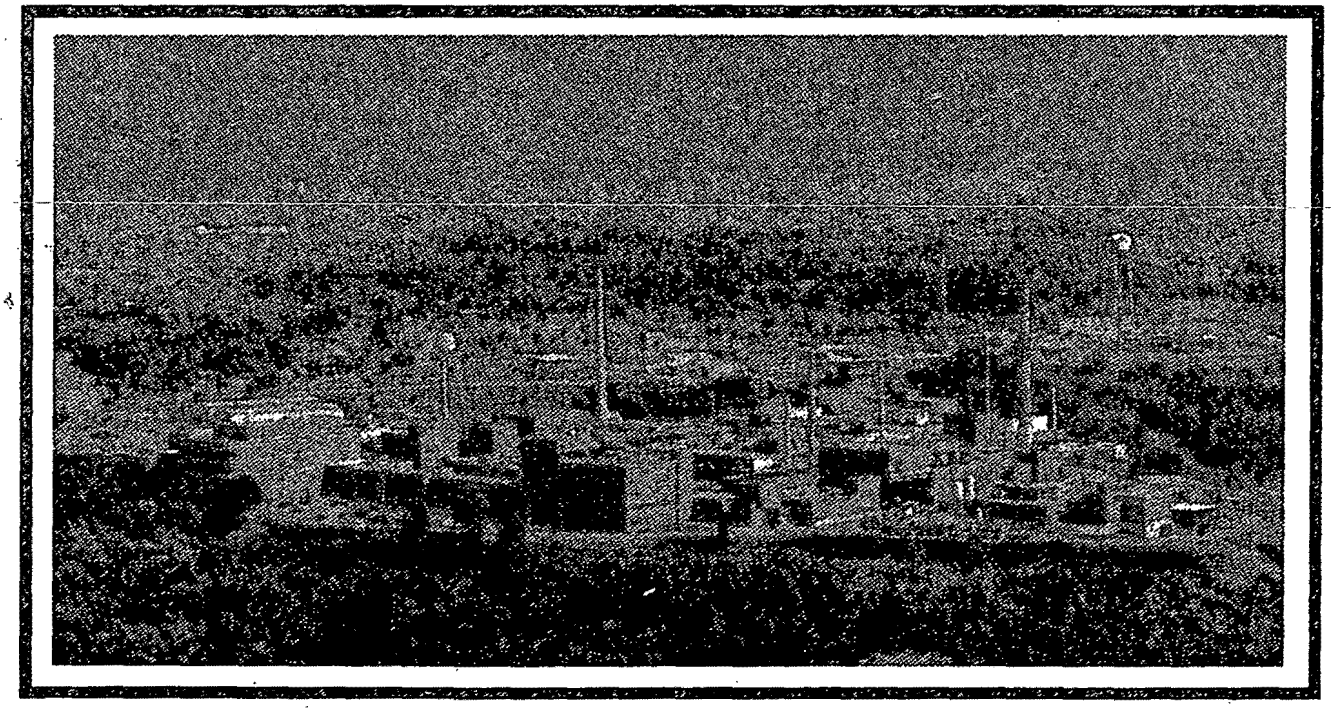
EG&G MOUND-30-03-04-02--9612020005

MOUND

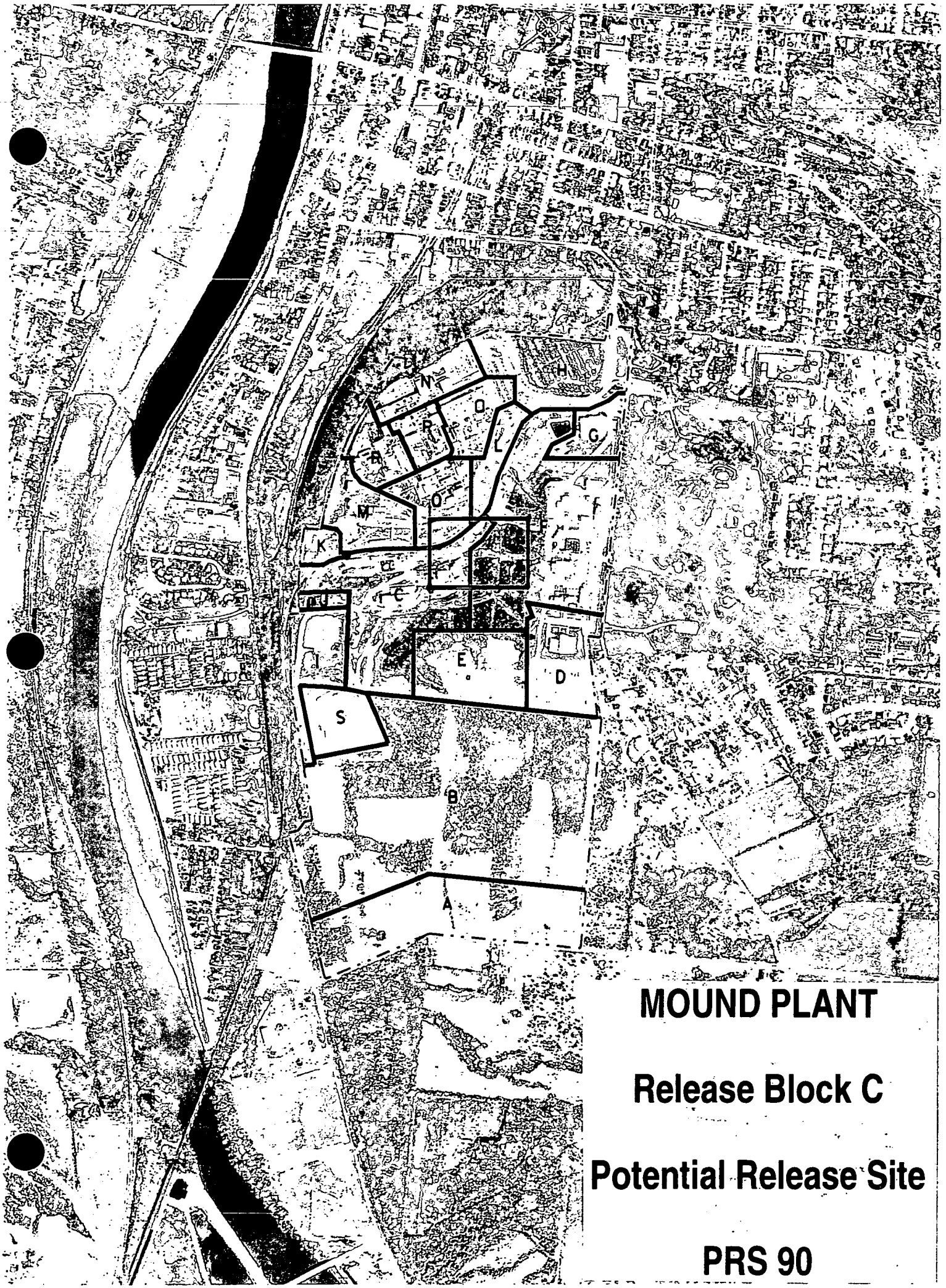
Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 90



PRS 90

REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comment.	Mar. 4, 1996
FINAL 1	Comment period expired. No comments. Recommendation page annotated.	Oct. 10, 1996
FINAL 2	Signature page changed to show correct review period.	Nov. 19, 1996



