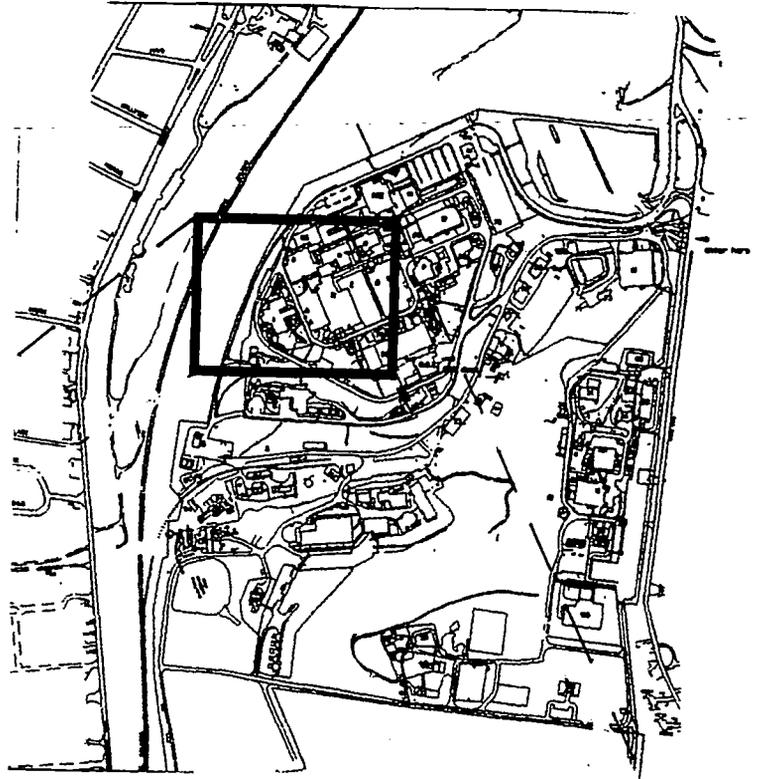


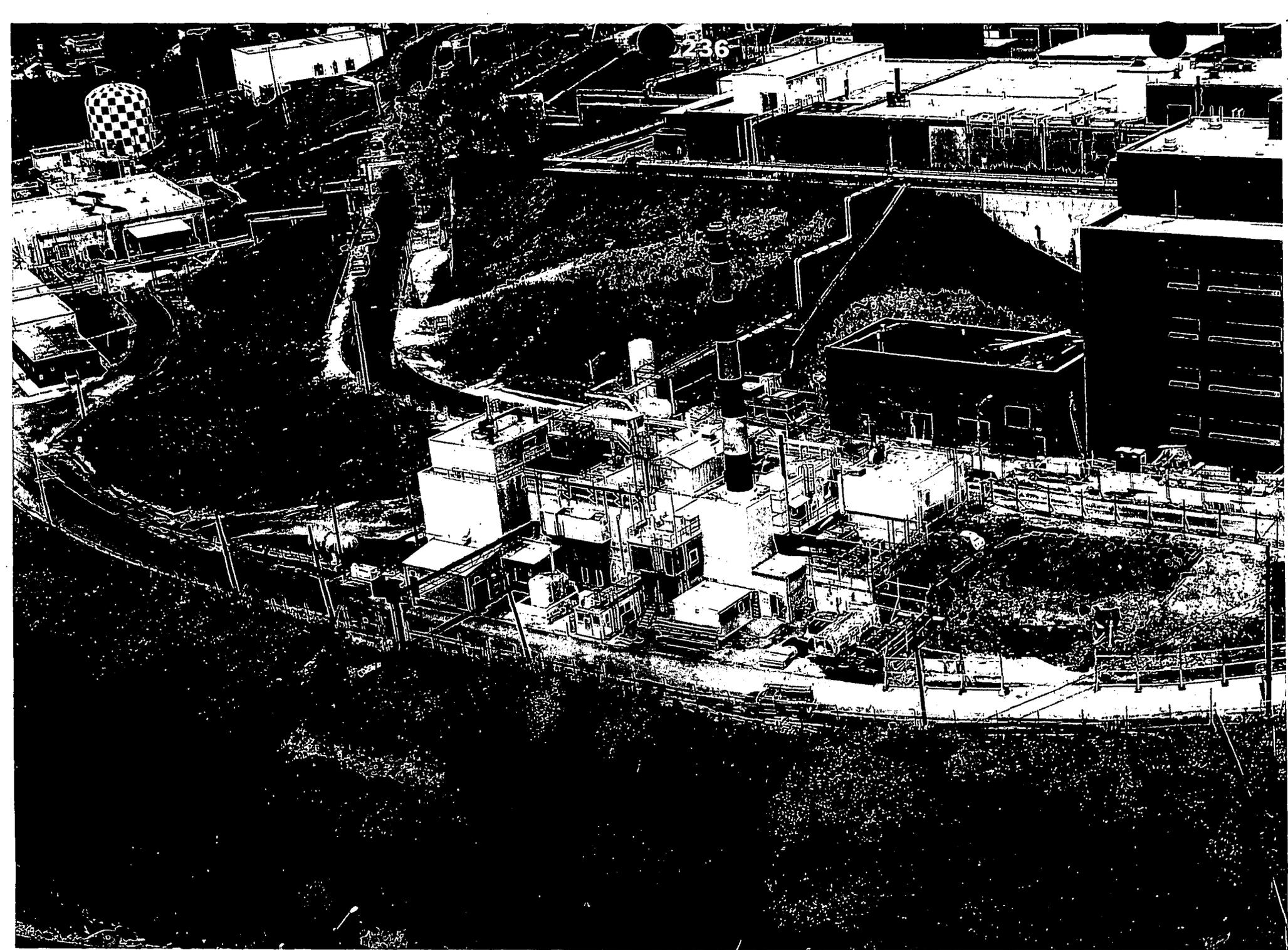
# MOUND PLANT

## Release Block R

### Potential Release Site

PRS 236





## PRS 236

### PRS HISTORY:

PRS 236 is the dock area on the southwest corner of SW Building where an elevated level of Plutonium-238 was detected. There is no history of a plutonium spill or leak in this area.

