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3001-0304160007

MOUND

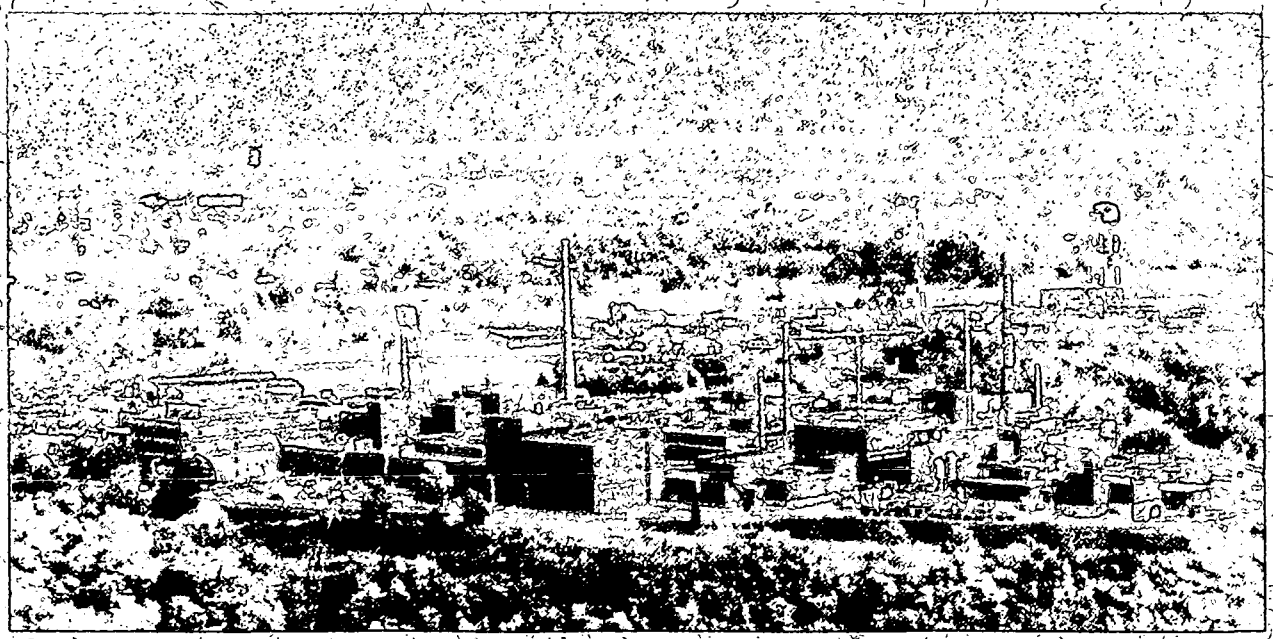
Environmental Restoration Program

MOUND PLANT

Potential Release Site Package

PRS #303

FINAL
JULY 2002



MOUND

Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PRS PACKAGE

Notice of Public Review Period

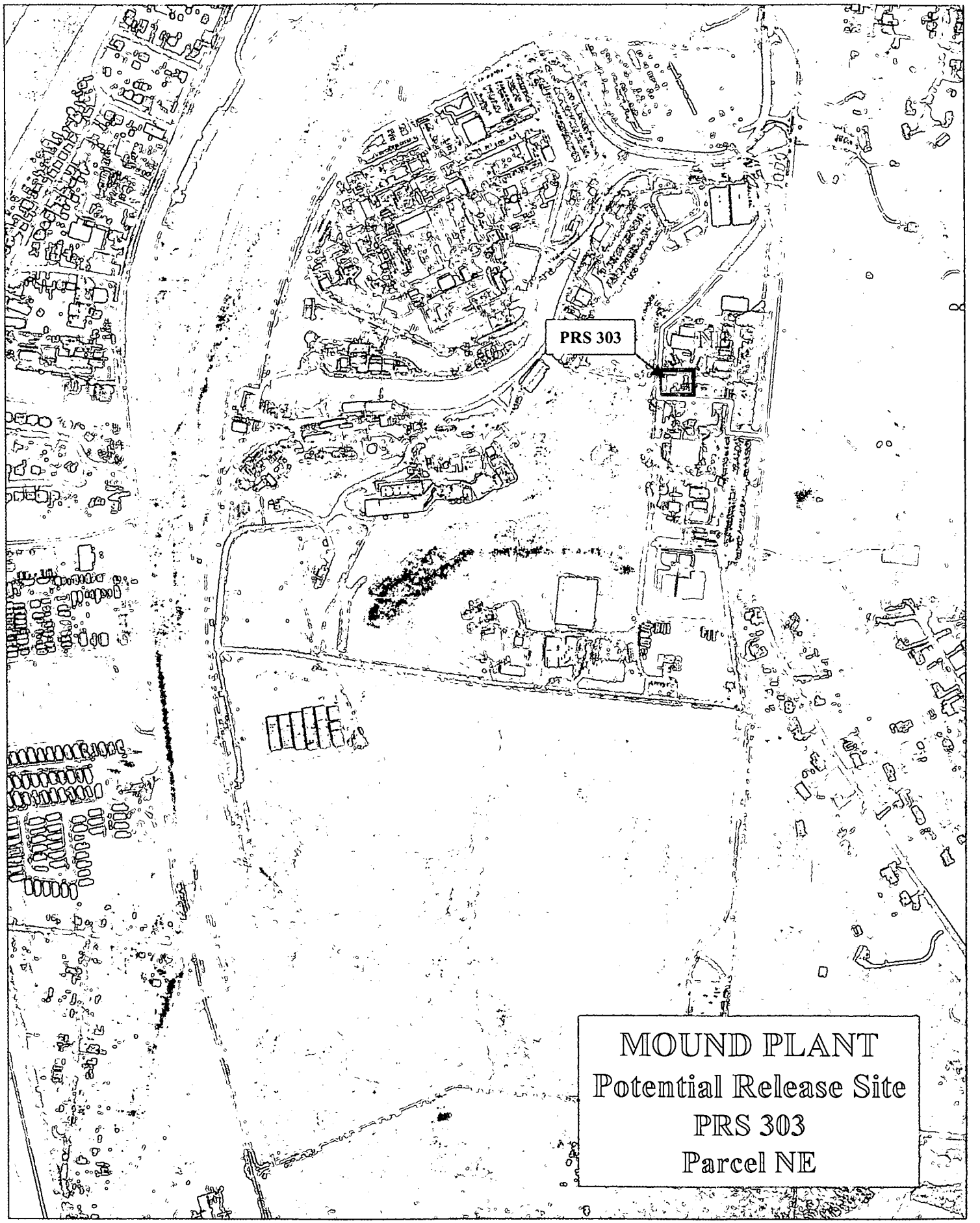
The following Potential Release Site (PRS) package is available for public review in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio. Public comment on this document will be accepted June 26, 2002 through July 26, 2002.

PRS 303: Warehouse 14

Questions can be referred to Paul Lucas at (937) 865-4578.

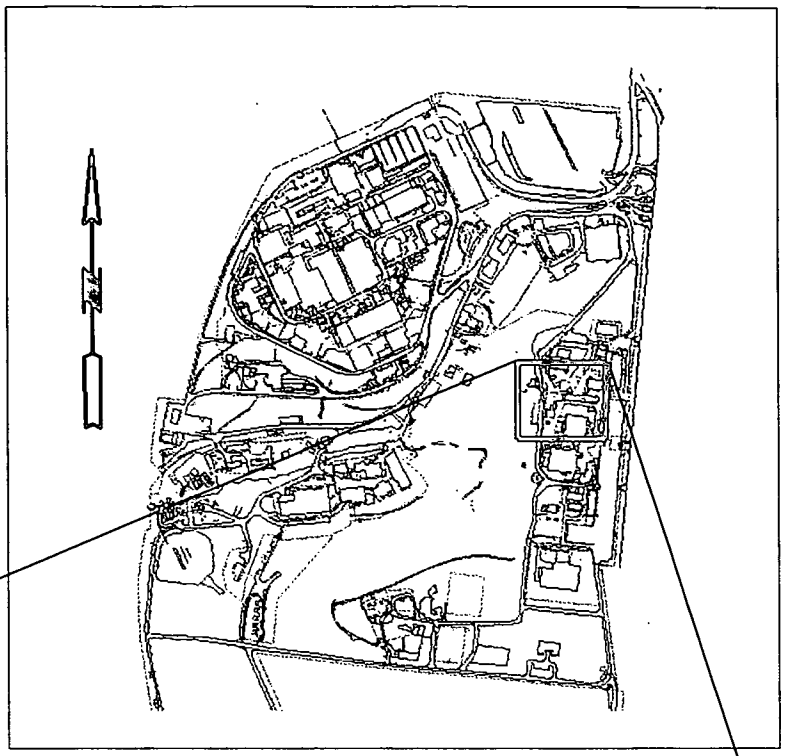
PRS 303 Package Tracking Sheet

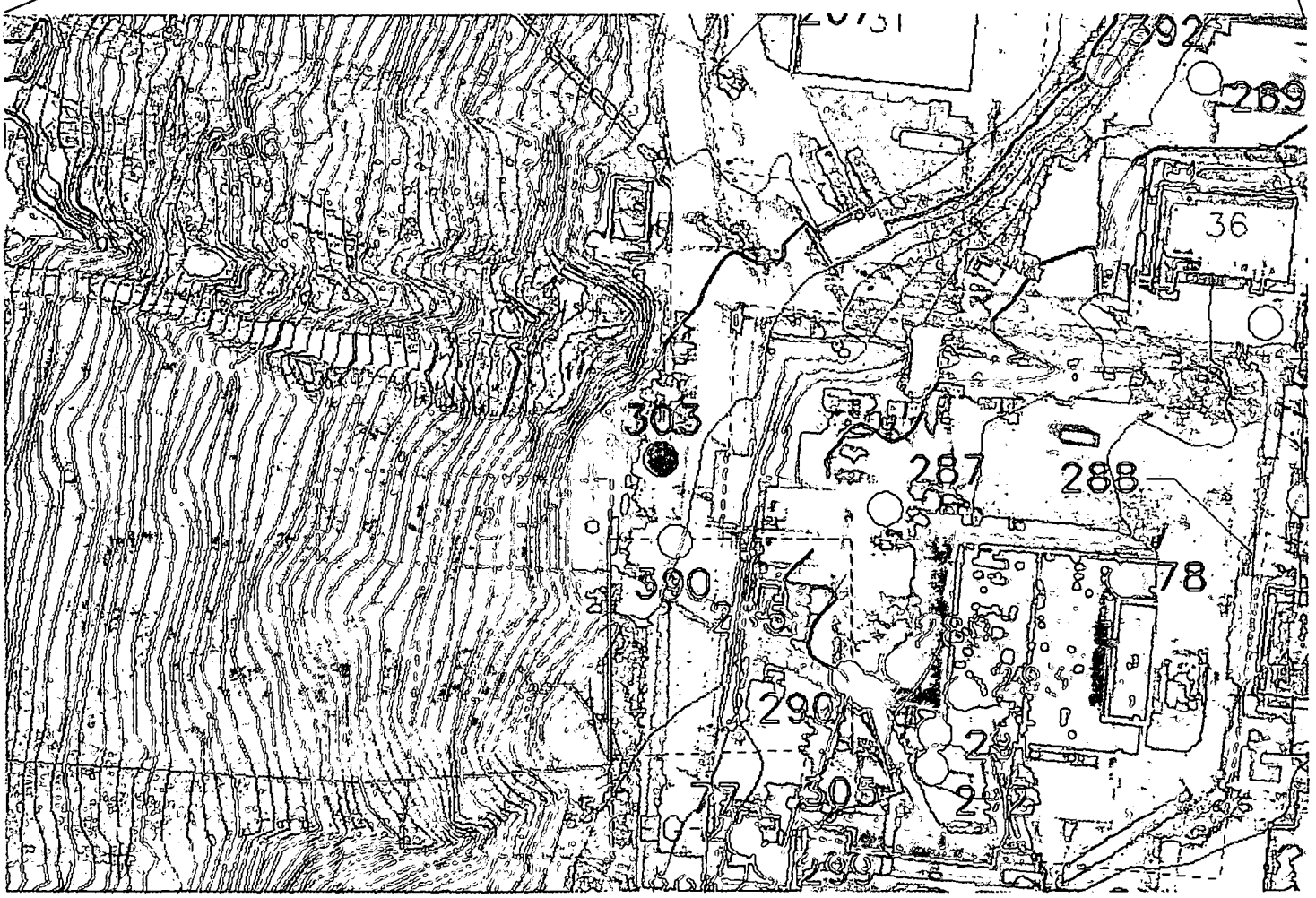
REVISION	DESCRIPTION	DATE
Regulator Release A		**15 August 1996**
Binning Revisions	Page 3.1, first paragraph: add the work "than" to the sentence "...similar to or less than that of the PETREX locations with the..."	**20 November 1996**
Working Draft/Draft	Presented at Core Team meeting of 5/30/2001. PRS 303 was binned as RA by the Core Team.	**4 June 2001**
Draft Proposed Final	Addendum 1 assembled. RA recommendation signed on 20 June 2001.	**20 June 2001**
Public Review Draft	Contains previous package material and Addendum 1. The public review period was from 26 June 2002- 26 July 2002.	**June 2002**
Final	No public comments were received.	**July 2002**


PRS 303
MOUND PLANT
Potential Release Site
PRS 303
Parcel NE

Mound Plant
PRS 303
Warehouse 14/(Pad 14)

On the map below:
- PRS number and location shown in black
- Fencing shown in red
- Elevation contours shown in brown
- Other PRS's shown in blue





MOUND

Environmental
Restoration
Program

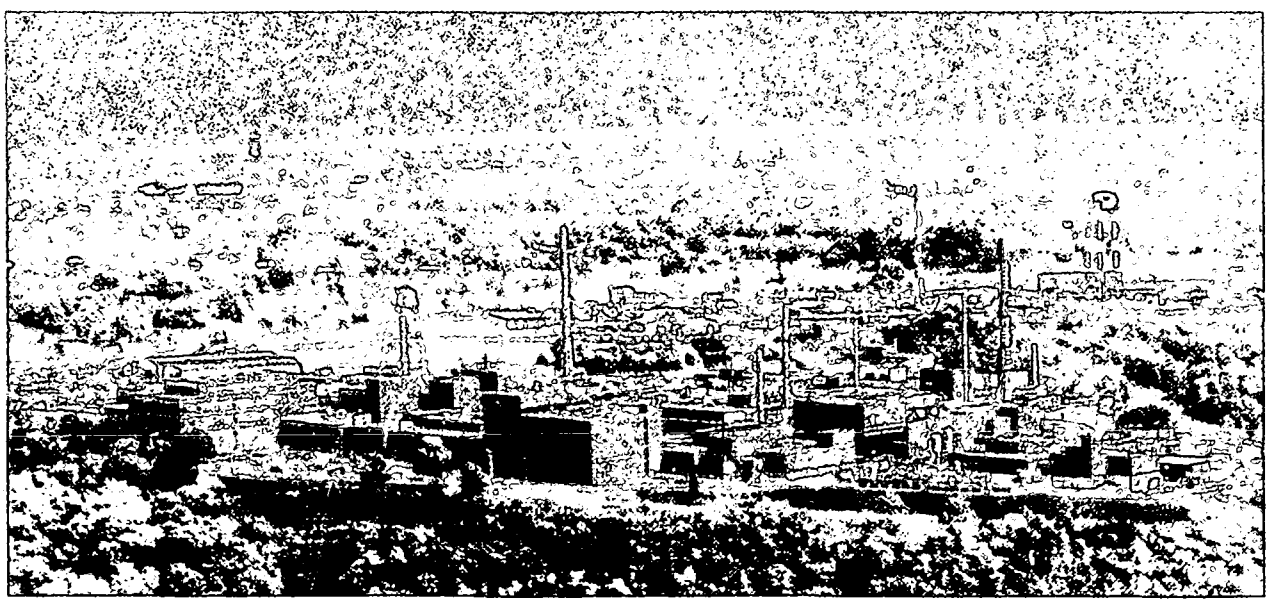
MOUND PLANT

Potential Release Site Package

PRS #303

Addendum 1

FINAL
JULY 2002



PRS 303
Addendum 1

BACKGROUND:

In September 1996, Potential Release Site (PRS) 303 was binned as requiring Further Assessment (FA). Sampling events in the vicinity of PRS 303, either subsequent to the FA binning or not included in the original data package, have resulted in additional data for consideration in determining the disposition of this PRS.