MOUND PLANT

Release Block C

Potential Release Site

PRS 90

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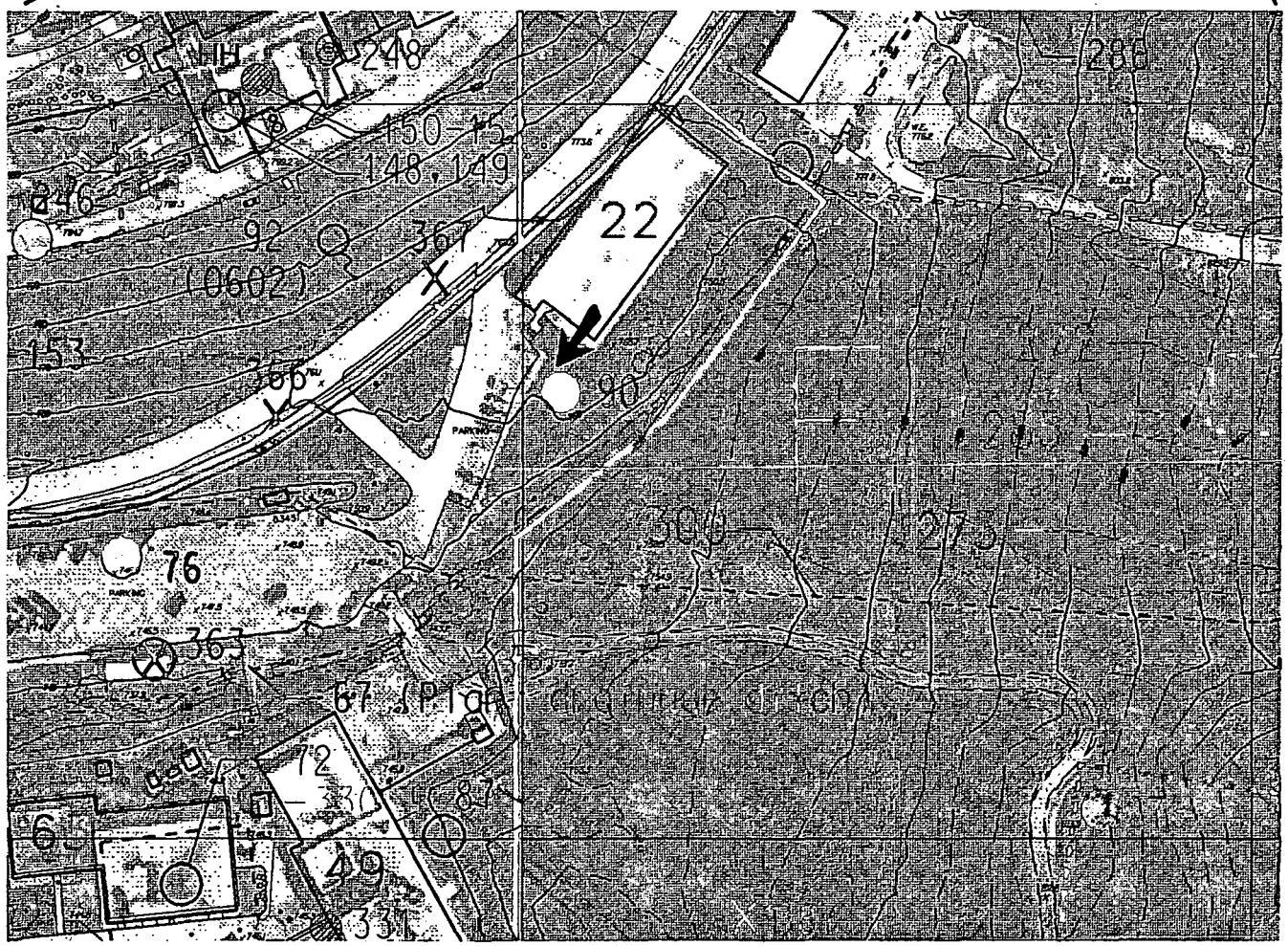
MOUND PLANT

Release Block C

Potential Release Site

PRS 90



90

PRS 90

PRS HISTORY:

Isolated thorium hot spot identified in October of 1983 during the Site Survey Project (sample #0425).[2] No radioactive or hazardous waste generating processes are known to have occurred at the location of PRS 90. Building 22, which is nearby, has never been utilized for radioactive processes.

CONTAMINATION:

The 1983 Site Survey Project reported 5.74 pCi/g thorium in a surface sample from PRS 90.[2]

PRS 90 and the surrounding soil was resampled in March 1995 as part of the "Other Soils" characterization effort. Five boreholes were drilled to 16 feet and sampled at the surface and every four feet. Sample results showed:

1) Metals concentrations were below soil guideline values.[4, 5, 7, 8]
2) Plutonium and thorium concentrations were below the Mound Plant's "as low as reasonably achievable" (ALARA) value of 25 pCi/g for plutonium and 5 pCi/g for thorium.[4, 5]
3) No volatile organic compounds (VOCs) were detected.[4, 8]

READING ROOM REFERENCES:

1) OU9, Scoping Reprt: Volume 12 - Site Summary Report, Final, December 1994. (pages 5-7)
2) OU9, Scoping Report, Volume 3 - Radiological Site Survey Report. (pages 8-13)
3) OU5, Operational Area Phase I Investigation, December 1994. (pages 14-18)

OTHER REFERENCES:

4) Other Soils Characterization Report, Draft, January 1996. (pages 19-21)
5) Mound Soil Screening Results, February 1995. (pages 22-24)
6) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, Volume II - Appendices A-G. (pages 25-29)
7) Risk Based Guideline Values, December 1995 - Final, Revision 3. (pages 30-32)
8) Other Soils Field Results. (pages 33-34)

PREPARED BY:

George Liebson, Member of EG&G Technical Staff
Eric Horstman, Member of EG&G Technical Staff

MOUND PLANT
PRS 90
SOIL CONTAMINATION - BUILDING 22

RECOMMENDATION:

Potential Release Site (PRS) 90 was based on an isolated thorium-238 reading of 5.74 pCi/g gathered during the 1983 site survey, however no known radioactive or hazardous waste generating processes are known to have occurred at the location of PRS 90. This "hot spot" was subsequently remediated. Soil borings and subsequent soil screening results from March, 1995 verified that thorium contamination was below the D&D clean-up level of 5 pCi/g surface and 15 pCi/g subsurface. The OU5 Operational Area Phase I Investigation further indicates that the area is below the D&D clean-up level of 5 pCi/g surface and 15 pCi/g subsurface, therefore, NO FURTHER ASSESSMENT is recommended for PRS 90.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 3/28/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 3/4/96 (date)

OEPA: Brian K. Nickel, Project Manager — 3/4/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from ~~4/15/96~~ 3/15/96 to ~~5/15/96~~ 4/01/96.

☒ No comments were received during the comment period.

☐ Comment responses can be found on page_____ of this package.

REFERENCE MATERIAL
PRS 90

Document Control No. _____

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

				Operational Jurisdiction				Historic Activities			
No.	Site Name	Location	Status	Regulated Units	Regulatory Authority	Spill Response	SWMU	Evidence Of Release	Response Authority	Further Action Recommended	FFA OU
69	Overflow Pond	H-5 I-5	Waters of the U.S.	(Cont.)	(Cont.)	(Cont.)	SWMU	No	CERCLA	Yes	9
70	Retention Basins and Weir Basin	H-5	Waters of the U.S.				SWMU	No	CERCLA	Yes	9
71	Building 85 Waste Solvent Tank (Tank 136)	I-5	Inactive	PBR	RCRA	RCRA	SWMU	No	CERCLA	No	5
72	Area 13, Polonium-Contaminated Wood from Dayton Unit IV	H-7	Historical	Runoff to plant drainage ditch	NA			Yes	CERCLA	Yes	5
73	Evaporator Storage Area	H-7	Historical		NA			No	CERCLA	No	5
74	Quonset Hut (former)	H-7	Historical		NA			No	CERCLA	No	5
75	Railroad Siding	G-6 G-7	Inactive		AEA	AEA		Yes	AEA	D&D	
76	Warehouse 9	G-7	Historical		NA			Yes	CERCLA	Yes	5
77	Warehouse 10	G-9	Historical		NA			Yes	CERCLA	Yes	5
78	Warehouse 13	G-9	Historical		NA			Yes	AEA	D&D	
79	Warehouse 15	E-8	Historical		NA			Yes	CERCLA	Yes	5
80	Warehouse 15A	F-8	Historical		NA			Yes	CERCLA	Yes	5
81	Drilling Mud Drum Storage Areas (3 locations)	H-5 I-4	Historical		NA		SWMU	No	CERCLA	No	5
82	Building 57 Diesel Fuel Storage Tank (Tank 118)	H-5	In service		BUSTR	BUSTR			NA	OM	
83	Building 2 Propane Storage Tank (Tank 122)	H-7	Inactive		AEA	NA		No	NA	OM	
84	Building 56 Diesel Fuel Storage Tank (Tank 223)	F-5	Historical		NA			No	CERCLA	Yes	2
85	Building 29 Solvent Storage Shed	E-8	Inactive	PBR	RCRA	RCRA	SWMU	No	NA	OM	
86	Building 29 Septic Tank (Tank 224)	E-9	Historical		NA			Yes	AEA	Yes	6
87	Building 49 Solvent Storage Shed	G-7	Inactive	PBR	RCRA	RCRA	SWMU	No	NA	OM	
88	Tritium in Buried Valley Aquifer	H-4	Historical		SDWA			Yes[d]	AEA	OM	
89	Test Fire Residual Storage Area	H-7	In Service	PBR	RCRA	RCRA	SWMU	No	NA	OM	
90	Site Survey Project Potential Hot Spot Location S0425	G-8	Grounds		AEA	NA		Yes	AEA	Yes	6
91	Main Hill Seep 0601	F-5	NA		NA			Yes	CERCLA	Yes	2
92	Main Hill Seep 0602	G-7	NA		NA			Yes	CERCLA	Yes	2

