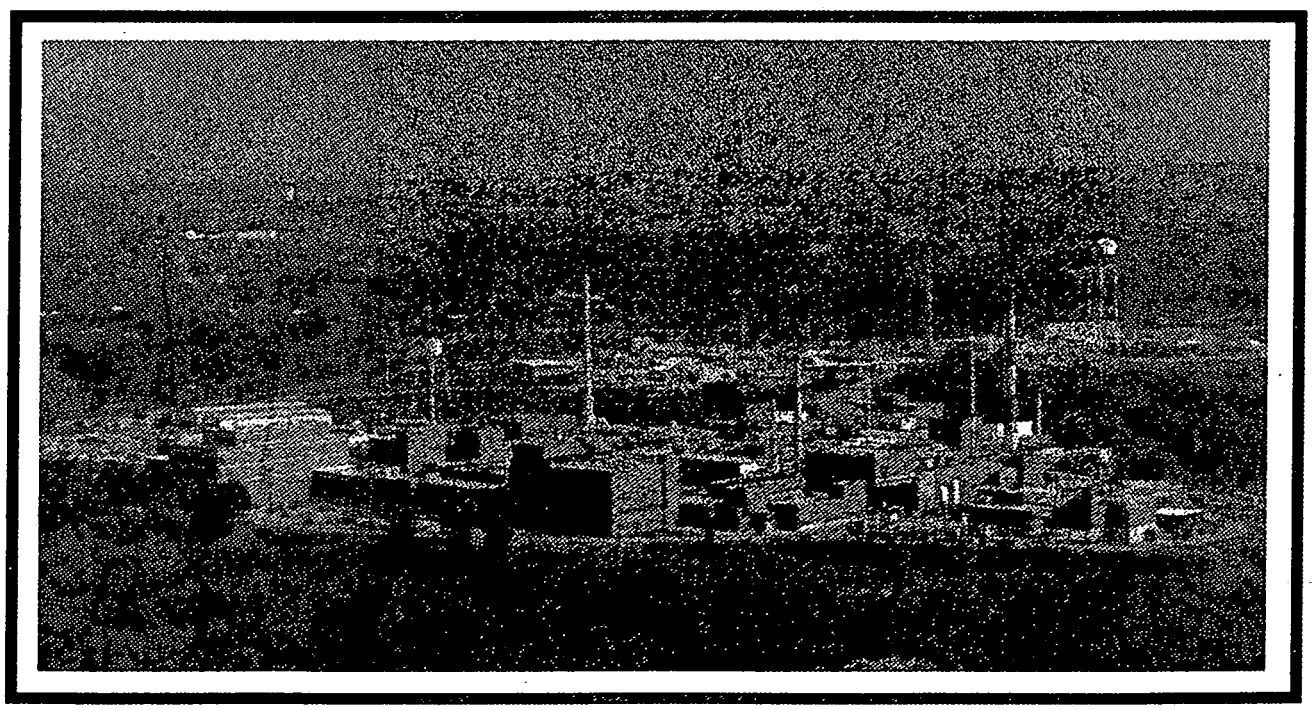
EG&G MOUND-30-03-04-02--9704140006

MOUND

Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 358



MOUND

Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PACKAGE

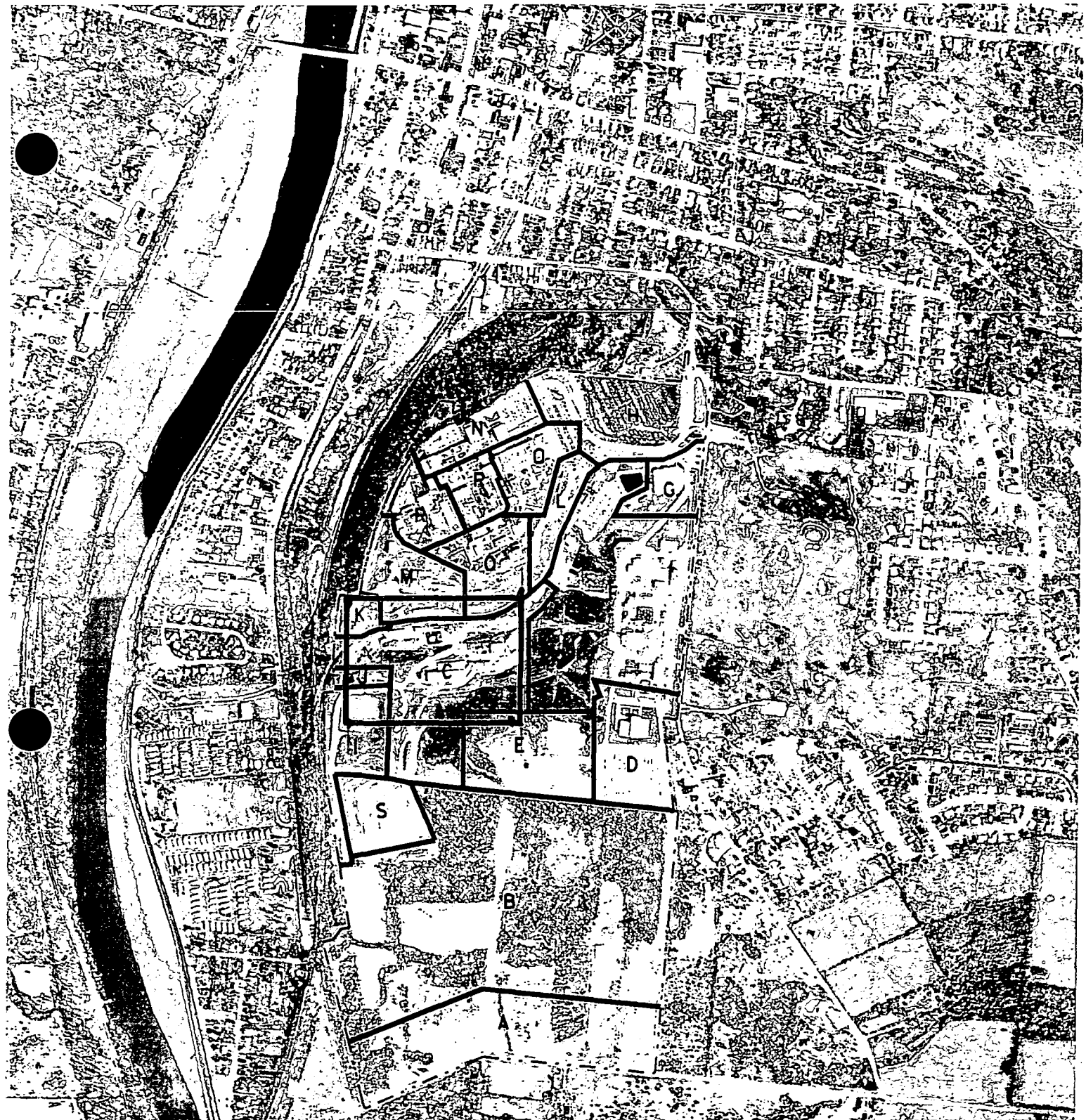
Notice of Public Review Period

The following potential release site (PRS) packages will be available for public review in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio beginning February 27, 1997. Public comment will be accepted on these packages from February 27, 1997, through April 3, 1997.

PRS 13:	Former Treatment Site - Trash Incinerator
PRS 23:	Solvent Waste Tank - Building 43 Settling Basin
PRS 24:	Solvent Storage Tank - Building 43
PRS 358:	Soil Contamination
PRS 365:	Soil Contamination
PRS 366:	Soil Contamination
PRS 367:	Soil Contamination
PRS 390/393/394:	Soil Contamination

Questions can be referred to Mound's Community Relations at (937) 865-4140.

REV.	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comments.	Oct. 3, 1996
FINAL 1	Comment period expired. No comments. Recommendation page annotated.	Apr. 7, 1997