CONTAMINATION:

Reconnaissance Sampling, Operable Unit 6, Decontamination & Decomissioning Areas[2,3]

Three borings (identified as MND10-0052, MND10-0053, and MND10-0054) were installed in the vicinity of PRS 303 during the Operable Unit 6, Decontamination & Decomissioning (OU6, D&D) reconnaissance sampling. A total of nine soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), inorganics (metals), thorium-232, and plutonium-238. No volatiles, semi-volatiles, radioisotopes, or inorganics were reported with concentrations greater than the comparison criteria. (See Table 1.)

Other Soils Characterization[4]

The "Other Soils" fieldwork was conducted to characterize several areas and hot spots under the Environmental Restoration (ER)/D&D Program. Area 12 was part of the "Other Soils" characterization and included a portion of the PRS 303 site. Four soil borings were installed within the PRS 303 area during the investigation, resulting in fourteen samples. No analytes were reported with concentrations greater than the comparison value with the exception of thorium-230 and radium-226. Thorium-230 was reported above the comparison value at one location (MND17-1202), at one foot below grade, and at a depth of four feet. (See Table 1.) Because the MDAs (Minimum Detectable Activities) of other gamma-spectroscopy sample results within this investigation were several times greater than the reported values at this location, these reported values were considered suspect. Radium-226 was detected at concentrations exceeding the comparison value. (See Table 1.)

Re-sample of Location MND17-1202 (March 2001)[5]

Because the "Other Soils" characterization results for thorium-230 for this location were considered suspect, the location was re-sampled by overdrilling using an auger drill bit. Samples were taken at zero to two feet and two to four feet depths. The samples were analyzed using alpha-spectroscopy. (See Table 1.)

Table 1: PRS 303 Sampling Information

Contaminant	Maximum Result	Background	Guideline Value (10^{-6})	Screening Level
Plutonium-238	23 pCi/g[2,3]	0.13 pCi/g	5.5 pCi/g	55 pCi/g (10^{-5})
Thorium-232	0.7 pCi/g[2,3]	1.4 pCi/g	0.1 pCi/g	1.5 pCi/g
Thorium-230	19.32 pCi/g[4]*	1.9 pCi/g	0.13 p Ci/g	**
Thorium-230	1.594 pCi/g[5]***	1.9 pCi/g.	0/13 pCi/g	**
Radium-226	3.34 pCi/g[4]	2.0 pCi/g	0.14 pCi/g	2.14 pCi/g
Beryllium	1.1 mg/kg[2,3]	1.3 mg/kg	0.7 mg/kg	NA

- * The detected thorium-230 results within PRS 303 from the "Other Soils" investigation were suspect and therefore warranted further investigation.
- ** In areas where thorium-230 is not a contaminant of concern, Mound will use its normal sample analysis process through gamma spectroscopy and will assure that a MDA of less than or equal to 10 pCi/g is achieved. In addition, if the detected value for thorium-230 is greater than the detection limit, we will re-analyze the sample.
- *** March 2001 resample results of the "Other Soils" location, MND17-1202.

READING ROOM REFERENCES:

1) PRS 303, FA Recommendation (unofficial), September 1996
3) MRC 1986 Stenhouse, M.J., and G.E. Kirsch. "Verification Survey of the WTS Excavation Area at the Mound Facility," Battelle, Columbus Division, Columbus, Ohio, Monsanto Research Corporation, October 1986.
4) DOE 1996a "Other Soils Characterization Report," EG&G Mound, Miamisburg, Ohio, May 1996.

OTHER REFERENCES:

2) GIS Mapping/Sampling Verification Sampling Information
5) Sample Data Sheets, "Other Soils" investigation location (March 2001) resample

PREPARED BY:

Dennis Gault, Member of BWXT of Ohio Technical Staff

MOUND PLANT
PRS 303 Addendum 1

WAREHOUSE 14 (AKA PAD 14)

RECOMMENDATION:

Potential Release Site (PRS) 303 was identified as a result of historical storage of waste materials in Warehouse 14 (aka, Pad 14).

The Core Team originally recommended Further Assessment for PRS 303. Subsequently, the cost of further investigation versus the cost of removing the potentially contaminated soils was evaluated. Cost estimates indicate that the cost of removal is not signifificantly greater than the cost of further assessment at PRS 303. Additionally, further assessment findings may indicate the need for a Response (Removal) Action, resulting in costs associated with both a further assessment and a response action. PRS 303 remediation requirements will be accomplished with PRS 285 removal operations.

Therefore, a RESPONSE ACTION is recommended for PRS 303.

CONCURRENCE:

DOE/MEMP: _____ 6/20/01
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 6/20/01
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 6/21/01
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from June 26, 2002 to July 26, 2002.

☑ No comments were received during the comment period.
☐ Comment responses can be found on page _____ of this package.

REFERENCE MATERIAL

PRS 303

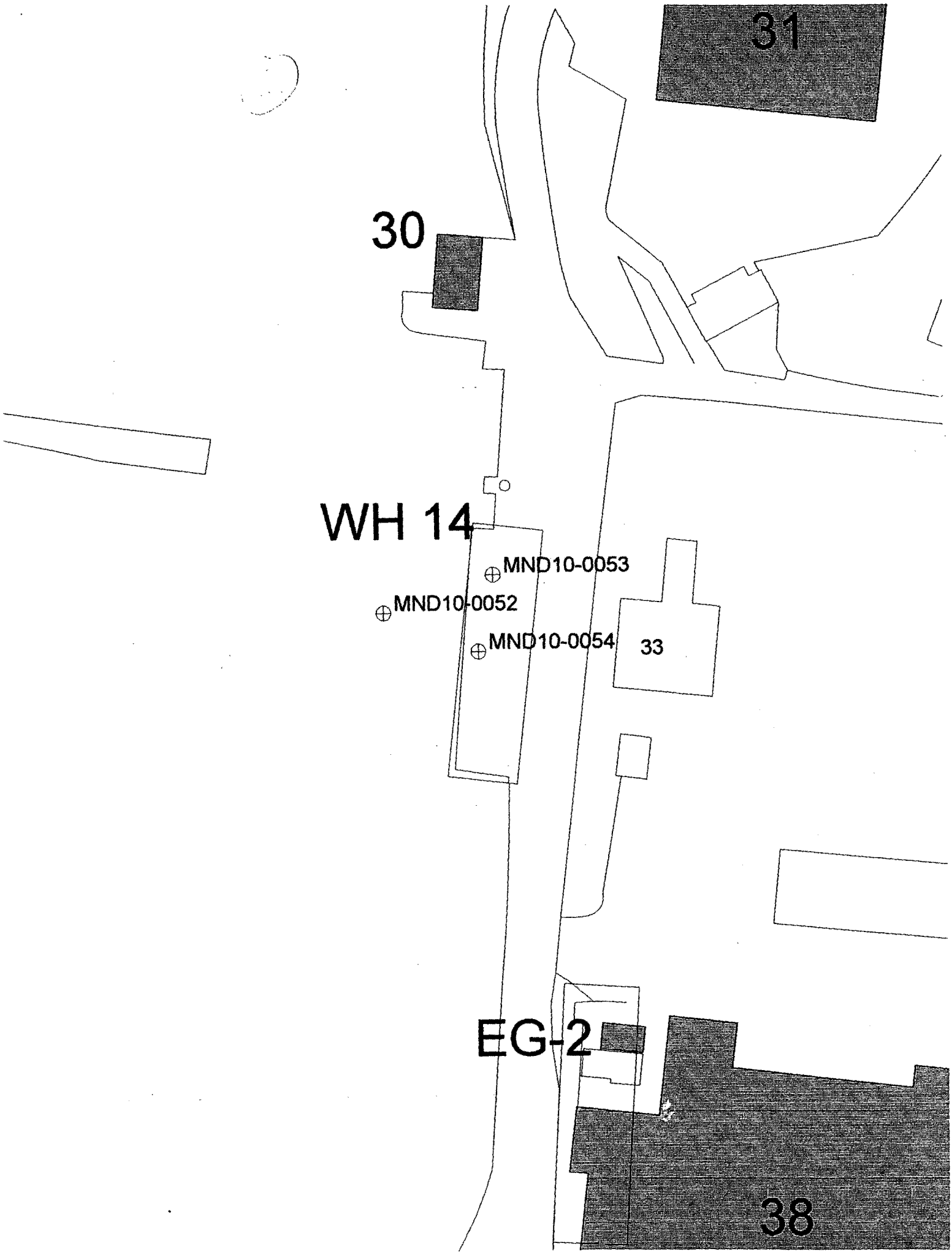
Addendum 1

Reference 1

RECOMMENDATION
PRS 303

Further assessment needed. PRS 303 has been identified because of potential radioactive contamination from the warehouse operations, however all data suggests no radiation issues exist with this PRS. Further assessment is needed (e.g., calibration of data) to clarify the "evaluated" soil gas readings.

Reference 2


31
30
WH 14
MND10-0053
MND10-0052
MND10-0054
33
EG-2
38

Location_name	Measured_Value	Value_name	Value_units	Detection	Start_depth	End_depth	Depth_unit	Project_code
MND10-0052	180	Pyrene	UG/KG		0	0.5	FT	OU6RECON
MND10-0052	6	Plutonium-238	PCI/G		3	4.5	FT	OU6RECON
MND10-0052	0.7	Thorium-232	PCI/G		3	4.5	FT	OU6RECON
MND10-0052	48	Beta-BHC	UG/KG	26	0	0.5	FT	OU6RECON
MND10-0052	2	Tetrachloroethene	UG/KG	6	3	4.5	FT	OU6RECON
MND10-0052	16	Acetone	UG/KG	11	3	4.5	FT	OU6RECON
MND10-0052	24	Dichloromethane (Methylene Chloride)	UG/KG	6	3	4.5	FT	OU6RECON
MND10-0052	3	2-Butanone	UG/KG	11	3	4.5	FT	OU6RECON
MND10-0052	590	Pyrene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0052	550	Fluoranthene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0052	280	Benzo(k)fluoranthene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0052	330	Chrysene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0052	240	Benzo(a)anthracene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0052	440	Phenanthrene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0052	2	Tetrachloroethene	UG/KG	5	0	0.5	FT	OU6RECON
MND10-0052	4	Acetone	UG/KG	11	0	0.5	FT	OU6RECON
MND10-0052	3	1,1,1-Trichloroethane	UG/KG	5	0	0.5	FT	OU6RECON
MND10-0052	19	Dichloromethane (Methylene Chloride)	UG/KG	5	0	0.5	FT	OU6RECON
MND10-0052	2	2-Butanone	UG/KG	11	0	0.5	FT	OU6RECON
MND10-0052	21	Aroclor-1260	UG/KG	170	0	0.5	FT	OU6RECON
MND10-0052	56	Aroclor-1254	UG/KG	170	0	0.5	FT	OU6RECON
MND10-0052	23	Plutonium-238	PCI/G		0	0.5	FT	OU6RECON
MND10-0052	0.6	Thorium-232	PCI/G		0	0.5	FT	OU6RECON

Location name	Measured Value	Value name	Value units	Detection	Start depth	End depth	Depth unit	Project code
MND10-0053	1	Tetrachloroethene	UG/KG	5	7	7.5	FT	OU6RECON
MND10-0053	15	Acetone	UG/KG	11	7	7.5	FT	OU6RECON
MND10-0053	2	1,1,1-Trichloroethane	UG/KG	5	7	7.5	FT	OU6RECON
MND10-0053	22	Dichloromethane (Methylene Chloride)	UG/KG	5	7	7.5	FT	OU6RECON
MND10-0053	5	2-Butanone	UG/KG	11	7	7.5	FT	OU6RECON
MND10-0053	2200	Potassium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	0.23	Thallium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	5.2	Arsenic	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	96	Bis(2-ethylhexyl)phthalate	UG/KG	790	3	7.5	FT	OU6RECON
MND10-0053	82	Di-n-octyl Phthalate	UG/KG	790	3	7.5	FT	OU6RECON
MND10-0053	110	Pyrene	UG/KG	790	3	7.5	FT	OU6RECON
MND10-0053	140	Fluoranthene	UG/KG	790	3	7.5	FT	OU6RECON
MND10-0053	87	Phenanthrene	UG/KG	790	3	7.5	FT	OU6RECON
MND10-0053	13100	Aluminum	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	24600	Iron	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	10700	Magnesium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	498	Manganese	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	39.9	Nickel	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	2.9	Silver	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	4080	Sodium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	481	Barium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	1.1	Beryllium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	4.2	Cadmium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	19.6	Chromium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	13.8	Cobalt	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	15.3	Copper	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	16.3	Vanadium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	65500	Calcium	MG/KG	0	3	7.5	FT	OU6RECON
MND10-0053	10	Plutonium-238	PCI/G		3	7.5	FT	OU6RECON
MND10-0053	0.6	Thorium-232	PCI/G		3	7.5	FT	OU6RECON
MND10-0053	593	Potassium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	2.1	Arsenic	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	89	Pyrene	UG/KG	710	0	0.5	FT	OU6RECON
MND10-0053	120	Fluoranthene	UG/KG	710	0	0.5	FT	OU6RECON
MND10-0053	140	N-Nitrosodiphenylamine	UG/KG	710	0	0.5	FT	OU6RECON
MND10-0053	1430	Aluminum	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	4390	Iron	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	56300	Magnesium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	362	Manganese	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	15.4	Nickel	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	2750	Sodium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	373	Barium	MG/KG	0	0	0.5	FT	OU6RECON

Location name	Measured value	Value name	Value units	Detection	Start depth	End depth	Depth unit	Project code
MND10-0053	0.77	Beryllium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	6.4	Cadmium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	4.1	Chromium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	6.1	Cobalt	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	17.8	Vanadium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	196000	Calcium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0053	10	Plutonium-238	PCI/G		0	0.5	FT	OU6RECON
MND10-0053	0.1	Thorium-232	PCI/G		0	0.5	FT	OU6RECON

Location name	Measured value	Value name	Value units	Direction	Start depth	End depth	Depth unit	Project code
MND10-0054	2	Toluene	UG/KG	5	6	6.5	FT	OU6RECON
MND10-0054	1	Tetrachloroethene	UG/KG	5	6	6.5	FT	OU6RECON
MND10-0054	18	Acetone	UG/KG	10	6	6.5	FT	OU6RECON
MND10-0054	8	1,1,1-Trichloroethane	UG/KG	5	6	6.5	FT	OU6RECON
MND10-0054	16	Dichloromethane (Methylene Chloride)	UG/KG	5	6	6.5	FT	OU6RECON
MND10-0054	4	2-Butanone	UG/KG	10	6	6.5	FT	OU6RECON
MND10-0054	627	Potassium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	2.2	Arsenic	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	3	Toluene	UG/KG	5	0	0.5	FT	OU6RECON
MND10-0054	1	Tetrachloroethene	UG/KG	5	0	0.5	FT	OU6RECON
MND10-0054	11	Acetone	UG/KG	10	0	0.5	FT	OU6RECON
MND10-0054	1	1,1,1-Trichloroethane	UG/KG	5	0	0.5	FT	OU6RECON
MND10-0054	18	Dichloromethane (Methylene Chloride)	UG/KG	5	0	0.5	FT	OU6RECON
MND10-0054	3	2-Butanone	UG/KG	10	0	0.5	FT	OU6RECON
MND10-0054	290	Pyrene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0054	310	Fluoranthene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0054	180	Benzo(k)fluoranthene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0054	200	Chrysene	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0054	330	N-Nitrosodiphenylamine	UG/KG	1800	0	0.5	FT	OU6RECON
MND10-0054	1510	Aluminum	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	3940	Iron	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	78100	Magnesium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	264	Manganese	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	17.8	Nickel	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	2430	Sodium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	430	Barium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	0.8	Beryllium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	8	Cadmium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	8.1	Chromium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	6.9	Cobalt	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	21	Vanadium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	176000	Calcium	MG/KG	0	0	0.5	FT	OU6RECON
MND10-0054	18	Plutonium-238	PCI/G		0	0.5	FT	OU6RECON
MND10-0054	0.1	Thorium-232	PCI/G		0	0.5	FT	OU6RECON
MND10-0054	2280	Potassium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	7650	Aluminum	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	17300	Iron	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	15100	Magnesium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	323	Manganese	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	32.5	Nickel	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	3440	Sodium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	460	Barium	MG/KG	0	3	6.5	FT	OU6RECON

Location_name	Measured_value	Value_name	Value_units	Detection	Start_depth	End_depth	Depth_unit	Project_code
MND10-0054	0.79	Beryllium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	3.9	Cadmium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	14.3	Chromium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	11.6	Cobalt	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	8.3	Copper	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	11.7	Vanadium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	99800	Calcium	MG/KG	0	3	6.5	FT	OU6RECON
MND10-0054	12	Plutonium-238	PCI/G		3	6.5	FT	OU6RECON
MND10-0054	0.1	Thorium-232	PCI/G		3	6.5	FT	OU6RECON