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[a]	Results	Ref
85	Building 29 Solvent Storage Shed	E-8	Inactive	Acetone	4	Suspected	S	4	1 14	SGS[b] Table B.3 Location 2137 Table B.9 RSS Location S0275	12 6
86	Building 29 Septic Tank (Tank 224)	E-9	Historical	Actinium-227, Radon-222, Thorium-228, Radium-226	3, 4, 6	Suspected	S	4, 6	2	Table B.9 (See discussion for Area 7 in Ref. 6)	6
87	Building 49 Solvent Storage Shed	G-7	Inactive	Organic solvents (including trichloroethene, isopropanol, ethanol, freon-TF, hexane)	4 9	Suspected	S	4	No Data		
88	Tritium in Buried Valley Aquifer	H-4	Historical	Tritium	1 18	Tritium, historically remediated	GW	18	16	Table B.9	11 18
89	Test Fire Residual Storage Area	H-7	In service	Unexploded detonation devices	4, 5, 18	None Suspected		5	No Data		
90	Site Survey Project Potential Hot Spot Location S0425	G-8	Grounds	Thorium	6	Unknown			14	Table B.9 (Appendix E in Ref. 6)	6
91	Main Hill Seep 0601	F-5	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	3, 4, 5, 10, 11, 16	Tables B.6, B.7, B.8, and B.9	18
92	Main Hill Seep 0602	G-7	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	3, 4, 5, 10, 11, 16	Tables B.6, B.7, B.8, and B.9	18
93	Main Hill Seep 0603	D-8	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	No Data		
94	Main Hill Seep 0604	D-6	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	No Data		
95	Main Hill Seep 0605	D-6	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	3, 4, 5, 10, 11, 16	Tables B.6, B.7, B.8, and B.9	18
96	Main Hill Seep 0606	C-7	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	No Data		
97	Main Hill Seep 0607	C-7	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	3, 4, 5, 10, 11, 16	Tables B.6, B.7, B.8, and B.9	18
98	Main Hill Seep 0608	D-6	NA	Tritium, VOCs	5, 18	Tritium, VOCs	SW	13	3, 4, 5, 10, 11, 16	Tables B.6, B.7, B.8, and B.9	18

Document Control No. DGC
W.P. DAVIS

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

The drilling and sampling were performed using an auger drill rig and a 2-ft, split-barrel sampler. As the split-barrel sampler was removed from the borehole, it was monitored for radioactivity contamination by Mound Plant health physics personnel using a FIDLER to detect radioactivity contamination that would pose a hazard to the workers present. After the soil was removed from the sampler and placed in sample containers, field team members wearing gloves brushed the remaining soil out of the sampler. The gloves were then monitored with an alpha scintillometer before the split-barrel sampler was used again. However, no standard decontamination was performed.

The core locations are shown in Plate 1. The core locations were surveyed by a licensed surveyor after drilling was completed. The available reports submitted to Mound Plant by the drilling subcontractors are presented in Appendix B.

2.1.4. Sample Analyses

2.1.4.1. FIDLER Screening

In order to identify samples with concentrations of plutonium-238 exceeding 25 pCi/g and total thorium exceeding 2 pCi/g, all of the soil samples collected were pulverized and then screened using a Bicron® FIDLER at the Mound Plant Soil Screening Facility, known as trailer 15 at the time of the Site Survey Project. The Soil Screening Facility is now located in the H Building at Mound Plant (Plate 1). The minimum detectable activity at which plutonium-238 can be reliably detected at the Mound Plant screening facility is estimated to be 25 pCi/g (Draper 1986b). The detection of plutonium-238 at lesser concentrations (12-25 pCi/g) was unreliable and had an estimated error of ±75 percent. The estimated error decreased with increasing sample activity; for samples with 25 to 100 pCi/g of plutonium-238, the estimated error was ±35 percent, and for samples with >100 pCi/g, the estimated error was ±30 percent (Casella and Bishop 1984). The minimum detectable activity for thorium from FIDLER screening was estimated to be about 2 pCi/g (Stought et al. 1988). The Mound Plant procedure for screening soil samples is provided in Appendix A.

2.1.4.2. Radiochemical Analysis for Plutonium-238

Because of the high error (±75 percent) involved in the FIDLER screening of samples containing less than 25 pCi/g of plutonium-238, all soil samples were radiochemically analyzed by Mound Plant for plutonium-238. The lower detection limit (LDL) for plutonium-238 by this method was estimated to be 0.01 pCi/g, with a relative precision (two standard deviations) of 25 percent. The overall precision of the plutonium-238 measurements was reported to be about 18 percent (DOE 1991b). The Mound

Plant procedure for the radiochemical analysis of soil samples for plutonium-238 is provided in Appendix A.

2.1.4.3. Radiochemical Analysis for Thorium

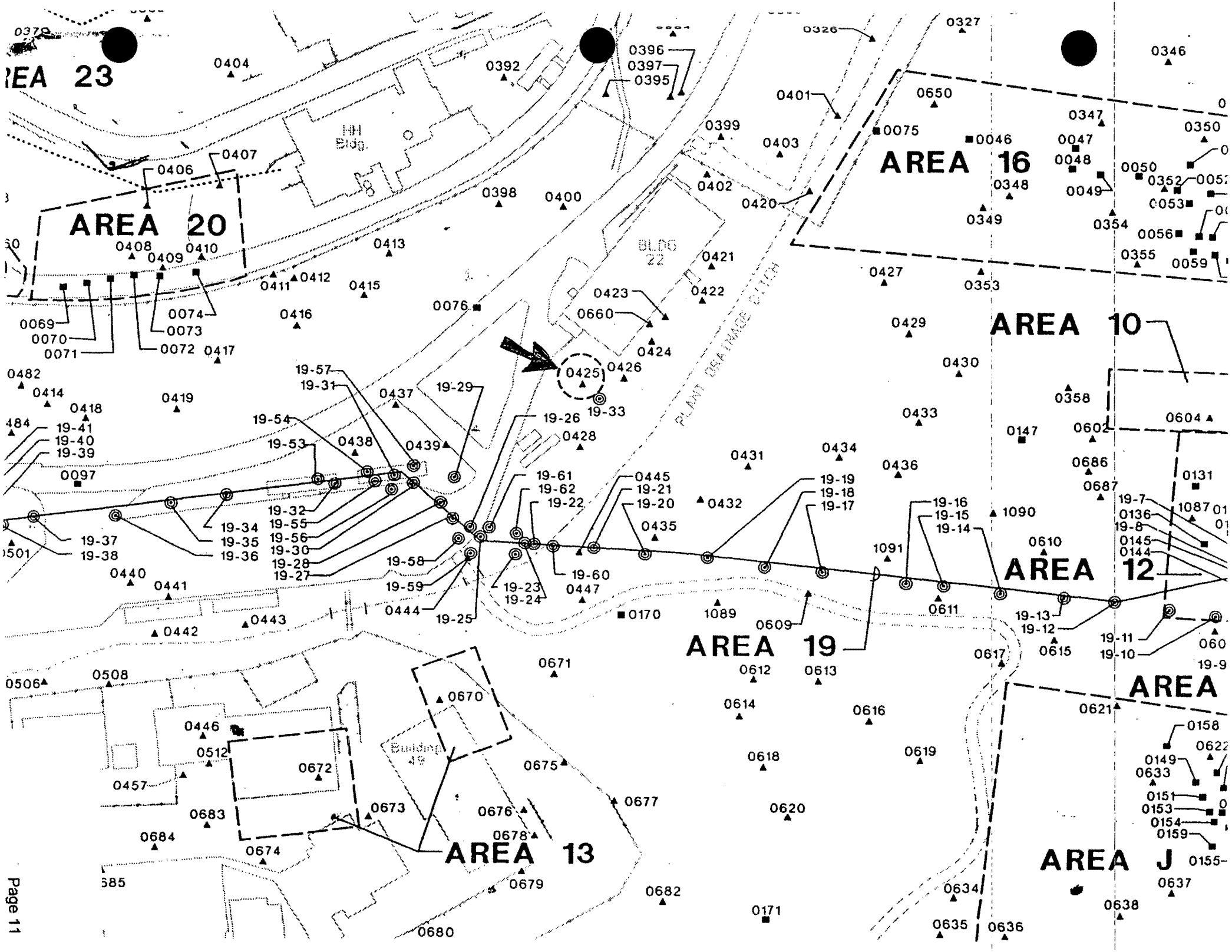
Samples with thorium concentrations in excess of 2 pCi/g by FIDLER screening were also radiochemically analyzed for thorium, resulting in the radiochemical analysis of about 12 percent of the samples. The LDLs for the thorium isotopes using radiochemical procedures were estimated to be

- 0.3 pCi/g for thorium-228, with a relative precision of 60 percent;
- 0.3 pCi/g for thorium-230, with a relative precision of 30 percent; and
- 0.1 pCi/g for thorium-232, with a relative precision of 70 percent.

The overall precision for the thorium measurement was reported to be about 25 percent. The thorium results were reported in pCi of total thorium per gram of soil, isotopes were not identified. The Mound Plant procedure for the radiochemical analysis of soil samples for thorium is provided in Appendix A.

2.1.4.4. Gamma Spectroscopy

Gamma spectroscopy was performed by Mound Plant on approximately 350 (18 percent) of the soil samples in order to verify the identity of the radionuclides present when screening indicated the presence of gamma-emitting radionuclides, but little excess plutonium or thorium was identified by radiochemical analysis. Gamma spectroscopy is capable of detecting a variety of gamma-emitting radionuclides; the radionuclides detected in samples collected during the Site Survey Project included cobalt-60, cesium-137, radium-226, actinium-227, and americium-241. No other gamma-emitting radionuclides with gamma energies below 1.5 megaelectron volts (MeV) were detected although the project report stated that subsequent sampling and analysis in some areas indicated bismuth-207 and bismuth 210. No polonium-210 peaks were detected in the Site Survey Project samples, confirming that polonium-210, which was used at Mound Plant in the 1950s, is no longer present due to radioactive decay (half-life of 138.4 days). The LDLs for cesium-137, cobalt-60, and americium-241 were given with the original data, and were estimated to be 0.5 pCi/g for each. The LDLs for radium-226 and actinium-227 were estimated to be 1.0 pCi/g for both (Stought 1990). The Mound Plant procedure for gamma spectroscopy is provided in Appendix A.