MOUND PLANT

Release Block C

Potential Release Site

PRS 358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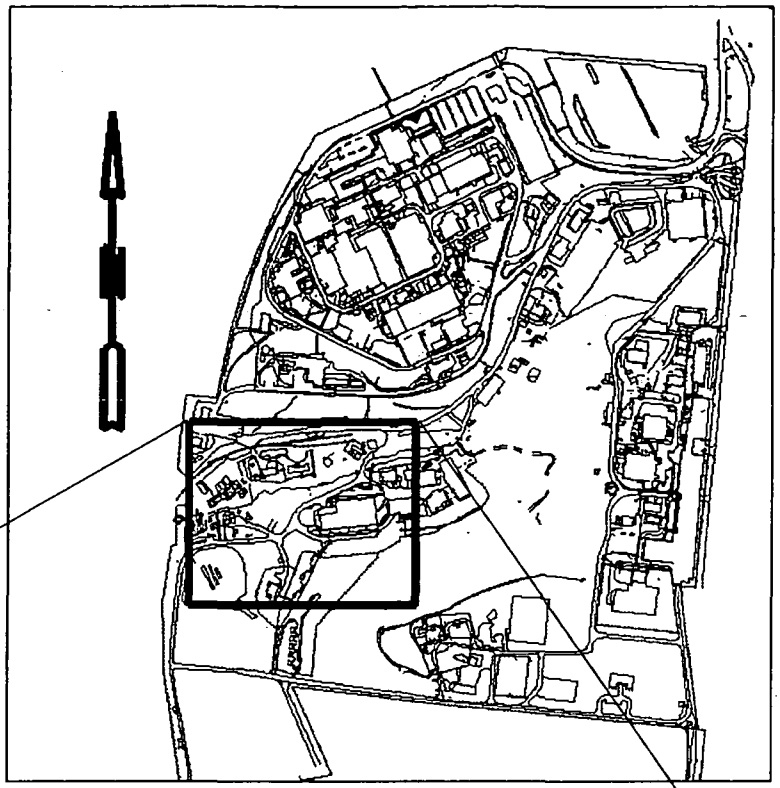
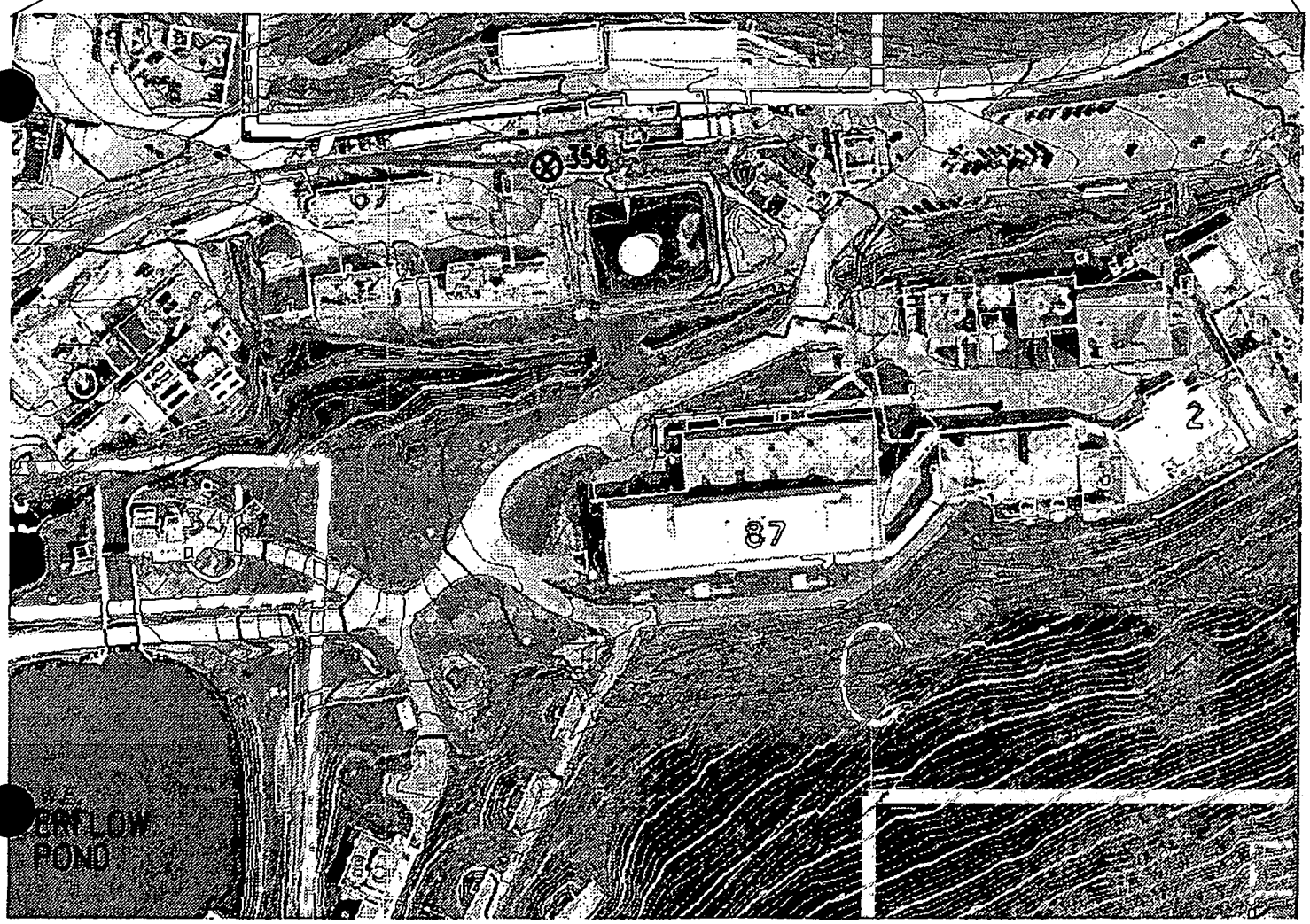
Mound Plant

Release Block C

Potential Release Site

PRS 358






358

PRS 358

PRS HISTORY:

Potential Release Site (PRS) 358 is located along the railroad siding near Building 24. Elevated levels of organic chemicals were detected by the qualitative PETREX survey during the **OU5, Non-AOC Investigation.**[1]

The site was analyzed for volatile organic compounds (VOCs) and for semivolatile organic compounds (SVOCs) via the PETREX soil gas survey. Sample results, corresponding to PRS 358, are listed relative to coordinates 12N20W, and sample No. 1022 within the referenced material. The results showed elevated ion counts for aromatics, SVOCs, petroleum hydrocarbons, and probably halogenated hydrocarbons.

CONTAMINATION:

The **Soil Gas Confirmation Sampling,**[2] of 1996, took a two foot deep core from the high PETREX reading location (see SGC-NAC-000008). The quantitative analysis showed that there were no analytes measured in excess of the guideline criteria.

The only other chemical data from the area are those from soil samples taken at the base of Building 24,[1] fifty feet north of the high PETREX hit (PRS 358). During the **OU5 Non-AOC** field survey, four surface and subsurface soil samples were taken from around Building 24. Two of them displayed three semivolatile organic compounds in excess of the guideline criteria. (See table below).

Analyte in Excess of Guideline	Concentration Measured	10^{-6} Construction Worker Guideline
benzo(a)anthracene	10000 ppb	4100 ppb
benzo(a)pyrene	9100 ppb	410 ppb
benzo(b)fluoranthene	16000 ppb	4100 ppb

Recent work along the railroad siding has disclosed radioactive contamination which is being addressed in PRS 75.

READING ROOM REFERENCES:

1) OU5, Operational Area Phase I Investigation Non-AOC Field Report, June 1995. (pages 5-18)
2) Soil Gas Confirmation Sampling, May 1996. (pages 19-29)

PREPARED BY:

Dean A. Buckner, Member of EG&G Technical Staff

MOUND PLANT
PRS 358
SOIL CONTAMINATION

RECOMMENDATION:

PRS 358 was identified due to elevated levels of organic chemicals detected by the qualitative PETREX survey during the **OU5, Non-AOC Investigation**. A subsequent quantitative analysis showed that there were no analytes measured in excess of the guideline criteria. The only other chemical data from the area are those from soil samples taken at the base of Building 24, located across the railroad tracks from PRS 358. These will be addressed as part of the Building 24 decontamination and decommissioning evaluation process. Therefore, NO FURTHER ASSESSMENT is recommended for PRS 358.

CONCURRENCE:

DOE/MB: _____ 12/18/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: _____ 12/18/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 12/18/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 2/27/97 to 4/3/97