Reference 3

SUMMARY REPORT

on the

VERIFICATION SURVEY OF THE WTS EXCAVATION AREA AT THE MOUND FACILITY

to

MONSANTO RESEARCH CORPORATION
MOUND FACILITY

October 1986

M. J. Stenhouse and G. E. Kirsch

BATTELLE
Columbus Division
505 King Avenue
Columbus, Ohio 43201

TABLE 1. SAMPLING LOCATIONS FOR VERIFICATION SURVEY OF FORMER WTS PIPELINE*

Test Hole Number	Coordinates S	Coordinates W	Elevation (feet)	Subsurface Sampling Pattern**
1	2,917.99	2,389.22	877.1	1, 2, 6
2	2,905.89	2,474.63	873.0	3, 4, 6
3	2,901.81	2,419.20	875.8	3, 4, 8
4	2,893.98	2,435.14	874.7	2, 4, 5
5	2,901.09	2,446.61	874.4	3,4, 8
6	2,899.40	2,459.51	873.8	2, 4, 7
7	2,884.00	2,478.77	872.5	4, 5, 3
8	2,890.94	2,492.89	869.8	2, 7, 8
9	2,906.29	2,498.91	866.0	2, 5, 7
10	2,912.81	2,533.61	858.9	3, 4, 6
11	2,891.07	2,567.69	846.2	3, 5, 7
12	2,864.84	2,607.83	833.7	1, 4, 5
13	2,843.67	2,646.08	824.4	2, 5, 7
14	2,817.72	2,694.28	812.8	2, 5, 7
15	2,791.35	2,735.84	802.4	2, 5, 8
16	2,775.76	2,764.85	795.0	2, 4, 6
17	2,736.96	2,825.90	778.6	1, 3, 4
18	2,712.64	2,869.02	769.5	1, 3, 4
19	2,684.47	2,910.83	762.9	3, 4, 6
20	2,659.29	2,958.42	760.0	2, 3, 8
21	2,635.91	2,996.07	753.6	4, 6, 7

TABLE 1. (Continued)

Test Hole Number	Coordinates S	Coordinates W	Elevation (feet)	Subsurface Sampling Pattern**
22	2,611.46	3,042.02	748.4	3, 4, 5
23	2,613.27	3,060.62	748.4	2, 3, 8
24	2,607.32	3,049.10	746.2	3, 4, 7
25	2,586.23	3,081.72	751.3	1, 2, 3
26	2,574.70	3,085.81	751.9	1, 5, 6
27	2,561.41	3,096.70	751.8	3, 4, 5
28	2,544.13	3,100.38	752.1	1, 3, 4
29	2,528.50	3,080.17	753.5	3, 5, 7
30	2,518.45	3,114.58	752.1	1, 3, 4,
31	2,505.45	3,126.78	750.7	1, 6, 7
32	2,490.97	3,176.97	750.2	1, 4, 5
33	2,517.09	2,936.47	749.8	4, 5, 8
34	2,461.90	3,266.02	749.7	3, 4, 7
35	2,448.51	3,312.99	748.2	2, 5, 6
36	2,438.96	3,362.09	747.6	3, 4, 7
37	2,410.91	3,426,84	746.6	2, 4, 7
38	2,406.09	3,455.03	745.4	1, 2, 4
39	2,393.77	3,467.81	745.4	6, 7, 8
40	2,383.51	3,482.24	745.0	2, 3, 5
41	2,377.83	3,493.48	744.8	2, 3, 8
42	2,355.72	3,487.74	745.6	3, 5, 7

TABLE 1. (Continued)

Test Hole Number	Coordinates S	Coordinates W	Elevation (feet)	Subsurface Sampling Pattern**
43	2,319.78	3,513.25	744.9	3, 4, 5
44	2,294.67	3,555.80	744.1	2, 4, 5
45	2,279.81	3,602.66	744.0	3, 4, 6
46	2,242.47	3,650.82	744.6	4, 6, 7
47	2,230.57	3,688.55	743.1	2, 3, 5
48	2,304.08	3,577.89	744.2	1, 2, 3
49	2,285.48	3,537.70	745.5	5, 6, 8
50	2,344.32	3,510.81	745.2	2, 3, 7
51	2,395.15	3,489.36	744.9	1, 2, 6
52	2,404.77	3,468.02	744.9	2, 6, 7
53	2,481.14	3,188.67	750.2	3, 4, 5
54	2,492.90	3,146.88	750.7	2, 3, 4
55	2,503.36	3,144.19	750.9	2, 3, 6
56	2,516.19	3,134.08	751.4	2, 3, 6
57	2,504.63	3,108.15	751.3	3, 4, 8
58	2,579.94	3,099.82	751.4	2, 3, 5
59	2,596.64	3,095.49	750.4	2, 3, 6
60	2,620.15	3,027.87	751.9	2, 3, 6
61	2,581.59	3,071.20	751.5	1, 3, 4
62	2,596.55	3,051.79	?	3, 4, 5

* See Appendix D for original survey data
** Surface sample also taken at each test hole site

TABLE 3. ANALYTICAL DATA [1,2]

Test Hole/ Location No.	Core Segment Depth, Feet	Battelle Pu-238 pCi/g
1	Surface	<LLD
	1 - 2	<LLD
	2 - 3	<LLD
	6 - 7	<LLD
2	Surface	<LLD
	3 - 4	<LLD
	4 - 5	<LLD
	6 - 7	<LLD
3	Surface	<LLD *
	3 - 4	<LLD
	4 - 5	<LLD
	8 - 9	<LLD
4	Surface	<LLD
	2 - 3	<LLD
	4 - 5	<LLD
	7 - 8	<LLD
5	Surface	<LLD
	3 - 4	<LLD
	4 - 5	<LLD
	6 - 7	<LLD
6	Surface	26
	2 - 3	<LLD
	4 - 5	24
	7 - 8	<LLD
7	Surface	81 *
	4 - 5	181
	5 - 6	42 *
	7 - 8	33 *
8	Surface	35 *
	2 - 3	28
	7 - 8	21
	8 - 9	46 *
9	Surface	<LLD
	2 - 3	<LLD
	5 - 6	<LLD
	7 - 8	<LLD

TABLE 3. ANALYTICAL DATA (Continued)

Test Hole/ Location No.	Core Segment Depth, Feet	Battelle Pu-238 pCi/g
10	Surface	<LLD
	3 - 4	<LLD
	4 - 5	<LLD
	6 - 7	<LLD
11	Surface	<LLD
	3 - 4	<LLD *
	5 - 6	<LLD
	7 - 8	<LLD
12	Surface	<LLD
	1 - 2	<LLD
	4 - 5	<LLD
	5 - 6	<LLD
13	Surface	23
	2 - 3	<LLD
	5 - 6	<LLD
	7 - 8	21
14	Surface	<LLD
	2 - 3	23
	5 - 6	410
	7 - 8	34
15	Surface	<LLD
	2 - 3	<LLD
	5 - 6	<LLD
	8 - 9	<LLD
16	Surface	<LLD
	2 - 3	<LLD
	4 - 5	<LLD
	6 - 7	<LLD
17	Surface	<LLD
	1 - 2	<LLD *
	3 - 4	<LLD
	4 - 5	<LLD
18	Surface	26
	1 - 2	<LLD
	3 - 4	22
	4 - 5	26
19	Surface	22
	3 - 4	<LLD
	4 - 5	<LLD
	6 - 7	<LLD

TABLE 3. ANALYTICAL DATA (Continued)

Test Hole/ Location No.	Core Segment Depth, Feet	Battelle Pu-238 pCi/g
20	Surface	<LLD
	2 - 3	<LLD
	3 - 4	<LLD
	8 - 9	<LLD
21	Surface	24
	4 - 5	<LLD
	6 - 7	<LLD
	7 - 8	<LLD
22	Surface	<LLD
	3 - 4	1057
	4 - 5	41
	5 - 6	<LLD
23	Surface	26
	2 - 3	114 *
	3 - 4	185 *
	8 - 9	<LLD
24	Surface	<LLD
	3 - 4	<LLD
	4 - 5	<LLD
	7 - 8	<LLD
25	Surface	<LLD
	1 - 2	<LLD
	2 - 3	<LLD
	3 - 4	26 *
26	Surface	<LLD
	1 - 2	<LLD
	5 - 6	<LLD
	6 - 7	<LLD
27	Surface	<LLD
	3 - 4	<LLD
	4 - 5	<LLD
	5 - 6	<LLD
28	Surface	<LLD
	1 - 2	<LLD
	3 - 4	<LLD*
	4 - 5	<LLD

TABLE 3. ANALYTICAL DATA (Continued)

Test Hole/ Location No.	Core Segment Depth, Feet	Battelle Pu-238 pCi/g
29	Surface	<LLD
	3 - 4	<LLD
	5 - 6	<LLD
	7 - 8	<LLD
30	Surface	<LLD
	1 - 2	<LLD
	3 - 4	<LLD
	4 - 5	21
31	Surface	<LLD
	1 - 2	<LLD
	6 - 7	31
	7 - 8	22
32	Surface	<LLD
	1 - 2	<LLD
	4 - 5	24
	5 - 6	<LLD
33	Surface	<LLD *
	4 - 5	<LLD
	5 - 6	<LLD
	8 - 9	23
34	Surface	27 *
	3 - 4	<LLD
	4 - 5	<LLD
	7 - 8	21
35	Surface	26
	2 - 3	<LLD
	5 - 6	26
	6 - 7	<LLD
36	Surface	<LLD
	3 - 4	22
	4 - 5	<LLD *
	7 - 8	<LLD
37	Surface	<LLD
	3 - 4	26
	5 - 6	28
	7 - 8	24
38	Surface	<LLD
	1 - 2	49
	2 - 3	50 *
	4 - 5	23

TABLE 3. ANALYTICAL DATA (Continued)

Test Hole/ Location No.	Core Segment Depth, Feet	Battelle Pu-238 pCi/g
39	Surface	<LLD
	6 - 7	26
	7 - 8	24
	8 - 9	<LLD
40	Surface	<LLD
	2 - 3	35
	3 - 4	29
	5 - 6	38
41	Surface	<LLD
	2 - 3	21
	3 - 4	<LLD
	8 - 9	23
42	Surface	<LLD
	3 - 4	<LLD
	5 - 6	<LLD
	7 - 8	24
43	Surface	<LLD
	3 - 4	<LLD
	4 - 5	<LLD
	5 - 6	24
44	Surface	<LLD
	2 - 3	38 *
	4 - 5	<LLD
	5 - 6	<LLD
45	Surface	<LLD
	3 - 4	<LLD
	4 - 5	<LLD
	6 - 7	<LLD
46	Surface	<LLD
	4 - 5	<LLD *
	6 - 7	<LLD
	7 - 8	<LLD
47	Surface	36
	2 - 3	<LLD
	3 - 4	<LLD
	5 - 6	<LLD

TABLE 3. ANALYTICAL DATA (Continued)

Test Hole/ Location No.	Core Segment Depth, Feet	Battelle Pu-238 pCi/g
48	Surface	<LLD
	1 - 2	<LLD
	2 - 3	<LLD
	3 - 4	<LLD
49	Surface	<LLD
	5 - 6	<LLD *
	6 - 7	<LLD
	8 - 9	<LLD
50	Surface	<LLD
	2 - 3	<LLD
	3 - 4	<LLD
	7 - 8	27 *
51	Surface	89
	1 - 2	<LLD
	2 - 3	26
	6 - 7	<LLD
52	Surface	<LLD
	2 - 3	41 *
	6 - 7	<LLD
	7 - 8	<LLD
53	Surface	22
	3 - 4	26
	4 - 5	<LLD
	5 - 6	22
54	Surface	25
	2 - 3	26
	3 - 4	23
	4 - 5	26
55	Surface	<LLD
	2 - 3	<LLD
	3 - 4	<LLD
	6 - 7	25
56	Surface	<LLD
	2 - 3	<LLD
	3 - 4	<LLD
	6 - 7	<LLD

TABLE 3. ANALYTICAL DATA (Continued)

Test Hole/ Location No.	Core Segment Depth, Feet	Battelle Pu-238 pCi/g
57	Surface	<LLD
	3 - 4	<LLD
	4 - 5	22
	8 - 9	<LLD
58	Surface	<LLD
	2 - 3	<LLD *
	3 - 4	<LLD
	5 - 6	<LLD
59	Surface	<LLD
	2 - 3	<LLD
	3 - 4	<LLD
	6 - 7	<LLD
60	Surface	<LLD
	2 - 3	21
	3 - 4	27 *
	6 - 7	<LLD
61	Surface	<LLD
	1 - 2	29 *
	3 - 4	<LLD
	4 - 5	<LLD
62	Surface	21
	3 - 4	50 *
	4 - 5	<LLD
	5 - 6	<LLD

LLD is taken as equal to or less than 20 Pci/g for a 400 second count.

Notes: 1. An asterisk denotes those samples which were subsequently submitted for independent radiochemical analysis.

2. Absolute errors are not provided for each Pu-238 activity value. As a guideline, the following minimum errors (at the ± 1σ level) may be taken for various Pu-238 activity levels. These errors depend on how much thorium is present; the first ± value is calculated for a thorium concentration of 1 pCi/g and the other ± value for 10 pCi/g thorium.

25 pCi/g Pu-238: ± 8 pCi/g; ± 38 pCi/g

50 pCi/g Pu-238: ± 9 pCi/g; ± 38 pCi/g

100 pCi/g Pu-238: ±9 pCi/g; ± 37 pCi/g

TABLE 4. COMPARISON OF Pu-238 DATA

Test Hole/Depth	Gamma Counting MRC Facility, pCi/g	Radiochemical Analysis Eberline Analytical, pCi/g
3/Surface	<LLD	<0.3
7/Surface	81	13 ± 1
7/5-6 Feet	42	12 ± 1
7/7-8 Feet	33	8.2 ± 0.5
8/Surface	35	8.2 ± 0.5
8/8-9 Feet	46	1.6 ± 0.2
11/3-4 Feet	<LLD	0.3 ± 0.1
17/1-2 Feet	<LLD	3.9 ± 0.3
23/2-3 Feet	114	150 ± 10
23/3-4 Feet	185	490 ± 10
25/3-4 Feet	26	53 ± 2
28/3-4 Feet	<LLD	3.1 ± 0.4
33/Surface	<LLD	12 ± 1
34/Surface	27	8.3 ± 0.4
36/4-5 Feet	<LLD	7.0 ± 0.5
38/2-3 Feet	50	37 ± 1
44/2-3 Feet	38	47 ± 1
46/4-5 Feet	<LLD	<0.4
49/5-6 Feet	<LLD	<0.2
50/7-8 Feet	27	0.0 ± 0.1
52/2-3 Feet	41	79 ± 2

TABLE 4. COMPARISON OF Pu-238 DATA

Test Hole/Depth	Gamma Counting MRC Facility, pCi/g	Radiochemical Analysis Eberline Analytical, pCi/g
58/2-3 Feet	<LLD	0.8 ± 0.1
60/3-4 Feet	27	24 ± 1
61/1-2 Feet	29	14 ± 1
62/3-4 Feet	50	58 ± 1

Note: LLD is taken as equal to or less than 20 pCi/g for a 400 second count.