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AREA 10
AREA 12
AREA 19
AREA 13
AREA J
HH Bldg.
BLDG 22
Building 49
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RADIOCHEMICAL ANALYSIS

Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
			10765	09-85	54	NR	NR		LDL	LDL	0.5	LDL
			10766	09-85	72	NR	NR		LDL	LDL	0.5	LDL
			10767	09-85	90	NR	NR		LDL	LDL	0.6	LDL
			10768	09-85	108	NR	NR		LDL	LDL	0.6	LDL
			10769	09-85	126	NR	NR		LDL	LDL	0.7	LDL
S0411	2300	3150	5869	07-84	0	1.15	b					
S0412	2310	3135	6864	08-84	0	0.08	2.97					
S0413	2325	3050	5868	07-84	0	1.21[c]	b					
S0414	2325	3375	6865	08-84	0	1.04	b					
S0415	2350	3085	2875	10-83	0	1.25	b					
S0416	2350	3150	6868	08-84	0	1.18	b					
S0417	2350	3225	6867	08-84	0	1.45	b					
S0418	2350	3350	6866	08-84	0	0.95	b					
S0419	2375	3275	2877	10-83	0	1.09	b					
C0075	2400	2620	8383	11-84	54	4.94[c]	b					
			8384	11-84	90	0.25	2.73					
S0420	2425	2695	6776	08-84	0	0.12	b					
S0421	2450	2800	10470	08-85	0	1.68	b					
S0422	2475	2820	6775	08-84	0	1.45	b					
S0423	2475	2855	10469	08-85	0	2.40	b					
S0424	2490	2875	10468	08-85	0	1.23	b					

GAMMA SPECTROSCOPY

RADIOCHEMICAL ANALYSIS

Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
S0425	2500	2945	4108	10-83	0	1.08	5.74					
S0426	2510	2910	10467	08-85	0	1.00	b					
S0427	2525	2670	6777	08-84	0	1.58	b					
S0428	2550	2970	6772	08-84	0	11.80	b					
S0429	2575	2670	6774	08-84	0	3.43	b					
S0430	2625	2645	4111	10-83	0	0.20[c]	b					
S0431	2625	2845	4110	10-83	0	1.79	b					
S0432	2635	2895	6780	08-84	0	5.78	b					
S0433	2650	2695	6778	08-84	0	0.98	b					
S0434	2650	2770	6773	08-84	0	12.10	b					
S0435	2650	2945	4109	10-83	0	0.83	b					
S0436	2685	2730	6779	08-84	0	7.83	b					
C0076	2400	3000	8290	11-84	36	0.15	b					
			8291	11-84	72	0.16	b					
			8292	11-84	126	0.11	b					
S0437	2450	3100	5878	07-84	0	1.52	b					
S0438	2474	3150	5879	07-84	0	0.27	b					
S0439	2500	3075	5880	07-84	0	0.49	b					
S0440	2500	3375	2984	10-83	0	0.96	b					
S0441	2525	3350	2982	10-83	0	0.07	b					

Document Control No.

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

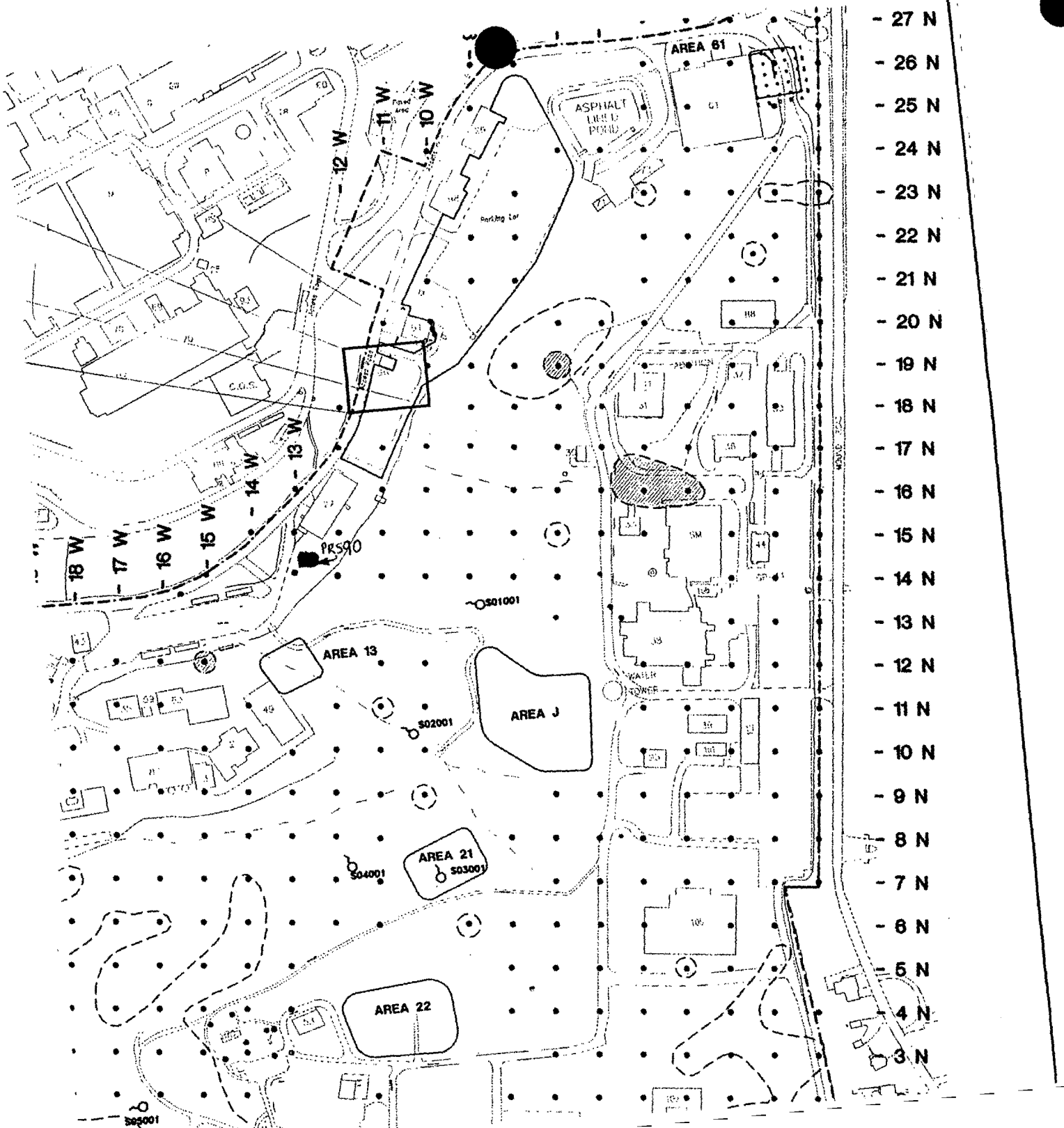
VOLUME I - TEXT

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies


AREA 61
ASPHALT LINED POND
Parking Lot
C.G.S.
PRS90
S01001
AREA 13
AREA J
S02001
AREA 21
S03001
S04001
AREA 22
S05001
WALK TOWER
12 W
11 W
10 W
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16 W
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14 W
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27 N
26 N
25 N
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22 N
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APPENDIX D

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

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	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:
12N15	157.3	65	8.45	4.0	NC	85	b	0.9	a
12N16	157.3	110	8.45	5.5	NC	9	a	0.7	a
12N17	157.3	60	8.45	3.5	NC	WIPE	c	WIPE	c
12N18	157.3	60	8.45	4.5	NC	WIPE	c	WIPE	c
12N19	157.3	55	8.45	4.5	NC	19	a	0.5	a
12N20	157.3	65	8.45	4.5	NC	WIPE	c	WIPE	c
12N21	157.3	50	8.45	3.5	NC	WIPE	c	WIPE	c
12N22	157.3	85	8.45	5.5	NC	16	a	1	a
12N23	157.3	75	8.45	5.0	NC	WIPE	c	WIPE	c
12N24	157.3	40	8.45	3.5	NC	WIPE	c	WIPE	c
13N01	253.5	180	12.48	10.0	NC	15	a	1.1	a
13N02	253.5	95	12.48	4.5	NC	WIPE	c	WIPE	c
13N03	130	110	6.5	4.5	NC	WIPE	c	WIPE	c
13N25	157.3	40	8.45	4.0	NC	WIPE	c	WIPE	c
13N26	157.3	60	8.45	4.0	NC	WIPE	c	WIPE	c
14N01	253.5	100	12.48	7.0	NC	WIPE	c	WIPE	c
14N02	122.2	80	5.59	4.5	NC	WIPE	c	WIPE	c
14N03	130	75	6.5	5.0	NC	WIPE	c	WIPE	c
14N07	170.3	100	9.72	7.0	NC	NR		NR	
14N08	170.3	150	9.72	10.0	NC	NR		NR	
14N09	170.3	145	9.72	10.0	NC	NR		NR	
14N10	170.3	85	9.72	8.0	NC	NR		NR	
14N11	170.3	115	9.72	10.0	NC	NR		NR	
14N12	170.3	130	9.72	8.0	NC	NR		NR	
14N13	157.3	100	8.45	5.5	NC	NR		NR	
14N15	157.3	70	8.45	4.0	NC	WIPE	c	WIPE	c
14N25	157.3	85	8.45	7.0	NC	9	a	0.6	a
14N26	157.3	80	8.45	7.5	NC	8	a	0.7	a
14N27	157.3	150	8.45	9.0	NC	20	a	0.9	a