☒ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

REFERENCE MATERIAL
PRS 358

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

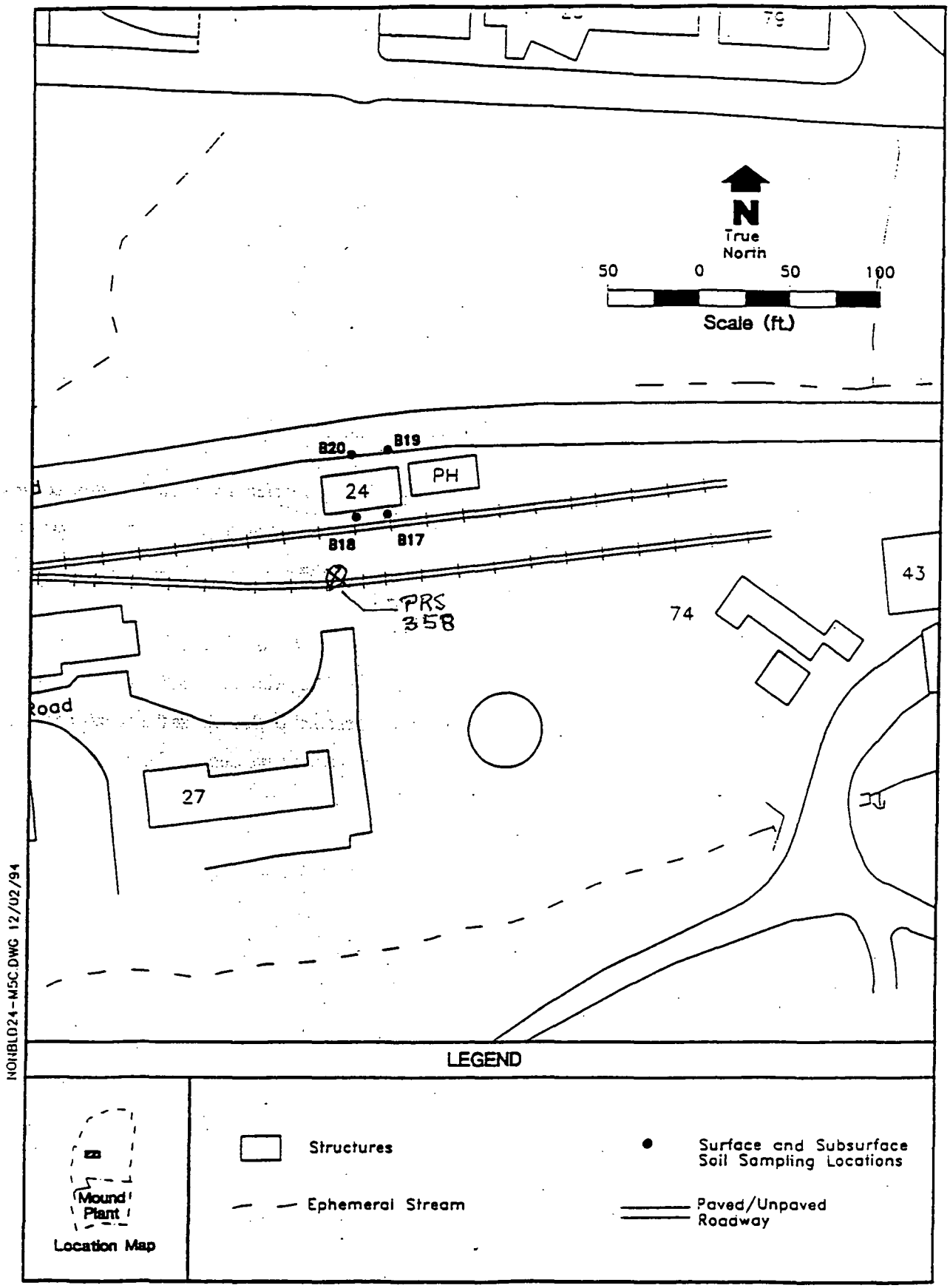


Figure 2.8. Sampling Locations at Building 24

1.2.2.1. Area 61

Area 61, located adjacent to the east side of Building 61, is approximately 100 feet by 100 feet (10,000 ft^2). Building 61 is the shipping and receiving center for the Mound Plant. The eastern edge of Area 61 is an undeveloped grassy area while the remainder of the site is an asphalt road and parking lot. A drainage area comprised of medium-sized rip rap, lies adjacent to the eastern side of the roadway dividing Area 61. It most likely receives run-off from northern slope of the SM/PP Hill (see Figure 1.2).

1.2.2.2. Fuel Area

The Fuel Area is located in the asphalt lot site adjacent to Building 66 and south of Building 51. The area is topographically flat and is bordered by an asphalt road to the west and a gravel drive to the east (see Figure 1.2). The Fuel Area contains two above ground fuel storage tanks on a concrete slab, two gasoline pumps, and an underground water-oil separator. The pumps and the separator are completely surrounded by asphalt. The fuel storage tanks are surrounded by concrete walls which are bordered on two sides by grassy strips.

1.2.2.3. Building 24

Building 24, which lies adjacent to the PH Building, is located in the western portion of the Non-AOC (see Figure 1.2). An asphalt road runs adjacent to the north side of Building 24. Railroad siding is adjacent to the south side of Building 24 with a roll-off box storage area to the west side. Except for the south side, the area surrounding Building 24 has been covered with asphalt or concrete. The area surrounding Building 24 is flat with little or no vegetation.

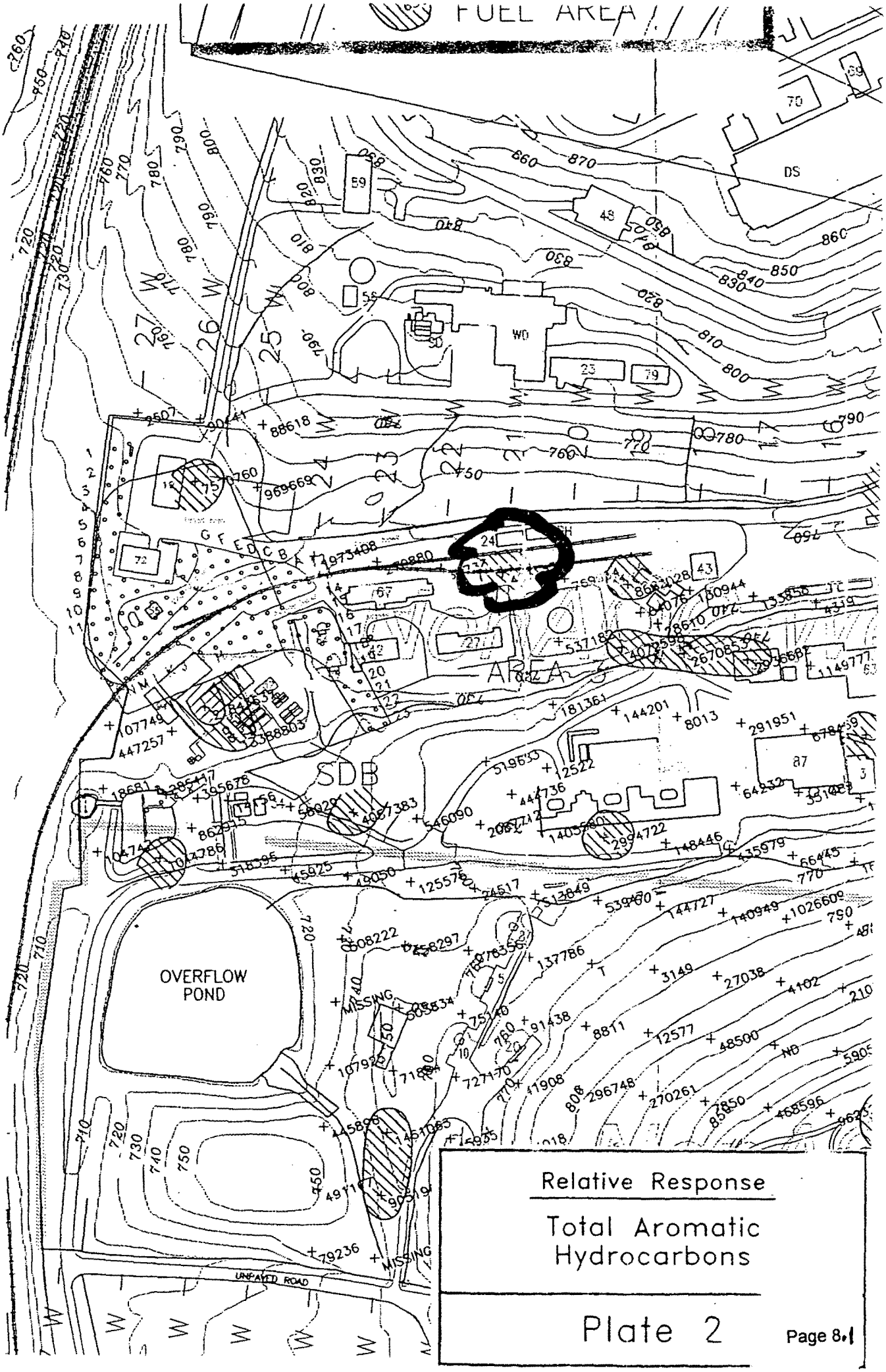
1.2.2.4. Area H Pyrotechnic Waste Disposal Area

Area H Pyrotechnic Waste Disposal Area, is located in the southern portion of the Non-AOC (see Figure 1.2). The surface topography is fairly flat and vegetation consists mainly of tall grasses. This area is comprised of Building 90, a retort, the pyrotechnic waste shed and biodegradation unit, a thermal treatment

Table 2 (cont'd)

Sample #	Total Aromatic Hydrocarbons (a)	Total Semivolatile Hydrocarbons (b)	Total C5 to C11 Petroleum Hydrocarbons (c)	Total Halogenated Hydrocarbons (d)
1003	15,224	ND	23,491	ND
3003 (e)	16,767	ND	21,433	ND
1004	15,011	ND	22,813	12,568
1005	5,348	ND	17,829	ND
1006	4,310	ND	9,932	ND
1007	125,202	1,311	1,077,032	37,147
1008	2,670,853	642,824	7,889,389	H
1009	181,361	1,126	355,107	ND
1010	519,683	19,490	771,907	334,370
1011	1,973,408	23,694	3,044,283	ND
3011 (e)	1,099,838	9,380	1,789,157	ND
1012	270,880	16,958	811,312	ND
1013	447,257	9,488	713,551	7,086
1015	7,570,760	1,200,505	30,786,838	H
1016	90,441	3,482	267,646	9,791
1017	969,669	ND	1,602,679	82,778
1018	144,201	ND	282,144	ND
1021	34,733	ND	68,783	4,170
→ 1022	4,231,332	1,103,597	18,183,317	H
1023	769,994	11,505	1,668,310	ND
1024	130,944	ND	265,177	313,351
1025	8,682,028	859	15,211,532	ND

