2952

WORK PLAN ADDENDUM FOR EXCAVATION OF TRENCHES IN THE OPERABLE UNIT 2 SOLID WASTE LANDFILL FEBRUARY 1992

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ADDENDUM

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WORK PLAN ADDENDUM

2951

FOR EXCAVATION OF TRENCHES IN THE

OPERABLE UNIT 2 SOLID WASTE LANDFILL

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

[redacted]

February 1992

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1.0 INTRODUCTION

This Work Plan Addendum describes additional field activities required for characterization of the Solid Waste Landfill in Operable Unit 2 for the RI/FS. Excavation of trenches is necessary to confirm the nature of the fill material as there were intervals of little or no recovery in some of the borings completed as part of Document Change Request 41 (DCR 41), "Additional Sampling for Operable Unit 2." The additional activities are necessary to provide information for the evaluation of treatment alternatives.

2.0 BACKGROUND

Five borings were completed within the Solid Waste Landfill during July and August of 1991 as part of the sampling effort described in DCR 41. Each boring fully penetrated the landfill and advanced approximately five feet past the fill/soil interface. Each boring was sampled continuously to provide samples for chemical and radiological analyses and for visual characterization of soils. The completed depths of the borings ranged from 13.5 to 19.5 feet below grade. The depths of the fill/soil interface ranged from 9.0 to 15.75 feet.

Sample recovery problems were encountered during split-spoon sampling above the fill/soil interface in three of the borings. Borings 1719, 1721, and 1722 each have three 1.5-foot sample intervals of non-recovery.

Boring 1719 (surface elevation = 590.1 feet) was drilled to a depth of 19.5 feet. The fill/soil interface was encountered at 15.75 feet below grade. A monitor well was installed with its tip at 16.25 feet below grade. The borehole sample intervals of 4.5 to 6.0, 7.5 to 9.0, and 9.0 to 10.5 feet were not recovered.

Boring 1721 (surface elevation = 588.6 feet) was completed at a total depth of 16.5 feet below grade. The fill/soil interface is at 12.5 feet. The sample intervals at 4.5 to 6.0, 6.0 to 7.5, and 10.5 to 12.0 feet were not recovered.

Boring 1722 (surface elevation = 588.4 feet) was drilled to a depth of 15.5 feet below grade. The fill/soil interface was encountered at 11.0 feet. Intervals from 4.5 to 6.0, 8.0 to 9.5, and 9.5 to 11.0 feet were not recovered. Intervals from 3.0 to 4.5 and 6.0 to 8.0 feet show recoveries of five inches and six inches,

respectively. The Site Geologist's observations indicate that a boulder or rubble was encountered at approximately six feet below grade.

3.0 PROGRAM JUSTIFICATION/OBJECTIVES

The nonrecoverable zones in Borings 1719, 1721, and 1722 present gaps in the visual characterization of the wastes within the Solid Waste Landfill. The Site Geologist noted that each of the five borings in the landfill produced essentially the same volume of cuttings (two 55-gallon drums per boring), and that the cuttings from each boring consisted predominantly of soil with some cobbles and construction debris. In each boring the visual classification of recoverable intervals indicates that the ratio of solid waste to soil is extremely low.

Excavation of trenches is needed to provide a definitive description of the intervals not recovered in Borings 1719, 1721, and 1722. Visual characterization of the nonrecovered materials is necessary to determine the nature of buried materials which were not recovered by the split-spoon sampling.

If perched groundwater/leachate is encountered in the trenches, analysis of it can be used to supplement the data derived from the simulated rainwater leach procedure that was conducted on the raw waste samples that were collected as part of the sampling specified in DCR 41. Table I provides a summary of the data quality objectives for the activities associated with the trenching of the landfill

4.0 EXCAVATION AND EVALUATION METHODS

Three trenches will be excavated in the solid waste landfill in order to provide a visual description of the fill material. The three trenches will be oriented approximately north/south and the surface length of each trench will be approximately 50 feet. Each trench will be excavated to a depth such that the intervals not recovered in the adjacent borings can be visually characterized. The depth of the trenches will not exceed a depth that is one foot above the base of the fill, as approximated from the adjacent boring. The depth to the base of the fill will be approximated using the boring logs from the boring closest to each trench location. The width and length of the trench will vary with fill consistency. Excavation will be performed with a track-mounted backhoe with an 18- to 24-inch wide bucket. The trenches and the excavated wastes types encountered will be visually characterized and depicted in cross section by the Site Geologist.