APPENDIX D

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

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	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:
15N01	253.5	190	12.48	10.0	NC	21	a	1.1	a
15N02	122.2	110	5.59	4.5	NC	WIPE	c	WIPE	c
15N03	130	80	6.5	6.0	NC	0	a	0	a
15N06	130	75	6.5	5.0	NC	NR		NR	
15N07	170.3	115	9.72	8.5	NC	30	b	1	a
15N08	170.3	155	9.72	9.0	NC	NR		NR	
15N09	170.3	125	9.72	10.5	NC	17 17	a a	1.2 1.1	a a
15N10	170.3	100	9.72	7.5	NC	19	a	0.9	a
15N11	170.3	120	9.72	8.5	NC	2	a	1	a
15N12	157.3	100	8.45	6.0	NC	17	a	0.6	a
15N13	157.3	85	8.45	4.5	NC	WIPE	c	WIPE	c
15N14	157.3	108	8.45	6.0	NC	NR		NR	
16N01	253.5	170	10.0	10.5	NC	17	a	1.1	a
16N02	122.2	70	5.59	4.5	NC	WIPE	c	WIPE	c
16N03	130	100	6.5	5.0	NC	0	a	0.5	a
16N04	130	150	6.5	9.0	NC	78	b	1.2	a
16N05	NC	NC	NC	NC	NC	243	b	1.2	a
16N06	130	45	6.5	4.5	NC	WIPE	c	WIPE	c
16N07	170.3	80	9.72	5.0	NC	4	a	1	a
16N08	170.3	45	9.72	4.5	NC	9	a	0.6	a
16N09	170.3	130	9.72	7.5	NC	NR		NR	
16N10	170.3	125	9.72	6.5	NC	NC		NC	
16N11	157.3	110	8.45	5.5	NC	NC		NC	
16N13	157.3	55	8.45	5.5	NC	NR		NR	
17N01	253.5	100	12.48	5.5	NC	0	a	0.5	a
17N02	130	80	6.5	4.5	NC	WIPE	c	WIPE	c
17N04	130	80	6.5	4.0	NC	WIPE	c	WIPE	c
17N05	130	90	6.5	4.0	NC	WIPE	c	WIPE	c

APPENDIX D

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

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	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:

NR - Not recorded
NC - No sample/reading taken
NA - Reading not taken; contamination criteria not exceeded.
a - Mound Soil Screening Facility detection level not exceeded.
b - Concentration at or above the Mound Soil Screening Facility detection level
c - Results of the wipe sample were less than 20 disintegrations per minute.
CPM - Counts per minute
KCPM - Counts per minute x 1000
pCi/g - Picocuires per gram

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

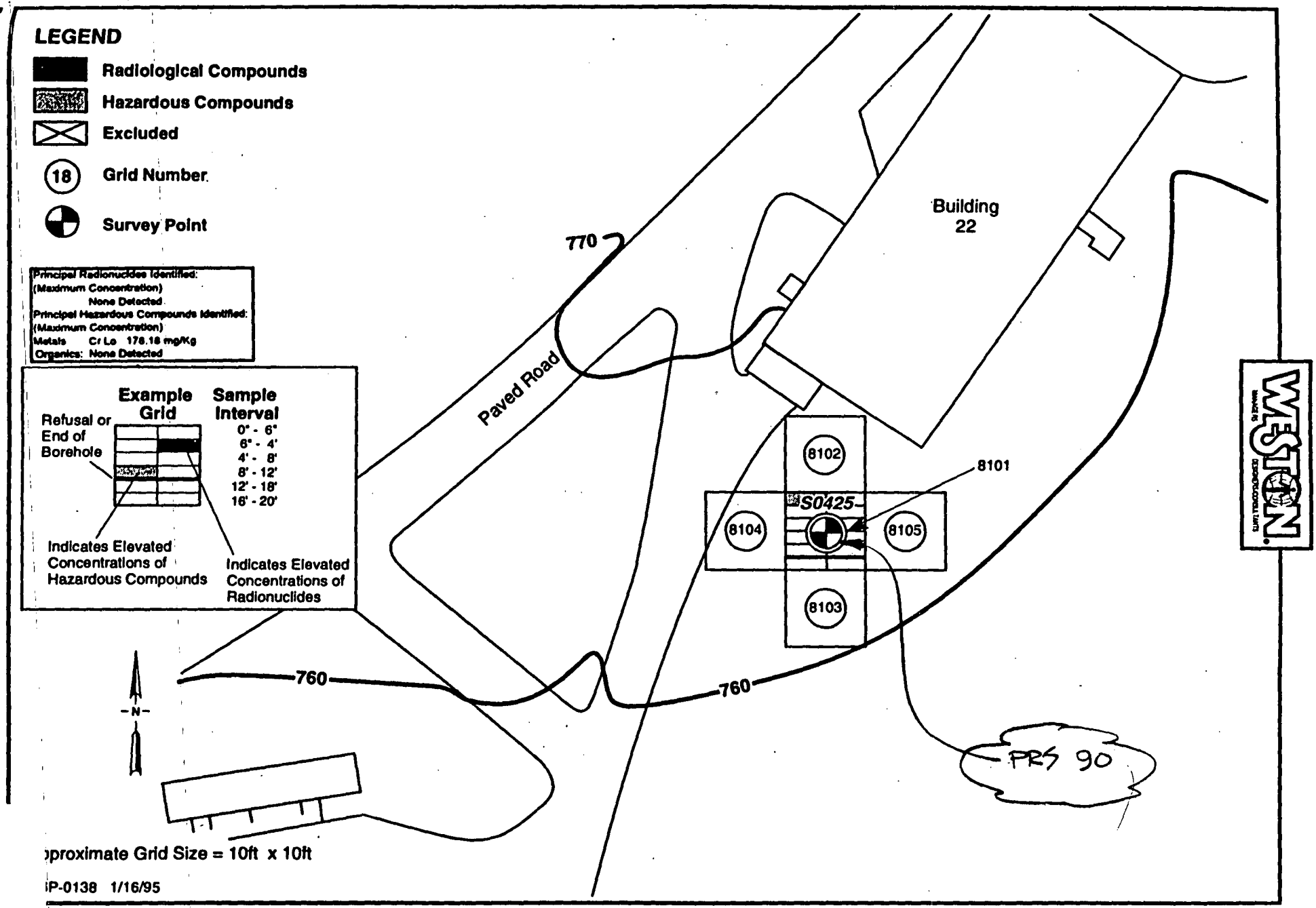


FIGURE 5.13 HOT SPOT S0425

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

	FIDLER		Organics		Rad Laboratory				
Sa[illegible]	Channel 1 (1K)	Channel 2 (5K)	OVA	OVM	Pu 238 (25)	Th 232 (5)	Ra 226 (5)	Cs 137 (15)	Am 241(20)
10[illegible]	<1000	<5000	<1	<1					

	PXRF Metals								
ample ID	As (102.07)	Ba (1489)	Cd	Cr HI	Cr LO (184.43)	Pb (172)	Hg	Se	Ag (2559)
101-5001	48.025	180.09	<44.5	<347	178.18	<10	<37	<14	<29

This table lists only those samples whose reported concentrations exceeded the Other Soils field action levels.