### CONTAMINATION:

The 1983-84 Radiological Site Survey<sup>2</sup> collected five samples from this dock area which were analyzed for radioactivity. The plutonium concentration detected in sample S0166 was 34.5 pCi/g and resulted in the PRS designation for this area. Adjacent samples S0165, S0167, and S0168 ranged from 0.22 - 1.76 pCi/g. These samples are below the As Low As Reasonably Achievable (ALARA) standard of 25 pCi/g. Thorium was not detected in any of these samples. The tritium concentration of the moisture in soil sample S0168 was 12.7 pCi/mL. The drinking water standard for tritium is 20 pCi/mL.

The 1992 Soil Gas Survey<sup>3</sup> analyzed four samples from this dock area. Toluene was the only volatile organic carbon (VOC) detected. The toluene concentration in these samples ranged from 0 - 106 parts per billion (ppb). The calculated guideline value for this soil gas contamination is 414,600 ppb.<sup>4</sup>

In 1995, five surface samples collected from the S0166 location. These samples were field screened for radioactivity and volatile organic compounds (VOCs) to supplement the previous investigations of the dock area.<sup>5</sup> No radioactivity above background levels were detected by the FIDLER survey. No soil gas VOCs were detected in these samples by the Organic Vapor Analysis field screening.

### READING ROOM REFERENCES:

- 1) Operable Unit 9 Site Scoping Report: Volume 12 - SiteSummary Report, December 1994. (pages 5-7)
- 2) Operable Unit 9 Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993. (pages 8-12)
- 3) Reconnaissance Sampling Report - Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill, February 1993. (pages 13-15)

### OTHER REFERENCES:

- 4) Comparison of Actual Soil Gas Values with Calculated Acceptable Soil Gas Values. (pages 16-18)
- 5) Other Soils Characterization Report, draft January 1996. (pages 19-24)

### PREPARED BY:

David Gloekler, Member of EG&G Technical Staff

**MOUND PLANT  
PRS 236  
SOIL CONTAMINATION  
SW BUILDING DOCK AREA**

**RECOMMENDATION:**

Potential Release Site (PRS) 236 was identified after 34.5 pCi/g of plutonium-238 was detected in a surface sample, location S0166, collected from the dock area on the southwest corner of SW Building in 1983-84. Four (4) adjacent samples ranged from 0.22 pCi/g - 1.76 pCi/g. All are below the  $10^{-5}$  Guideline Value of 55 pCi/g. Toluene was the only volatile organic compound (VOC) detected. The toluene concentration ranged from 0-106 parts per billion (ppb), which is below the calculated guideline value of 414,600 ppb.

In 1995, five surface samples were collected from the S0166 location. These samples were field screened for radioactivity and VOCs to supplement the previous investigations. No radioactivity above background levels or soil gas VOCs were detected.

Since the detection of a slightly elevated level of plutonium-238 was limited to the one of five samples and additional sampling indicated no detections above background, NO FURTHER ASSESSMENT is recommended for PRS 236.

**CONCURRENCE:**

DOE/MB: Arthur W. Kleinrath 5/8/96  
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 5/8/96  
Timothy J. Fischer, Remedial Project Manager (date)

OHIO EPA: Brian K. Nickel 5/8/96  
Brian K. Nickel, Project Manager (date)

**SUMMARY OF COMMENTS AND RESPONSES:**

Comment period from \_\_\_\_\_ to \_\_\_\_\_.

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

**REFERENCE MATERIAL**  
**PRS 236**

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
231	T Building, Corridor 8 Alpha Wastewater Sump (Tank 233)	F-7	Historical Filled with concrete 1982	Alpha wastewater from process area floor drains	3, 4	Unknown - filled with concrete			No Data		
232	T Building, Corridor 7 Alpha Wastewater Sump (Tank 234)	F-7	Historical Filled with concrete 1982	Alpha wastewater from process area floor drains	3, 4	Unknown - filled with concrete			No Data		
233	Room T-63 Alpha Wastewater Sump (Tank 235)	F-7	Historical Filled with concrete 1982	Alpha wastewater from process area floor drains	3, 4	Unknown - filled with concrete			No Data		
234	Building 58 Diesel Fuel Storage Tank (Tank 222)	E-6	Historical	Diesel fuel	3	Tank Removed			No Data		
235	Area of Possible Elevated Thorium Activity	E-8	Grounds	Thorium	6	Possible fugitive dust	S	4, 6	1	SGS <sup>b</sup> Table B.3 Locations 2021, 2148, and 2149	12
									14, 15	Table B.1	6
236	Site Survey Project Potential Hot Spot Location S0166	F-6	Grounds	Plutonium-238	6	Isolated activity from unknown sources			13	Table B.9 (Appendix E in Ref. 6)	6
237	Site Survey Project Potential Hot Spot Location S0175	E-5 E-6	Grounds	Cobalt-60, Cesium-137	6				14, 15	Table B.9 (Appendix E in Ref. 6)	6
238	Site Survey Project Potential Hot Spot Location S1092	G-7	Grounds	Thorium	6				14	Table B.9 (Appendix E in Ref. 6)	6
	Site Survey Project Potential Hot Spot Location S0208	F-5	Grounds	Plutonium-238	6				13	Table B.9 (Appendix E in Ref. 6)	6
	Site Survey Project Potential Hot Spot Location S0472	G-6	Grounds	Thorium	6				14	Table B.9 (Appendix E in Ref. 6)	6