TABLE 1

DATA QUALITY OBJECTIVES FOR TRENCHING ACTIVITIES IN THE SOLID WASTE LANDFILL OF OPERABLE UNIT 2

Activity	Excavate trenches in the Solid Waste Landfill near Borings 1719, 1721, and 1722. Visually characterize the wastes. Field screen the wastes for volatile organics and radioactivity.	Collect samples of perched groundwater/leachate if encountered, and analyze for general groundwater chemistry, full radiological, and HSL plus analyses.
Objectives	Provide a visual characterization of the intervals that were not recovered in the above borings. Estimate the percentage of burnable material in the Landfill. Provide additional field screening of the contents of the landfill for volatile organic compounds and radioactivity.	Characterize the perched water/leachate. Provide data for the geochemical fate and transport modelling.
Prioritized data uses	The priority data uses are to establish visual characterization of the Solid Waste Landfill.	The priority data use is site characterization. If these samples are collected the data will be used for geochemical fate and transport modelling in support of the risk assessment.
Appropriate analytical level	Excavation, visual characterization, and field screening: Level I HSL plus: Level III General Groundwater Chemistry and Radiological: Levels III and V respectively.	
Constituents of concern	In perched groundwater: HSL plus, full radiological, and general groundwater chemistry.	
Level of concern	Not applicable. Concentrations obtained will be modified by the fate and transport model prior to arriving at the receptor for risk assessment.	
Required detection limits	Specified in the RI/FS QAPP, dated March, 1988, Section 4.	
Critical samples	The visual characterization is considered necessary to complete the characterization of the Solid Waste Landfill. The perched groundwater/leachate samples are not critical.	

One test trench will be located adjacent to each boring in which there were recovery deficiencies. Trench 1, adjacent to Monitoring Well 1719, will be placed 10 to 15 feet west of the protective well cover to avoid disturbance of the well and will be excavated to a depth of approximately 11 feet. Trenches 2 and 3 will be placed immediately adjacent to Boring Locations 1721 and 1722, and will be excavated to depths of approximately 11.5 feet and 10.0 feet, respectively, as shown in Figure 1.

During excavation, the excavated material will be monitored from the bucket of the backhoe by conducting radiological field screening with a pancake GM, an alpha detector. Screening for volatile organics will be completed with an HNu. This screening will occur at depth intervals of three feet or whenever a change in fill material is observed. An SPA-3 probe attached to a pole with a rate-meter scale will be used to scan at least three vertical profiles along the length of each of the sides of the trenches. The ends of each trench will also be scanned with the SPA-3. The location and vertical and lateral extent of any zones with high counts will be delineated on the cross section of the trench wall. The depth of the trench will be measured during excavation using surveying rods or a weighted tape. All measurements are to be made from the surface and referenced to mean sea level.

If leachate/perched groundwater is encountered during excavation, a sample will be collected and analyzed for general groundwater chemistry, full radiological, HSL plus, and Appendix IX analyses to provide consistency with analytical requirements outlined in DCR 41. The individual analytes included in these analyses are shown in Table 2, Target Analyte List (TAL) 3.47A. If rain water or surface water collects in a trench it will not be sampled. The Site Geologist will make the determination regarding the origin of any water that may accumulate in a trench.

Video tape recording equipment and still photography will be used as an additional documentation tool during the excavation of the trenches.

After each test trench has been inspected and described, it will be backfilled with the material which was excavated from the trench.

RI/FS and FEMP standard operating procedures will be employed to address management of excavated material, equipment decontamination, etc. A site-specific health and safety plan will be developed, approved and implemented for this activity prior to the start of field activities.

