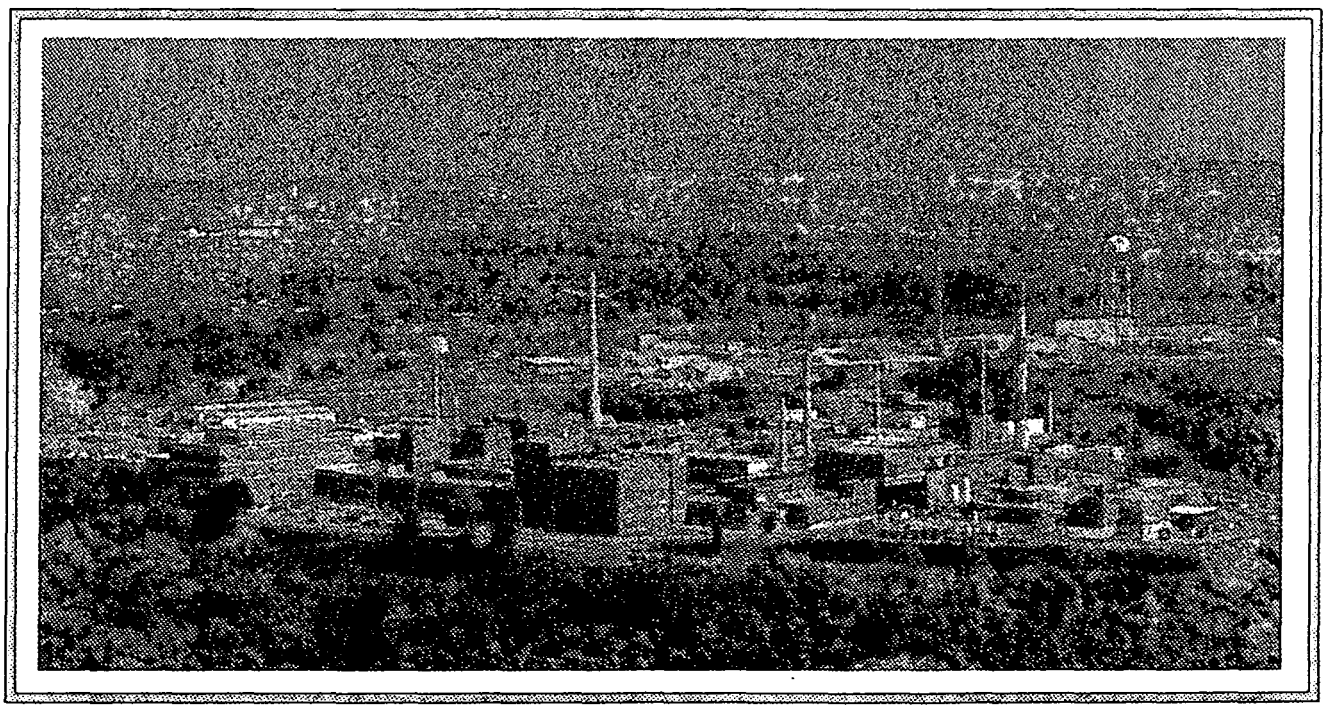
EG&G MOUND-30-03-03-03--9612230068

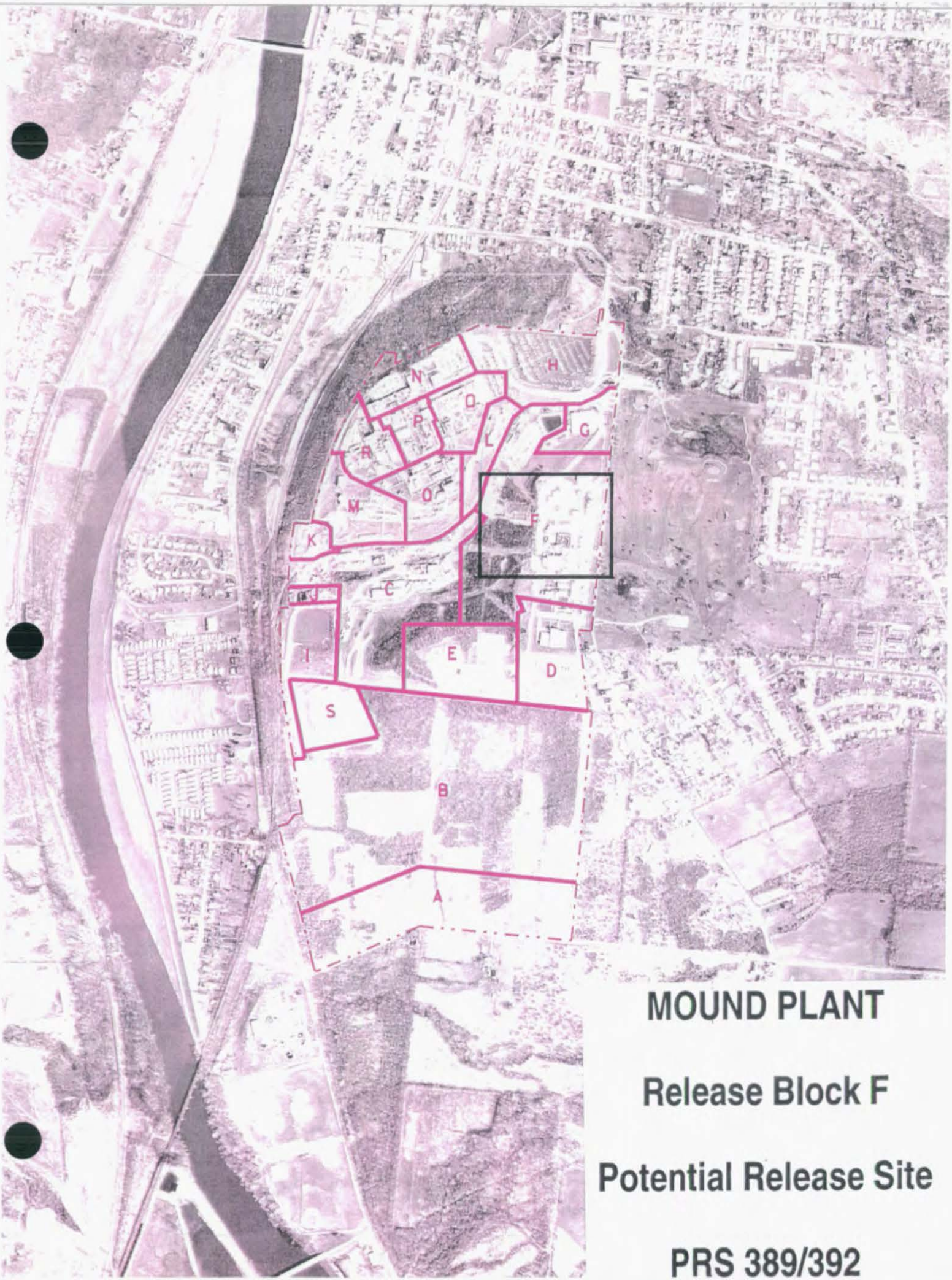
MOUND

Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 389/392



REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comment.	**Dec. 19, 1996**
FINAL 1		