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

Site Name	Radiological Contaminants															
	Potassium-40	Plutonium-239	Plutonium-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	Reference
172. WDA Building Basement Wash Sump (AKA Glass Melter Room Sump)			257,000			1302 (c)	65.7									7
174. WD Building Drum Staging Area			1,302			ND										7
★ ★ 236. Site Survey Project Potential Hot Spot Location S0166 and S0168			1.76 34.5			12.73	←	S0168 S0166								8
237. Site Survey Project Potential Hot Spot Location S0175				10				82	.8							8
238. Site Survey Project Potential Hot Spot Location S1092			0.31		323	.5										8
239. Site Survey Project Potential Hot Spot Location S0208			61			.72										8
240. Site Survey Project Potential Hot Spot Location S0472			1.2		7.5											8
258. Area H Open Burn Pit (AKA Pyrotechnic Waste Disposal Area)			0.81		<2											8
259. Pyrotechnic Waste Shed			0.31		<2											7
260. Thermal Treatment Unit			0.81		<2											7
268. Building 31, Contaminated Material Storage Building			8.15		150											8
270. Underground Sewer Lines G6 and G7						ND										7
279. Old Firing Range Drum Storage Area	28.2			0.121	1.48				12.2							7
280. Waste Oil Drum Field Area			NR		9.2											7
303. Warehouse 14 (AKA Pad 14)			10.2	<2												7
307. Site Survey Project Potential Hot Spot Location C0007			.39		41.6											8

(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

★ ★ -

Data for sample S0166 was added to this table. Data from sample S0168 was accidentally listed as the hot spot for PRS 236. See page 11 for additional sample data.

**ENVIRONMENTAL RESTORATION PROGRAM**

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

**MOUND PLANT  
MIAMISBURG, OHIO**

**June 1993**

**DEPARTMENT OF ENERGY  
ALBUQUERQUE FIELD OFFICE**

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

**FINAL**

1494500

1495000



6501 Americas Parkway N.E.  
SUITE 800  
ALBUQUERQUE, NM 87110  
PHONE: (505) 884-5050

ER PROGRAM

MOUND PLANT

MIAMISBURG, OHIO

PLATE 1

( 1 OF 2 )