500 TIMES LESS THAN RISK BASED SOIL GUIDELINE FOR CHROMIUM III

MOUND SOIL SCREENING RESULTS

TEST RESULTS - SODIUM IODIDE SOIL SCREEN
(MD-80030, OP. 1355)
400 SECOND COUNT
PREPARED BY BETTY PETERS -EXT. 4408

Thorium
Plutonium

SAMPLE NO.	DATE COLLECTED	DATE SCREENED	SAMPLER	SAMP TYPE	88 KEV WINDOW pCi/g	17 KEV WINDOW pCi/g	MORE ISO-TOPES	GRID LOCATION	WELL
501751	02/27/95	02/28/95	[redacted] 5983	CONT	0.9	3	N	WESTON OTHER SOILS 8101-5001	C
501750	02/27/95	02/28/95	[redacted] 5983	CONT	1.3	17	N	WESTON OTHER SOILS 8101-5004	A
501748	02/27/95	02/28/95	[redacted] 5983	CONT	1.4	19	N	WESTON OTHER SOILS 8101-5008	A
501749	02/27/95	02/28/95	[redacted] 5983	CONT	1.0	14	N	WESTON OTHER SOILS 8101-5012	A
501746	02/27/95	02/28/95	[redacted] 5983	CONT	0.8	14	N	WESTON OTHER SOILS 8101-5016	A
501747	02/27/95	02/28/95	[redacted] 5983	CONT	0.8	13	N	WESTON OTHER SOILS 8102-5001	C
501744	02/27/95	02/28/95	[redacted] 5983	CONT	1.2	20	N	WESTON OTHER SOILS 8102-5004	A
501743	02/27/95	02/28/95	[redacted] 5983	CONT	0.9	16	N	WESTON OTHER SOILS 8102-5008	B
501745	02/27/95	02/28/95	[redacted] 5983	CONT	1.0	20	N	WESTON OTHER SOILS 8102-5012	C

surface sample
4 foot sample
borehole location
8 foot sample

MOUND SOIL SCREEN DATA

TEST RESULTS - SODIUM IODIDE SOIL SCREEN
(MD-80030, OP. 1355)
400 SECOND COUNT
PREPARED BY BETTY PETERS -EXT. 4408

#	DATE COLLECTED	DATE SCREENED	SAMPLER	SAMP TYPE	88 KEV WINDOW pCi/g	17 KEV WINDOW µCi/g	MORE ISO-TOPES	GRID LOCATION	WELL
501766	02/28/95	02/28/95	[redacted]5983	CONT	0.7	14	N	WESTON OTHER SOILS 8103-5001	C
9501761	02/28/95	02/28/95	[redacted]5983	CONT	2.3	22	N	WESTON OTHER SOILS 8103-5004	A
9501764	02/28/95	02/28/95	[redacted]5983	CONT	1.1	13	N	WESTON OTHER SOILS 8103-5008	B
9501762	02/28/95	02/28/95	[redacted]5983	CONT	1.0	11	N	WESTON OTHER SOILS 8103-5012	B
9501758	02/28/95	02/28/95	[redacted]5983	CONT	1.0	14	N	WESTON OTHER SOILS 8103-5016	A
501767	02/28/95	02/28/95	[redacted]535	CONT	1.0	15	N	WESTON OTHER SOILS 8104-5001	A
9501763	02/28/95	02/28/95	[redacted]5983	CONT	1.1	10	N	WESTON OTHER SOILS 8104-5004	C
9501760	02/28/95	02/28/95	[redacted]5983	CONT	1.0	9	N	WESTON OTHER SOILS 8104-5008	C
9501757	02/28/95	02/28/95	[redacted]5983	CONT	0.8	16	N	WESTON OTHER SOILS 8104-5012	B
9501755	02/28/95	02/28/95	[redacted]5983	CONT	1.0	5	N	WESTON OTHER SOILS 8105-5001	C
9501765	02/28/95	02/28/95	[redacted]5983	CONT	1.0	16	N	WESTON OTHER SOILS 8105-5004	A
9501756	02/28/95	02/28/95	[redacted]5983	CONT	0.9	0	N	WESTON OTHER SOILS 8105-5008	A
9501759	02/28/95	02/28/95	[redacted]5983	CONT	0.7	5	N	WESTON OTHER SOILS 8105-5012	B

MOUND SOIL SCREEN DATA

Document Control No.