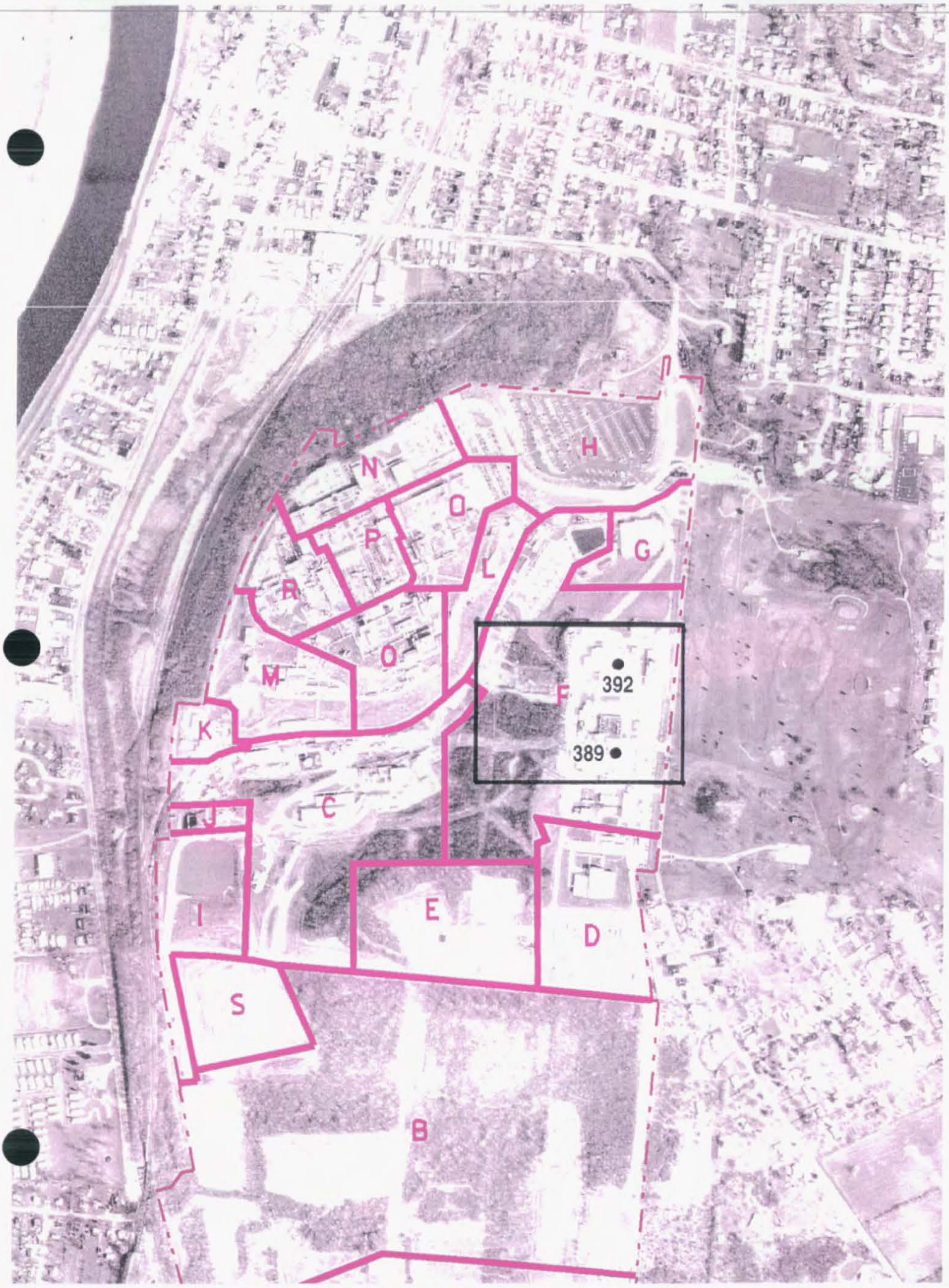


MOUND PLANT

Release Block F

Potential Release Site

PRS 389/392


H
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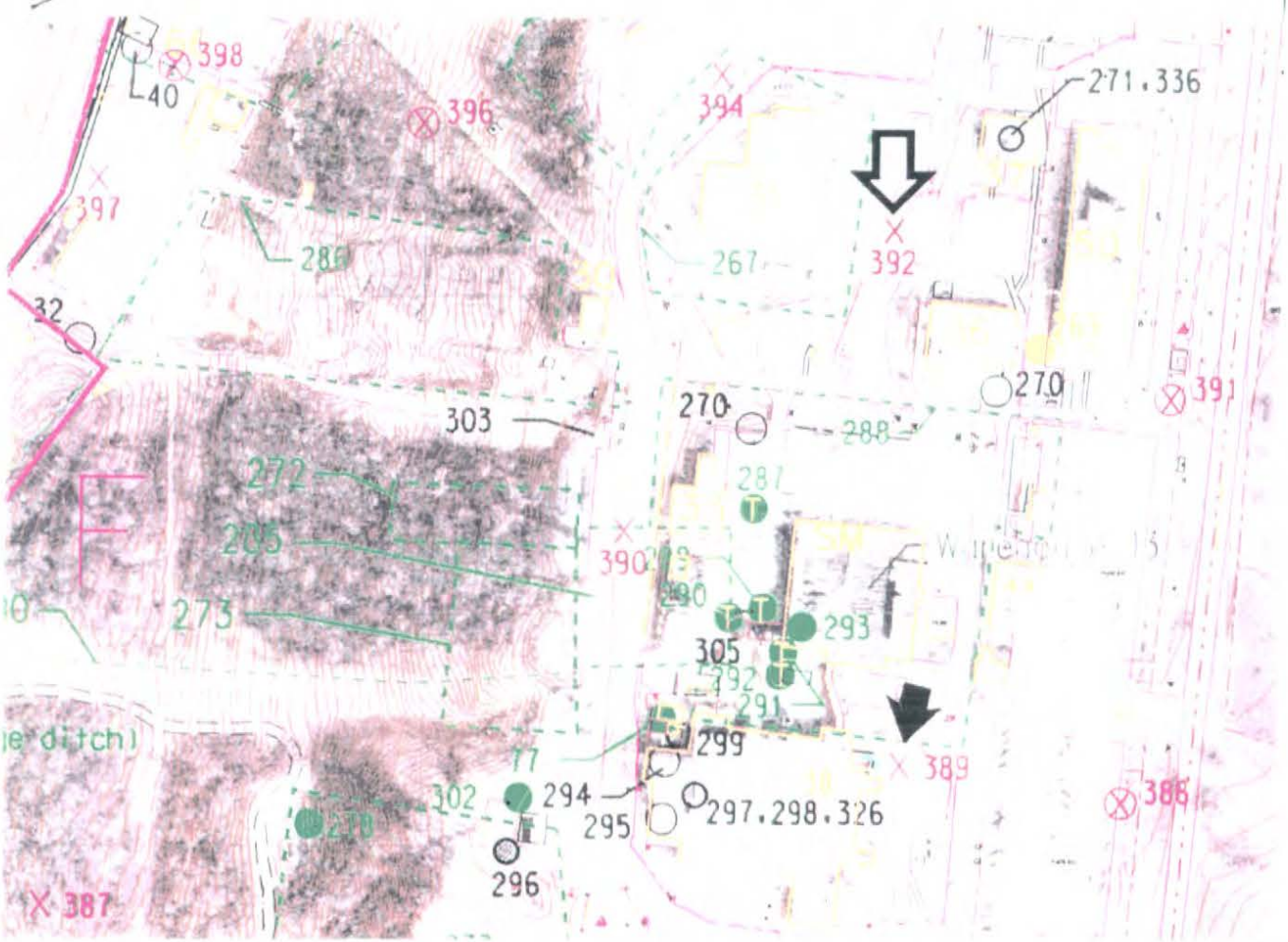
MOUND PLANT

Release Block F

Potential Release Site

PRS 389/392



389

PRS 389/392

PRS HISTORY:

PRS 389 and 392 are soils potential release sites (PRSs) located in the eastern sector of the original Mound plant (see map on page 22). These soils locations were identified as PRSs due to qualitative hydrocarbon detections found during the PETREX soil gas portion of the ***OU5, Non Area of Concern*** investigation.

PRS 392 is located approximately 100 feet east of Building 31. The Building 31 area is currently used as a storage and shipment facility for metal boxes filled with low level radioactive waste. PRS 389 is located just south of the Special Metallurgical Building (SM). The SM Building was a plutonium-238 processing facility from 1960 through 1972. The SM Building was decontaminated and decommissioned in 1995.

CONTAMINATION:

1. In 1983, the ***Radiological Site Survey***[2] investigated radionuclides in the soils at the Mound site via Mound Soil Screening, radiochemistry, and gamma spectroscopy. Seven samples at two locations were taken within 150 feet of PRS 389. No samples were taken in the vicinity of PRS 392 (see map on page 7). Results from the PRS 389 samples showed:

PRS	Sample Type and Location	Results (Maximum)	Guideline Criteria
389	One surface soil sample S0589 taken approx. 150 feet east of PRS. Six core samples taken at C0125 approx. 50 feet north of PRS.	Plutonium-238 at 33.6 pCi/g at C0125 (54" depth)	25 pCi/g (Mound ALARA)
		Thorium-232 at 3.25 pCi/g, at C0125 (72" depth)	5 pCi/g [ref 4]

2. In 1994, the ***OU5, Operational Area Phase I Investigation***[1] analyzed the Mound site for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) via a qualitative PETREX soil gas survey. The OU5 investigation also analyzed surface soil for radiological contamination via Mound FIDLER (field instrument for detecting low energy radiation) and Mound soil screening. Results showed:

PRS	Results - OU 5 Operational Area Phase I Investigation
389	**Qualitative Soil Gas:** Relatively high aromatic, semivolatile and petroleum hydrocarbons **Radioactive Soil Screen:** less than 20 dpm (disintegrations per minute)
392	**Qualitative Soil Gas:** Relatively high halogenated hydrocarbons **Radioactive Soil Screen:** 6 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 0.8 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])

3. In 1996, the ***Soil Gas Confirmation Sampling***[5] investigation performed a quantitative sampling of the *PETREX* soil gas locations with the highest ion counts in the eastern sector of the Mound plant. These locations were identified as *Soil Gas Confirmation Sampling* locations 5, 6 and 9 (the corresponding *PETREX* sample locations are 919, 941 and 946 respectively).