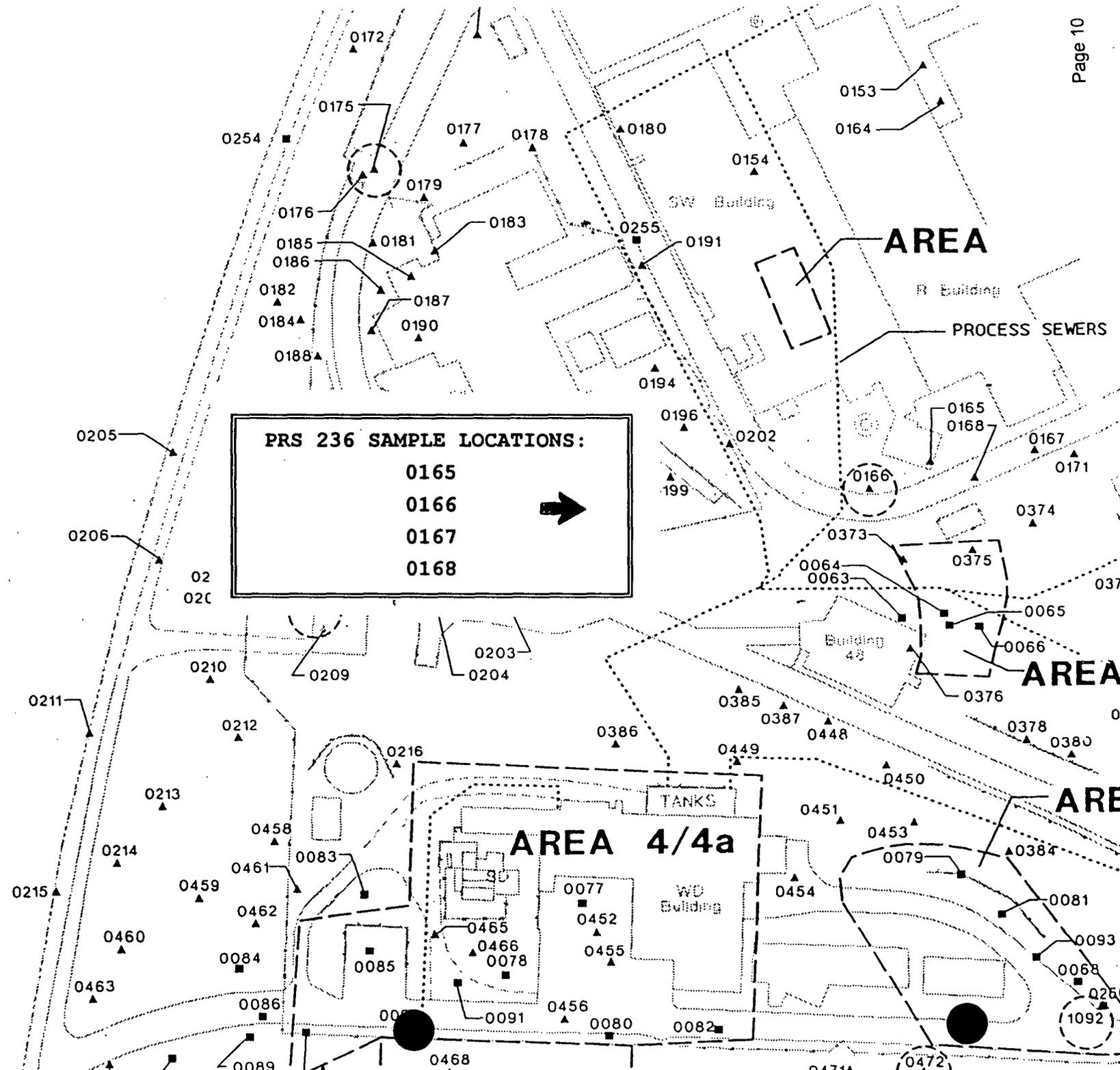
SITE SURVEY PROJECT SAMPLING LOCATIONS

PREPARED FOR

SITE SCOPING REPORT: VOLUME 3,

RADIOLOGICAL SITE SURVEY

MLROAD



**PRS 236 SAMPLE LOCATIONS:**

0165  
 0166  
 0167  
 0168

➔

**AREA**

**AREA**

**AREA**

**AREA 4/4a**

SW Building

R Building

PROCESS SEWERS

Building 48

TANKS

WD Building

# RADIOCHEMICAL ANALYSIS

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)
	South	West										
S0161	1775	2795	3093	10-83	0	1.19	b					
S0162	1775	2845	6206	08-84	0	0.62	b					
S0163	1775	2870	6207	08-84	0	0.34	b					
S0164	1505	3175	3096	10-83	0	0.25	b					
→ S0165	1750	3300	6211	08-84	0	0.22 <sup>c</sup>	b					
→ S0166	1750	3350	4000	10-83	0	34.50	b					
→ S0167	1775	3225	6212	08-84	0	0.81	b					
→ S0168	1775	3275	3099	10-83	0	1.76	b	12.73				
S0169	1790	3010	8424	11-84	0	0.05	b					
S0170	1790	3025	3097	10-83	0	0.41	b					
S0171	1790	3200	3098	10-83	0	1.87	b					
S0172	1285	3555	4081	10-83	0	0.17	b	1.65				
S0173	1315	3465	3050	10-83	0	0.17 <sup>c</sup>	b					
C0254	1325	3630	8415	11-84	36	0.22	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.

#### **4.1.11. Locations With Elevated Plutonium-238**

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The evaluation of the Site Survey Project data for the compilation of this report indicated that three potential hot spots contained levels of plutonium-238 in excess of 25 pCi/g. These are all surface locations, numbered S0166, S0208, and S0706 on Table IV.9. These areas indicated plutonium-238 values of 34.5, 61.0, and 28.9 pCi/g, respectively. Surface location 0166 is located near the SW(1) and R Buildings on the Main Hill; surface location 0208 is located northwest of the WD(2) Building; and surface location 0706 is located north of the Area 1 runoff channel that goes west toward Area 2 (Plate 1(3)). The Area 1 runoff channel is located in a ditch, and location 0706 is either on the embankment or in the woods above Area 1. The review of process history indicates that the elevated plutonium-238 activity in the three potential hot spot locations cannot be easily associated with process information. Areas 3, 4 and 4a, 7, 8, 12, and J also indicated elevated levels of plutonium-238. The elevated concentrations are not directly ascribed to process history, but may be due to spills, runoff, or other unknown processes. Descriptions of these areas are provided in companion sections of this report. Areas 3, 7, 8, and 12 are included in section 5; additional descriptions of Area 7 are provided in section 7; areas 4 and 4a are included in section 3; and Area J is described in section 10.

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Environmental Restoration Program

**RECONNAISSANCE SAMPLING REPORT  
SOIL GAS SURVEY AND GEOPHYSICAL  
INVESTIGATIONS, MOUND PLANT  
MAIN HILL AND SM/PP HILL**