Reference 4

Document Control No. _____

Environmental Restoration Program

OTHER SOILS CHARACTERIZATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

Volume II – Appendices

May 1996

Final
(Revision 0)

U.S. Department of Energy
Ohio Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

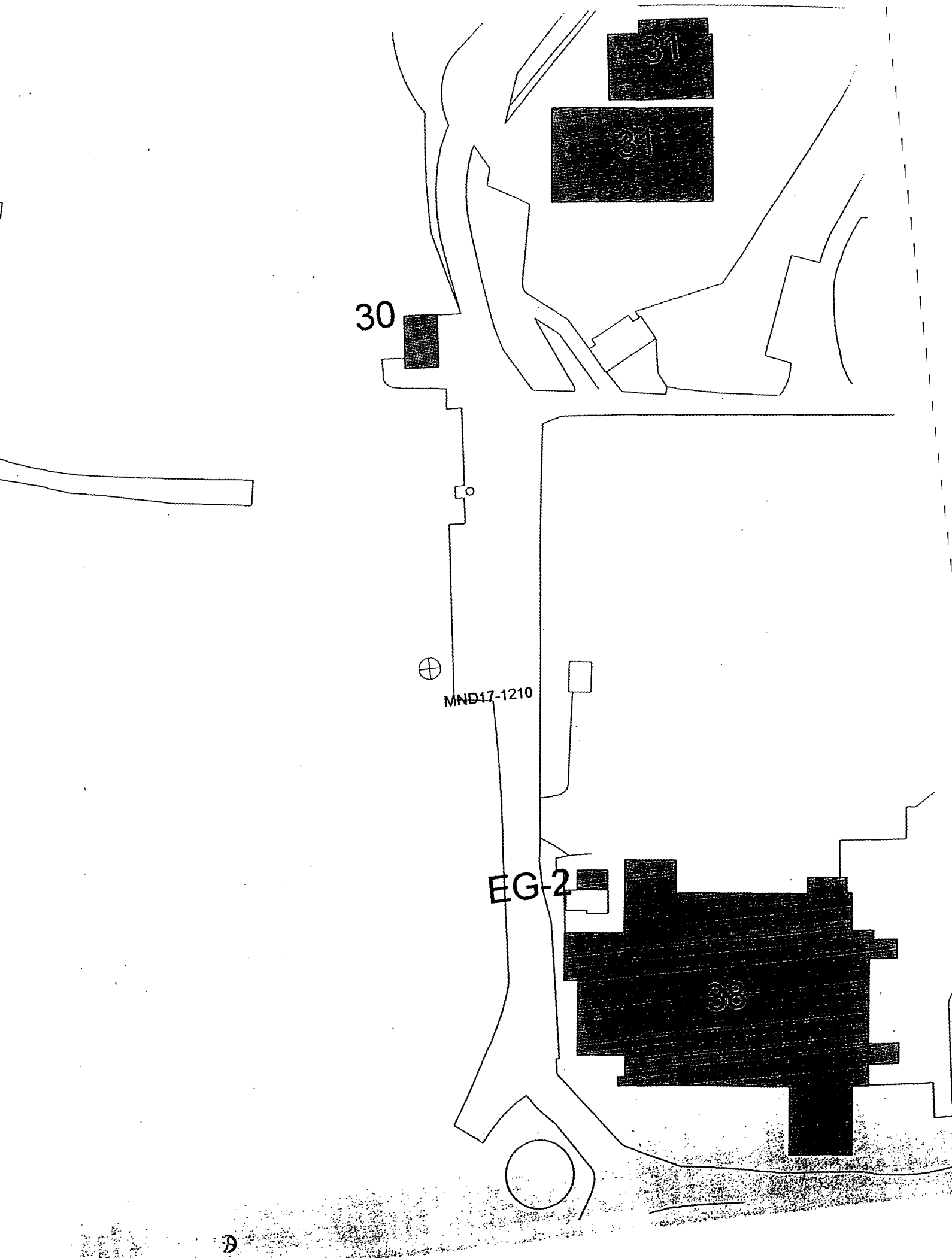
Tabulated Radiological Data

Gamma

Gamma Scan Data

Sample ID	Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
1018-5008	<0.03	<0.03	2.04	<0.18	<4.5	0.79	<0.89	<4.45	<46.72	<0.05
1019-5001	0.02	0.3	1.9	<0.1	<3.6	0.6	<1.1	<3.2	<45.4	<0.04
1019-5004	<0.02	0.2	1.8	<0.1	<3.6	0.5	<0.8	<3	<40.2	<0.04
1022-5004	<0.02	0.15	2.13	<0.16	<4.27	0.57	<0.74	<3.52	<38.61	<0.04
1023-5001	<0.02	0.2	1.6	<0.1	<3.5	0.5	<0.9	<2.9	<40.5	<0.04
1023-5004	<0.02	<0.1	1.87	<0.15	<3.32	0.56	<0.68	<3.1	<40.16	<0.04
1025-5001	<0.02	0.2	1.6	<0.1	<3.4	0.5	<1	<3	<46.1	<0.04
1025-5004	<0.02	0.2	2	<0.1	<3.6	0.5	<0.8	<3	<37.4	<0.04
1026-5001	<0.02	0.63	1.63	<0.18	<4.06	0.6	<0.9	<3.86	<43.67	<0.04
1026-5004	<0.02	0.08	1.61	<0.17	<4.22	0.53	<0.9	<3.3	<39.6	<0.04
1026-5008	<0.02	<0.02	1.82	<0.14	<3.98	0.51	<0.69	<3.17	<31.29	<0.04
1027-5001	<0.02	0.7	1.6	<0.2	<3.9	0.6	<1	<3.2	<48.4	<0.04
1027-5004	<0.02	0.2	2.2	<0.1	<3.6	0.5	<0.9	<3	<33.1	<0.04
1201-5004	0.04	<0.1	2.5	<0.7	<16.13	0.53	<3.49	<17.8	<165.2	<0.17
1201-5008	<0.07	<0.09	2.18	<0.51	<11.93	0.38	<2.77	<9.33	<107.1	<0.13
1202-5001	<0.07	0.12	2.67	<0.44	13.24	<0.31	<2.63	<14.45	<80.11	<0.11
1202-5001	<0.02	<0.02	1.5	<0.1	<2.9	0.3	<1	<2.9	<21.5	<0.03
1202-5004	<0.14	0.16	<1.2	<0.65	19.72	0.76	<3.85	<14.06	<116.3	<0.14
1202-5008	<0.08	0.06	1.98	<0.68	<12.72	0.6	<4.22	<15.72	<139.5	<0.15
1210-5001	<0.1	<0.08	3.34	<0.85	<18.45	1.58	<4.32	<12.03	<189.5	<0.2
1210-5004	<0.08	0.1	<0.92	0.57	<14.66	0.9	<4.14	<12.78	<123.8	<0.15
1210-5008	<0.08	0.06	1.94	<0.76	<15.5	0.78	<2.44	<10.45	<159.4	<0.17
1213-5001	<0.1	<0.14	3.53	<0.88	<20.32	<0.67	<4.14	14.74	<207.9	<0.2
1213-5004	<0.05	<0.1	2	<0.42	<11.85	<0.33	<2.71	<15.68	<116	<0.13
1213-5008	<0.06	<0.1	2.59	<0.57	<12.5	0.18	<2.52	<11.56	<120.5	<0.15
1213-5012	1.18	<0.15	<4.8	2.21	<64.37	33.55	<13.2	<35.35	<440.2	<0.62
1213-5016	<0.11	<0.08	<1.58	<0.74	<15.38	0.57	<4.41	<17.55	<180.8	<0.18
1213-5017	<0.1	0.1	2.61	<0.77	<20.3	2.51	<4.77	<16.23	<153	<0.19
1214-5001	<0.1	<0.1	2.45	<0.76	<17.19	<0.47	<3.85	<18.86	<165.9	<0.21
1214-5004	1.36	<0.09	<1.69	<0.58	<11.85	0.55	3.62	18.04	<128.9	<0.14
1214-5008	<0.09	<0.07	<1.99	<0.8	<18.34	1.35	<3.12	<14.17	<155.9	<0.17
1214-5012	<0.08	<0.1	<0.96	<0.55	<12.14	1.03	<3.62	<11.72	<80.77	0.11
1214-5015	<0.07	<0.07	<1.31	<0.56	<11.62	0.53	<2.91	<9.15	<118.5	<0.11
1217-5001	<0.1	<0.07	2.77	<0.81	<25.72	2.51	<5.49	<16.45	<177	<0.26
1217-5004	<0.13	<0.14	<2.9	<1.11	<2.48	4.12	<6.55	<16.62	<246.3	<0.31
1217-5004	<0.04	<0.08	2.8	<0.3	<8.4	7	<1.8	<5	<52.4	<0.08
1217-5008	<0.18	0.37	<4.43	<2.31	<59.39	22.24	<10.61	<30.41	<459.1	<0.61
1217-5008	<0.08	<0.09	4.1	<0.6	<17.3	32.6	<3.4	<8.5	<100.1	<0.2
1218-5001	<0.13	<0.07	<2.61	<0.8	<16.83	3.54	<6.34	10.61	<183.2	<0.24
1218-5004	<0.14	0.24	<2.92	<1.01	<27.57	3.36	<5.37	<17.43	<202.1	<0.27
1218-5004	<0.03	0.07	3	<0.2	<6.6	2.9	<1.6	<5	<46	<0.06
1218-5012	<0.21	<0.28	11.85	<2.73	<67.72	30.19	<11.76	<29.3	<548.6	<0.68
1219-5001	<0.08	<0.12	3.03	<0.77	<19.5	0.72	<4.1	<10.25	<229.2	<0.21
1219-5004	<0.1	0.27	<2.02	<1.19	<30.45	4.72	<5.11	<15.47	<213.3	<0.24
1219-5008	<0.13	<0.19	<3.29	<1.33	<23.19	6.9	<7.05	<22.83	<335	<0.34
1219-5012	<0.1	<0.05	3.5	<0.58	<17.43	<0.61	<3.55	<13.77	<126.6	<0.17
1220-5001	0.86	0.19	2.16	<0.57	<14.11	0.61	<4.21	<19.93	<137.6	<0.14
1220-5004	<0.07	<0.09	1.82	<0.52	<15.48	1.91	<2.8	<11.76	<133.3	<0.14
1220-5008	<0.08	0.06	<1.27	<0.32	<12.09	0.33	<2.41	<7.97	<83.45	<0.09
1220-5012	<0.06	<0.06	<1.22	<0.5	<11.71	0.36	1.87	<7.74	<35.81	<0.12
1223-5001	<0.08	0.21	<1.83	<0.72	<17.27	<0.83	<3.67	12.46	<100.7	<0.14
1223-5004	<0.09	<0.14	<2.39	<0.89	<22.11	1.09	<2.36	<14.52	<168.1	<0.18
1223-5008	<0.5	<0.66	17.69	<4.82	<127.4	193.3	<28	<62.8	<980.9	<1.51
1223-5012	<0.48	<0.65	30.43	7.21	<163.8	161.5	<29.12	<65.4	<1227	2.1
1224-5001	<0.1	0.21	<2.24	<0.72	<19.87	1.02	<4.47	<20.36	<152.4	<0.18
1224-5004	<0.13	<0.16	<2.98	1.51	<28.56	4.46	<5.3	<17.83	<231.9	<0.31
1224-5008	<0.26	<0.39	14.81	<2.89	<86.89	61.87	<15.6	<36.13	<555.3	0.86
1225-0008	<0.2	<0.3	13.8	<2.7	<75.7	104	<12.7	<31.6	<583.7	<0.7
1225-5001	<0.14	<0.15	<1.46	<1.04	<26.61	3.34	<5.14	<17.38	<234.6	<0.29
1225-5004	<0.12	0.18	<3.28	<1.03	<30.89	7.52	<5.54	<21.66	<203.1	<0.3
1225-5008	<0.5	<0.73	17.03	6.76	<167.4	212.1	<29.51	<10.82	<1260	<1.66
1226-5001	0.07	<0.16	2.88	<0.84	<22.61	3.3	<4.88	<12.42	202.5	<0.23
1226-5004	<0.13	0.22	<3.55	<1.07	<32.19	6.94	<6.39	<14.46	<253.2	<0.33
1226-5008	<0.1	<0.08	5.13	<0.85	<23.01	2.02	<5.18	<13.47	<151.7	<0.24
1226-5012	<0.1	0.18	2.74	<0.62	<18.37	0.53	<4.23	<5.6	<146	<0.18
1227-5001	<0.09	<0.12	<2.49	<1	<25.84	1.6	<5.39	<17.94	<229.9	<0.21
1227-5004	<0.08	0.24	<2.03	<0.49	<15.38	1.24	<3.69	<14.28	<110.2	<0.16
1227-5008	0.06	0.11	2.11	<0.42	<12.61	0.48	<2.77	<12.4	<110.7	<0.1
1227-5010	<0.12	<0.07	1.6	<0.7	<15.33	<0.37	<3.63	<15.14	<135	<0.16

Reference 5


31
31
30
MND17-1210
EG-2
38

Project: PRS-303 - Soils
RSDS: 01-ER-037
Submitted: March 14, 2001
Submitted by: Connie Kline, x4635

Plutonium Concentrations

Sample ID	Lab I.D.	Pu-238 pCi/g	+/-, pCi/g	LDL, pCi/g	Pu-239 pCi/g	+/-, pCi/g	LDL, pCi/g
MD17-1202 (0'-2')	0102800	6.052	0.445	0.001	0.030	0.004	0.001
MD17-1202 (2'-4')	0102801	0.622	0.046	0.002	0.003	0.001	0.002

Thorium Concentrations

Sample ID	Lab I.D.	Th-230 pCi/g	+/-, pCi/g	LDL, pCi/g	Th-227 pCi/g	+/-, pCi/g	LDL, pCi/g
MD17-1202 (0'-2')	0102800	1.594	0.152	0.014	0.282	0.046	0.062
MD17-1202 (2'-4')	0102801	1.198	0.105	0.009	0.212	0.032	0.023

Thorium Concentrations

Sample ID	Lab I.D.	Th-228 pCi/g	+/-, pCi/g	LDL, pCi/g	Th-232 pCi/g	+/-, pCi/g	LDL, pCi/g
MD17-1202 (0'-2')	0102800	1.082	0.112	0.038	1.061	0.110	0.048
MD17-1202 (2'-4')	0102801	0.913	0.084	0.009	0.898	0.083	0.009

Data Verification: [signature]