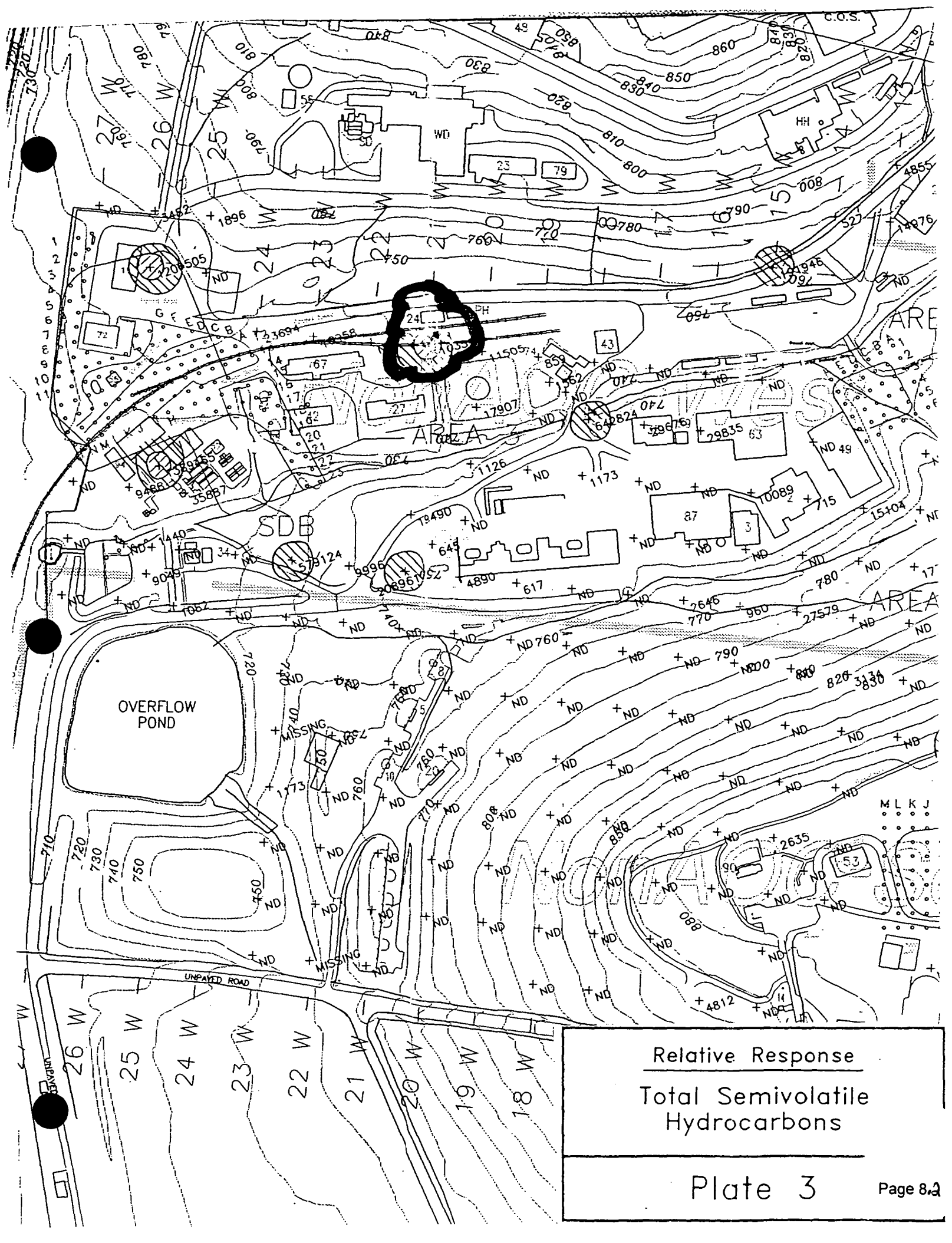
Key: (a) Intensity of response to ions of atomic masses 78, 92, 106, 120, 134, 148, 162, 176, 190, and 204.
(b) Intensity of response to ions of atomic masses 128, 142, 153, 156, 178, 184, 198, 202, and 212.
(c) Intensity of response to ions of atomic masses 70, 72, 78, 84, 86, 92, 98, 100, 106, 110, 112, 114, 120, 124, 126, 128, 134, 138, 140, 142, 148, 152, 154, and 156.
(d) Intensity of response to ions of atomic masses 101, 130, 146, 151, and 164.
(e) Duplicate of preceding sample.
→ H High levels of petroleum hydrocarbons have interfered with the identification of halogenated hydrocarbons in this sample; see text.
T High levels of terpenes have interfered with the identification of petroleum hydrocarbons in this sample; see text.
ND The targeted compounds were not detected in this sample.
* Travel Blank