   PRSs 389 and 392 (*PETREX* sample locations 925 and 915 respectively) are also located in Mound's eastern sector and had lower ion counts than the sampled *Soil Gas Confirmation* locations 5, 6 and 9. Hence, the quantitative *Soil Gas Confirmation* results from locations with the highest ion counts provide evidence about the risk of contamination at other locations with similar or lower ion counts such as PRSs 389 and 392. The map on page 19 shows the locations of PRSs 389 and 392 relative to the *Soil Gas Confirmation Sampling* locations 5, 6 and 9).

   The following table lists the qualitative (*PETREX*) and quantitative (*Soil Gas Confirmation Sampling*) results for the locations with the highest ion counts. The table also compares these results to the relative ion counts for PRSs 389 and 392:

PETREX Soil Gas Contaminant Family	Maximum Ion Count[ref 1]	Confirm Sample #	Confirmation Sample Results that Exceed Guideline Criteria (GC)[ref 3,5]	Ion Counts at PRSs 389 and 392[ref 1]	
Total Aromatic Hydrocarbons	6,078,070	(#5)	None	1,727,811 38,590	PRS 389 PRS 392
Total Semivolatile Hydrocarbons	744,700	(#9)	None	158,310 No Detect	PRS 389 PRS 392
Total C5-C11 Petroleum Hydrocarbons	11,565,340	(#5)	None	4,845,396 103,682	PRS 389 PRS 392
Total Halogenated Hydrocarbons	89,852	(#6)	450 ug/kg Benzo(a)pyrene (GC = 410 ug/kg[ref 4])	H 40,930	PRS 389 PRS 392

H = Denotes interference by petroleum hydrocarbons

The above table and discussion make no conclusions about individual contaminant concentrations at PRSs 389 and 392 only that the overall health risk from PRSs 389 and 392 is expected to be similar to or less that of the PETREX locations with the highest measured ion counts.

READING ROOM REFERENCES:

1) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, Volume I and II, Final (Revision 0), June 1995. (pages 8-15)
2) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, Final, June 1993. (pages 6-7.1)
3) Risk Based Guideline Values, Final, (Revision 0), December 1995.

OTHER REFERENCES:

4) Code of Federal Regulations, 40 CFR 192.41 and 40 CFR 192.12.
5) Soil Gas Confirmation Sampling, (Revision 0), May 1996. (pages 16-25)

PREPARED BY:

George Liebson, Member of EG&G Technical Staff

MOUND PLANT
PRS 389/392
SOIL CONTAMINATION

RECOMMENDATION:

PRSs 389 and 392 are located in the eastern sector of the original Mound plant. These soil locations were identified as PRSs due to qualitative hydrocarbon detections found during the PETREX soil gas portion of the ***OU5, Non Area of Concern*** investigation.

In 1996, the Soil Gas Confirmation sampling effort sampled the locations with the highest ion counts (confirmation sample locations 5, 6 and 9) in the eastern sector and discovered no contamination above the 2×10^{-6} risk range. PRSs 389 and 392 were not sampled as part of the *Soil Gas Confirmation Sampling* but the PRSs had lower ion counts than confirmation sample locations 5, 6, and 9. This implies that these PRSs will have similar or lower health risk.

All radiological samples collected near these PRSs indicate that radionuclides are below their applicable 10^{-5} Risk Based Guideline Criteria or regulatory levels. Therefore, NO FURTHER ASSESSMENT is recommended.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath 11/20/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 11/20/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 11/20/96
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 389/392

Document Control No. DCC

Environmental Restoration Program

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

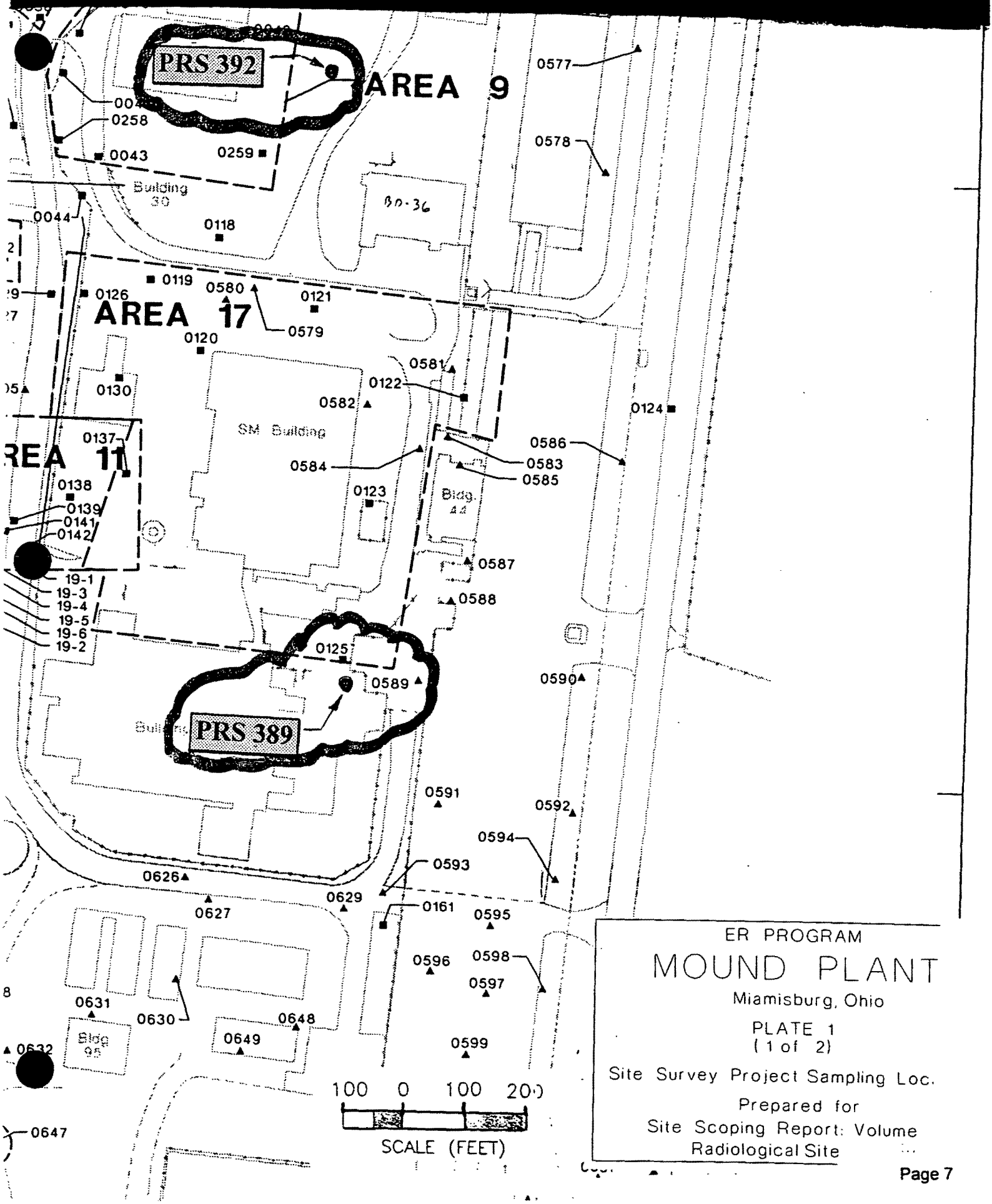
MOUND PLANT
MIAMISBURG, OHIO

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)

Site Survey Project Sampling Loc.