Date: 3/28/01

Steve Howard x4188
ES&C
Environmental/Analytical Services

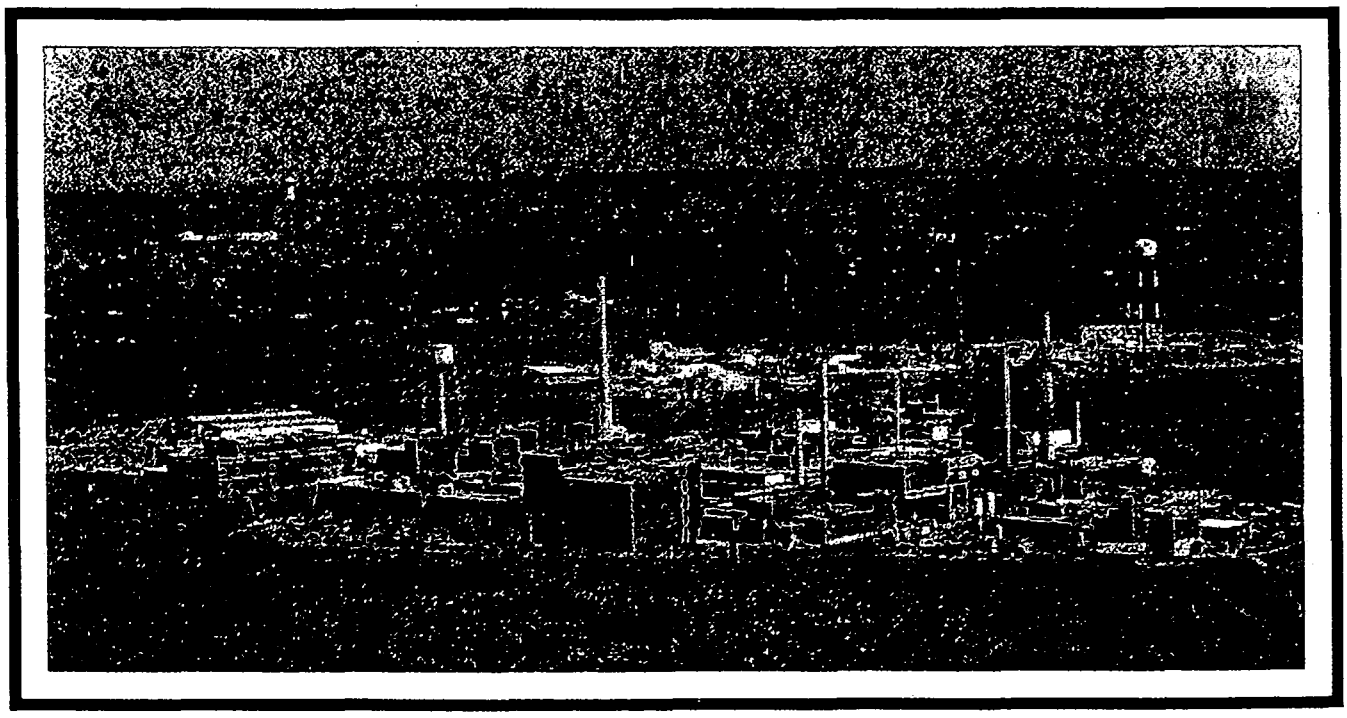
MOUND

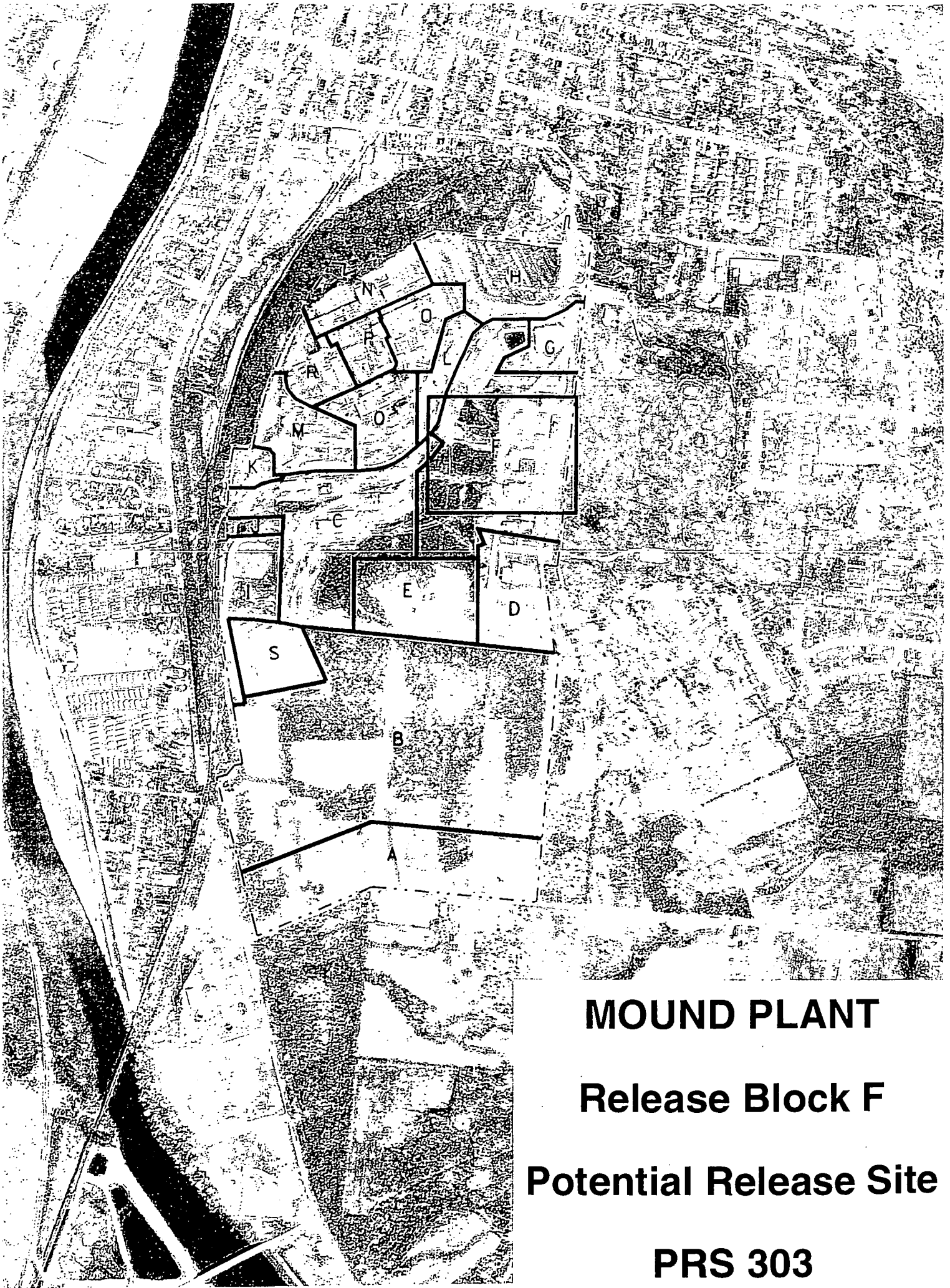
Environmental
Restoration
Program

MOUND PLANT

Potential Release Site Package

PRS #303



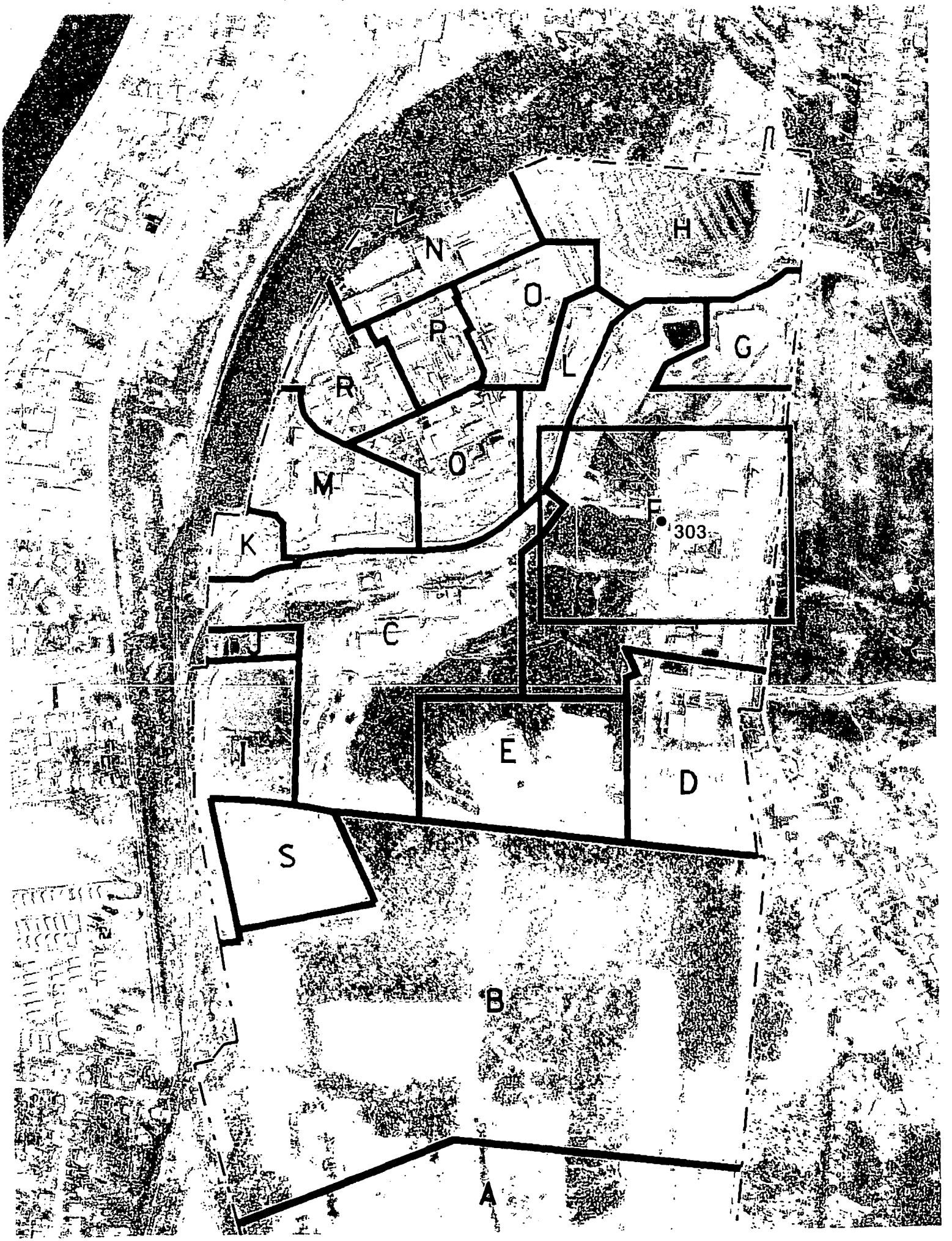


MOUND PLANT

Release Block F

Potential Release Site

PRS 303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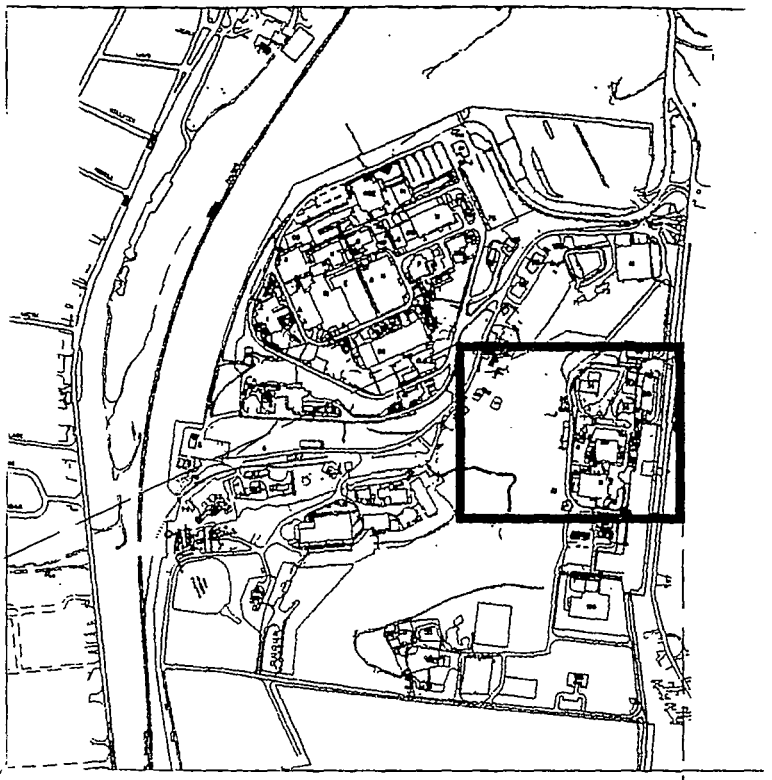
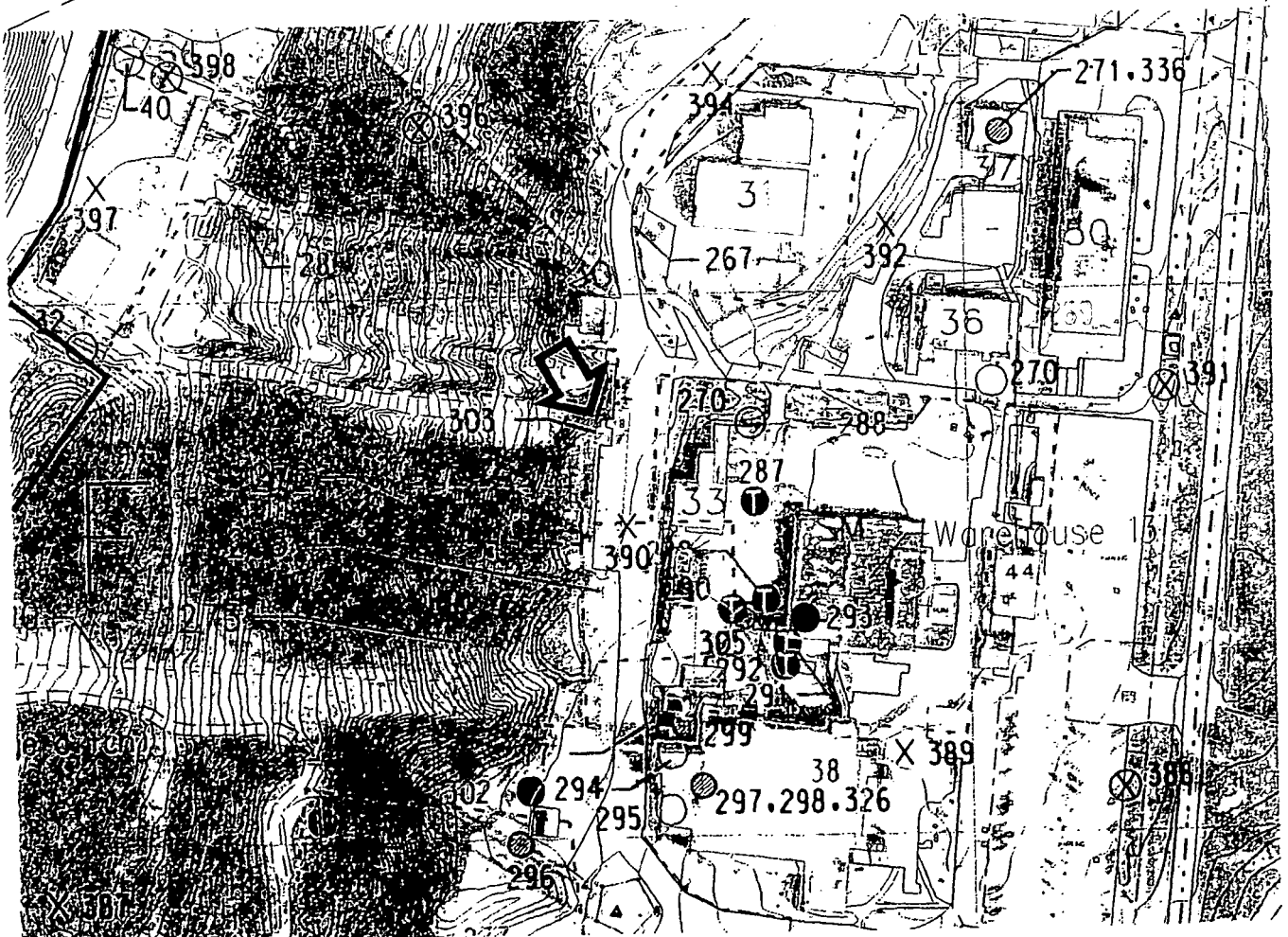
MOUND PLANT

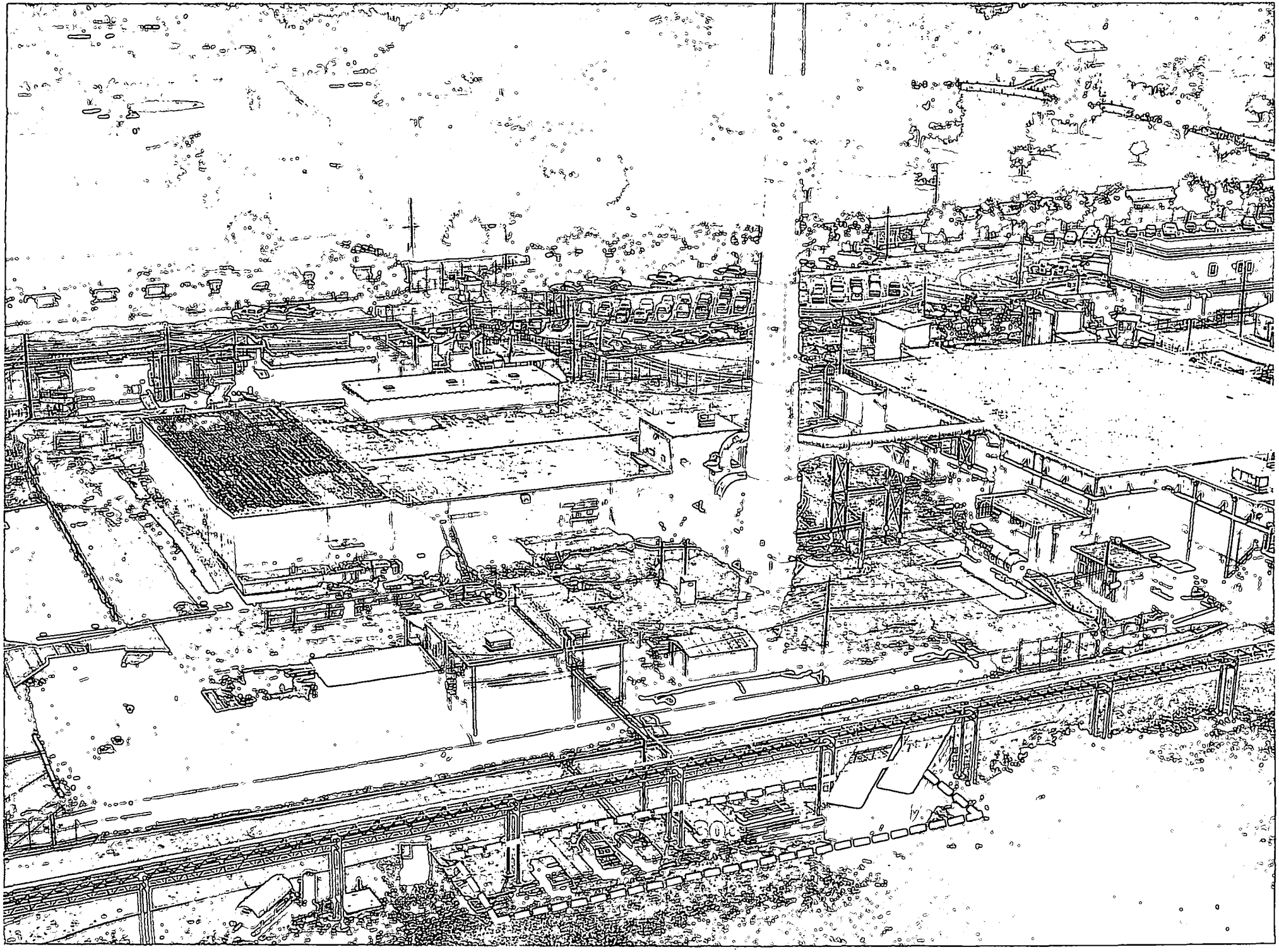
Release Block F

Potential Release Site

PRS 303







PRS 303

PRS HISTORY:

PRS 303 was identified as a potential release site as a result of historical information on the operations conducted in Warehouse 14 (AKA Pad 14) and conjecture as to how the building was dismantled and disposed.[1,2]

The historical data suggests that Warehouse 14 was built sometime prior to 1958, and was utilized for the storage of equipment destined for disposal, drums of recoverable plutonium-238 and drums of contaminated trash. The building was present in 1965, but plant photographs indicate the building no longer existed in 1968 and no records of decommissioning exist. A concrete pad (floor) is still present.[2]

CONTAMINATION:

1. In 1983, the ***Radiological Site Survey***[3] took 11 soil core samples at two locations near PRS 303.(see reference section, page 11, sample locations 127 and 128). Sample analysis identified thorium 232 (Th-232) at concentrations less than 2.0 pCi/g compared to a guideline criteria of 5 pCi/g.[5] Plutonium 238 (Pu-238) concentrations ranged from 0.06 to 10.2 pCi/g compared to the Mound ALARA plutonium guideline criteria of 25 pCi/g.