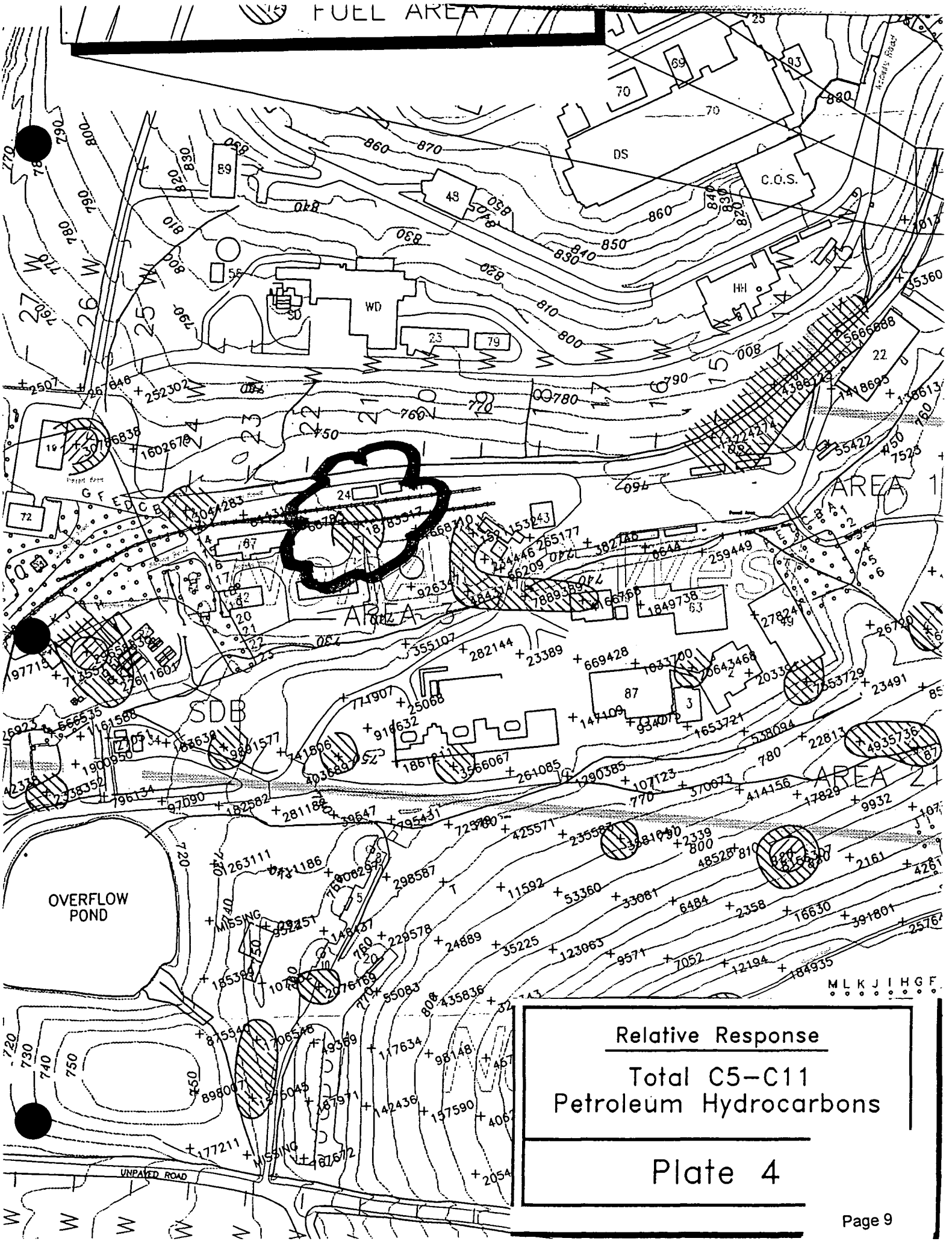


Relative Response

Total Aromatic Hydrocarbons

Plate 2

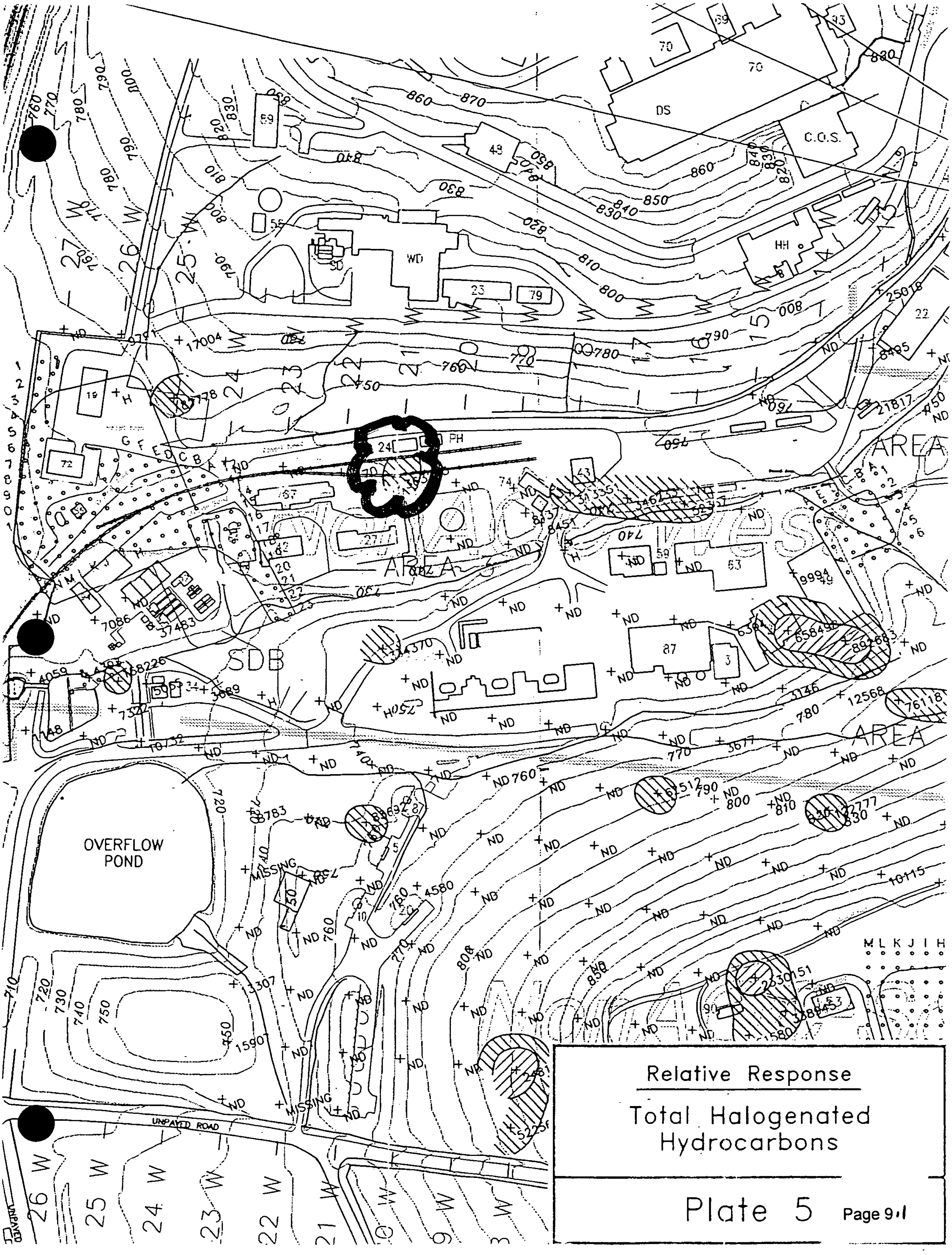

OVERFLOW POND
UNPAVED ROAD
SDB
AREA
Relative Response
Total Semivolatile Hydrocarbons
Plate 3



Relative Response

Total C5–C11 Petroleum Hydrocarbons

Plate 4



Relative Response

Total Halogenated Hydrocarbons

Plate 5 Page 9-1

At each sampling location, soil was screened before and during sampling with a FIDLER to detect radiological activity. Surface soil samples were collected and analyzed for Pu-238 and Th-232 at the Mound Plant Soil Screening Facility (see Section 2.1.4.2). Results of the soil screening are presented in Appendix D.

Building 24

A total of four surface soil samples (B17001, B18001, B19001, and B20001) and four subsurface soil samples (B17002, B18002, B19002, and B20002) were collected from the north and south sides of Building 24. Sample boring locations are displayed as B17 through B20 in Figure 2.8.

On August 8, 1994, surface samples, B17001 and B18001, were collected using stainless steel scoops and bowls at soil boring locations B17 and B18, respectively. Prior to sampling, soil boring B17 was moved approximately three feet south because of high FIDLER readings at the original location. FIDLER readings were lower at the new B17 location and allowed work to continue safely. A soil screening sample taken at the original B17 location indicated concentrations of Pu-238 and Th-232 at 26 pCi/g and 5.5 pCi/g, respectively. Subsurface samples, B17002 and B18002, were collected using a hand auger at depths of three feet and 3.6 feet, respectively. Depth was reached by loosening the rocky and compact soil with a spud bar and power auger, and removing the soil with a hand auger. The power auger would not penetrate the compact and rocky soil beyond a depth of three feet.

On August 9, 1994, a burn permit was issued for the use of a generator and impact hammer to remove asphalt plugs to permit sampling at soil boring locations B19 and B20. After the asphalt plugs were removed, surface samples B19001 and B20001 were collected using a stainless steel scoops and bowls. Subsurface samples, B19002 and B20002, were collected from the respective soil boring using a hand auger at a depth of three feet for both samples. Depth was reached by loosening the rocky and compact soil with a spud bar and power auger, and removing the soil with a hand auger. The power auger would not penetrate the compact and rocky soil beyond a depth of three feet.

During digging, a borehole was monitored for combustibles and volatile emissions as described in SOP 6.1, Health and Safety Monitoring of Combustible Gas Levels and SOP 6.2, Health and Safety Monitoring of Organic Vapors with a Photoionization Detector.

Soil descriptions and all other pertinent information were recorded on the borehole log sheets for the Building 24 sampling according to SOP 4.1, Soil Boring and SOP 5.1, Soil and Rock Borehole Logging and Sampling. Sampling events were recorded in the Soil Boring Logbook (see Appendix A.6) and the Sample Manager Logbook (see Appendix A.5).

At each soil sampling location, soil was screened before and during sampling with a FIDLER to detect radiological activity. Surface soil samples were collected and analyzed for Pu-238 and Th-232 at the Mound Plant Soil Screening Facility (see Section 2.1.4.2). Results of the soil screening are presented in Appendix D.

2.4.3. Quality Assurance Summary Report

All sampling was conducted in accordance with the OU5 QAPjP (DOE 1993a). Quality control samples were collected and analyzed as specified in the QAPjP. Two duplicate quality control samples were collected at sample locations BB2001 and B18002. BB2101 was analyzed for explosives and B18102 was analyzed for radiological compounds only. The field and laboratory data variances are summarized in the following subsections.

2.4.2.1. Field Variance Report

The surface soil sampling was completed with no variances. Subsurface samples at Building 24 were collected at a depth of approximately three feet, instead of the target depth of five feet. The five foot depth was not obtainable due to the inability to penetrate the rocky soil and compact road fill material with a power auger and/or hand auger.

2.4.2.2. Laboratory Data Variance Report

All soil samples were analyzed and validated in accordance with the OU5 QAPjP (DOE 1993a) to assure uniform and defensible data quality. A DQA report is presented in Appendix G of this report. The DQA was conducted to: (1) incorporate the analytical data validation results with the field QC sample results, (2) evaluate the impact of all QC measures on the overall data quality, and (3) remove all unusable values from the investigation has been determined to be acceptable and in compliance with the OU5 QAPjP stated DQOs.