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

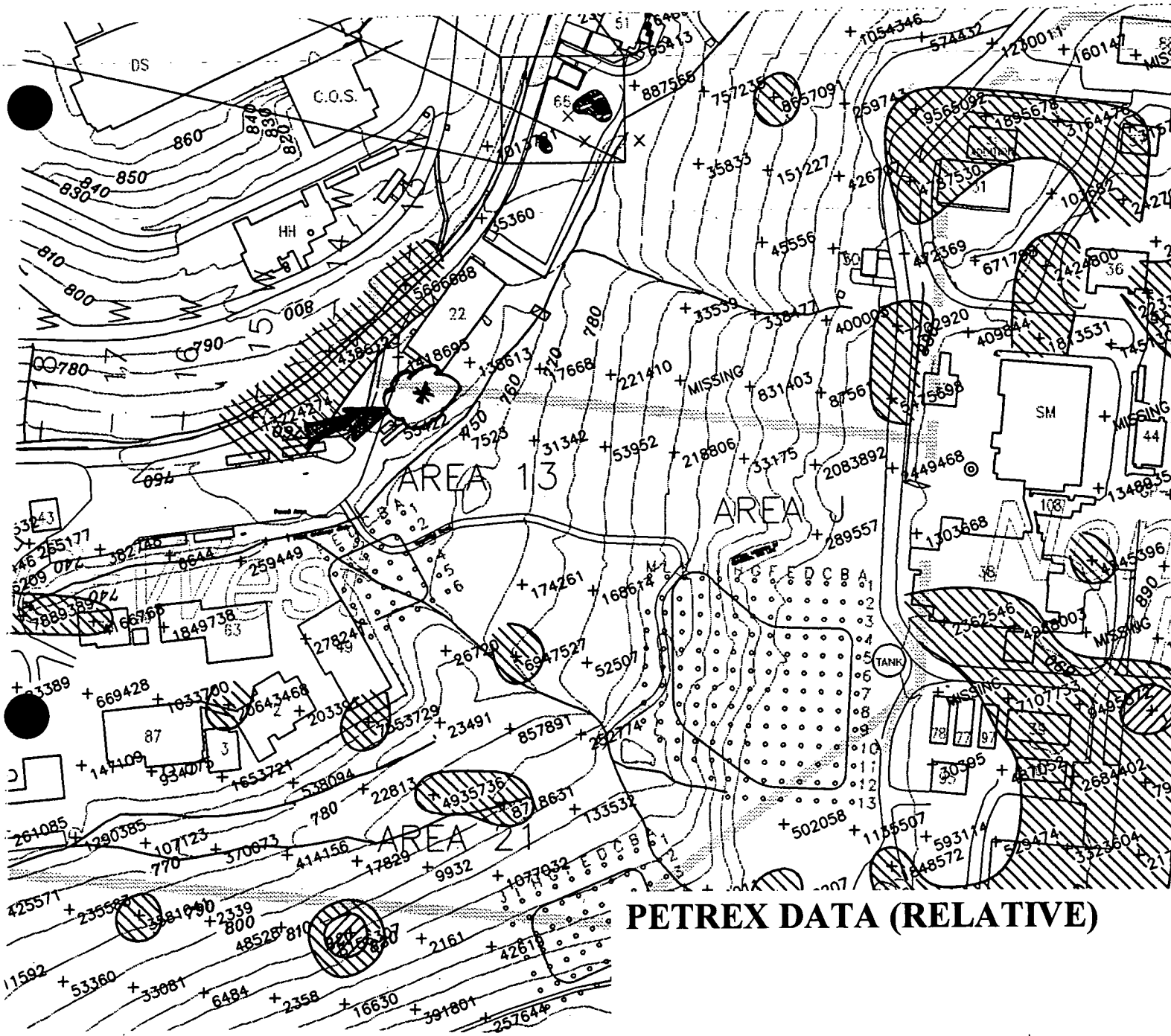
VOLUME II: APPENDICES A-G

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

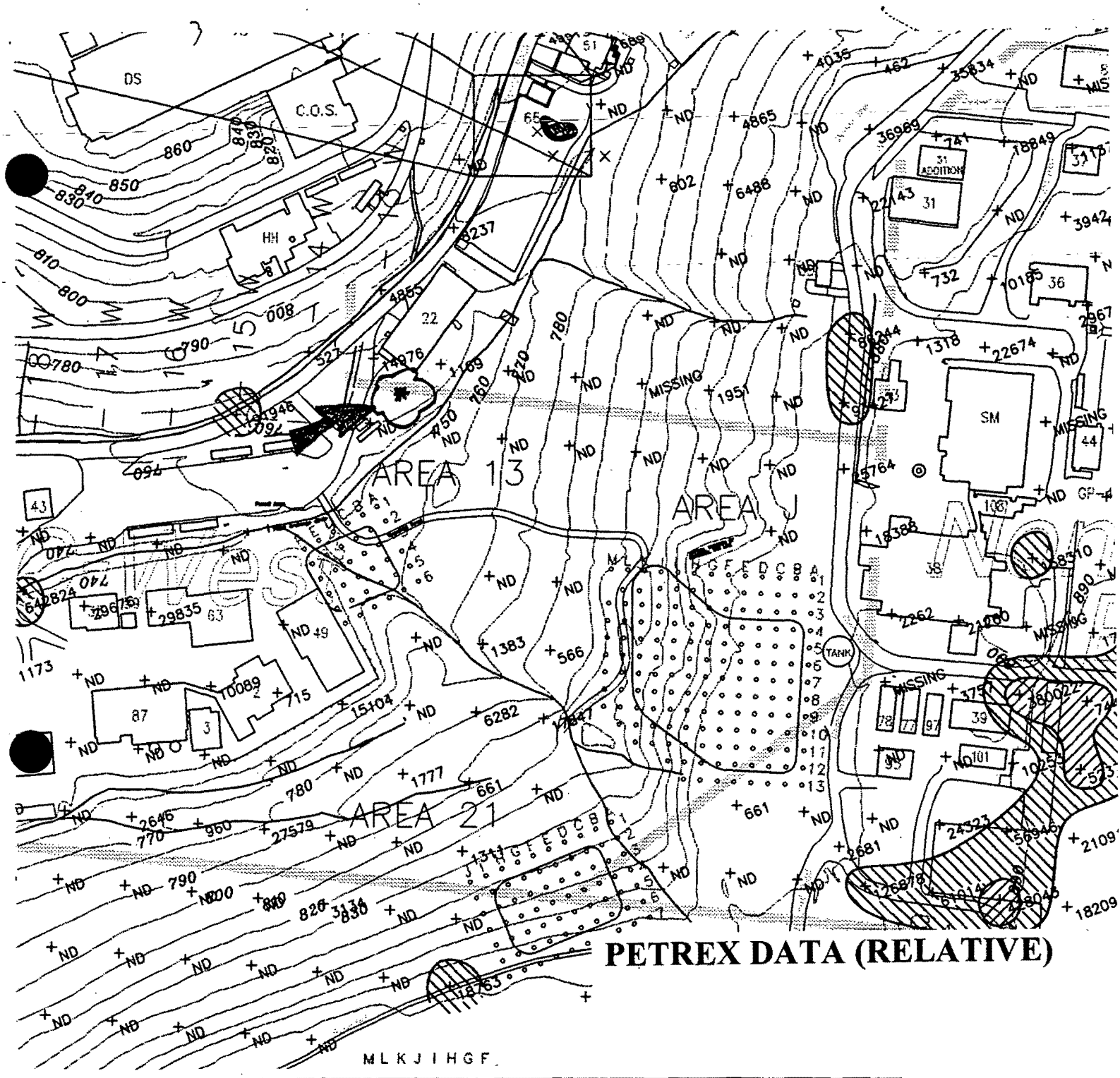


LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 8,000,000	≥ 29,000,000	≥ 11,500,000	≥ 23,000,000	≥ 25,000,000
1,500,000–7,999,999	3,000,000–28,999,999	1,600,000–11,499,999	4,000,000–22,999,999	3,000,000–24,999,999

Relative Response

Total C5–C11
Petroleum Hydrocarbons

Plate 4

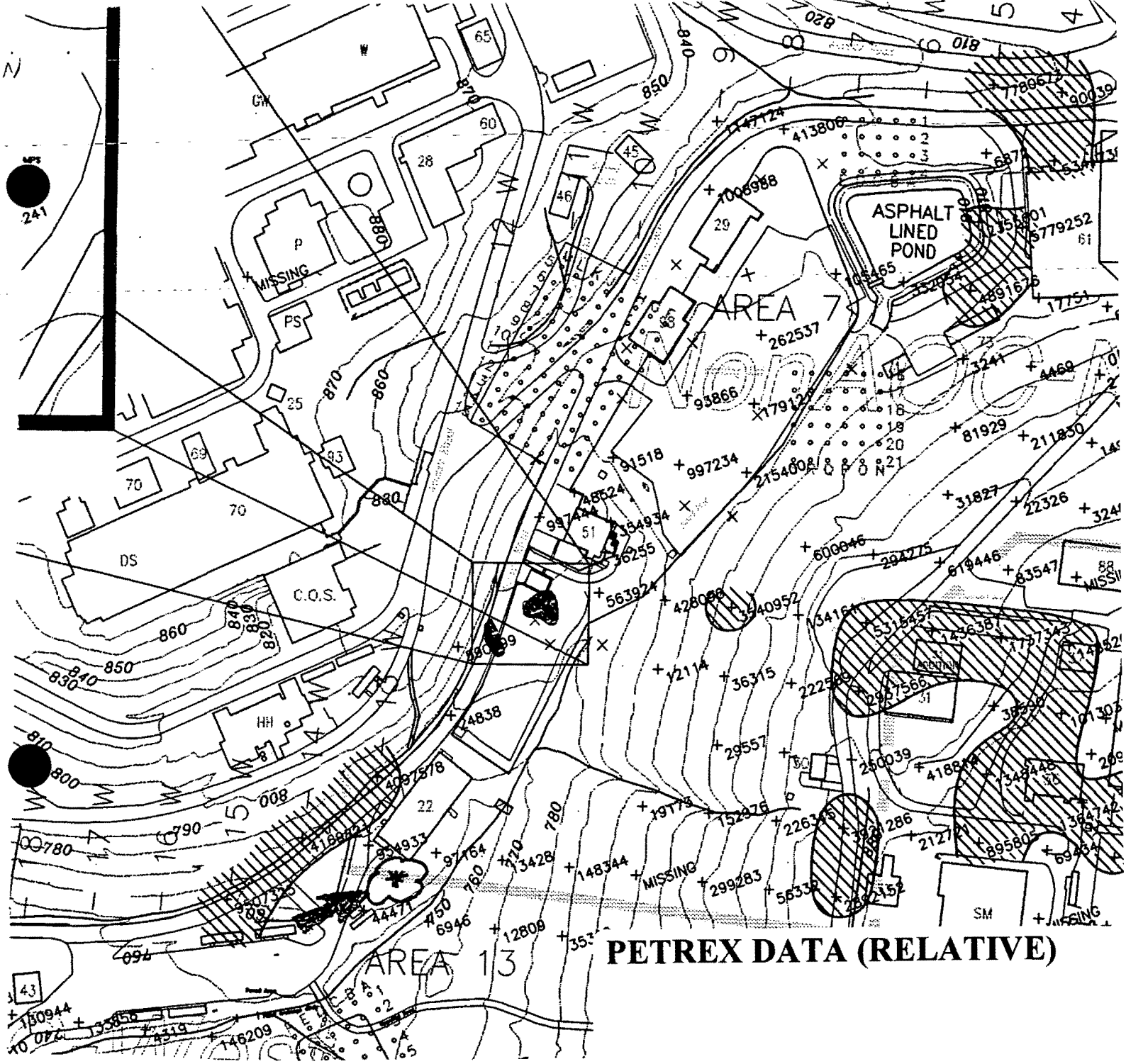


LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 70,000	≥ 1,000,000	≥ 300,000	≥ 800,000	≥ 1,400,000
7,000–69,999	100,000–999,999	30,000–299,999	80,000–799,999	180,000–1,399,999