2. In 1994, the ***OU5, Non-AOC Field Report***[4] performed sampling for radiological surface contamination as well as a *PETREX* qualitative soil gas sampling for hydrocarbons at PRS 303. Radiological field screening indicated no Pu-238 or Th-232 activity above screening criteria. Hence, no samples were collected for analysis by the Mound radiological labs. The *PETREX* qualitative soil gas survey indicated that PRS 303 is within an area that exhibits relatively high aromatic and petroleum hydrocarbons; and moderately high semivolatile hydrocarbons. No halogenated hydrocarbons were detected.

3. In 1996, the quantitative ***Soil Gas Confirmation Sampling***[6] sampled the *PETREX* soil gas locations with the highest *PETREX* ion counts in the northern sector of the Mound plant. These locations were identified as *Soil Gas Confirmation Sampling* locations 2 and 4 (the corresponding *PETREX* sample locations are 974 and 890 respectively).

   The ion counts in the PRS 303 area, also in Mound's northern sector, were all lower than the ion counts at *Soil Gas Confirmation Sampling* locations 2 and 4. Hence, the quantitative *Soil Gas Confirmation* results taken at the locations with the highest ion counts (locations 2 and 4) provide evidence about the risk of contamination at other locations with similar or lower ion counts such as PRSs 303. The map on page 35 shows the locations of PRS 303 relative to the *Soil Gas Confirmation Sampling* locations 2 and 4.

   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 PRS 303.

PETREX Soil Gas Contaminant Family	Maximum Ion Count[4]	Confirm Sample #	Confirmation Sample Results that Exceed Guideline Criteria (GC)	Ion Counts at PRS 303	
Total Aromatic Hydrocarbons	7,780,673	2	None	3,921,286	
Total Semivolitile Hydrocarbons	7,015,960	2	1300 ug/kg Benzo(a)pyrene (GC = 410 ug/kg [ref 5])	93,427	
Total C5-C11 Petroleum Hydrocarbons	24,166,931	2	None	7,202,920	
Total Halogenated Hydrocarbons	1,370,283	4	None	Non-detect	

The above table and discussion make no conclusions about individual contaminant concentrations at PRSs 303 only that the overall health risk from PRS 303 is expected to be similar to or less than that of the PETREX locations with the highest measured ion counts (*Confirmation Sampling* locations 2 and 4).

READING ROOM REFERENCES:

1) OU9, Site Scoping Report, Vol. 12 - Site Summary Report, Final, Dec. 1994. (pages 5-6.1)
2) OU9, Site Scoping Report, Vol. 7 - Waste Management, Final, February 1993. (pages 7-9)
3) OU9, Site Scoping Report, Vol. 3 - Radiological Site Survey, Final, June 1993. (pages 10-13)
4) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, Final, June 1995. (pages 14-25)

OTHER REFERENCES

5). Code of Federal Regulations, 40CFR192.41 and 40CFR 192.12
6) Soil Gas Confirmation Sampling, (Revision 0), May 1996. (pages 26-35)

PREPARED BY:

Gerald F. Maul, Member of EG&G Technical Staff

MOUND PLANT
PRS 303

RECOMMENDATION: _____

_____

_____

_____

CONCURRENCE:

DOE: _____

USEPA: _____

OEPA: _____

REFERENCE MATERIAL
PRS 303

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

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
300	Area 19, Underground Waste Transfer Line	G-6 G-7 G-8 G-9	Historical	Plutonium-238, Nitric acid	1, 4, 5, 18	Plutonium-238	S	1, 6, 18	14	Tables B.1, B.6, B.7, and B.8	6, 8
301	Building 38 In-Line Incinerator	G-9	Historical	Plutonium-238	2, 4	None Suspected D&D 1986			No Data - pending verification		
302	Area D, Acid Leach Field	H-8 H-9 G-8 G-9	Historical	Plutonium-238, Thorium	1, 4, 5, 18	Plutonium-238	S	6	4, 6 14	Tables B.6, B.7, and B.8 Table B.1 (Table IV.10 in Ref. 6)	8 6
303	Warehouse 14 (AKA Pad 14)	G- 9	Grounds	Thorium sludge constituents Plutonium-238	4	None Suspected			14	Table B.9 RSS[c] Locations C0127 and C0128 (Appendix E in Ref. 6)	6
304	Excavated Materials Disposal Area (AKA Rader's Hill)	I-8	Grounds	Thorium	4	Thorium < 2 pci/gm	S	6	14	Table B.1	6
305	SM Stack	G-9	In service	Plutonium-238	4	None suspected beyond routine emissions	A	4, 18	No Data		
306	SM/PP Hill Seep 0609	L-9	NA	None suspected	5, 18	None suspected			No Data		
307	Site Survey Project Potential Hot Spot Location C0007	E-9	Grounds	Thorium	6	Isolated activity from unknown source			14	Table B.9 (Appendix E in Ref. 6)	6
308	Site Survey Project Potential Hot Spot Location C0028	F-10	Grounds	Thorium	6						
309	Site Survey Project Potential Hot Spot Location S0307	F-9	Grounds	Thorium	6						
310	Site Survey Project Potential Hot Spot Location S0647	H-9	Grounds	Cesium-137	6				15	Table B.9 (Appendix E in Ref. 6)	6

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

Reference List

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

Document Control No. _____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

February 1993

FINAL
(Revision 0)

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

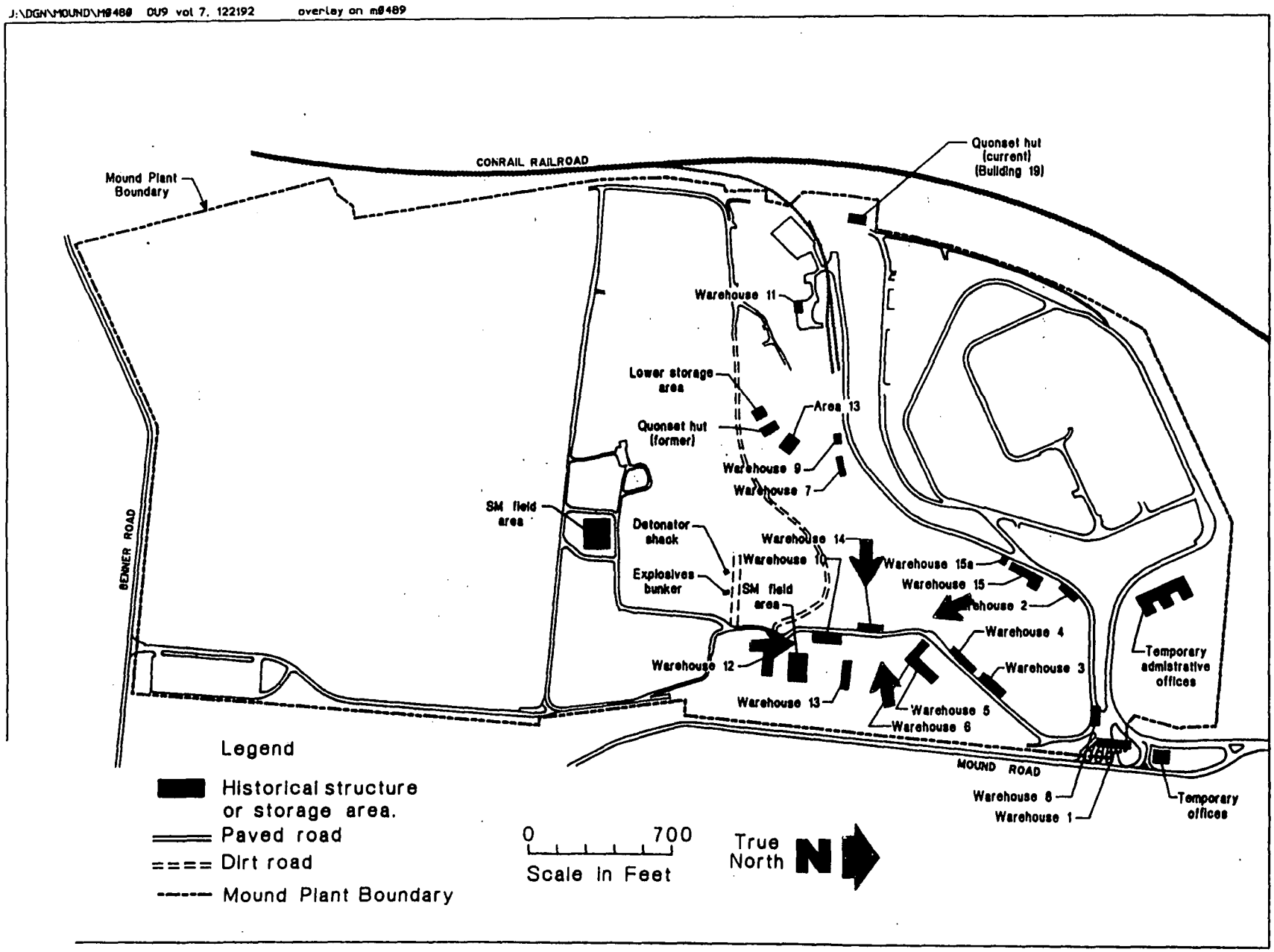


Figure 5.2. Historic buildings, structures, and storage areas.

and, as with many of the old warehouses, the flooring was too contaminated to remove from the site and may have been burned in place. The site of Warehouse 9 currently lies under a paved parking lot.

Warehouse 10 was located on the SM/PP Hill in an area now partially occupied by Building 38 (Figure 5.2). Warehouse 10 was used in the early 1950s to store materials contaminated with polonium-210 from the Dayton units (Bradley 1953e). Over the years much of the radioactivity died away and by August 1956, the materials were either cleaned and sold for salvage or shipped to ORNL for burial (Meyer 1956b). The building itself was sold for salvage, but the flooring was too contaminated and was burned in place during the fall of 1956 (Meyer 1956e, 1957a).

Warehouse 13 was located on the SM/PP Hill in the area now occupied by the SM Building (Figure 5.2). It was a wooden structure and probably had a concrete floor. During the mid-1950s, Warehouse 13 was used to store waste materials from the radium/actinium program and the Purex pilot plant (Bradley 1953f). In 1952, materials contaminated with low levels of radioactivity from the radium/actinium program were placed in Warehouse 13 until they were moved to the Quonset hut for shipment offsite (Bradley 1952f). These were probably solid wastes of some sort, as all liquids were processed in an evaporator (see project descriptions in this report). In March 1953, eight 55-gallon drums of sludge with high gamma radiation (1.5 rem), along with miscellaneous tanks, pipes, and valves from the Purex pilot plant, were moved to Warehouse 13 for storage (MCC 1952-1957). By September 1953, the sludge drums were moved from Warehouse 13 to Warehouse 9 for shipment offsite. One of the drums apparently leaked and the contents were redrummed in Warehouse 13. The floors of Warehouse 13 were scrubbed (MCC 1953-1957). No record was found of the decommissioning of Warehouse 13, but it is noted during a review of photographs that the building was gone by August 1956. The floor remained and was used as a pad for storage of thorium drums in 1959.

Warehouse 14 was located on the SM/PP Hill, on the west side of the access road just south of the present Building 30 (Figure 5.2). It was a wooden structure and probably also had a concrete floor. Very little is actually known about this structure. A logbook entry on August 30, 1958, indicates equipment destined for disposal was stored in Warehouse 14 (MCC 1951-1961). No other data were given. Another log book entry, dated January 18, 1966, indicates that WD sludge was moved to the Warehouse 14 area, behind the SM Building (MRC 1961-1968). In January 1966, drums of apparently recoverable plutonium-238 and contaminated trash were to be moved from Warehouse 14 to the new storage Building 31. Contaminated trash was apparently stored since May 1965 (McMannon 1963-1966). There are no records of the decommissioning of Warehouse 14, but it is noted during a review of photographs that the building was gone by March 1968. The floor is still present.

Document Control No: DGC
W.P. DAVIS

Environmental Restoration Program

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

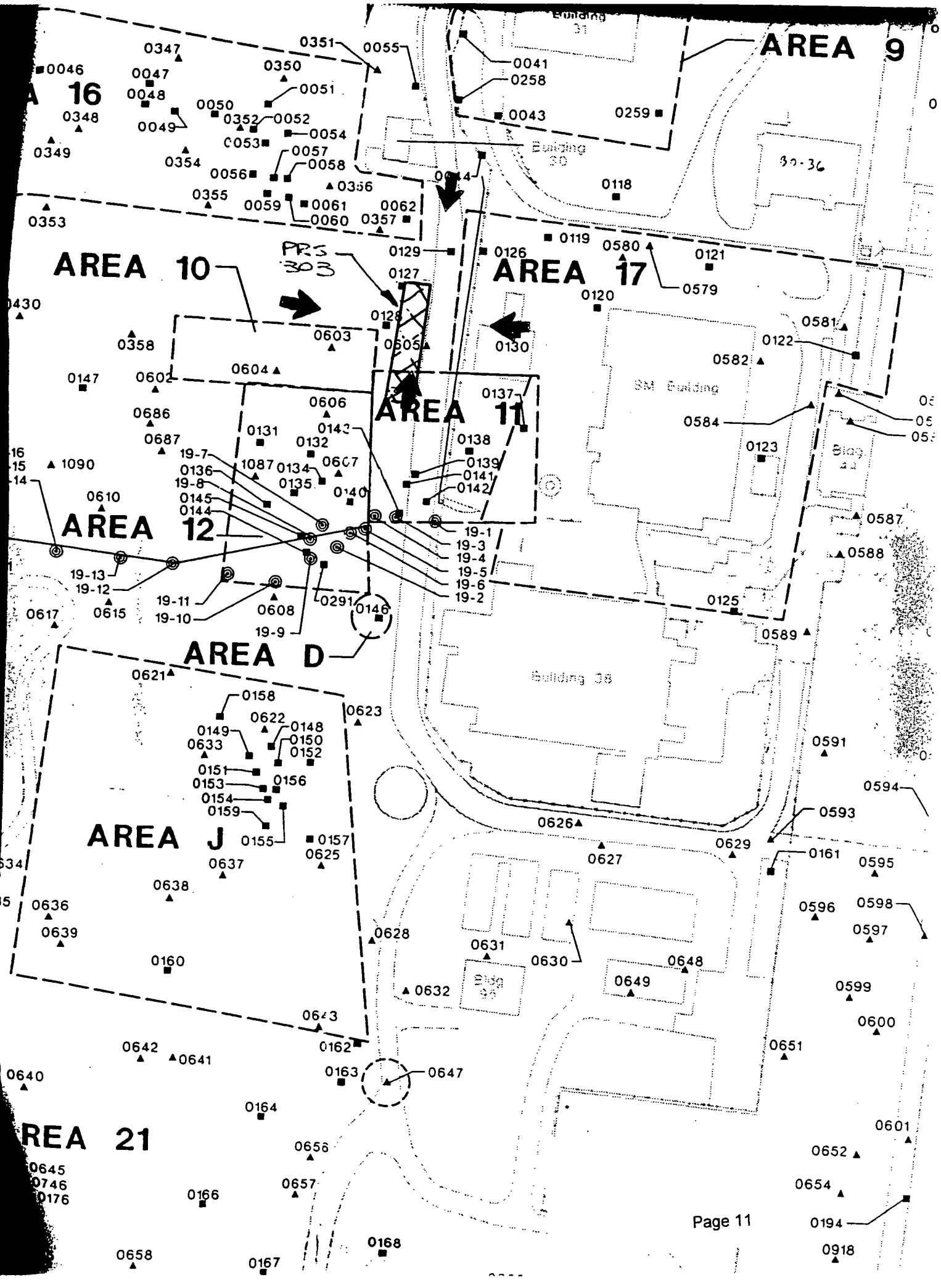
MOUND PLANT
MIAMISBURG, OHIO

June 1993

FINAL

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies


AREA 9
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AREA 10
AREA 17
AREA 11
AREA 12
AREA D
AREA J
AREA 21
PRS 303
Building 31
Building 30
Building 36
SM Building
Building 38
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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)
C0127	2725	2340	1212	12-82	18	1.57	b					
			1213	12-82	36	1.40	b					
			1214	12-82	54	0.15	b					
			1215	12-82	72	0.54	b					
			1216	12-82	90	0.06[c]	b					
			1217	12-82	120	0.11	b					
S0602	2725	2565	4112	10-83	0	5.13	b					
C0128	2750	2365	1207	12-82	18	7.97	b					
			1208	12-82	36	6.15	b					
			1209	12-82	54	10.20	b					
			1210	12-82	72	0.94	b					
			1211	12-82	84	0.23	b					
S0603	2750	2415	6784	08-84	0	0.69	b					
C0129	2715	2290	1218	12-82	18	3.70	b					
			1219	12-82	36	0.41	b					
			1220	12-82	54	0.92	b					
			1221	12-82	72	0.85	b					
			1222	12-82	90	0.05	b					
			1223	12-82	108	0.04	b					
S0604	2750	2465	1319	08-84	0	11.80	b					
S0605	2780	2340	9549	06-85	0	NR	NR		LDL	LDL	0.7	LDL
C0130	2800	2265	1336	12-82	18	48.10	b					
			1337	12-82	36	1.41	b					
			1338	12-82	54	1.25[c]	9.99[c]					
			1339	12-82	90	0.39	b					
			1340	12-82	108	0.37	b					
C0131	2800	2500	1198	12-82	18	82.60	76.90					
			1199	12-82	36	NR	174.80					
			1200	12-82	54	313.00	189.90					