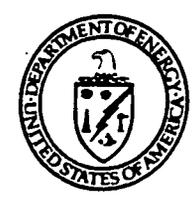
**REPORT  
APPENDICES A, B AND D**

**MOUND PLANT  
MIAMISBURG, OHIO**

February 1993

**Department of Energy  
Albuquerque Field Office**

Environmental Restoration Program  
EG&G Mound Applied Technologies



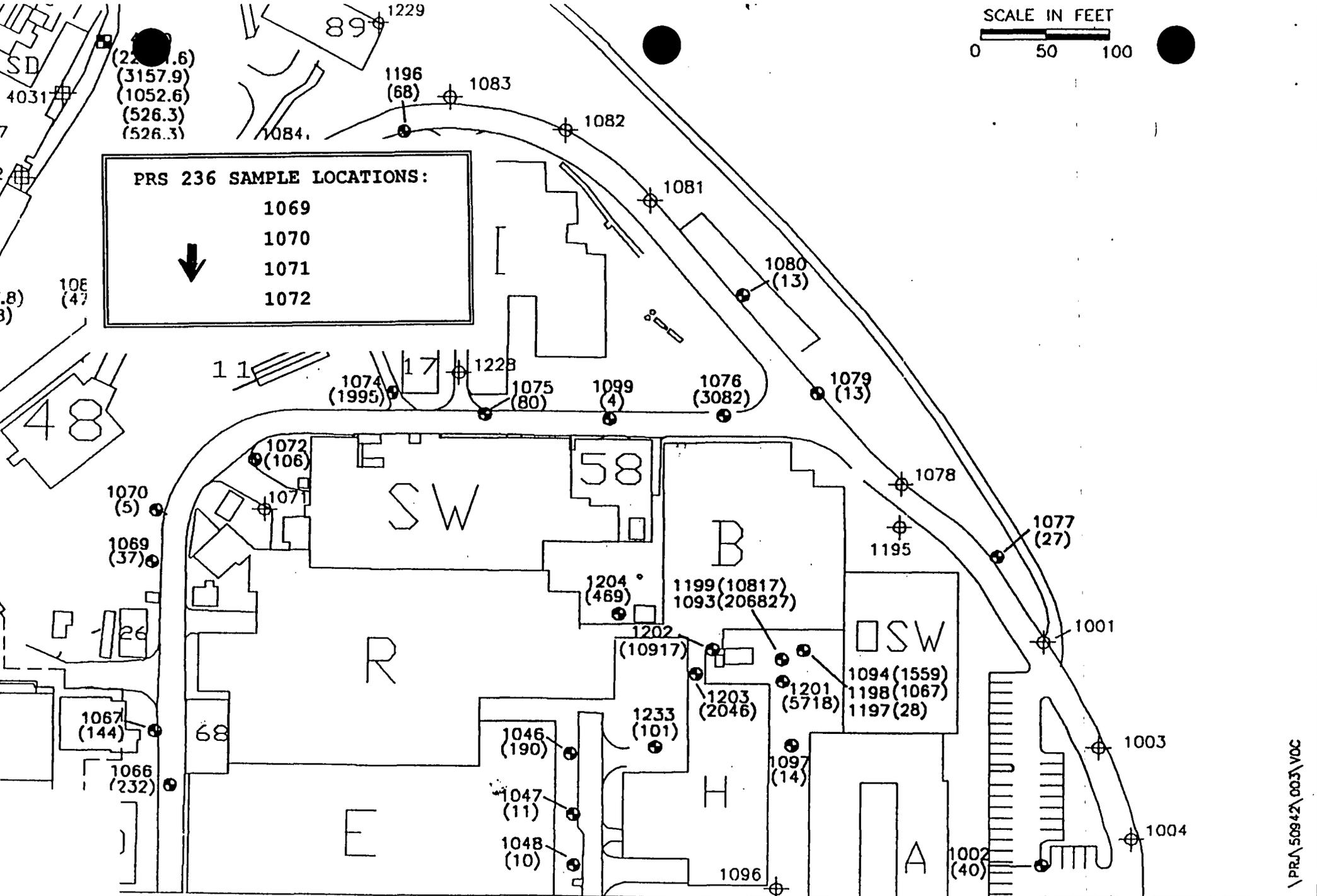


Figure B.20. TVOC Results, Main Hill West

TABLE II.4. SUMMARY OF POSITIVE DETECTIONS—MAIN HILL  
(ppb)

SAMPLEID	SAMPLE DATE	FREON 11	FREON 113	TRAN-12DCE	CIS-12DCE	111TCA	PCE	TCE	TOLUENE
MND-01-1002-1003	28 JUL 92	---	---	---	---	---	---	---	40
MND-01-1003-0005	28 JUL 92	---	---	---	---	---	---	---	3*
MND-01-1005-0005	28 JUL 92	---	---	---	---	---	---	---	21*
MND-01-1007-0005	29 JUL 92	---	---	---	---	---	---	2	---
MND-01-1008-0005	29 JUL 92	---	---	---	---	---	---	---	5
MND-01-1008-1005	29 JUL 92	---	---	---	---	---	---	---	3
MND-01-1009-0005	29 JUL 92	---	---	---	---	---	---	4	19
MND-01-1010-0005	29 JUL 92	---	---	---	---	---	---	---	13
MND-01-1014-0005	29 JUL 92	---	---	---	---	---	---	---	8
MND-01-1016-0003	30 JUL 92	---	---	---	---	---	---	2	8
MND-01-1046-0005	4 AUG 92	---	---	---	---	2	---	188	3*
MND-01-1047-0005	4 AUG 92	---	---	---	---	7	---	4	---
MND-01-1048-0005	4 AUG 92	---	---	---	---	6	---	4	---
MND-01-1050-0003	4 AUG 92	---	---	---	---	---	---	8	---
MND-01-1050-1003	4 AUG 92	---	---	---	---	---	---	17	27*
MND-01-1051-0003	4 AUG 92	---	---	---	---	---	---	8	5*
MND-01-1052-0003	4 AUG 92	---	---	---	---	---	---	---	13*
MND-01-1053-0002	5 AUG 92	2	---	---	---	---	---	---	447
MND-01-1054-0005	5 AUG 92	4	---	---	---	7	---	228*	11
MND-01-1055-1005	5 AUG 92	---	---	---	---	---	---	4*	5
MND-01-1057-0005	5 AUG 92	---	---	---	---	---	---	---	24
MND-01-1062-0003	5 AUG 92	---	---	---	---	13	---	6	---
MND-01-1064-0005	11 AUG 92	---	---	---	---	---	---	---	19
MND-01-1066-0005	11 AUG 92	---	---	---	---	6	---	---	226
MND-01-1067-0005	11 AUG 92	---	---	---	---	---	---	11	133
MND-01-1069-1005	12 AUG 92	---	---	---	---	---	---	---	37
MND-01-1070-0005	12 AUG 92	---	---	---	---	---	---	---	5
MND-01-1070-1005	12 AUG 92	---	---	---	---	---	---	---	5
MND-01-1072-0005	12 AUG 92	---	---	---	---	---	---	---	106
MND-01-1074-0005	12 AUG 92	---	799	---	---	---	1191	---	5
MND-01-1074-1005	12 AUG 92	---	812	---	---	---	1117	---	5
MND-01-1075-0005	12 AUG 92	---	---	---	---	---	---	---	80
MND-01-1076-0005	12 AUG 92	---	2934	---	---	148	---	---	---
MND-01-1077-0005	12 AUG 92	---	---	---	---	---	---	---	27
MND-01-1079-0005	13 AUG 92	---	13	---	---	---	---	---	---
MND-01-1080-0005	13 AUG 92	---	13	---	---	---	---	---	---
MND-01-1085-0005	13 AUG 92	---	102	---	---	22	---	41	---
MND-01-1086-0005	13 AUG 92	---	47	---	---	---	---	---	---
MND-01-1093-0005	15 AUG 92	---	**131000	247	40800	---	---	**34780	53*
MND-01-1094-0005	14 AUG 92	---	83	13	485	---	---	978	---
MND-01-1097-0002	14 AUG 92	---	---	---	---	---	---	6	8
MND-01-1099-0005	15 AUG 92	---	---	---	---	---	---	4	8*
MND-01-1101-0005	16 AUG 92	---	865	---	---	---	---	---	8
MND-01-1102-0005	16 AUG 92	---	419	---	---	---	---	---	13
MND-01-1106-0003	16 AUG 92	---	329	---	---	---	---	6	---
MND-01-1108-0005	16 AUG 92	---	---	---	---	---	---	6	---
MND-01-1109-0005	16 AUG 92	---	---	---	---	---	---	8	13
MND-01-1110-0005	16 AUG 92	---	---	---	---	---	---	---	255