2952

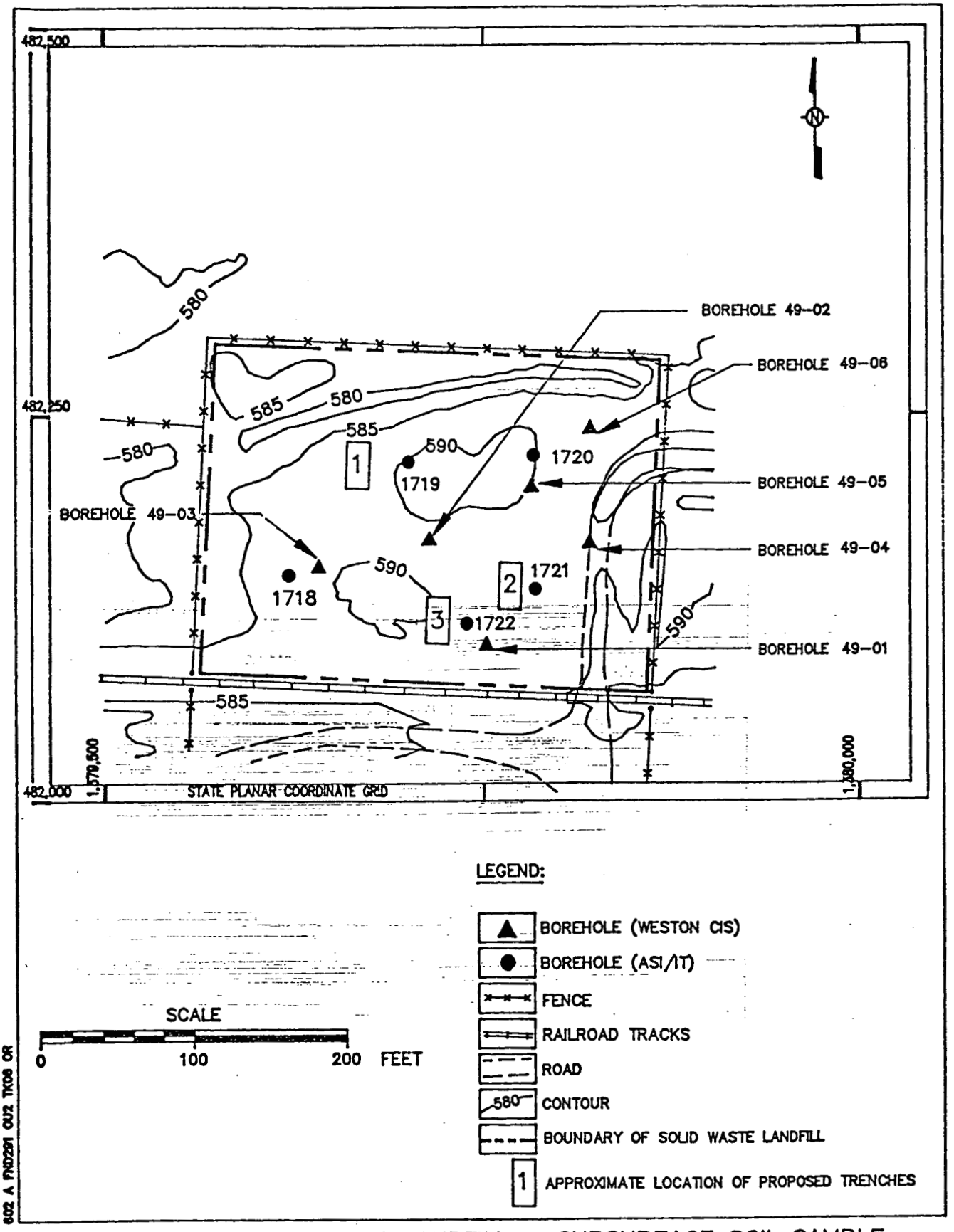

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FIGURE 1. SOLID WASTE LANDFILL – SUBSURFACE SOIL SAMPLE LOCATIONS AND PROPOSED TRENCH LOCATIONS