Relative Response

Total Semivolatile Hydrocarbons

Plate 3

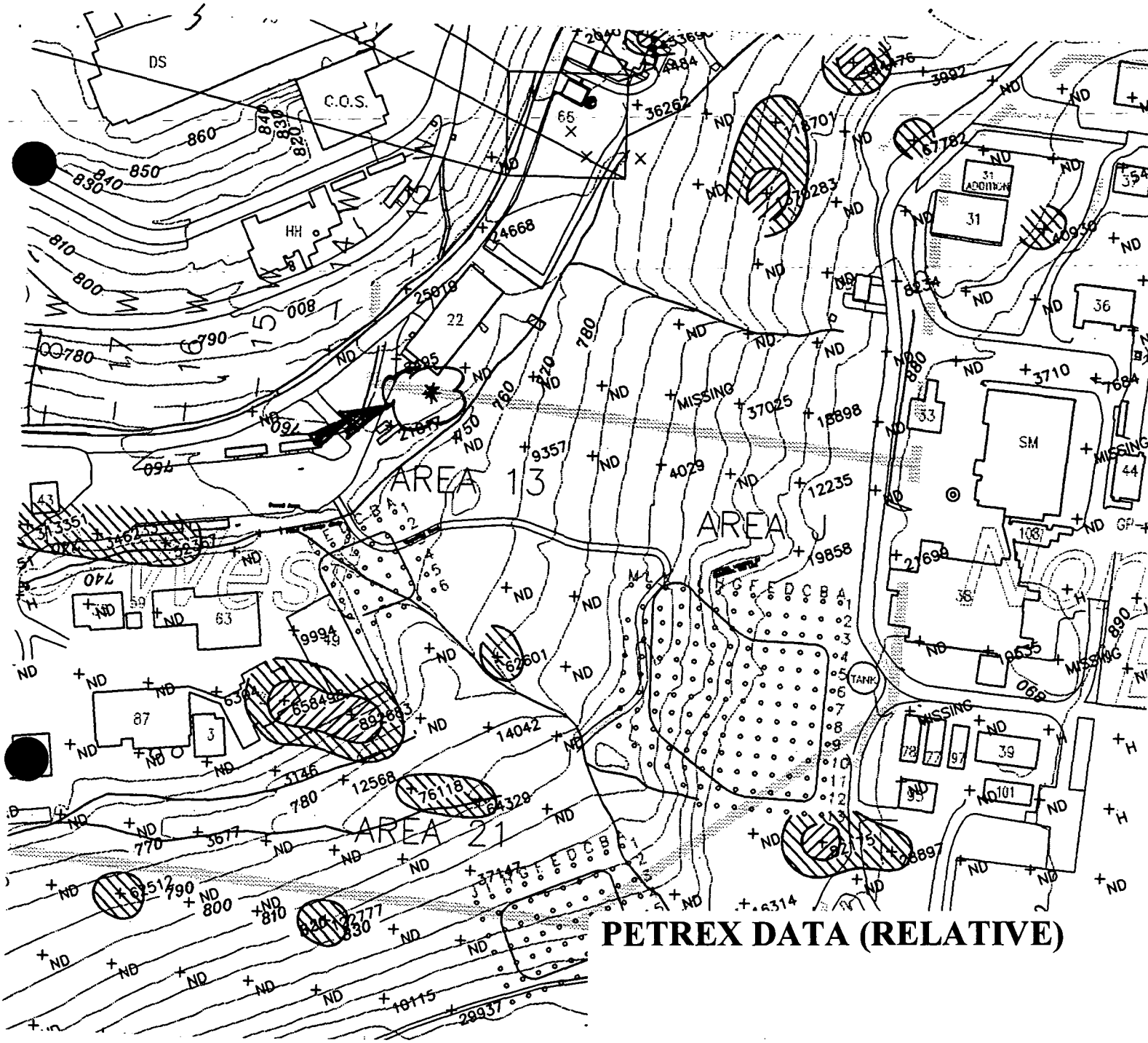


LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 4,200,000	≥ 20,000,000	≥ 5,000,000	≥ 10,000,000	≥ 5,800,000
850,000–4,199,999	2,600,000–19,999,999	850,000–4,999,999	1,500,000–9,999,999	1,400,000–5,799,999

Relative Response

Total Aromatic Hydrocarbons

Plate 2



LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 500,000	≥ 500,000	≥ 80,000	≥ 400,000	≥ 250,000
50,000–499,999	50,000–499,999	20,000–79,999	40,000–399,999	35,000–249,999

Relative Response

Total Halogenated Hydrocarbons

Plate 5

RISK-BASED GUIDELINE VALUES

MOUND PLANT
MIAMISBURG, OHIO

December 1995

Submitted to the
Office of Southwestern Area Programs (EM-453)
Environmental Restoration
and the
Miamisburg Area Office
U.S. DEPARTMENT OF ENERGY

Prepared by
HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
Environmental Management and Enrichment Facilities
Managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

FINAL
(REVISION 3)

TABLE 4A

Construction/Mound Employee - Soil/Sediment Guideline Values: Chemicals (Units = mg/kg)

CHEMICAL	Ingestion				Inhalation				Ingestion + Inhalation			
	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1
High Explosives												
HMX				5.50e+04								
PETN												
RDX	2.70e+03	2.70e+02	2.70e+01	3.20e+03								
Inorganics												
Aluminum												
Antimony				4.25e+02								
Arsenic				3.20e+02	6.00e+05	6.00e+04	6.00e+03					
Barium				7.50e+04				1.55e+07				7.50e+04
Beryllium	7.00e+01	7.00e+00	7.00e-01	5.50e+03	3.65e+06	3.65e+05	3.65e+04		7.00e+01	7.00e+00	7.00e-01	
Cadmium (Diet)				1.05e+03	5.00e+06	5.00e+05	5.00e+04					
Chromium III				1.05e+06								
Chromium VI				5.50e+03	7.50e+05	7.50e+04	7.50e+03					
Cobalt												
Copper												

TABLE 4B Construction/Mound Employee - Soil/Sediment Guideline Values: Radionuclides (Units = pCi/g)

RADIONUCLIDE	Ingestion			External			Inhalation			Ingestion + External + Inhalation		
	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6
Actinium-227+D	2.65e+02	2.65e+01	2.65e+00	1.65e+02	1.65e+01	1.65e+00	2.20e+05	2.20e+04	2.20e+03	1.00 e+02	1.00 e+01	1.00 e+00
Americium-241	5.00e+02	5.00e+01	5.00e+00	2.10e+04	2.10e+03	2.10e+02	4.45e+05	4.45e+04	4.45e+03	4.45e+02	4.95e+01	4.95 e+00
Bismuth-207	3.30e+04	3.30e+03	3.30e+02	1.75e+01	1.75e+00	1.75e-01	1.80e+09	1.80e+08	1.80e+07	1.75e+01	1.75e+00	1.75 e-01
Cesium-137+D	5.50e+03	5.50e+02	5.50e+01	4.65e+01	4.65e+00	4.65e-01	9.00e+08	9.00e+07	9.00 e+06	4.60e+01	4.60e+00	4.6 e-01
Cobalt-60	9.00e+03	9.00 e+02	9.00 e+01	10.00e+00	1.00e+00	1.00e-01	2.50e+08	2.50e+07	2.50 e+06	1.00 e+01	1.00e+00	1.00 e-01
Plutonium-238	5.50e+02	5.50e+01	5.50 e+00	5.00e+06	5.00 e+05	5.00 e+04	6.50e+05	6.50 e+04	6.50 e+03	5.50e+02	5.50 e+01	5.50 e+00
Plutonium-239	5.50e+02	5.50 e+01	5.50 e+00	7.50e+06	7.50 e+05	7.50 e+04	6.00e+05	6.00 e+04	6.00 e+03	5.50 e+02	5.50 e+01	5.50 e+00
Plutonium-240	5.50e+02	5.50 e+01	5.50 e+00	5.00e+06	5.00 e+05	5.00 e+04	6.00e+05	6.00 e+04	6.00 e+03	5.50 e+02	5.50 e+01	5.50 e+00
Radium-226+D	5.50 e+02	5.50 e+01	5.50 e+00	1.45e+01	1.45e+00	1.45e-01	6.00e+06	6.00e+05	6.00 e+04	1.40e+01	1.40e+00	1.40 e-01
Strontium-90+D	3.00e+03	3.00 e+01	3.00 e+00				2.45e+08	2.45 e+07	2.45 e+06	3.00 e+02	3.00 e+01	3.00 e+00
Thorium-228+D	7.00e+02	7.00 e+01	7.00 e+00	10.00e+01	10.00 e+00	1.00e+00	1.75e+05	1.75e+04	1.75 e+03	8.50e+01	8.50 e+00	8.50 e-01
Thorium-230	4.45e+03	4.45e+02	4.45e+01	2.20e+06	2.20 e+05	2.20 e+04	10.00e+05	10.00 e+04	10.00 e+03	4.40e+03	4.40e+02	4.40 e+01
Thorium-232	5.00e+03	5.00 e+02	5.00 e+01	4.95e+06	4.95 e+05	4.95 e+04	9.00e+05	9.00 e+04	9.00 e+03	5.00e+03	5.00 e+02	5.00 e+01
Tritium	2.35e+06	2.35 e+05	2.35 e+04				1.80e+11	1.80 e+10	1.80 e+09	2.35e+06	2.35 e+05	2.35 e+04

OTHER SOILS
FIELD SAMPLING DATA

Key to interpreting sample data:

Sample nomenclature is of the form **XXYY-ZZ00**

Where:
XX = Area designation

YY = Sample Location
- 01 = Historical Hot Spot Location
- 02 = Approx 10 feet north of historical location
- 03 = Approx 10 feet south of historical location
- 04 = Approx 10 feet west of historical location
- 05 = Approx 10 feet east of historical location

ZZ = Sample Type
- 50 = Soil

00 = Sample Depth
- 01 = Surface
- 04 = 0-4 feet
- 08 = 4-8 feet
- 12 = 8-12 feet

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT S0425 81XX W.O. NO. ____

TASK DESC ... D. ____

PREPARED ... ROVED BY

MATH CHEC ...

METHOD REV ... DATE ____

Sample ID	Rad Laboratory (25) Plutonium	Rad Laboratory (5) Thorium	Fidler (1K) Channel 1	Fidler (5K) Channel 2	α	β	Organics OVA	Organics OVM	Metals
8101-5001	—	—	—	—	—	—	—	—	
5004	—	—	—	—	—	—	—	—	
5008	—	—	—	—	—	—	—	—	
5012	—	—	—	—	—	—	—	—	
5016	—	—	—	—	—	—	—	—	
8102-5001	—	—	—	—	—	—	—	—	
5004	—	—	—	—	—	—	—	—	
5008	—	—	—	—	—	—	—	—	
5012	—	—	—	—	—	—	—	—	
8102-5016									
8103-5001	—	—	—	—	—	—	—	—	
5004	—	—	—	—	—	—	—	—	
5008	—	—	—	—	—	—	—	—	
5012	—	—	—	—	—	—	—	—	
5016	—	—	—	—	—	—	—	—	
8104-5001	—	—	—	—	—	—	—	—	
5004	—	—	—	—	—	—	—	—	
5008	—	—	—	—	—	—	—	—	
5012	—	—	—	—	—	—	—	—	
8105-5001	—	—	—	—	—	—	—	—	
5004	—	—	—	—	—	—	—	—	
5008	—	—	—	—	—	—	—	—	
5012	—	—	—	—	—	—	—	—	
5016			—	—	—	—	—	—	

OTHER SOILS FIELD SAMPLING DATA

Blank entry	Sample results not currently available.
U	Sample resolution undistinguishable from preset Field Action Levels.
-	Sample results less than preset Field Action Levels.