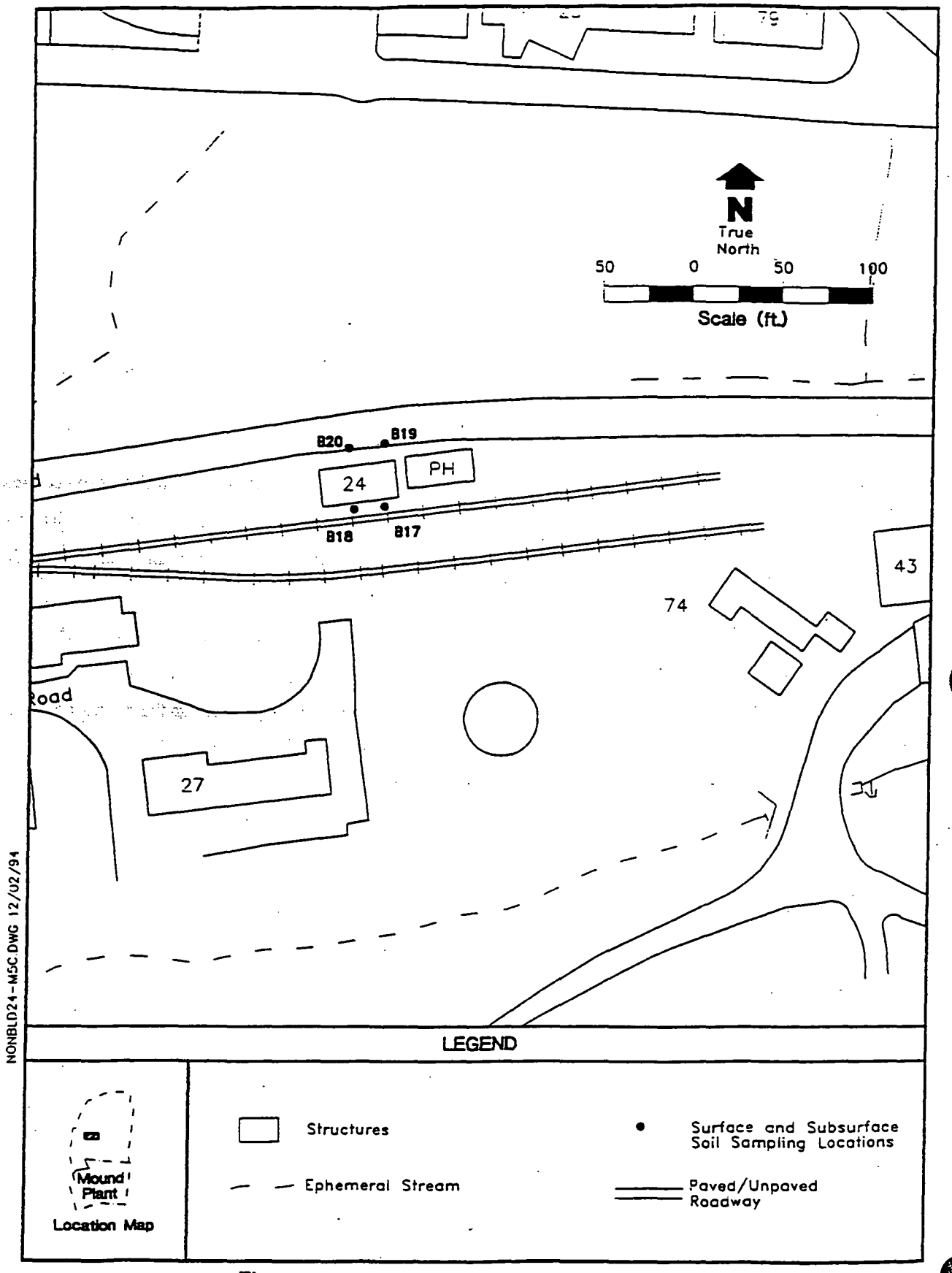


Figure 2.8. Sampling Locations at Building 24

locations, B17 and B18. The concentrations of Pu-238 and Th-232 in the surface soil screening sample collected at soil boring B18 were 38 pCi/g and 6.7 pCi/g, respectively. A soil screening sample taken at the original B17 location indicated concentrations of Pu-238 and Th-232 at 26 pCi/g and 5.5 pCi/g, respectively. No other samples collected at Building 24 had concentrations of Pu-238 or Th-232 that exceeded the Mound Plant Soil Screening Facility detection limits. The results of the soil screening analyses are presented in Appendix D.

2.4.4.2. Chemical Data

In Area H Pyrotechnic Waste Disposal Area, one explosive, nitrobenzene, was detected in the surface soil sample BB6001 at an estimated concentration of 0.38J mg/kg.

In the Building 34 Firefighting Training Area, 22 metals were detected in the surface soil sample BB1001. Four of these metals (calcium, chromium, copper, and nickel) were detected at estimated concentrations. Results are summarized in Table II.9.

At Building 24 chemical compounds were detected in the soil samples. Results are presented in Table II.10. No VOCs or cyanide were detected in the samples. SVOCs were most abundant in surface samples B17001 and B18001 and subsurface sample B17002. Several metals and lanthanides were detected in every sample.

2.4.5. Comparison with Historical Chemical Data

Limited historical chemical data is available for comparison for these areas of interest. No historical chemical data is available for Building 24. Soil sampling was conducted in Area H Pyrotechnic Waste Disposal Area as part of the OU3 Miscellaneous Sites Limited Field Investigation (DOE 1992a), however, no explosives were detected in concentrations above detection limits in any samples.

Soil in the Building 34 Firefighting Training Area was also sampled during the OU3 Limited Field Investigation (DOE 1992a). Subsurface soil samples were collected using hollow stem auger drilling techniques. A total of 21 samples were collected at eight locations and analyzed for several parameters, including TAL metals (see Figure 2.9). Inorganic compounds were not detected, except for antimony in two surface samples (MND33-0111 and -0112) at concentrations of 36.2 and 36.6 mg/kg.

Table II.10. Chemical Results from Building 24 Soil Samples
Page 1 of 4

Parameter	Units	B17001	B17002	B18001	B18002	B19001	B19002	B20001	B20002
Semi-volatile Organics									
Naphthalene	µg/kg	190J	65J	2,200J	---	---	---	---	39J
2-Methylnaphthalene	µg/kg	110J	86J	970J	---	---	---	190J	---
Acenaphthylene	µg/kg	62J	---	---	---	---	---	---	---
Acenaphthene	µg/kg	340J	---	5,500	---	---	---	---	---
Dibenzofuran	µg/kg	160J	---	2,600J	---	---	---	---	---
Fluorene	µg/kg	250J	---	4,000	---	---	---	---	---
Phenanthrene	µg/kg	2,800	290J	22,000	---	---	---	150J	43J
Anthracene	µg/kg	370	---	5,600	---	---	---	---	---
Carbazole	µg/kg	300J	---	4,000	---	---	---	---	---
Di-n-butylphthalate	µg/kg	58J	67J	480J	98J	---	---	670JB	---
Fluoranthene	µg/kg	3,200	510	23,000	---	---	52J	---	58J
Pyrene	µg/kg	3,000	580	25,000	---	---	45J	190J	55J
Benzo(a)anthracene	µg/kg	1,400	330J	10,000	---	---	---	---	---
bis(2-ethylhexyl)phthalate	µg/kg	480	170J	530J	---	39J	54J	82J	---
Benzo(b)fluoranthene	µg/kg	2,600	560	16,000	---	---	56J	130J	52J
Benzo(k)fluoranthene	µg/kg	3,900	860	27,000	---	---	240J	210J	85J
Benzo(a)pyrene	µg/kg	1,200	260J	9,100	---	68J	---	72J	---
Indeno(1,2,3-cd)pyrene	µg/kg	1,000	140J	5400	---	---	---	---	---
Dibenzo(a,h)anthracene	µg/kg	260	---	930J	---	---	---	---	---
Benzo(g,h,i)perylene	µg/kg	2,000	210J	5,800	---	---	---	---	---

Table II.10. Chemical Results from Building 24 Soil Samples
Page 2 of 4

Parameter	Units	B17001	B17002	B18001	B18002	B19001	B19002	B20001	B20002
Semi-volatile Organics									
Chryene	µg/kg	1600	310J	11000	---	48J	40J	180J	42J
Benzoic acid	µg/kg	---	---	---	---	---	---	---	39J
Butylbenzylphthalate	µg/kg	---	---	---	---	---	---	670JB	---
Pesticides/PCBs									
Aroclor-1248	µg/kg	720J	220	---	---	---	---	---	---
Aroclor-1254	µg/kg	830J	200	---	---	---	---	---	---
Endosulfan Sulfate	µg/kg	---	---	---	---	0.39J	---	---	0.7J
Aldrin	µg/kg	---	---	---	---	---	0.8J	1.2J	1.4J
Endrin	µg/kg	---	---	---	0.7J	---	---	---	---
4,4'-DDE	µg/kg	---	---	---	---	---	0.55J	---	---
Dieldrin	µg/kg	---	---	---	---	---	---	---	0.52J
Inorganics									
Arsenic	mg/kg	3.8	5	6.5	4.3	---	2.6	1.9	2.9
Aluminum	mg/kg	3,700	9,050	3,760	12,700	2,950	4,970	1,100	5,160
Barium	mg/kg	29	36.4	52.3	36.9	34	37.6	10.2	59.8
Cadium	mg/kg	0.46	0.25	0.63	---	---	---	---	---
Calcium	mg/kg	89,600J	91,200J	95,500J	75,000J	345,000J	105,000J	107,000J	116,000J
Chromium	mg/kg	12.8	13	9.5	16.8	9.1	6.6	2.7	7.5
Cobalt	mg/kg	4.2	8.4	4.3	11.8	5.4	2.9	1.0	3.2
Copper	mg/kg	26.5	22.4	33.9	19.7	11.6	6.9	3.9	7.7

Table II.10. Chemical Results from Building 24 Soil Samples
Page 3 of 4

Parameter	Units	B17001	B17002	B18001	B18002	B19001	B19002	B20001	B20002
Inorganics (continued)									
Iron	mg/kg	10,300	18,800	11,000	27,200	10,100	6,870	3,310	7,930
Lead	mg/kg	20	11.3	53.7	11.4	8	7.2	2.9	6.9
Magnesium	mg/kg	40,300	25,400	36,000	13,800	73,600	40,600	56,900	43,500
Manganese	mg/kg	249J	512J	300J	549J	615J	238J	134J	277J
Nickel	mg/kg	15.1	17.7	10.1	24.4	12.4	7.1	4.1	7.7
Potassium	mg/kg	1,130	2,980	1,130	3,620	1,210	1,220	641	1,480
Vanadium	mg/kg	10.1	16.6	9.8	20.1	13.4	9.7	9.7	10.4
Zinc	mg/kg	51.7	45.3	95.3	52.5	27.2	20.8	9.4	19.2
Bismuth	mg/kg	65.2	56.8	63.8	38.7	62	66.4	69.1	73.6
Lithium	mg/kg	3.8J	16.6J	5.1J	26.2J	1.8J	4.7J	1.7J	7.1J
Mercury	mg/kg	---	---	0.5	---	---	---	---	---
Beryllium	mg/kg	---	0.45	0.25	0.63	---	---	---	---
Silver	mg/kg	---	---	0.74	---	---	---	---	---
Sodium	mg/kg	---	394	---	544	980	1,020	405	933
Lanthanides									
Cerium	mg/kg	16	15.9	17.4	30.4	---	---	---	---
Gadolinium	mg/kg	64.1J	---	11.2J	55.5J	---	---	---	90J
Lanthanum	mg/kg	5.2	9.1	9.8	10.4	4.6	6.3	---	4.9
Praseodymium	mg/kg	35.4	---	36.1	---	---	---	---	10.7