EXCAVATIONS ON THE SOLID WASTE LANDFILL

PERCHED GROUNDWATER LEACHATE SAMPLES FROM TRENCHES

TAL 3.47 A

FEMP RI/FS HSL PLUS, GENERAL GROUNDWATER QUALITY, AND ADDITIONAL APPENDIX IX ANALYTICAL PARAMETERS

FEMP RI/FS - FULL RADIOLOGICAL - ANALYTICAL PARAMETERS

INORGANICS

1		Aluminum
2		Antimony
3		Arsenic
4		Barium
5		Beryllium
6		Cadmium
7		Calcium
8		Chromium (Total)
9		Cobalt
10		Copper
11		Cyanide
12		Iron
13		Lead
14		Magnesium
15		Manganese
16		Mercury
17		Molybdenum
18		Nickel
19		Potassium
20		Selenium
21		Silicon
22		Silver
23		Sodium
24		Thallium
25		Vanadium
26		Zinc
27	*	Tin

PESTICIDES / PCBs

1		4,4'-DDD
2		4,4'-DDE
3		4,4'-DDT
4		Aldrin
5		alpha-BHC
6		alpha-Chlordane
7		Aroclor 1016
8		Aroclor 1221
9		Aroclor 1232
10		Aroclor 1242
11		Aroclor 1248
12		Aroclor 1254
13		Aroclor 1260
14		beta-BHC
15		delta-BHC
16		Dieldrin
17		Endosulfan sulfate
18		Endosulfan-I
19		Endosulfan-II
20		Endrin
21		Endrin aldehyde
22		Endrin ketone
23		gamma-BHC
24		gamma-Chlordane
25		Heptachlor
26		Heptachlor epoxide
27		Methoxychlor
28		Toxaphene
29	*	Chlordane

1		Cesium 137
2		Gross alpha
3		Gross beta
4		Neptunium 237
5		Plutonium 238
6		Plutonium 239/240
7		Radium 226
8		Radium 228
9		Ruthenium 106
10		Strontium 90
11		Technetium 99
12		Thorium 228
13		Thorium 230
14		Thorium 232
15		Total Thorium
16		Total Uranium
17		Uranium 234
18		Uranium 235/236
19		Uranium 238

DIOXINS / FURANS

1		1,2,3,4,6,7,8-Heptachlorodibenzofuran
2		1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
3		1,2,3,4,7,8-Hexachlorodibenzofuran
4		1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
5		1,2,3,4,7,8,9-Heptachlorodibenzofuran
6		1,2,3,6,7,8-Hexachlorodibenzofuran
7		1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
8		1,2,3,7,8-Pentachlorodibenzofuran
9		1,2,3,7,8-Pentachlorodibenzo-p-dioxin
10		1,2,3,7,8,9-Hexachlorodibenzofuran
11		1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
12		2,3,4,6,7,8-Hexachlorodibenzofuran
13		2,3,4,7,8-Pentachlorodibenzofuran
14		2,3,7,8-TCDD
15		2,3,7,8-TCDF
16		Octachlorodibezofuran
17		Octachlorodibezo-p-dioxin
18		Total Heptachlorodibenzofuran
19		Total Heptachlorodibenzo-p-dioxin
20		Total Hexachlorodibenzofuran
21		Total Hexachlorodibenzo-p-dioxin

ORGANOPHOSPHORUS PESTICIDES

1		Azinphosmethyl
2		Demeton
3		Diazinon
4		Disulfoton
5		Ethion
6		Malathion
7		Parathion, ethyl
8		Parathion, methyl
9	*	Tetraethyldithiopyrophosphate

MISCELLANEOUS

1		Ammonia
2		Chloride
3		Fluoride
4		Nitrate
5		Phenols
6		Phosphorus (total)
7		Sulfate
8		Sulfide
9		Total Organic Carbon (TOC)
10		Total Organic Halogens (TOX)
11		Total Organic Nitrogen (TON)