**COMPARISON OF ACTUAL SOIL GAS**  
**VALUES WITH CALCULATED**  
**ACCEPTABLE SOIL GAS VALUES**

# SCREENING POTENTIAL RELEASE SITES BASED ON SOIL GAS READINGS

Soil gas readings can be utilized in the PRS screening process to identify potential release sites that may present a potential soil contamination problem for volatile organics. The soil gas survey that was conducted at Mound as part of the "Reconnaissance Sampling Report--Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill" investigated 8 volatile compounds. The concentrations of these compounds in the in the vapor phase within the pore spaces of the soil can be correlated to the actual soil contaminant concentrations by utilizing a method developed by ICF Kaiser Engineers. This technique has been used with US EPA Region IX approval at a large Superfund site contaminated with many of the same chemicals found at relatively low levels in soils at the Mound Plant.

The soil concentration can be estimated from the soil gas values by the following equation:

$$C_t = (C_g/P_b) * [(P_b * K_d / H) + [p_w / H] + [p_t - p_w]]$$

where

$C_g$	concentration of volatile chemical concentrations as soil vapor in ng/ml
$P_b$	Bulk density of the soil in g/ml
$K_d$	soil/water partition coefficient in ml/g
$H$	Dimensionless Henry's Law Constant
$p_w$	water filled porosity
$p_t$	total porosity
$C_t$	target soil concentration in ng/g or ug/kg (ppb)

The technique that Mound Plant will use for screening a PRS, is to compare the soil gas values obtained at a PRS with soil gas concentrations that are known to be below any regulatory or health based level of concern. The risk based guideline values for the Mound Plant (DOE, December 1995) soils are based upon  $10^{-6}$  risk levels or a hazard index of 1. These values correspond to direct soil exposure to persons who's activities place them at the highest risk, in particular inhalation and ingestion by a Mound Plant construction worker.

Another potential exposure path must be considered, however. The potential for some of the organic contaminants to leach into ground water must be considered in developing protective soil screening levels. A "Mound Plant Soil Screening Level" paper explains the calculation of soil screening levels. For all of the chemicals that the soil gas survey identified, the calculated soil screening level soil concentrations are below the standard guideline values, therefore they are more conservative and are appropriate to be used as the basis for the soil gas calculations.

By re-arranging the equation, and using either the soil guideline values or the soil screening levels as the target soil concentration, a soil gas concentration can be calculated; this calculated soil gas concentration can be compared to the actual observed soil gas values:

$$C_g = (P_b * C_t) / [(P_b * K_d / H) + [p_w / H] + [p_t - p_w]]$$

The values of the soil specific and chemical parameters for this equation are summarized as follows:

$P_b$	1.6	Bulk density of the soil in g/ml
$p_w$	0.15	water filled porosity
$p_t$	0.43	total porosity
$foc$	0.02	fraction organic material in soil (used in developing the SSL values)

NAME	H <sub>2</sub> O	K <sub>d</sub>	Calculated/ Acceptable Soil Screening Level Value	Calculated/ Acceptable Soil Gas Reading	Calculated/ Acceptable Soil Gas Reading
	mg/g	ml/g	mg/kg (ppm)	ng/ml	ppb
Toluene	2.52E-01	3.42	22.06	1.56E+03	7414600
Trichloroethane (TCE)	4.35E-01	2.24	0.07	1.26E+01	2400
111 Trichloroethane (TCA)	7.63E-01	2.2	3.01	9.46E+02	173400
Trans-1,2 Dichloroethene (DCE)	2.29E-01	1	0.70	1.41E+02	35700
cis-1,2 Dichloroethene (DCE)	1.85E-01	2.78	0.31	1.97E+01	5000
Freon 11	NA	NA			
Freon 113	NA	NA			
Tetrachloroethene (PCE)	7.09E-01	2.78	0.09	2.13E+01	3100

na not available

**IF THE SOIL GAS READING IS BELOW THE VALUES IN THE CALCULATED SOIL GAS READING COLUMN (SHADED), THEN THERE IS NO THREAT TO GROUNDWATER FROM THIS PRS.**

The soil screening level values are calculated using the Soil Screening Methodology. The Potential Release Site is assumed to be more than 100 meters from a potential drinking water source with an aquifer thickness of 15 meters and a source size of 10 meters. The hydraulic gradient is assumed to be 0.01 which is conservative for most of the Mound Plant PRSs. In special instances where the PRS lies less than 100 meters from a potential drinking water source, or the hydraulic gradient is much less than 0.01, new SSL values and new acceptable soil gas values will be calculated for that particular PRS.