Prepared for
Site Scoping Report: Volume
Radiological Site

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)
C0125	3085	2185	1358	12-82	18	0.43	b					
			1359	12-82	36	0.25	3.11					
			1360	12-82	54	33.60	b					
			1361	12-82	72	0.13[c]	3.25[c]					
			1362	12-82	90	1.97	b					
			1363	12-82	108	0.19	b					
S0589	3125	2135	4007	10-83	0	9.00[c]	b					
S0590	3175	2010	4010	10-83	0	1.05	b					
S0591	3225	2160	4008	10-83	0	6.12	b	0.15				
S0592	3275	2060	[illegible]09	10-83	0	[illegible]	b	0.33				
S0593	3275	2230	4012	10-83	0	1.07	b					
S0594	3320	[illegible]	292[illegible]	10-83	0	6.55	[illegible]70					
S0595	3335	2160	2932	[illegible]0-83	0	0.14	b					
S059[illegible]	3350	2220	2933	10-83	0	0.02	b	[illegible].63				
S0597	[illegible]	2185	5813	07-84	[illegible]	3.67	b					
S0598	3400	2140	2929	10-[illegible]3	0	5.30	[illegible]30					
S[illegible]99	3425	2220	5814	07-84	0	1.45	b					
S0600	3460	2210	29[illegible]	10-83	0	4.06	2.27	0.69				
S0601	3555	2220	[illegible]1	10-83	0	0.42[c]	2.4[illegible]	0.[illegible]				
C0126	2725	2265	1319	12-82	18	5.57	b					

[a]C denotes core location and S denotes surface sample location on Plate 1.
[b]Thorium results of ≤ 2 pCi/g are listed as "b".
[c]Verification sample analyzed for QA/QC.
[d]No MRC ID assigned because *in situ* gamma spectrometry was performed for thorium-232.
[e]Gamma results could not be confirmed using the gamma spectroscopy printout given in this appendix.
[f]The depth for this sample was given as "SS". For mapping purposes (Plates 1 and 5), this is assumed to be a surface sample.
[g]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.

Document Control No.

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

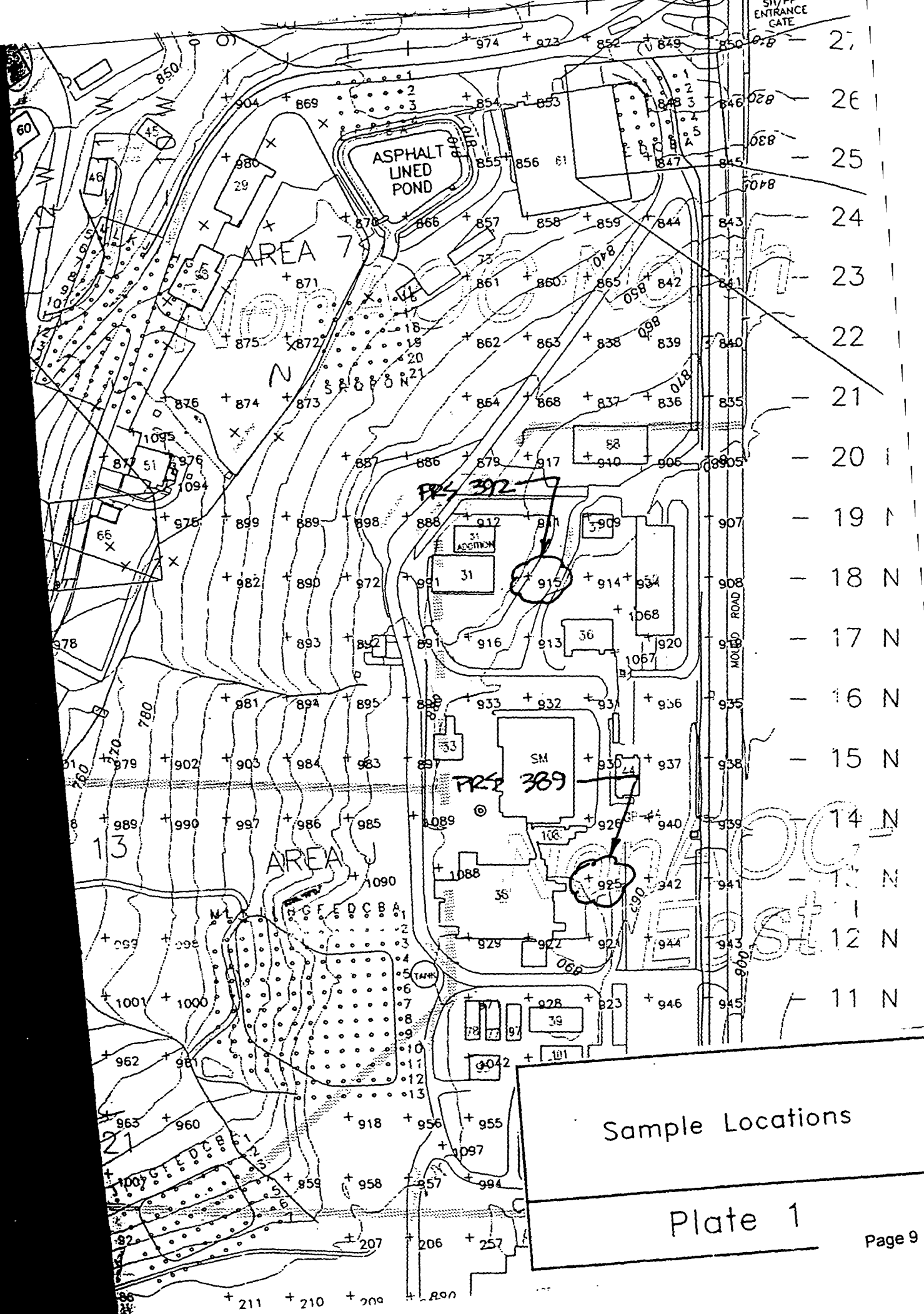
VOLUME II - APPENDICES A-G

June 1995

Final (Revision 0)

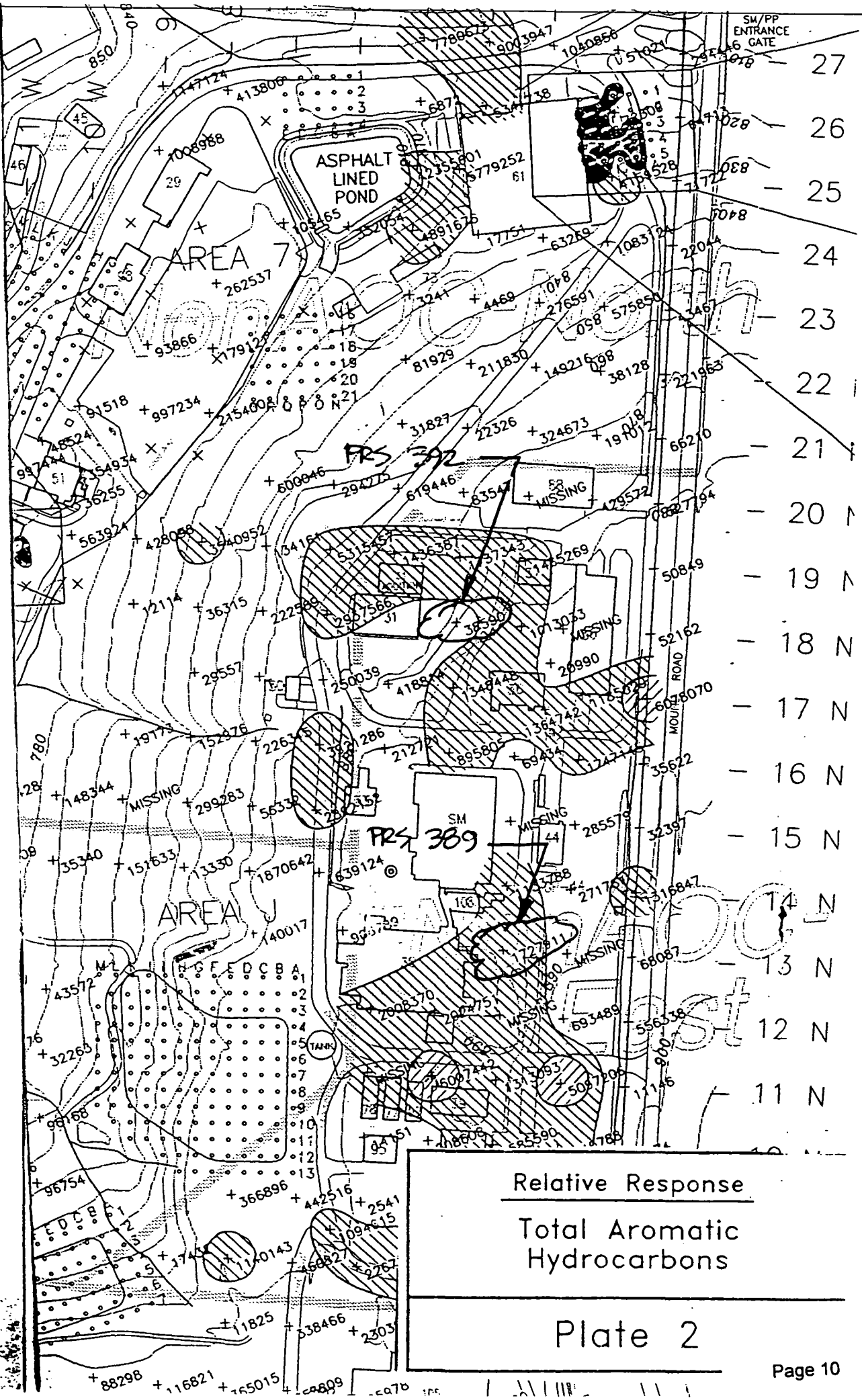
U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies



Sample Locations

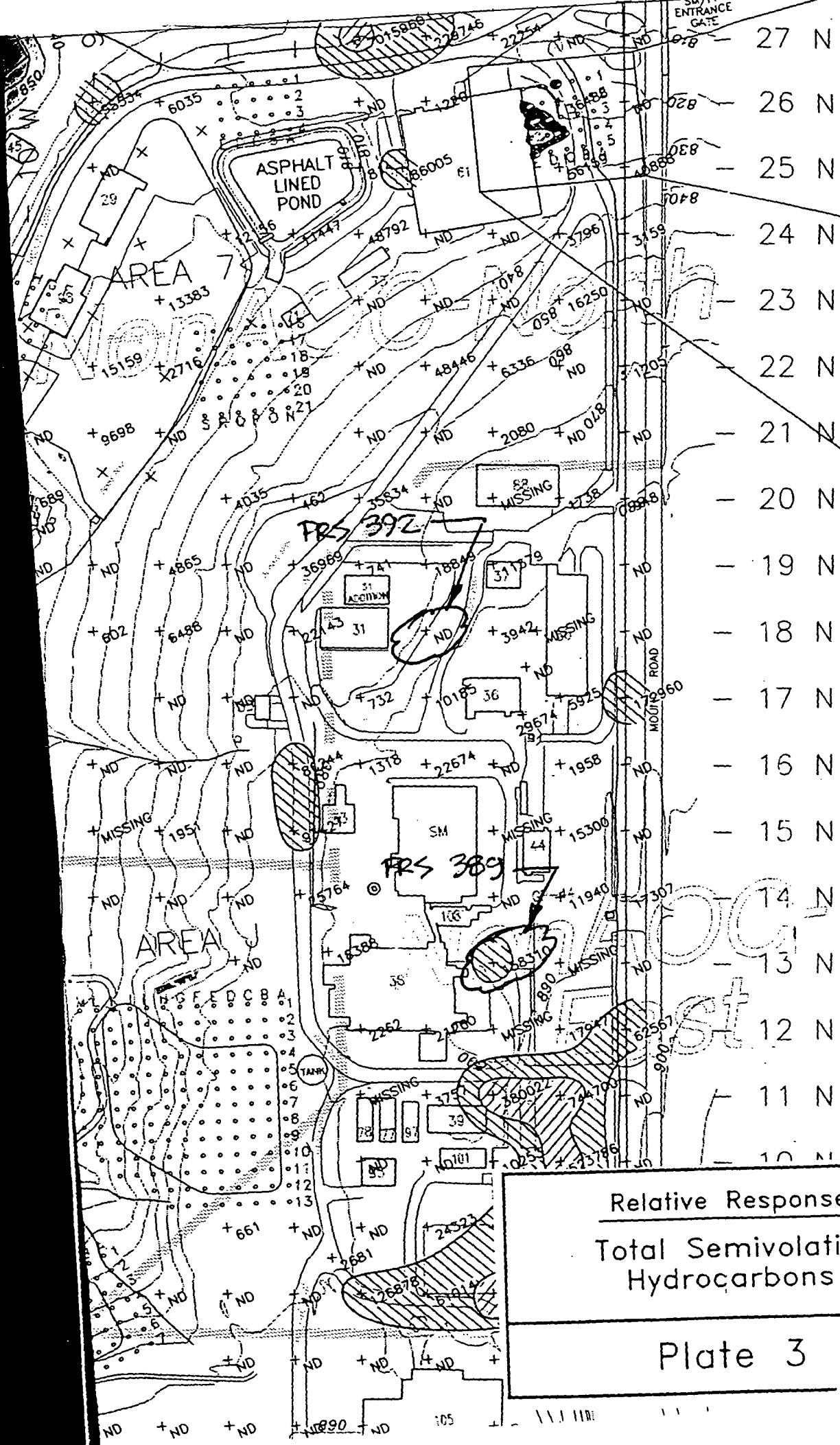
Plate 1



Relative Response

Total Aromatic Hydrocarbons

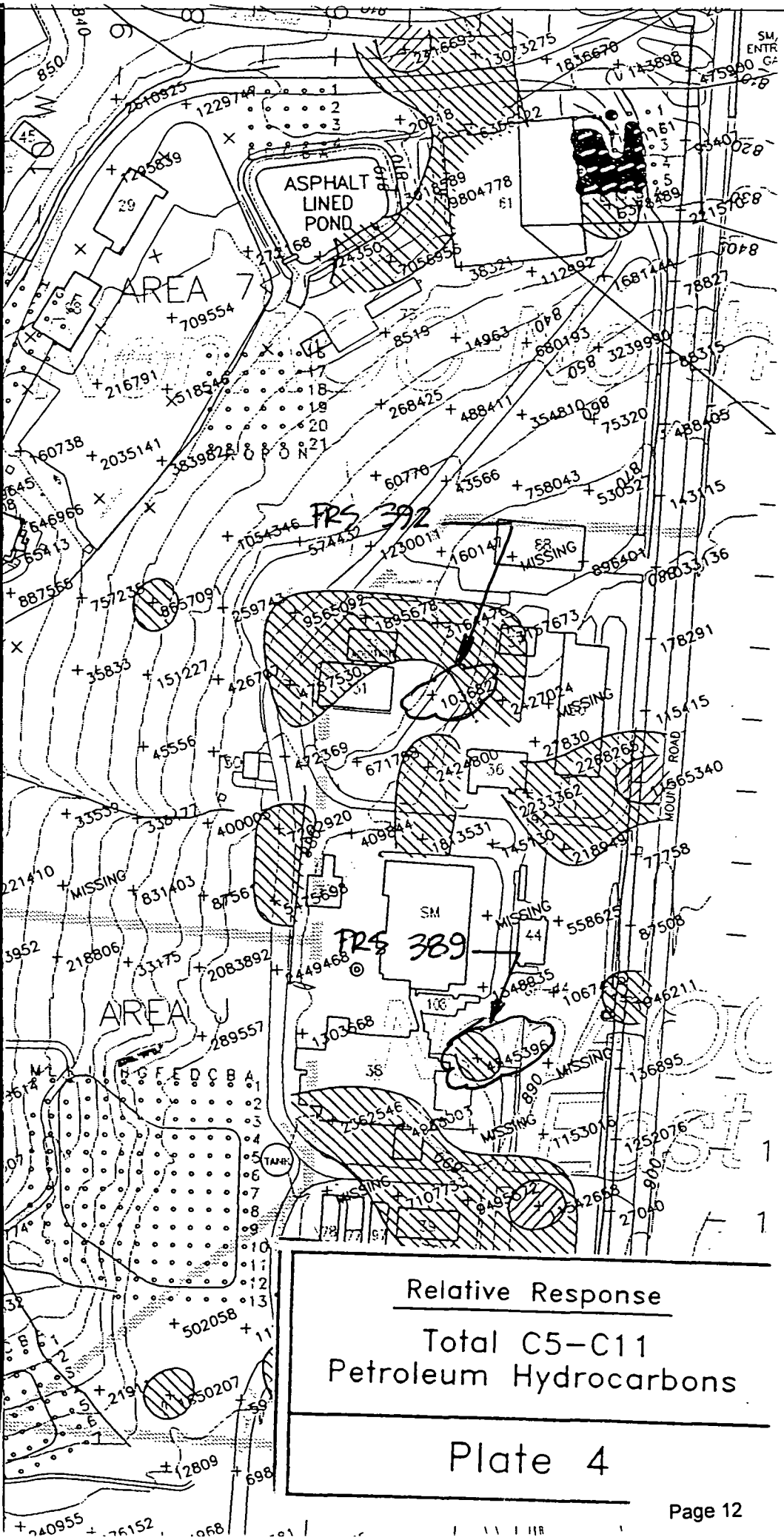
Plate 2



Relative Response

Total Semivolatile Hydrocarbons

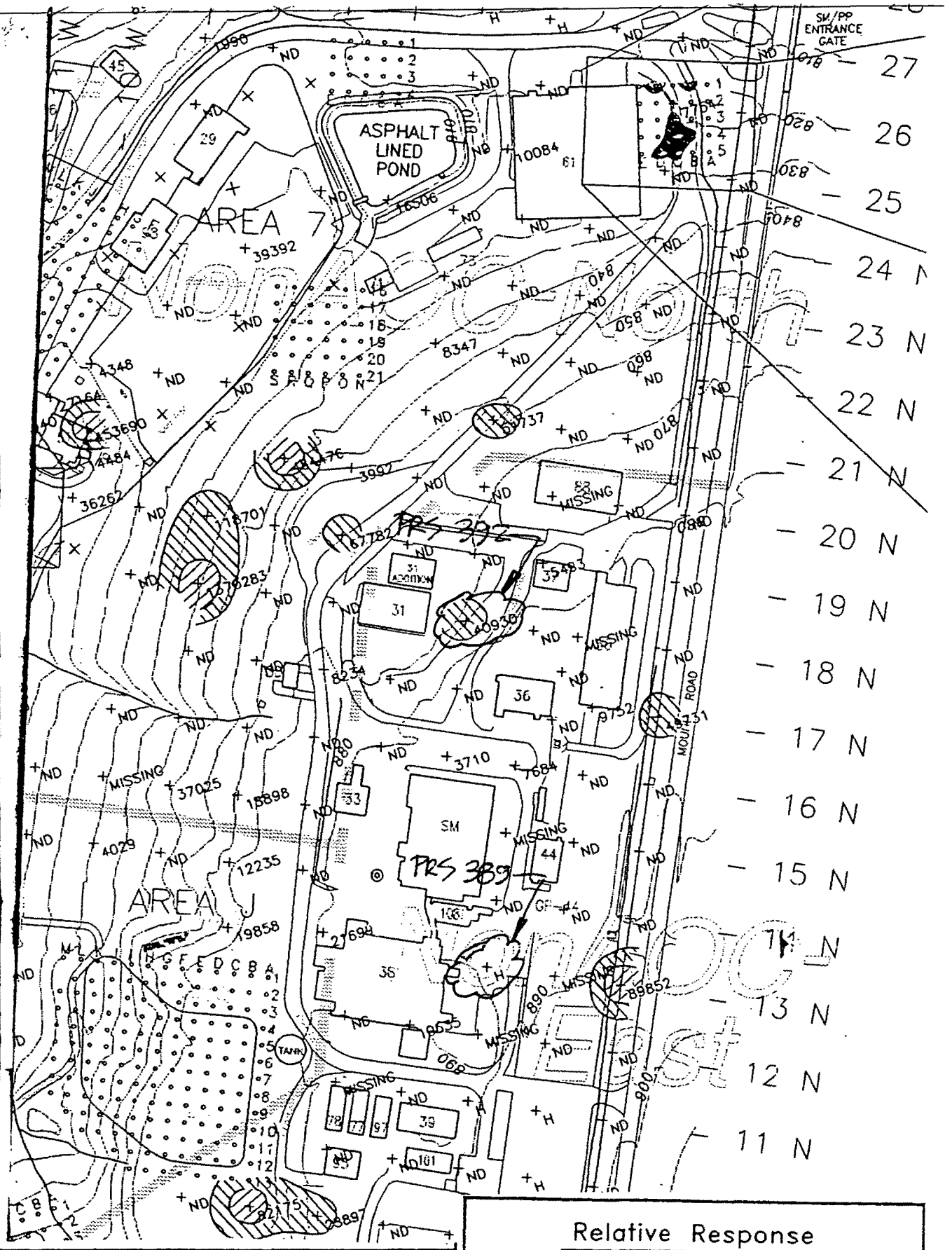
Plate 3



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

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				
14N10	170.3	85	9.72	8.0	NC				
14N11	170.3	115	9.72	10.0	NC				
14N12	170.3	130	9.72	8.0	NC				
14N13	157.3	100	8.45	5.5	NC				
14N15	157.3	70	8.45	4.0	NC				
14N25	157.3	85	8.45	7.0	NC				
14N26	157.3	80	8.45	7.5	NC				
		[illegible]	8.45	9.0	NC				

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

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:
17N06	130	100	6.5	5.0	NC	0	a	0.9	a
17N07	170.3	130	9.72	6.5	NC	21	a	1.2	a
17N08	170.3	130	9.72	8.0	NC	19	a	1.2	a
17N09	170.3	80	9.72	5.5	NC	NC		NC	
17N10	170.3	100	9.72	6.0	NC	NC		NC	
17N11	170.3	90	9.72	7.0	NC	NC		NC	
17N12	152.1	40	8.45	4.5	NC	6	a	0.6	a
18N01	253.5	185	12.48	9.0	NC	16	a	1.1	a
18N02	130	80	6.5	4.0	NC	WIPE	c	WIPE	c
18N03	130	75	6.5	5.0	NC	WIPE	c	WIPE	c
18N04	130	60	6.5	4.5	NC	6	a	0.8	a
18N06	130	90	6.5	6.5	NC	WIPE	c	WIPE	c
18N07	170.3	100	9.72	7.0	NC	13	a	0.7	a
18N08	170.3	170	9.72	11.0	NC	22	a	1.1	a
18N09	170.3	150	9.72	10.5	NC	NR		NR	