HERBICIDES

1	*	2,4-D
2	*	2,4,5-TP
3	*	2,4,5,T

* ADDITIONAL PARAMETERS FROM APPENDIX IX

EXCAVATIONS ON THE SOLID WASTE LANDFILL

PERCHED GROUNDWATER LEACHATE SAMPLES FROM TRENCHES

TAL 3.47 A

FEMP RI/FS HSL PLUS AND ADDITIONAL APPENDIX IX ANALYTICAL PARAMETERS

	SEMIVOLATILE ORGANICS
1	1,2-Dichlorobenzene
2	1,2,4-Trichlorobenzene
3	1,3-Dichlorobenzene
4	1,4-Dichlorobenzene
5	2-Chloronaphthalene
6	2-Chlorophenol
7	2-Methylnaphthalene
8	2-Methylphenol
9	2-Nitroaniline
10	2-Nitrophenol
11	2,4-Dichlorophenol
12	2,4-Dimethylphenol
13	2,4-Dinitrophenol
14	2,4-Dinitrotoluene
15	2,4,5-Trichlorophenol
16	2,4,6-Trichlorophenol
17	2,6-Dinitrotoluene
18	3-Nitroaniline
19	3,3'-Dichlorobenzidine
20	4-Bromophenyl phenylether
21	4-Chloro-3-methylphenol
22	4-Chloroaniline
23	4-Chlorophenyl-phenyl ether
24	4-Methylphenol
25	4-Nitroaniline
26	4-Nitrophenol
27	4,6-Dinitro-2-methylphenol
28	Acenaphthene
29	Acenaphthylene
30	Anthracene
31	Benzoic acid
32	Benzo(a)anthracene
33	Benzo(a)pyrene
34	Benzo(b)fluoranthene
35	Benzo(g,h,i)perylene
36	Benzo(k)fluoranthene
37	Benzyl alcohol
38	bis(2-Chloroethoxy)methane
39	bis(2-Chloroethyl)ether
40	bis(2-Chloroisopropyl) ether
41	bis(2-Ethylhexyl)phthalate
42	Butyl benzyl phthalate
43	Carbazole
44	Chrysene
45	Dibenzofuran
46	Dibenzo(a,h)anthracene
47	Diethylphthalate
48	Dimethylphthalate
49	Di-n-butyl phthalate
50	Di-n-octyl phthalate
51	Fluoranthene
52	Fluorene
53	Hexachlorobenzene
54	Hexachlorobutadiene
55	Hexachlorocyclopentadiene
56	Hexachloroethane
57	Indeno(1,2,3-cd)pyrene
58	Isophorone
59	Naphthalene
60	Nitrobenzene
61	N-Nitroso-di-n-propylamine
62	N-Nitrosodiphenylamine
63	Pentachlorophenol
64	Phenanthrene
65	Phenol
66	Pyrene