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*DRAFT*  
OTHER SOILS  
CHARACTERIZATION  
REPORT

MOUND PLANT  
MIAMISBURG, OHIO

JANUARY 1996

U.S. DEPARTMENT OF ENERGY  
OHIO FIELD OFFICE

DECONTAMINATION AND DECOMMISSIONING PROGRAM  
EG&G MOUND APPLIED TECHNOLOGIES

### 3.0 Methods

Three locations in Area 23 were sampled by the field team while wearing Level C respiratory protection. Level of protection and required personnel protective equipment were defined in the RWP and outlined in the site HASP.

#### Hot Spots

Except as indicated below, all Hot Spots sampling and screening methods followed the guidelines of the SAP. Minor variations to sample location or labeling conventions are detailed in ISPCNs in Appendix A.

#### C0028

Field screening of soil samples collected at C0028 showed elevated alpha and beta activity surrounding the Hot Spot. After consultation with the Mound Project Engineer, 8 additional locations were sampled to define the extent of this activity. An additional Mound Rad Lab detection of elevated Pu238 resulted in additional borings in the area. A total of 11 locations were sampled in addition to the original 5 outlined in the SAP.

#### S0166

Due to the presence of multiple underground utilities at and around this location, the sample depth was reduced from 13 feet to 6 inches. Historic contamination recorded at this location was expected at surface locations.

#### S0175

Perpendicular underground utilities crossing at this Hot Spot resulted in total reconfiguration of the sampling pattern in this area. Six sample locations were identified around S0175. The new configuration is best illustrated by Figure 5.1 in Section 5.0.

Mound services were required in order to remove 2 sections of fence north of S0175 to allow access to borehole locations.

#### S0208

A steep slope and limited access resulted in hand augering of soil samples at this location. A stainless steel auger was used to collect samples to a total depth of 2 feet bgs. In order to provide ample sample for Mound Rad Lab and PXRF analysis, the surface sample was incorporated into the 0- to 2-ft. composite sample. The east location was eliminated due to physical constraints (Bldg. 89).

## 5.0 Results

### Hot Spots

#### S0166

Analyses of soil samples revealed no radiological, organic or inorganic compounds in concentrations exceeding the action levels defined in Section 5.1. Figure 5.12 graphically represents Hot Spot S0166 field sampling results.

#### S0425

One sample from hot spot S0425 (Area 81) triggered field screening action levels:

- One sample exceeded limits for hazardous compounds

Elevated concentrations of chromium were detected by the PXRF in soil samples collected from the site.

Table 5.12 shows Hot Spot S0425 field results exceeding action levels. Figure 5.13 graphically represents Hot Spot S0425 field sampling results.

Table 5.12 Hot Spot S0425 Field Sampling Results

Sample ID	FIDLER		Organics		Rad Laboratory				
	Channel 1 (1K)	Channel 2 (5K)	OVA	OVM	U 235 (5)	Th 232 (5)	Ra 226 (5)	Cs 137 (15)	Am 241(20)
8101-5001	<1000	<5000	<1	<1					

Sample ID	PXRF Metals								
	As (102.07)	Ba (1489)	Cd	Cr HI	Cr LO (184.45)	Pb (172)	Hg	Sr	Ag (2550)
8101-5001	48.025	180.09	<44.5	<34	178.18	<10	<37	<14	<20

#### S0971

Analyses of soil samples revealed no radiological, organic or inorganic compounds in concentrations exceeding the action levels defined in Section 5.1. Figure 5.14 graphically represents Hot Spot S0971 field sampling results.

#### S0982

Analyses of soil samples revealed no radiological, organic or inorganic compounds in concentrations exceeding the action levels defined in Section 5.1. Figure 5.15 graphically represents Hot Spot S0982 field sampling results.

### LEGEND

-  Radiological Compounds
-  Hazardous Compounds
-  Excluded
-  Grid Number
-  Survey Point

Principal Radionuclides Identified:  
(Maximum Concentration)  
None Detected

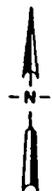
Principal Hazardous Compounds Identified:  
(Maximum Concentration)  
Metals : None Detected  
Organics : None Detected

Example Grid	Sample Interval
	0' - 6"
	6" - 4'
	4' - 8'
	8' - 12'
	12' - 18'
	16' - 20'