18N12	152.1	100	8.45	6.5	NC	0	a	0.3	a
19N01	253.5	155	12.48	9.5	NC	3	a	0.6	a
19N02	130	85	6.5	4.0	NC	NC		NC	
19N03	130	70	6.5	5.0	NC	4	a	0.8	a
19N04	130	60	6.5	4.0	NC	WIPE	c	WIPE	c
19N05	130	65	6.5	4.0	NC	WIPE	c	WIPE	c
19N06	130	60	6.5	5.0	NC				
19N07	176.8	325	8.97	20.0	45				
19N08	176.8	125	8.97	7	NC				
19N09	176.8	170	8.97	9.5	NC				
19N10	176.8	70	8.97	3.5	NC				
20N01	253.5	95	12.48	5.0	NC				
20N02	130	105	6.5	6.5	NC				

PRS 392

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

MOUND

Environmental
Restoration
Program

Further Assessment

Soil Gas Confirmation Sampling

Mound Plant
Miamisburg, Ohio

May 1996

Revision 0

Department of Energy

EG&G Mound Applied Technologies

Table I.1 Soil Analyte List

Volatile Organic Compounds

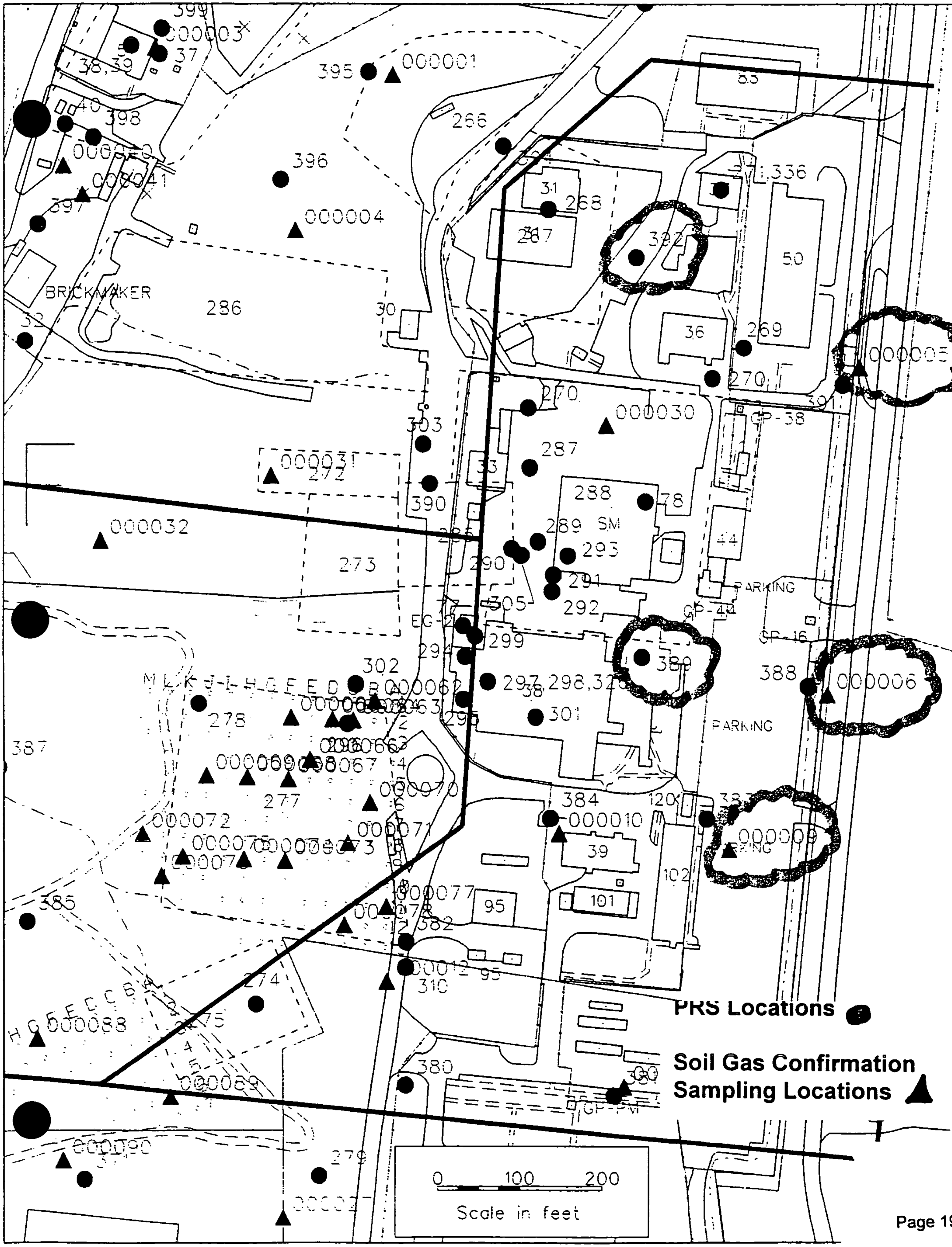
Acetone
Benzene
Bromodichloromethane
Bromoform
Bromomethane
2-Butanone
Carbon Disulfide
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Dibromochloromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
1,2-Dichloroethene (total)
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylbenzene
2-Hexanone
Methylene Chloride
4-Methyl-2-Pentanone
Styrene
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane-
Trichloroethene
Toluene
Vinyl Acetate
Vinyl Chloride
Xylenes (total)