		ADDITIONAL SEMIVOLATILE ORGANICS
67	*	Famphur
68	*	N-Nitrosomethylethylamine
69	*	1-Naphthylamine
70	*	1,2-Dibromo-3-chloropropane
71	*	1,2,4,5-Tetrachlorobenzene
72	*	1,3,5-Trinitrobenzene
73	*	1,4-Naphthoquinone
74	*	2-Acetylaminofluorene
75	*	2-Naphthylamine (beta-Napthylamine)
76	*	2-Picoline
77	*	2,3,4,6-Tetrachlorophenol
78	*	2,6-Dichlorophenol
79	*	3-Methylcholanthrene
80	*	3-Methylphenol
81	*	3,3'-Dimethylbenzidine
82	*	4-Aminobiphenyl
83	*	4-Nitroquinoline 1-oxide
84	*	5-Nitro-o-toluidine
85	*	7,12-Dimethylbenz(a)anthracene
86	*	Acetophenone
87	*	alpha,alpha-Dimethylphenethylamine
88	*	Aniline
89	*	Aramite
90	*	Chlorobenzilate
91	*	Diallate
92	*	Dimethoate
93	*	Dinoseb
94	*	Diphenylamine
95	*	Ethyl methacrylate
96	*	Ethyl methanesulfonate
97	*	Hexachlorophene
98	*	Hexachloropropene
99	*	Isodrin
100	*	Isosafrole
101	*	Kepone
102	*	m-Dinitrobenzene
103	*	Methapyrilene
104	*	Methyl methanesulfonate
105	*	N-Nitrosodiethylamine
106	*	N-Nitrosodimethylamine
107	*	N-Nitrosodi-n-butylamine
108	*	N-Nitrosomethylvinylamine
109	*	N-Nitrosomorpholine
110	*	N-Nitrosopiperidine
111	*	N-Nitrosopyrrolidine
112	*	o-Toluidine
113	*	O,O-Diethyl-O-2-pyrazinyl phosphorothioate
114	*	O,O,O-Triethyl phosphorothioate
115	*	Pentachlorobenzene
116	*	Pentachloroethane
117	*	Pentachloronitrobezene (PCNB)
118	*	Phenacetin
119	*	Phorate
120	*	p-Nitroaniline
121	*	p-Nitrophenol
122	*	p-Phenylenediamine
123	*	Pronamide
124	*	Pyridine
125	*	p-(Dimethylamino)azobenzene
126	*	Safrole

* ADDITIONAL PARAMETERS FROM APPENDIX IX

2952

EXCAVATIONS ON THE SOLID WASTE LANDFILI

PERCHED GROUNDWATER LEACHATE SAMPLES FROM TRENCHES

TAL 3.47 A

FEMP RI/FS HSL PLUS AND ADDITIONAL APPENDIX IX ANALYTICAL PARAMETERS

	VOLATILE ORGANICS
1	1,1-Dichloroethane
2	1,1-Dichloroethene
3	1,1,1-Trichloroethane
4	1,1,2-Trichloroethane
5	1,1,2,2-Tetrachloroethane
6	1,2-Dichloroethane
7	1,2-Dichloroethene (total)
8	1,2-Dichloroethylene
9	1,2-Dichloropropane
10	2-Butanone
11	2-Hexanone
12	4-Methyl-2-pentanone
13	Acetone
14	Benzene
15	Bromodichloromethane
16	Bromoform
17	Bromomethane
18	Carbon disulfide
19	Carbon tetrachloride
20	Chlorobenzene
21	Chloroethane
22	Chloroform
23	Chloromethane
24	cis-1,3-Dichloropropene
25	Dibromochloromethane
26	Ethylbenzene
27	Methylene chloride
28	Styrene
29	Tetrachloroethene
30	Toluene
31	Total xylenes
32	trans-1,3-Dichloropropene
33	Trichloroethene
34	Vinyl acetate
35	Vinyl chloride

		ADDITIONAL VOLATILE ORGANICS
36	*	1,1,1,2-Tetrachloroethane
37	*	1,2-Dibromoethane (Ethylene dibromide)
38	*	1,2,3-Trichloropropane
39	*	1,4-Dioxane
40	*	Acetonitrile
41	*	Acrolein
42	*	Acrylonitrile
43	*	Allyl chloride
44	*	Chloroprene
45	*	Dichlorodifluoromethane
46	*	Ethyl cyanide
47	*	Isobutyl alcohol
48	*	Methacrylonitrile
49	*	Methyl iodide
50	*	Methyl methacrylate
51	*	trans-1,4-Dichloro-2-butene
52	*	Trichlorofluoromethane
53	*	Methylene bromide

* ADDITIONAL PARAMETERS FROM APPENDIX IX

5.0 REPORTS

A report shall be written by the Site Geologist at the completion of sampling activities. This report will include copies of the excavation logs along with interpretations by the geologist, presentation of findings regarding the visual inspection of material excavated, whether material was considered burnable, and the results of the screening with field instruments. All photographs and vidoetape(s) depicting the trenching activities will be included in the report. This report will be used in making further determinations regarding characterization of the landfill.