Table II.10. Chemical Results from Building 24 Soil Samples
Page 4 of 4

Parameter	Units	B17001	B17002	B18001	B18002	B19001	B19002	B20001	B20002
Lanthanides (continued)									
Dypsprosium	mg/kg	---	---	---	4.6	---	---	---	---
Lutetium	mg/kg	---	---	---	0.9	---	---	---	---
Samarium	mg/kg	---	---	---	---	---	---	---	53.1
Anions									
Chloride	mg/kg	61.8J	---	105J	100J	44.6J	345J	56.7J	124J
Fluoride	mg/kg	2.83J	1.96J	6.16J	3.37J	---	---	---	---
Sulfate	mg/kg	178J	492J	303J	427J	108J	53.3J	24.7J	148J
Nitrate-nitrite	mg/kg	4.22	1.91	5.79	1.05	1.76	6.95	2.66	7.62
Other Data									
Total Organic Carbon	mg/kg	6520J	14,500J	10,500J	4,800J	17,600J	7,020J	51,300J	9,650J

--- Not detected in sample
J Estimated Quantity
B Estimated due to blank contamination
ng/kg milligram per kilogram
ug/kg microgram per kilogram

3.4. SOIL SAMPLING: AREAS OF SPECIAL INTEREST

In Area H Pyrotechnic Waste Disposal Area, one explosive, nitrobenzene, was detected in surface soil sample BB6001 at an estimated concentration of 0.38J mg/kg.

In Building 34 Firefighting Training Area, 22 metals were detected in the surface soil sample BB1001. Four of these metals (calcium, chromium, copper, and nickel) were detected at estimated concentrations. These results were inconsistent with a historical investigation during which only one metal, antimony, was detected. Antimony was not detected during this investigation.

The soil sampling conducted at Building 24 indicates the presence of radiological and chemical contaminants as summarized below:

- Nine radionuclides were detected in the nine soil samples. Except for K-40, all other radionuclides were listed at estimated quantities (J) or trace values;
- SVOCs were primarily detected in surface soil samples B17001 and B18001, and subsurface soil sample B17002;
- No VOCs or cyanide were detected in the samples;
- Nineteen of the 22 metals were detected in a majority of the eight soil samples.

3.5. MONITORING WELL W410

Soil and groundwater sampling at monitoring well W410 indicates the presence of chemical and radiological contamination as summarized below:

- A total of eight radionuclides were detected in the soil samples and seven radionuclides in the groundwater sample. Tritium was detected at 4223.3 pCi/L in groundwater sample W41001. No Pu-238 or Th-232 was detected by the analytical laboratory. This is

MOUND

Environmental
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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

Table I.2. Variance From 3-Foot Sampling Depth Specification

Location	Description of Variance
SGC-NAC-000001	Core sampler hit refusal at 2 feet.
SGC-NAC-000002	Relocated due to utilities.
SGC-NAC-000003	Core sampler hit refusal at 2 feet.
SGC-NAC-000004	Core sampler hit refusal at 18 inches.
SGC-NAC-000005	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-NAC-000006	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-NAC-000007	Core sampler hit refusal at 18 inches.
SGC-NAC-000008	Drilled to 2 feet due to utilities.
SGC-NAC-000010	Drilled to 1 foot; hand-augered rest due to utilities; flag against building, so sample taken 6 feet from flag.
SGC-NAC-000012	Drilled to 2 feet due to utilities.
SGC-SAN-000018	Core sampler hit refusal at 2 feet; relocated from inside clarifier.
SGC-NAC-000029	Core sampler hit refusal at 18 inches.
SGC-A61-000043	Sampled 1 foot from flag.
SGC-A61-000047	Drilled to 2 feet due to utilities.
SGC-A61-000048	Drilled to 2 feet due to utilities.
SGC-A61-000049	Relocated due to utilities.
SGC-A61-000051	Core sampler hit refusal at 18 inches.
SGC-A61-000052	Relocated due to utilities; core sampler hit refusal at 18 inches.
SGC-A61-000053	Core sampler hit refusal at 2 feet.
SGC-A13-000056	Core sampler hit refusal at 18 inches
SGC-A13-000058	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-A13-000060	Core sampler hit refusal at 1 foot.
SGC-AOJ-000064	Core sampler hit refusal at 2 - 3 inches.
SGC-AOJ-000066	Core sampler hit refusal at 4 inches.
SGC-AOJ-000067	Core sampler hit refusal at 6 inches.
SGC-AOJ-000069	Core sampler hit refusal at 2 feet.
SGC-A03-000080	Core sampler hit refusal at 20 inches
SGC-A03-000081	Drilled to 2 feet due to utilities.
SGC-A03-000082	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-A03-000083	Sampled 25 feet from original location due to storm sewer; core sampler hit refusal at 18 inches.
SGC-A03-000087	Core sampler hit refusal at 2 feet.
SGC-A21-000088	Core sampler hit refusal at 18 inches.
SGC-A21-000090	Core sampler hit refusal at 20 inches.
SGC-SDB-000097	Relocated due to utilities.
SGC-SDB-000098	Relocated from inside a building.
SGC-SDB-000101	Relocation of SGC-SDB-000099; first location surveyed incorrectly.
SGC-SDB-000102	Relocation of SGC-SDB-000100; first location surveyed incorrectly.

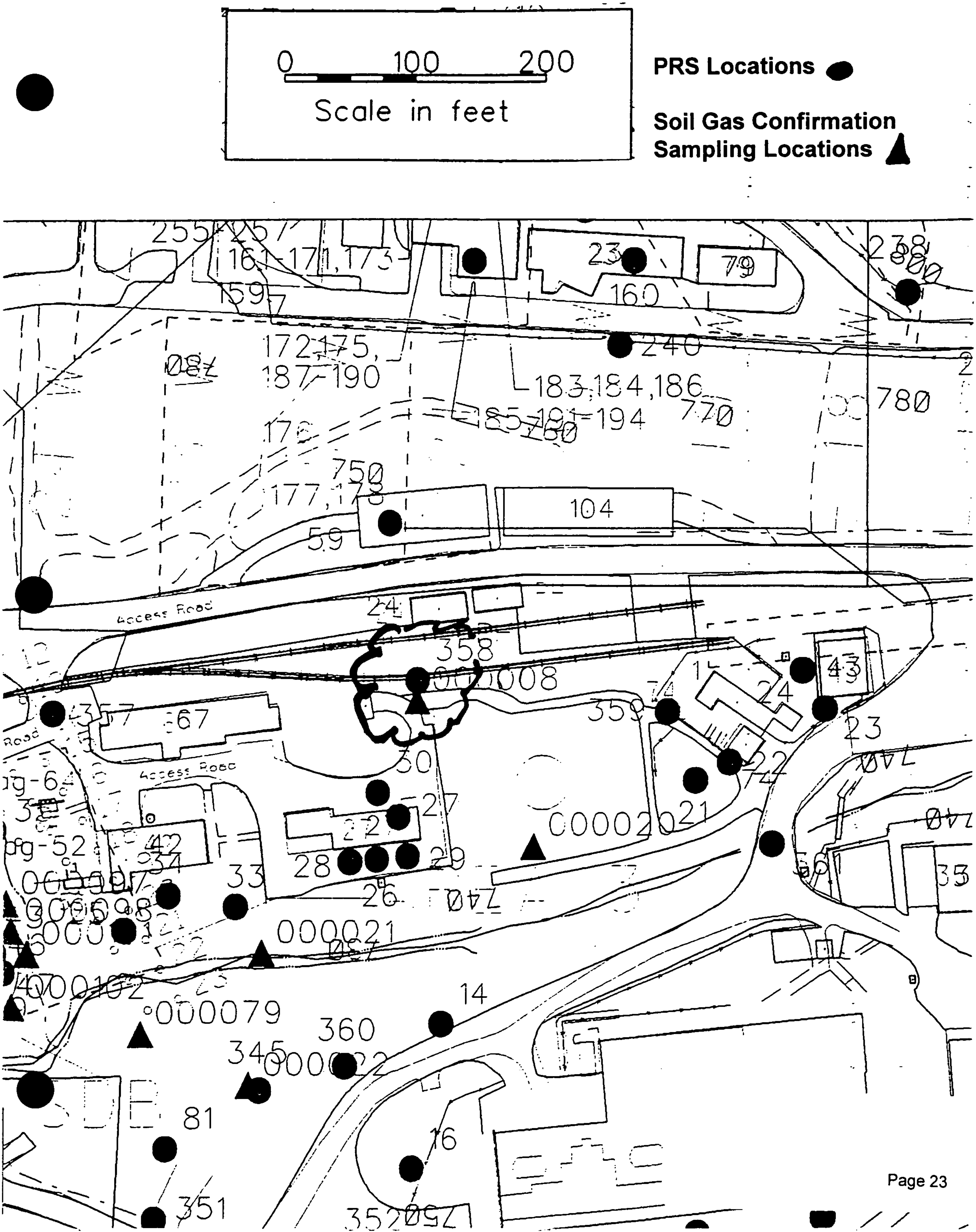
0 100 200
Scale in feet
PRS Locations
Soil Gas Confirmation
Sampling Locations
Access Road
Access Road
104
358
000008
000020
000021
000079
14
360
345
81
351
16
43
23
24
21
22
27
28
29
26
33
42
67
59
240
160
79
780
770
750
183,184,186
185,191-194
172,175,
187-190
161-171,173