Semivolatile Organic Compounds

Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
bis(2-Chloroethoxy)methane
bis(2-Chloroethyl)ether
bis(2-Ethylhexyl)phthalate
4-Bromophenyl-phenylether
Butylbenzylphthalate
Carbazole
4-Chloroaniline
4-Chloro-3-methylphenol
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl-phenylether
Pentachlorophenol
Phenanthrene
Phenol
Chrysene
Dibenz(a,h)anthracene
Dibenzofuran
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3-Dichlorobenzidine
2,4-Dichlorophenol
Diethylphthalate
2,4-Dimethylphenol
Dimethyphthalate
Di-n-butylphthalate
Di-n-octylphthalate
4,6-Dinitro-2-methylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Fluoranthene
Fluorene
Pyrene
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno(1,2,3-cd)pyrene
Isophorone
2-Methylnaphthalene
2-Methylphenol
4-Methylphenol
Naphthalene
2-Nitroaniline
3-Nitroaniline
4-Nitroaniline
Nitrobenzene
2-Nitrophenol
4-Nitrophenol
N-Nitroso-di-n-propylamine
N-Nitroso-diphenylamine
2,2-oxybis(1-Chloropropane)
2,4,5-Trichlorobenzene
2,4,6-Trichlorobenzene

Table I.1 Soil Analyte List (Continued)

Pesticides/PCB's		
Aroclor-1016	Delta-BHC	Endosulfan II
Aroclor-1221	Gamma-BHC	Endosulfan sulfate
Aroclor-1232	alpha-Chlordane	Endrin
Aroclor-1242	gamma-Chlordane	Endrin aldehyde
Aroclor-1248	4,4'-DDD	Endrin ketone
Aroclor-1254	4,4'-DDE	Heptachlor
Aroclor-1260	4,4'-DDT	Heptachlor epoxide
Aldrin	Dieldrin	Methoxychlor
Alpha-BHC	Endosulfan I	Toxaphene
Beta-BHC		
Inorganics		
Aluminum	Copper	Potassium
Antimony	Cyanide	Selenium
Arsenic	Iron	Silver
Barium	Lead	Sodium
Beryllium	Lithium	Thallium
Bismuth	Magnesium	Tin
Cadmium	Manganese	Vanadium
Calcium	Mercury	Zinc
Chromium	Molybdenum	Nitrate/Nitrite
Cobalt	Nickel	Explosives (USATHAMA,PETN)
Radionuclides		
Americium-241	Plutonium-238	Thorium-230
Bismuth-207	Plutonium-239/240	Thorium-232
Bismuth-210	Potassium-40	Uranium-234
Cesium-137	Radium-226	Uranium-235
Cobalt-60	Thorium-228	Uranium-238



399
000003
37
38,39
395
000001
40
398
266
396
000041
397
000004
BRICKMAKER
286
30
31
268
271,336
392
50
36
269
270
000005
391
000030
GP-38
303
287
000031
272
390
288
78
SM
289
293
000032
273
290
291
292
305
44
PARKING
GP-44
GP-16
EG-21
299
294
389
388
000006
302
000062
297,298,326
301
PARKING
278
387
000070
277
384
120
000010
000009
000072
000071
39
102
385
000077
95
101
382
000012
310
274
000088
275
380
000089
GP-PM
000090
279
0
100
200
Scale in feet
PRS Locations
Soil Gas Confirmation Sampling Locations

Table A.1

Detected Volatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000002	SGC-NAC-000003	SGC-NAC-000004	SGC-NAC-000005	SGC-NAC-000006
PETREX SAMPLE AREA			NORTH	NORTH	NORTH	EAST	EAST
Acetone	NA	21000000	36				
1,2-Dichloroethene (total)	NA	43000000					
2-Butanone	NA	93000000					
Benzene	NA	8.90E+03	1 J				
Carbon Disulfide	NA	280000					
Chloroform	NA	3100					
Chloromethane	NA	NA					
Ethylbenzene	NA	480					
Methylene Chloride	NA	3.95E+05	6			7	8
Tetrachloroethene	NA	21000000					
Toluene	NA	250000	1 J	1 J			
Trichloroethene	NA	41000					
Xylene (total)	NA	430000000					

No entry - not detected

J - Numerical value is an estimated quantity

C - Identification confirmed by GC/MS

mg/kg - micrograms per kilogram

Red = above Guideline Criteria (GC)

Green = above GC and below Background

Magenta = above Background and Below GC

Blue = above Background (no GC)

Table A.2.

Detected Semivolatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000001	SGC-NAC-000002	SGC-NAC-000003	SGC-NAC-000004	SGC-NAC-000005	SGC-NAC-000006	SGC-NAC-000007
PETREX Sample Area			NORTH	NORTH	NORTH	NORTH	EAST	EAST	WEST
Acenaphthene	NA	NA		190 J	[illegible] J				
Acenaphthylene	NA	NA		730				42 J	
Anthracene	NA	64,000,000		1300	66 J		25 J	55 J	
Benzo(a)anthracene	NA	4,100		15[illegible]	180 J		160 J	350 J	57 J
Benzo(a)pyrene	NA	410		1300	180 J		200 J	450	65 J
Benzo(b)fluoranthene	NA	4,100		1000	180 J		190 J	400	[illegible] J
Benzo(g,h,i)perylene	NA	NA		550	110 J		100 J	260 J	26[illegible]
Benzo(k)fluoranthene	NA	41,000		100[illegible]	[illegible] J		190 J	440	58[illegible]
Bis(2-ethylhexyl)phthalate	NA	215,000							
Butylbenzylphthalate	NA	43,000,000							
Carbazole	NA	NA		600	62 J			34 J	
Chrysene	NA	410,000		1500	220		240 J	490	68 J
Di-n-butyl phthalate	NA	21,000,000	120 J			[illegible]0 J			
Di-n-octyl phthalate	NA	4,300,000							
Dibenz(a,h)anthracene	NA	410		180[illegible]	40 J		37 J	87 J	
Dibenzofuran	NA	NA		1100	23 J				
Diethyl phthalate	NA	NA							
Fluoranthene	NA	8,500,000		3400 D			400 J	800	[illegible]0 J
Fluorene	NA	NA		1500	42[illegible]				
Indeno(1,2,3-cd)pyrene	NA	4,100		69[illegible]	120 J		130 J	320 J	36 J
2-Methylnaphthalene	NA	NA		[illegible]0					
Naphthalene	NA	NA		[illegible]00 D	24 J				
Phenanthrene	NA	NA		47[illegible] D	380		150 J	280 J	53[illegible]
Phenol	NA	130,000,000							
Pyrene	NA	6,400,000	24 J	2700 D	440		340 J	730	[illegible]20 J

No entry - not detected
J - Value is an est. quantity
D - Sample was diluted
NA - Value not available
H - Analyzed outside holding time
µg/kg - micrograms per kilogram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.2.