Refusal or End of Borehole

Indicates Elevated Concentrations of Hazardous Compounds

Indicates Elevated Concentrations of Radionuclides



Approximate Grid Size = 10ft x 10ft

5P-5214 11/13/95

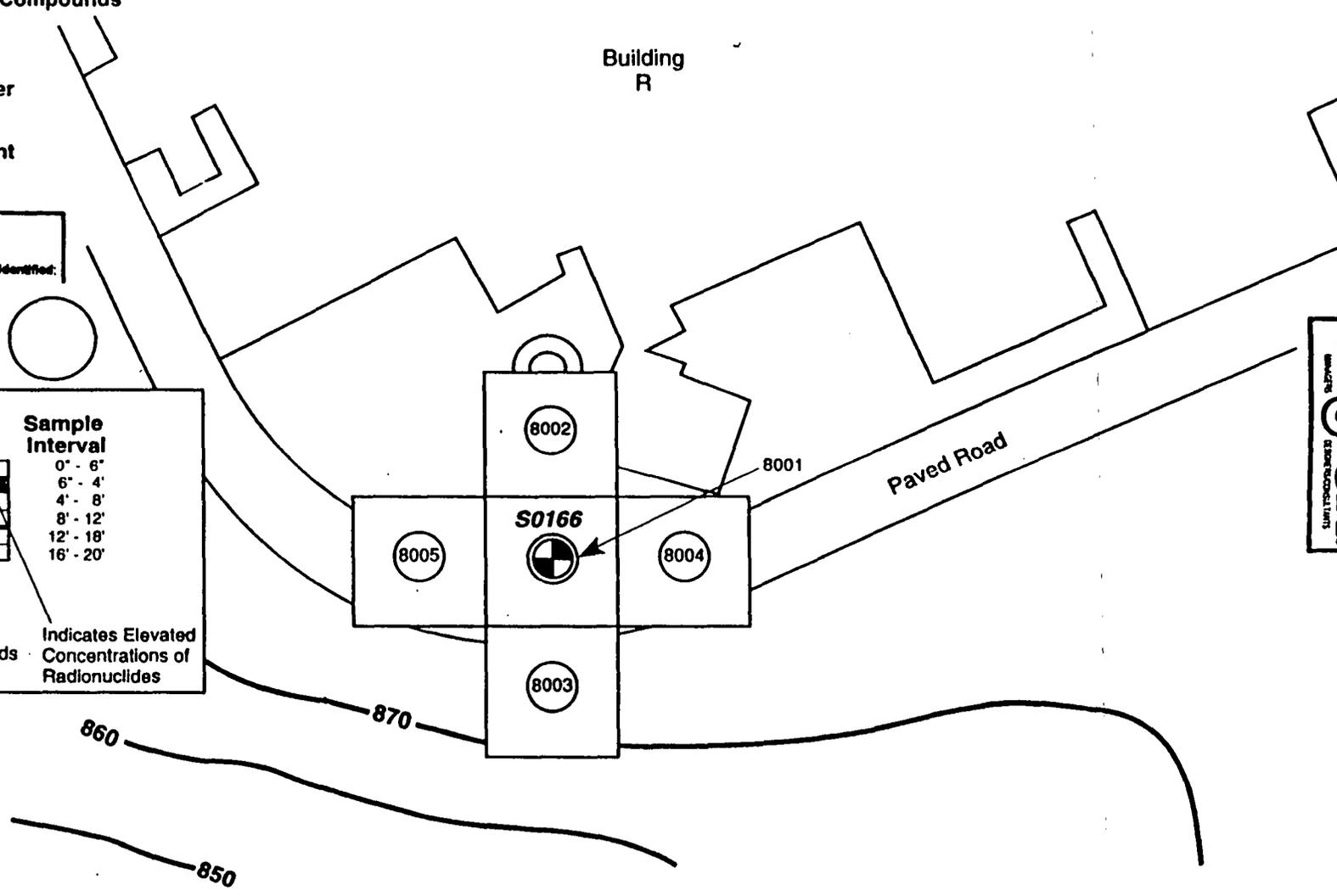


FIGURE 5.12 HOT SPOT S0166

## 6.0 Analysis and Conclusions

~~SOIL CO28 also contains 30 cubic yards of soil with elevated concentrations of both radioactive and hazardous compounds.~~

~~Soil samples from SO425, SO175, S1092, and SO971 had elevated concentrations of hazardous compounds~~

**Table 6.9 Area 80 Analysis**

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent		Volume		Minimum	Maximum	Mean
				Lateral (ft <sup>2</sup> )	Vertical (ft)	Net (yd <sup>3</sup> )	Gross (yd <sup>3</sup> )			
80 SO166	NA	None Detected		NA	NA	NA	NA			

**Table 6.10 Area 81 Analysis**

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent		Volume		Minimum	Maximum	Mean
				Lateral (ft <sup>2</sup> )	Vertical (ft)	Net (yd <sup>3</sup> )	Gross (yd <sup>3</sup> )			
81 SO425	A	HAZ	Cr	100ft <sup>2</sup>	0'-0.5'	NA	NA			

**Table 6.11 Area 83 Analysis**

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent		Volume		Minimum	Maximum	Mean
				Lateral (ft <sup>2</sup> )	Vertical (ft)	Net (yd <sup>3</sup> )	Gross (yd <sup>3</sup> )			
83 SO971	NA	None Detected		NA	NA	NA	NA			

**Table 6.12 Area 84 Analysis**

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent		Volume		Minimum	Maximum	Mean
				Lateral (ft <sup>2</sup> )	Vertical (ft)	Net (yd <sup>3</sup> )	Gross (yd <sup>3</sup> )			
84 SO988	NA	None Detected		NA	NA	NA	NA			



SHEET \_\_\_ of \_\_\_

CLIENT/SUBJECT SD166 80XX W.O. NO. \_\_\_\_\_

TASK DESCRIPTION \_\_\_\_\_ TASK NO. \_\_\_\_\_

PREPARED BY _____	DEPT _____	DATE _____	APPROVED BY _____ DEPT _____ DATE _____
MATH CHECK BY _____	DEPT _____	DATE _____	
METHOD REV. BY _____	DEPT _____	DATE _____	

Sample ID	Rad Laboratory		Fidler		$\alpha$	B	Organics		Metals
	(25) Plutonium	(51) Thorium	(1K) channel1	(5K) Channel2			OVA	OVM	
8001-5001	A	A	—	—	—	—	—	—	
8002-5001	S	9	—	—	—	—	—	—	
8003-5001	P	n	—	—	—	—	—	—	
8004-5001	H	A	—	—	—	—	—	—	
8005-5001	L	L	—	—	—	—	—	—	
	T	T	—	—	—	—	—	—	