Radiochemical Analysis

E-56

f 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)
C0289	2422.7	2081.0	None[d]	07-84	0	NR	0.6					
			None[d]	07-84	12	NR	1.1					
			None[d]	07-84	24	NR	0.5					
			None[d]	07-84	36	NR	0.8					
			None[d]	07-84	48	NR	1.0					
			None[d]	07-84	60	NR	0.8					
C0290	2401.5	2102.1	None[d]	07-84	0	NR	0.7					
			None[d]	07-84	12	NR	0.8					
			None[d]	07-84	24	NR	0.8					
			None[d]	07-84	36	NR	0.6					
			None[d]	07-84	48	NR	0.6					
			None[d]	07-84	60	NR	0.9					
			None[d]	07-84	72	NR	0.8					
C0291	2915.3	2490.3	None[d]	07-84	0	NR	0.6					
			None[d]	07-84	12	NR	0.4					
			None[d]	07-84	24	NR	0.5					
			None[d]	07-84	36	NR	0.4					
			None[d]	07-84	48	NR	0.4					
			None[d]	07-84	60	NR	0.3					
			None[d]	07-84	72	NR	0.5					
			None[d]	07-84	84	NR	0.4					
			None[d]	07-84	96	NR	0.7					
			None[d]	07-84	108	NR	0.6					
			None[d]	07-84	120	NR	0.3					
			None[d]	07-84	132	NR	0.9					
S1092	2185	3362	8413	12-84	f	0.31	323.5[g]					

[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.

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

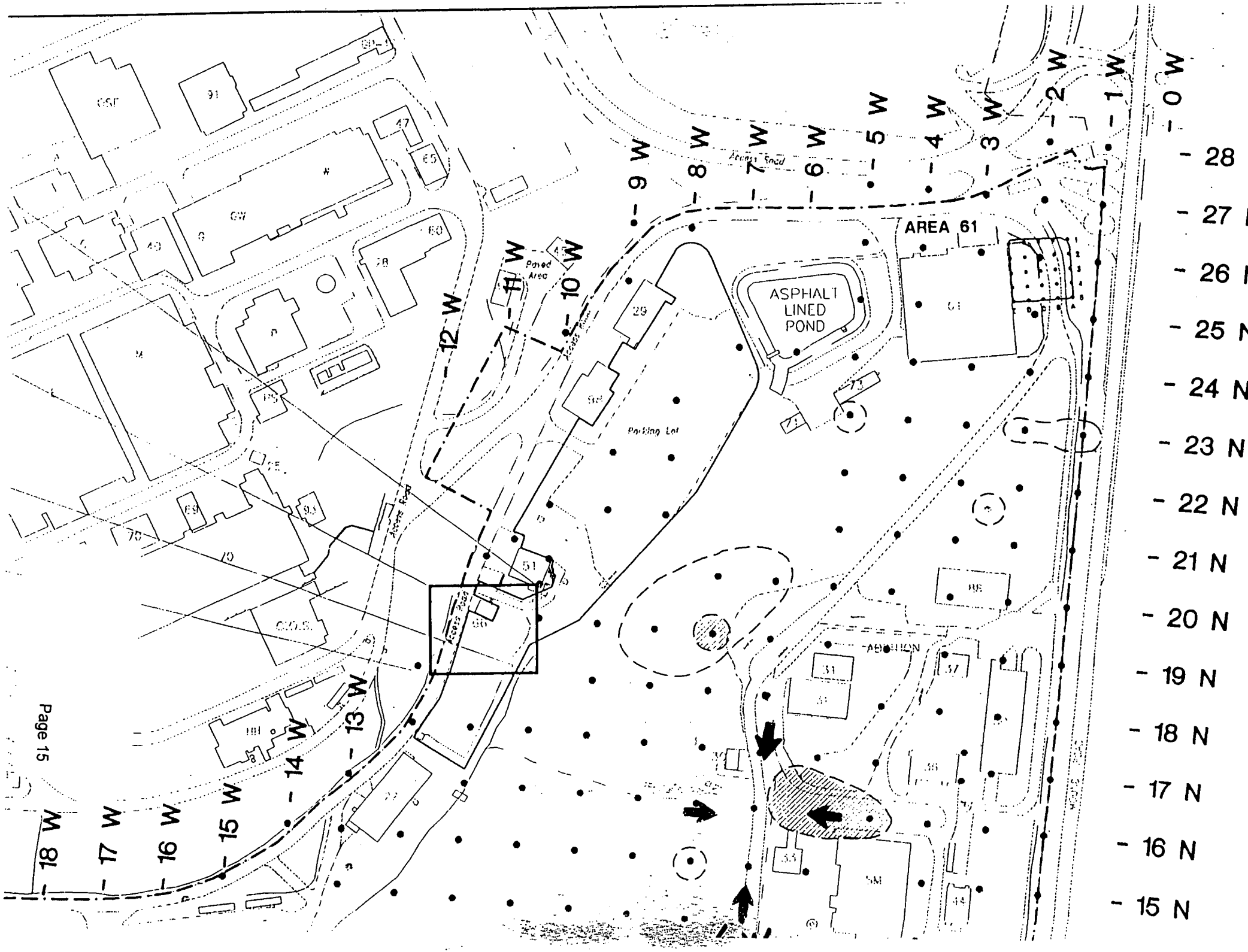
VOLUME I - TEXT

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
Paved Area
Access Road
ADDITION
0 W
1 W
2 W
3 W
4 W
5 W
6 W
7 W
8 W
9 W
10 W
11 W
12 W
13 W
14 W
15 W
16 W
17 W
18 W
28 N
27 N
26 N
25 N
24 N
23 N
22 N
21 N
20 N
19 N
18 N
17 N
16 N
15 N

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
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EG&G Mound Applied Technologies

FIDLER Data

Mound Soil Screen Data

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	a	1.2	a
						17	a	1.1	a
15N10	170.3	100	9.72	7.5	NC	19	a	0.9	a
15N11	170.3	120	9.72	8.5	NC	3	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	
		55	8.45	5.5	NC	NR		NR	
		100	12.48	5.5	NC	0	a	0.5	a
		80	6.5	4.5	NC	WIPE	c	WIPE	c
		80	6.5	4.0	NC	WIPE	c	WIPE	c
		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

Table 4 (cont'd)

Sample #	Total Aromatic Hydrocarbons (a)	Total Semivolatile Hydrocarbons (b)	Total C5 to C11 Petroleum Hydrocarbons (c)	Total Halogenated Hydrocarbons (d)
893	29,557	ND	45,556	ND
894	152,976	ND	338,477	ND
895	226,315	ND	400,003	ND
896	3,921,286	86,244	7,202,920	ND
897	2,892,152	93,427	5,475,698	ND
3897 (e)	6,465,295	106,916	10,972,839	ND
898	134,161	ND	259,743	ND
899	428,096	ND	757,235	ND
900	954,933	14,976	1,418,695	8,495
901	97,164	1,169	138,613	ND
902	148,344	ND	221,410	ND
904	1,147,124	95,534	2,610,925	1,990
972	222,569	ND	426,707	ND
973	9,003,947	229,746	13,073,275	H
974	7,780,673	7,015,960	24,166,931	H
975	563,924	ND	887,565	36,262
3975 (e)	259,145	ND	375,901	20,054
976	354,934	689	646,966	453,690
977	590,399	ND	1,013,721	ND
978	24,838	8,237	35,360	24,668
979	13,428	ND	17,668	ND
980	1,008,988	ND	1,295,839	ND
981	19,173	ND	33,539	ND
982	12,114	602	35,833	ND
983	56,332	ND	87,561	18,898
984	299,283	1,951	831,403	37,025
991	2,937,566	22,143	4,787,530	ND
1014	4,097,578	4,855	5,666,688	25,019
1072	10,954,078	49,812	12,297,858	18,013
1073	3,084,241	849,005	10,254,085	H
3073 (e)	4,644,141	1,374,870	15,240,276	H

PETREX Data (Relative)

North

Contour Interval 10 ft.

100 0 100 200

SCALE (FEET)

LEGEND

Structures

Plant Boundary

Paved/Unpaved Roadway

Ephemeral Stream

700 Contour Line

Features:

+ PETREX Sample Location

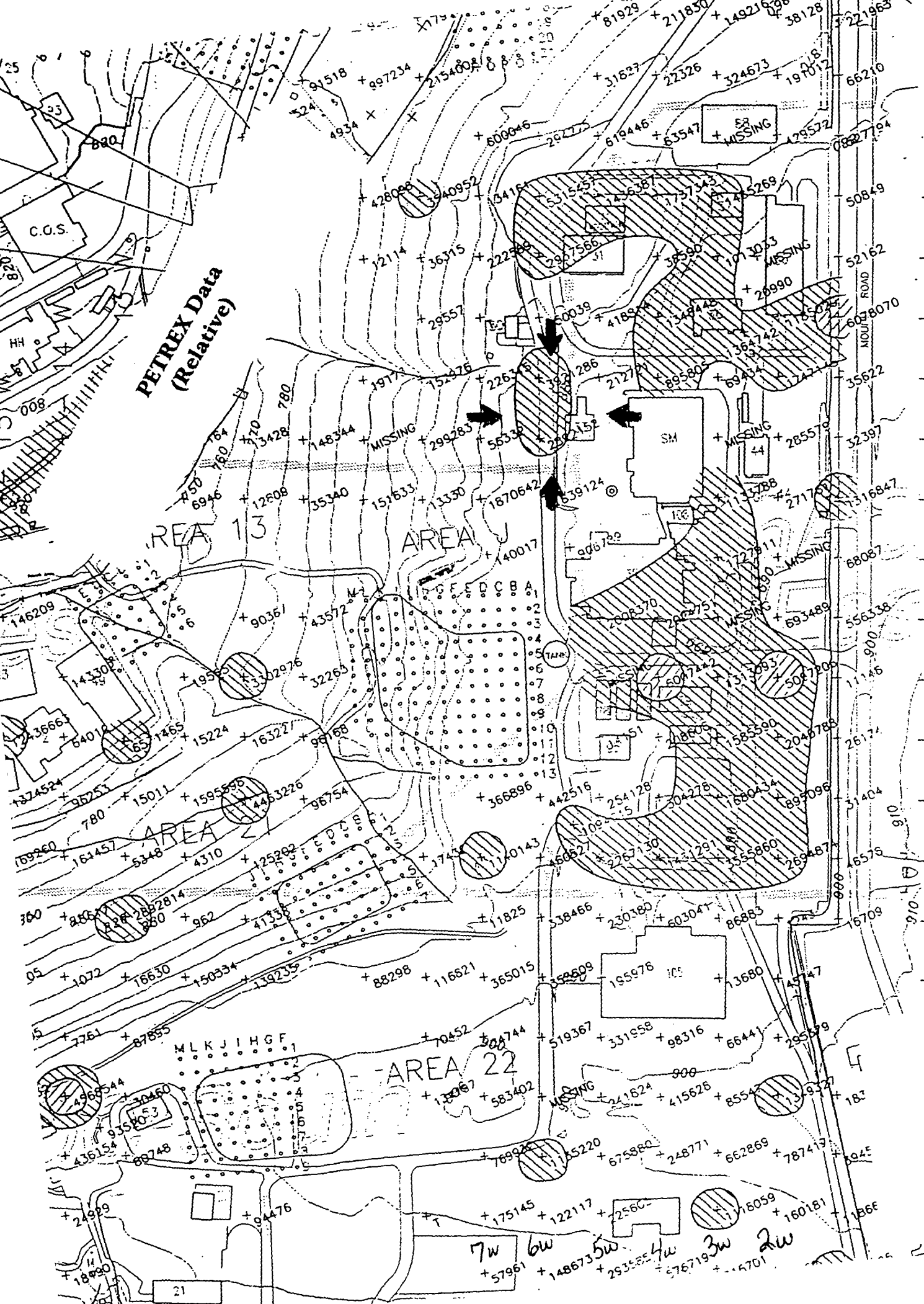
ND Not Detected

T Denotes interference by terpenes; see text.

Relative Response

Total Aromatic Hydrocarbons

Plate 2


PETREX Data
(Relative)
C.O.S.
AREA 13
AREA 21
AREA 22
MOUNT ROAD
7w
6w
5w
4w
3w
2w

Contour Interval 10 ft.