Detected Semivolatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000009	SGC-NAC-000010	SGC-NAC-0000[illegible]	SGC-NAC-000012	SGC-NAC-0000[illegible]	[illegible]C-NAC-000016	SGC[illegible]AC-000[illegible]7
PETREX Sample Area			EAST	EAS[illegible]	[illegible]ST	EAST	SOUT[illegible]	SOUTH	SOUT[illegible]
Acenaphthene	NA	NA							
Acenaphthylene	NA	NA							
Anthracene	NA	64,000,000							
Benzo(a)anthracene	NA	4,100				18 J		47 J	
Benzo(a)pyrene	NA	410				21		[illegible] J	
Benzo(b)fluoranthene	NA	4,100				[illegible] J		39	
Benzo(g,h,i)perylene	NA	NA						33 J	
Benzo(k)fluoranthene	NA	41,000				17 J		46 J	
Bis(2-ethylhexyl)phthalate	NA	215,000	71 J		36 J	35 J		100	
Butylbenzylphthalate	NA	43,000,000							
Carbazole	NA	NA							
Chrysene	NA	410,000		20 J		22 J		51 J	
Di-n-butyl phthalate	NA	21,000,000							
Di-n-octyl phthalate	NA	4,300,000							
Dibenz(a,h)anthracene	NA	410							
Dibenzofuran	NA	NA							
Diethyl phthalate	NA	NA							
Fluoranthene	NA	8,500,000		31 J		38 J		100 J	28 [illegible]
Fluorene	NA	NA							
Indeno(1,2,3-cd)pyrene	NA	4,100						27 J	
2-Methylnaphthalene	NA	NA							
Naphthalene	NA	NA					61 J		
Phenanthrene	NA	NA						63 J	
Phenol	NA	130,000,000							
Pyrene	NA	6,400,000		31 [illegible]	20 J	37 J		87 J	26 J

No entry - not detected
J - Value is an est. quantity
D - Sample was diluted
NA - Value not available
H - Analyzed outside holding time
µg/kg - micrograms per kilogram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.4.
Detected Inorganics

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000001	SGC-NAC-000002	SGC-NAC-000003	SGC-NAC-000004	SGC-NAC-000005	SGC-NAC-000006	SGC-NAC-000007	SGC-NAC-000008	SGC-NAC-000009
PETREX Sample Area			NORTH	NORTH	NORTH	NORTH	EAST	EAST	WEST	WEST	EAST
TAL INORGANICS (mg/kg)											
Aluminum	19000	NA	11000	4196	1910	1140	7970	7780	7200	28[illegible]	18700
Antimony	NA	85		0.23 B		0.24 B	0.41 B			0[illegible] B	0.91 B
Arsenic	8.6	64	1.5 B	2.1 B	2.9 B	1.4 B	7	7.2	1.9 B	3.2	11.1
Barium	180	15,000	16	20.7 B	23.7 B	47.1 B	73.6	86.4	26.2 B	23.2 B	163
Beryllium	1.3	1	0.5		2 B	0.65	0.38	0.28	0.28		0.9 B
Bismuth	NA	NA									0.85 B
Cadmium	2.1	210		0.25 B	0.19 B		0.36 B	0.5 B	0[illegible] B	0.22 B	6
Calcium	310000	NA	162000	6000	95500	152[illegible]0	13600	86200	83906	113000	5940
Chromium	20	110,000	13.2	7	3.8	5.2	13	11.6	14	5.7	20.3
Cobalt	19	NA	9.8 B	4.[illegible]	2.3 B	0.1 B	7.6 B	7.6 B	1 B	3.3 B	13
Copper	26	NA	16.2	11.9	9.9	1	14.5	15.2	3.2	13.9	19.2
Cyanide	ND	4,300									
Iron	35000	NA	2130[illegible]	10600	5680	21800	17200	17700	23000	7[illegible]	29400
Lead	48	NA		5.2	2	8.6	30.9	25.1	7.2	5.9	22.2
Lithium	26	NA	1 B	12.5 B	6	23 B	7.7 B	10.3 B	3.2 B	8.2 B	14.7 B
Magnesium	40000	NA	16	57800	2[illegible]00	5670	5210	35600	21600	47900	4500
Manganese	1400	27,000	695	384	270	612	383	589	493	256	728
Mercury	ND	64			0.13						
Molybdenum	27	NA	0.43 B	1.2 B	0.77 B		1.7 B	1.5 B	0[illegible] B	1.4 B	1.8 B
Nickel	32	4,300	18.4	9.9	6.4 B	6	11.1	16.1	[illegible]	8.1 B	24.5
Potassium	1900	NA	1780	[illegible]	346 B	2080	574 B	744 B	1590	463 B	1420
Selenium	NA	NA									
Silver	1.7	1,100			0.24 B						
Sodium	240	NA	228 B	888 B	150 B	137 B	411 B	348 B	246 B	1 B	1010 B
Thallium	0.46	NA									
Tin	20	NA	1.[illegible]			1.4 B	1 B			4.5 B	1.5 B
Vanadium	25	1,500	14.9	8.3	4.7	16.3	23.1	18.9	14.2	7.4	42.7
Zinc	140	64,000	53.3	29.5		67	59	69.2	[illegible]	36.6	71.8
OTHER INORGANICS											
% Solids (%)	NA	NA	[illegible].9	9[illegible].8	88.5	83.3	78.4	75	83.9	[illegible]5	78.9
Nitrate/Nitrite (mg-N/kg)	NA	NA	[illegible]	1.8	1.2	2.1	7.2	4.8	1.6	26.5	2.2

No entry - not detected
mg/kg - milligrams/kilogram
NA - Value not available
NC - Background not comp
ND - No detections in background samples
mg-N/kg - milligrams per kilogram, reported as nitrogen
J - Numerical value is an estimated quantity
B - Analyte detected in blanks associated with this sample
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.5.

Detected Radionuclides (pCi/g)

ANALYTE	Background	Industrial Scenario Guideline Criteria	SGC-NAC-000001	SGC-NAC-000002	SGC-NAC-000003	SGC-NAC-000004	SGC-NAC-000005
PETREX Sample Area			NORTH	NORTH	NORTH	NORTH	EAST
Americium-241	ND	4.95					
Bismuth-207	ND	0.18					
Bismuth-210	ND	NA					
Cesium-137	0.42	0.46					
Cobalt-60	NC	0.10					
Plutonium-238	0.13	5.5	1.42	0.[illegible]9	0.833	0.087	0.543
Plutonium-239/240	0.18	5.5			0.0252		
Potassium-40	37	NA	21.7	2.95	6.53	27.4	15.1
Radium-226+D	2	0.14	1.03	0.478	0.508	1.16	1.22
Thorium-228+D	1.5	0.85	1.52	0.277	0.37	1.24	1.05
Thorium-230	1.9	44	0.814	0.374	0.[illegible]	0.[illegible]8	1.19
Thorium-232	1.4	50	1.3	0.184	0.3[illegible]5	[illegible].17	0.95
Uranium-234	1.1	38	2.[illegible]	0.401	0.[illegible]19	[illegible].934	0.874
Uranium-235+D	0.11	3.4	0.0974		[illegible]0.04	[illegible]0349	0.0328
Uranium-238+D	1.2	11.0	2.35	0.392	0.512	0.[illegible]18	0.913

No entry - not detected
ND -No detections in background samples
NA - Data not available
NC - Background value not computed
pCi/g - picocuries per gram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.5.

Detected Radionuclides (pCi/g)

ANALYTE	Background	Industrial Scenario Guideline Criteria	SGC-NAC-000006	SGC-NAC-000007	SGC-NAC-000008	SGC-NAC-000009	SGC-NAC-000010
PETREX Sample Area			EAST	WEST	WEST	EAST	EAST
Americium-241	ND	4.95					
Bismuth-207	ND	0.18					
Bismuth-210	ND	NA					
Cesium-137	0.42	0.46	0.861				
Cobalt-60	NC	0.10					
Plutonium-238	0.13	5.5	4.32	0.537	0.0826	0.0233	0.107
Plutonium-239/240	0.18	5.5					
Potassium-40	37	NA	14.3	0.8	.72	12.9	
Radium-226+D	2	0.14	0.87	.37	0.571	0.764	0.917
Thorium-228+D	1.5	0.85	1.06	0.431	0.678	0.779	0.9
Thorium-230	1.9	44	1.18	0.582	0.541	1.09	.27
Thorium-232	1.4	50	1.18	0.328	0.554	0.838	0.708
Uranium-234	1.1	38	0.761	0.551	.361	0.712	0.97
Uranium-235+D	0.11	3.4					0.045
Uranium-238+D	1.2	11.0	0.815	0.57	0.414	0.774	1.

No entry - not detected
ND -No detections in background samples
NA - Data not available
NC - Background value not computed
pCi/g - picocuries per gram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)