Table A.1

Detected Volatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000007	SGC-NAC-000010	SGC-NAC-000011	SGC-NAC-000012	SGC-NAC-000013
PETREX SAMPLE AREA			WEST	EAST	WEST	EAST	EAST
Acetone	NA	21000000					
1,2-Dichloroethene (total)	NA	43000000					
2-Butanone	NA	93000000				8 J	10 J
Benzene	NA	8.90E+03					
Carbon Disulfide	NA	280000					4 J
Chloroform	NA	3100					
Chloromethane	NA	NA		4 J			
Ethylbenzene	NA	480					
Methylene Chloride	NA	3.95E+05		8			
Tetrachloroethene	NA	21000000					
Toluene	NA	250000			2 J		
Trichloroethene	NA	41000	7				7
Xylene (total)	NA	430000000					

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

NOTE: Volatile in sample No. 000008 were not detected. Therefore, were not recorded in this table.

Table A.2. Soil Gas Confirmation Detected Semivolatile Organic Compounds (cont.)

ANALYTE	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	SGC NAC 000015	Background	10^{-6} Construction Worker Guidelines
SEMIVOLATILES (µg/Kg)								
Acenaphthene							NA	NA
Acenaphthylene							NA	NA
Anthracene							NA	320000000
Benzo(a)anthracene	57 J				18 J		NA	4100
Benzo(a)pyrene	65 J				21 J		NA	410
Benzo(b)fluoranthene	67 J				22 J		NA	4100
Benzo(g,h,i)perylene	26 J						NA	NA
Benzo(k)fluoranthene	58 J				17 J		NA	41000
Bis(2-ethylhexyl)phthalate		71 J		36 J	35 J		NA	215000
Butylbenzylphthalate							NA	215000000
Carbazole							NA	NA
Chrysene	68 J		20 J		22 J		NA	410000
Di-n-butyl phthalate							NA	105000000
Di-n-octyl phthalate							NA	21500000
Dibenz(a,h)anthracene							NA	410
Dibenzofuran							NA	NA
Diethyl phthalate							NA	NA
Fluoranthene	110 J		31 J		38 J		NA	42500000
Fluorene							NA	NA
Indeno(1,2,3-cd)pyrene	36 J						NA	4100
2-Methylnaphthalene							NA	NA
Naphthalene						61 J	NA	NA
Phenanthrene	53 J						NA	NA
Phenol							NA	650000000
Pyrene	120 J		31 J	20 J	37 J		NA	32000000

Table A.3. Soil Gas Confirmation Detected Pesticides/PCB's

ANALYTE	SGC NAC 000008	SGC NAC 000010	SGC NAC 000031	SGC A66 000041	SGC A61 000044	SGC A13 000060	Background	10^{-6} Construction Worker Guidelines
PESTICIDES/PCB (µg/kg)								
Aroclor-1248	48			110	98		ND	380
Aroclor-1254	43				55		ND	21500
Alpha-Chlordane							ND	NA
Gamma-Chlordane						3.7	ND	NA
4,4'-DDT							13000	9000
Dieldrin		4.4	5•				ND	185
Endosulfan I				3.4•	2.4•		ND	NA
Endosulfan II							NA	NA
Endrin			11•				ND	NA
Heptachlor						2.9	ND	NA

Table A.4. Soil Gas Confirmation Detected TAL Inorganics (cont.)

ANALYTE	SGC NAC 000007	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	Background	10^{-6} Construction Worker Guidelines
INORGANICS (mg/kg)								
Aluminum	10200	2820	18700	7300	10300	13100	19000	NA
Antimony		0.27 B	0.91 B	0.21 B	1.2 B		NA	425
Arsenic	1.9 B	3.2	11.1	7.2	2.2 B	1.9 BJ	8.6	320
Barium	26.2 B	23.2 B	163	64.7	13.5 B	78.4	180	75000
Beryllium	0.28		0.9 B	0.34	0.36 B	0.44	1.3	0.7
Bismuth			0.85 B		0.99 B		NA	NA
Cadmium	0.33 B	0.22 B	6	0.62 B	5.2	6.0	2.1	1050
Calcium	83900	113000	5940	41500	90800	127000 J	310000	NA
Chromium	14.3	5.7	20.3	12	11.9	17.3	20	1050000
Cobalt	11 B	3.3 B	13	7.9 B	13.7	12.7 J	19	NA
Copper	16.2	13.9	19.2	17.4	16.6	21.3 J	26	NA
Cyanide							ND	21400
Iron	23000	7660	29400	17300	25600	27900	35000	NA
Lead	7.2	5.9	22.2	16.5	5.7	9.3 J	48	NA
Lithium	3.2 B	8.2 B	14.7 B	9.2 B	27.3	25.3	26	NA
Magnesium	21600	47900	4500	16700	12300	19900 J	40000	NA
Manganese	493	256	728	604	908	658	1400	135000
Mercury							NC	320
Molybdenum	0.63 B	1.4 B	1.8 B	2.3 B	0.58 B	1.3 B	27	NA
Nickel	22.6	8.1 B	24.5	16.5	21.6	26.4	32	21500
Potassium	1590	463 B	1420	794 B	2210 B	1630	1900	NA
Selenium					0.31 B		NA	NA
Silver							1700	5500000
Sodium	246 B	341 B	1010 B	82 B	288 B	2490 J	[illegible]	NA
Thallium							460	NA
Tin		4.5 B	1.5 B			1.6 B	20	NA
Vanadium	14.2	7.4	42.7	19.2	15.8	22.4	25	7500
Zinc	53.8	36.6	71.8	299	59.9	68.5	140	320000

Table A.5. Soil Gas Confirmation Detected Nitrate-Nitrite

ANALYTE	SGC NAC 000001	SGC NAC 000002	SGC NAC 000003	SGC NAC 000004	SGC NAC 000005	SGC NAC 000006	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	83.9	93.8	88.5	83.3	78.4	75.0	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.0	1.8	1.2	2.1	7.2	4.8	26	NA

ANALYTE	SGC NAC 000007	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	83.9	95.0	78.9	83.9	90.1	84.7	NA	NA
Nitrate/Nitrite (MG-N/KG)	1.6	26.5	2.2	5.9	5.3	1.8	26	NA

ANALYTE	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	SGC NAC 000016	SGC NAC 000017	SGC SAN 000018	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	81.7	80.9	74.0	85.3	72.8	84.2	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.1	4.9	3.0	2.4	6.4	13.7	26	NA

ANALYTE	SGC NAC 000019	SGC NAC 000020	SGC NAC 000021	SGC NAC 000022	SGC NAC 000023	SGC NAC 000024	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	85.3	87.6	77.4	78.3	77.5	89.5	NA	NA
Nitrate/Nitrite (MG-N/KG)	6.5	2.1	6.1	2.2	11.6	2.2	26	NA

Table A.6. Soil Gas Confirmation Detected Radionuclides (cont.)

ANALYTE	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	SGC NAC 000013	SGC NAC 000014	Background	10^{-6} Construction Worker Guidelines
RADIONUCLIDES (pCi/g)									
Americium-241					-0.238	0.0694		ND	4.95
Bismuth-207					0.0292	-0.0304		ND	0.175
Bismuth-210					0.0355	0.0297		ND	NA
Cesium-137					0.0371	0.0175	0.826	0.42	0.46
Cobalt-60					0.0547	-0.0280		NC	0.1
Plutonium-238	0.0826	0.0233	0.107	0.0718	0.101	0.0107	0.671	0.13	5.5
Plutonium-239/240					0.00154	-0.000127	0.0206	0.18	5.5
Potassium-40	7.72	12.9	15.0	17.8	15.5	4.65	22.5	37	NA
Radium-226	0.571	0.764	0.917	0.778	0.592	0.263	1.10	2	0.14
Thorium-228	0.678	0.779	0.914	0.913	0.697	0.247	1.18	1.5	0.85
Thorium-230	0.541	1.09	1.27	0.902	0.803	0.359	1.09	1.9	44
Thorium-232	0.554	0.838	0.708	0.830	0.769	0.210	1.08	1.4	50
Uranium-234	0.361	0.712	0.897	0.882	0.693	0.378	0.866	1.1	37.5
Uranium-235			0.0459		0.0231	0.0183	0.0548	0.11	3.35
Uranium-238	0.414	0.774	1.06	0.871	0.681	0.424	1.01	1.2	11