100 0 100 200

SCALE (FEET)

LEGEND

Structures

Plant Boundary

Paved/Unpaved Roadway

Ephemeral Stream

700 Contour Line

Features:

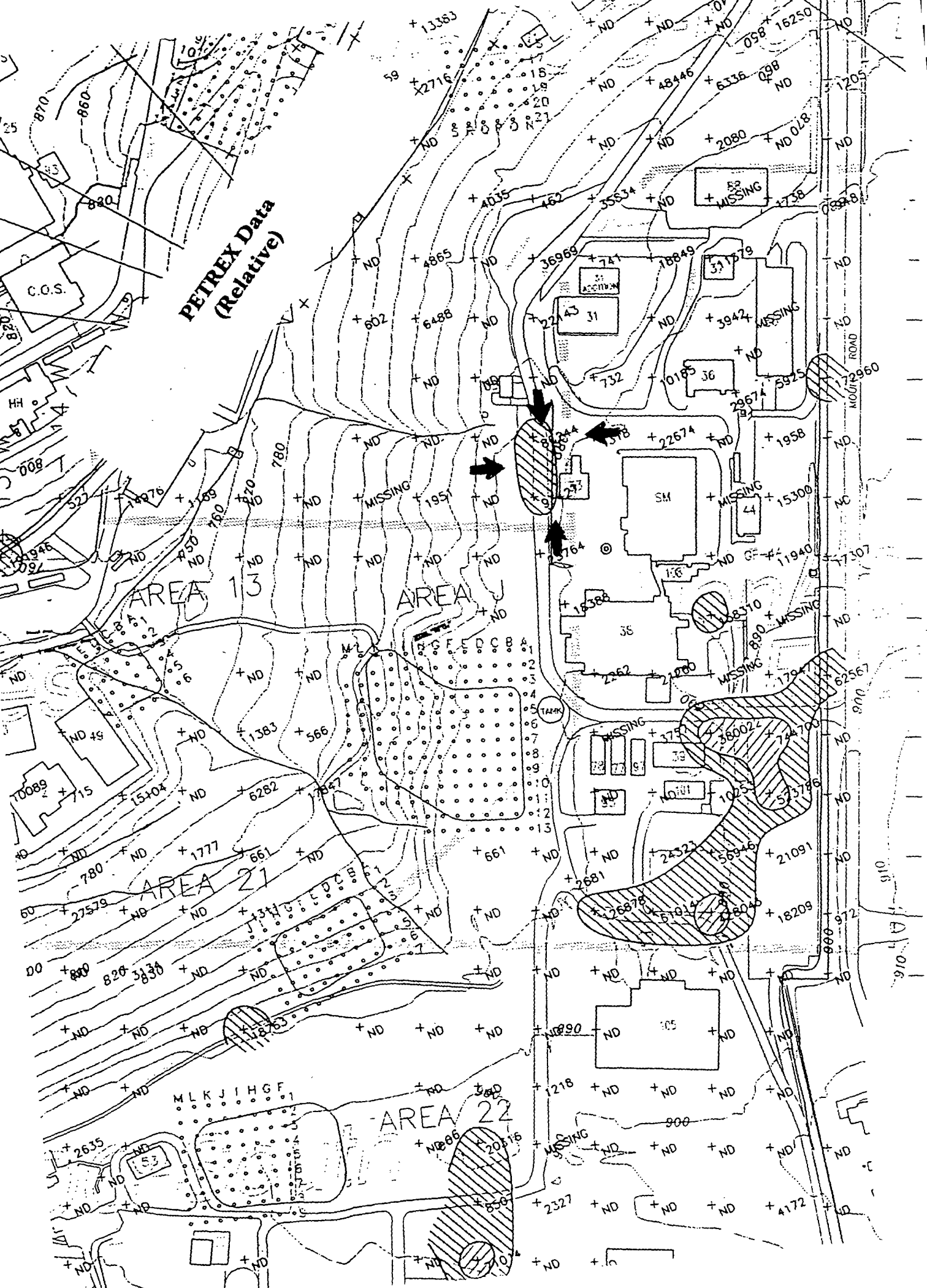
+ PETREX Sample Location

ND Not Detected

Relative Response

Total Semivolatile Hydrocarbons

Plate 3


PETREX Data
(Relative)
AREA 13
AREA J
AREA 21
AREA 22
C.O.S.
MISSING
ND

Contour Interval 10 ft.

100 0 100 200

SCALE (FEET)

LEGEND

Structures

Plant Boundary

Paved/Unpaved Roadway

Ephemeral Stream

700 Contour Line

Features:

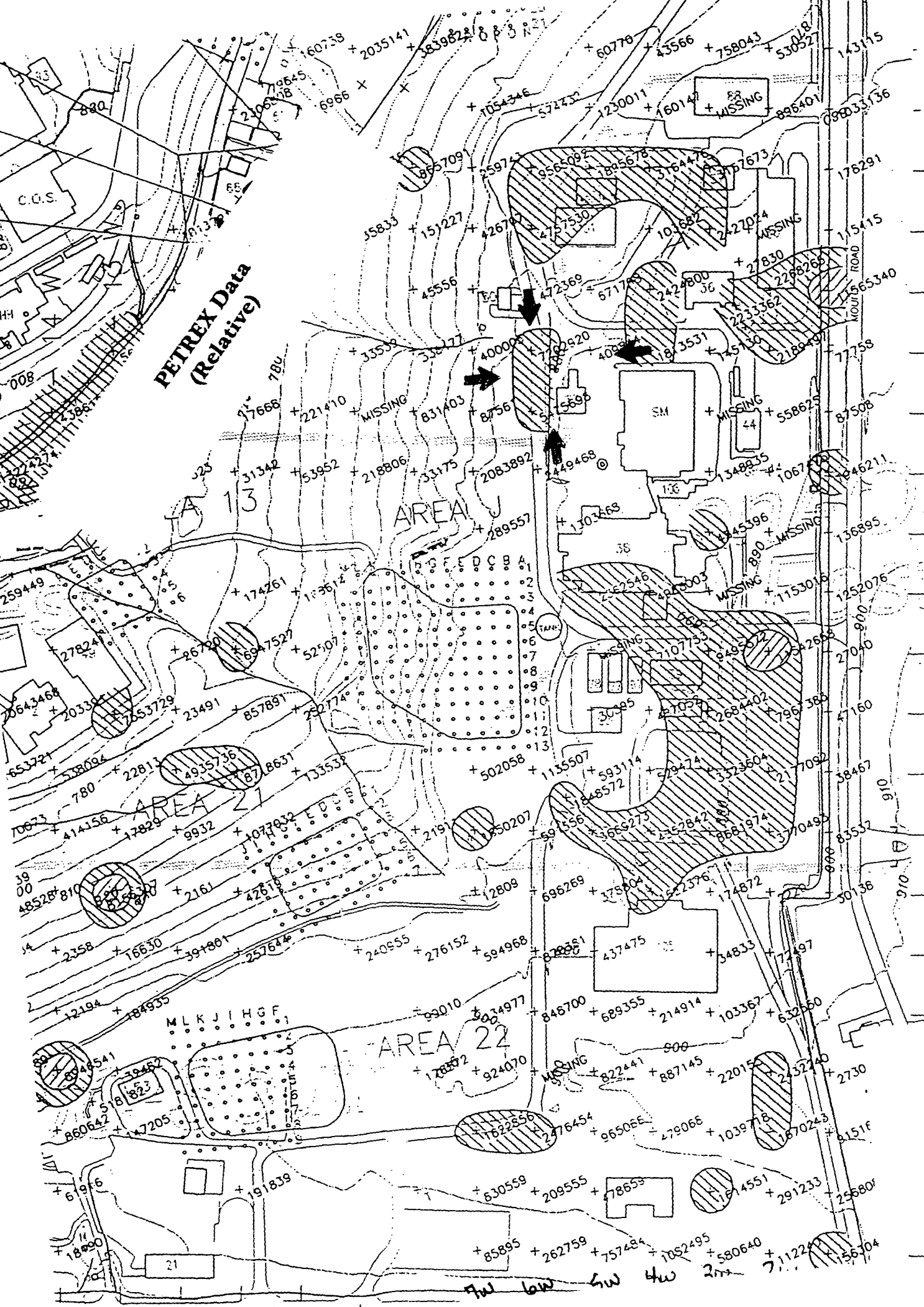
+ PETREX Sample Location

T Denotes interference by terpenes; see text.

Relative Response

Total C5–C11 Petroleum Hydrocarbons

Plate 4


PETREX Data
(Relative)
AREA 13
AREA 21
AREA 22
C.O.S.
SM
TANK
MOUTS ROAD
MISSING

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

Semivolatile Organic Compounds

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

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.

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	12				
Benzene	NA	8.90E+03	1 J				
Carbon Disulfide	NA	280000					
Chloroform	NA	3100			67		
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	63 J				
Acenaphthylene	NA	NA		730				42 J	
Anthracene	NA	64,000,000		1300	66 J		25	55 J	
Benzo(a)anthracene	NA	4,100		1500	180 J		160 J	300 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	460	67 J
Benzo(g,h,i)perylene	NA	NA		550	100 J		100 J	260	26 J
Benzo(k)fluoranthene	NA	41,000		1000	160 J		190 J	4[illegible]	58 J
Bis(2-ethylhexyl)phthalate	NA	215,000							
Butylbenzylphthalate	NA	43,000,000							
Carbazole	NA	NA		600	[illegible]			34 J	
Chrysene	NA	410,000		1500	22[illegible]		240 J	490	6[illegible] J
Di-n-butyl phthalate	NA	21,000,000	120			280 J			
Di-n-octyl phthalate	NA	4,300,000							
Dibenz(a,h)anthracene	NA	410		180 J	40 J		37	[illegible] J	
Dibenzofuran	NA	NA		1100	23				
Diethyl phthalate	NA	NA							
Fluoranthene	NA	8,500,000		3400 D	[illegible]		400 J	800	110 J
Fluorene	NA	NA		1500	42				
Indeno(1,2,3-cd)pyrene	NA	4,100		690	120 J		[illegible] J	[illegible] J	[illegible] J
2-Methylnaphthalene	NA	NA		970					
Naphthalene	NA	NA		4000 D	24				
Phenanthrene	NA	NA		4700 D	[illegible]		150 J	280 J	53 J
Phenol	NA	130,000,000							
Pyrene	NA	6,400,000	2[illegible] J	2700 D	4[illegible]		340 J	[illegible]	120 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	4190	1910	11400	7970	7780	10200	2820	18700
Antimony	NA	85		0.23 B		0.24 B	0.41			0.27 B	0.91 B
Arsenic	8.6	64	B	2.1 B	2.9	1.4 B		2	1.8		11.1
Barium	180	15,000	.6	20.7 B	B	47.1 B	3.6	86.	B	23.2	
Beryllium	1.3	1	0.56		0. B	0.65	0.38	0.28	.28		.9 B
Bismuth	NA	NA									0.85 B
Cadmium	2.1	210		0.25 B	.19 B		0.36 B	0.5 B	0.33 B	0.22 B	6
Calcium	310000	NA	162000	159000	500	152000	00	86200	00	113000	5940
Chromium	20	110,000	13.2	6.7	3.8	15.2		11	14	5.7	20.3
Cobalt	19	NA	9 B	4.5 B	2.3 B	10.1 B	7.6 B	.6 B	11 B	B	13
Copper	26	NA	2	11.9	9.9	17.1	14.5	15.2	16.2	.9	19.2
Cyanide	ND	4,300									
Iron	35000	NA	300	10600		21800	17200	700	23000	60	29400
Lead	48	NA	7	5.2	1	8.6	30.9	2	7.2	5	22.2
Lithium	26	NA	2 B	12.5 B	.2	23 B	7 B	10.3	B	8.2	14.7 B
Magnesium	40000	NA	6160	57800	900	5670	0	35600	00	47900	45
Manganese	1400	27,000	69	384	270	612	383	589	493	256	28
Mercury	ND	64			0.13						
Molybdenum	27	NA	.43 B	1.2 B	0.77 B		B	1.5	B	1.4 B	1.8 B
Nickel	32	4,300	18.4	9.9	6.4	20.6	11.1	16	22.6	8.1	24.5
Potassium	1900	NA	780	742 B	346	2080	574 B	4 B	1590	46	1420
Selenium	NA	NA									
Silver	1.7	1,100			0. B						
Sodium	240	NA	228	888 B	50	137 B	411 B	8 B	246 B	B	1010 B
Thallium	0.46	NA									
Tin	20	NA	1.1			1.4 B	B			4.5	B
Vanadium	25	1,500	14	8.3	4.7	16.3	23.1	18.9	.2	7.4	
Zinc	140	64,000		29.5		67	59	69.2	53.8	36.6	1.8
OTHER INORGANICS											
% Solids (%)	NA	NA	83	93.8	5	83.3	78.4	75	8	95	8.9
Nitrate/Nitrite (mg-N/kg)	NA	NA	2	1.8	2	2.1	7.2	4.8	1.6	26.5	2.2

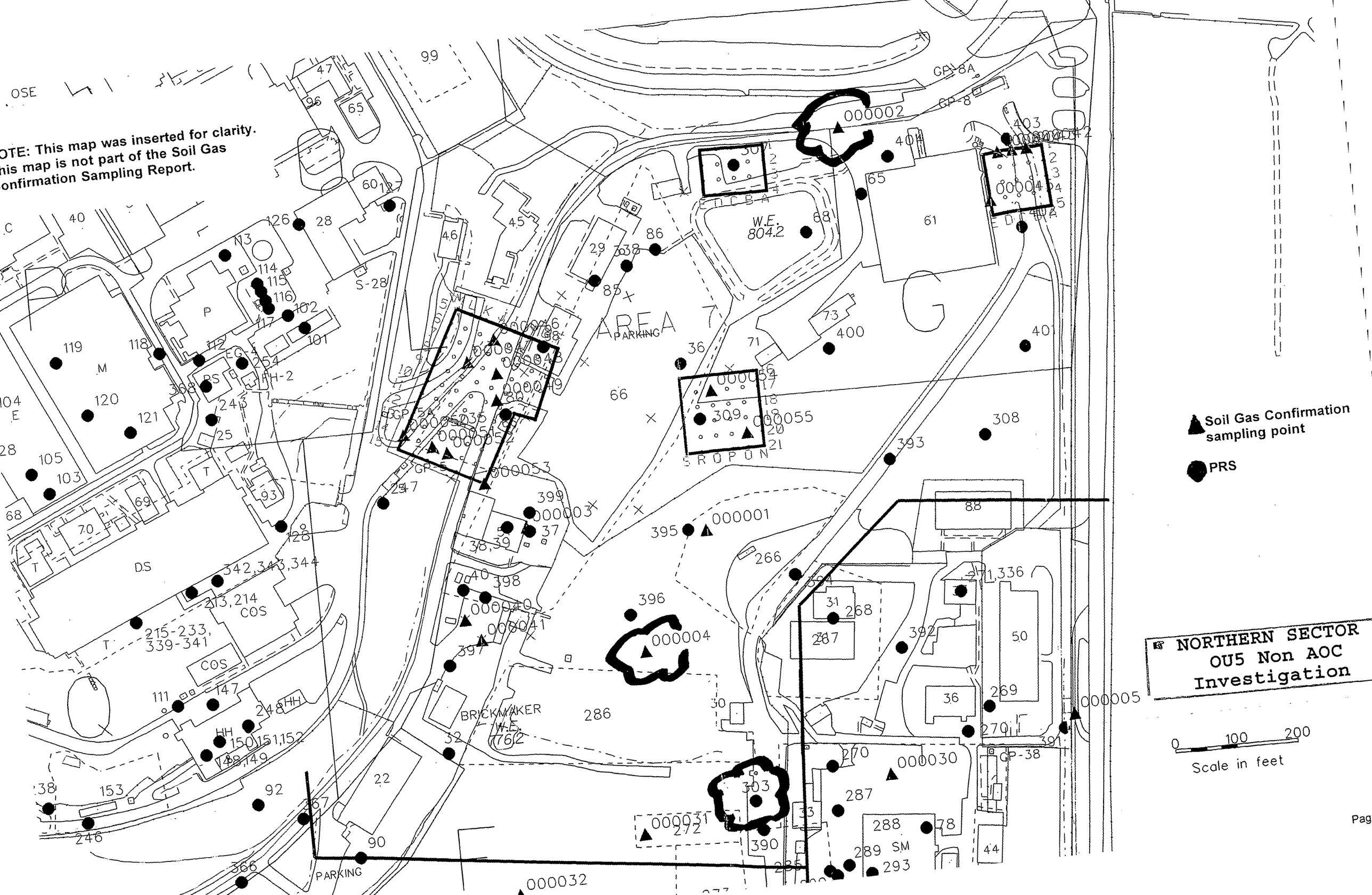
No entry - not detected
mg/kg - milligrams/kilogram
NA - Value not available
NC - Background not comp
ND - No detections in background samples
mg-N/kg - milligrams per kilogram, reported as nitrogen
J - Numerical value is an estimated quantity
B - Analyte detected in blanks associated with this sample
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	0.069	0.[illegible]	0.087	0.543
Plutonium-239/240	0.18	5.5			0.0[illegible]2		
Potassium-40	37	NA	21.[illegible]	2.95	[illegible].53	27.4	15.1
Radium-226+D	2	0.14	[illegible]	0.478	0.508	1.16	[illegible]
Thorium-228+D	1.5	0.85	[illegible]	0.277	[illegible].37	1.24	[illegible]
Thorium-230	1.9	44	[illegible]814	0.374	0.6[illegible]	0.98	1.19
Thorium-232	1.4	50	1.3	0.184	0.3[illegible]	1.17	0.95
Uranium-234	1.1	38	2.1[illegible]	0.401	0.[illegible]19	0.934	0.874
Uranium-235+D	0.11	3.4	[illegible]		0.04	0.0349	0.[illegible]8
Uranium-238+D	1.2	11.0	[illegible]5	0.392	0.[illegible]12	0.918	0.91[illegible]

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)


NOTE: This map was inserted for clarity.
This map is not part of the Soil Gas
Confirmation Sampling Report.
Soil Gas Confirmation sampling point
PRS
NORTHERN SECTOR
OU5 Non AOC
Investigation
0 100 200
Scale in feet
AREA 7
PARKING
W.E. 804.2
BRICKMAKER W.E. 762
SROPON
COS
DS
SM
000001
000002
000003
000004
000005
000030
000031
000032
000035
000040
000041
000043
000049
000053
000054
000055
000056
000058
000042
GP-8A
GP-8
GP-5A
GP-5
GP-38
S-28
EG-4
FH-2