

Trench BPL-2**04/01/87****9:15 — 10:45**

The trench was approximately 8 ft long and 6.5 ft deep. The soil was darkly stained at the surface. Glass jar and VOA samples were collected at the surface (BPL-2 surface and BPL-2 6"-12"). The soil was mottled medium to dark brown, very moist and cohesive silty clay. Metal components were found at all depths. A very strong organic odor was observed in the dark brown portions of the clay. VOA samples were collected at 1.5 ft below land surface and at 5.5 ft below land surface (BPL-2 1.5' and BPL-2 5.5'-6'). Another glass jar sample was also collected at 5.5 ft below land surface (BPL-2 5.5'). At this depth, the radiation was approximately equal to background levels.

Trench BPL-3**04/01/87****11:05 — 11:30**

The trench was approximately 8 ft long and 6 ft deep. VOA and glass samples were collected at the surface (BPL-3 6"-12", BPL-3 surface). The top 0.5 ft was light brown sandy clayey silt with radioactivity reading above background levels. From 0.5 to 2.5 ft, the soil was medium brown silty clay. From 2.5 to 5.5 ft, the soil was dark brown cohesive silty clay. At 3.5 ft, VOA and glass samples were collected (BPL-3 3.5', BPL-3-3.5). From 5.5 to 6 ft, the soil was light brown sandy silty clay, odorless, apparently undisturbed. *

Trench BPL-4**04/01/87****11:40 — 12:00**

The trench was approximately 8 ft long and 5 ft deep. VOA and glass samples were collected at the surface (BPL-4 6"-12", BPL-4 .5'-1'). From 0 to 1.5 ft, the soil was a dry, medium brown clayey silt. From 1.5 to 5 ft, the soil was a cohesive medium brown silty clay. VOA and glass samples were collected at 4.5 to 5 ft below land surface (BPL-4 4.5'-5', BPL-4 4.5'-5').

Trench BPL-5**04/01/87****12:30 — 13:30**

The trench was approximately 8 ft long and 5 ft deep. VOA and glass samples were collected at the surface (BPL-5 6"-12", BPL-5 surface). The soil in the top 1 ft was a cohesive medium brown sandy silty clay. From 1 to 5 ft, the soil was a medium reddish brown sandy silty clay. VOA and glass samples were collected at 4 ft below land surface (BPL-5 4.0', BPL-5 4').

Trench BPL-6**04/01/87****13:35 — 13:50**

The trench was approximately 6 ft long and 3 ft deep. VOA and glass samples were collected at the surface (BPL-6 6"-12", BPL-6 surface). The soil was a slightly moist medium brown silty clay. No components were unearthed, and no additional samples were taken.

Trench BPL-7**04/01/87****13:55 — 14:25**

The trench was approximately 8 ft long and 6 ft deep. VOA and glass samples were collected from the surface (BPL-7 6"-12", BPL-7 surface). The soil in the top foot was dry light brown silty sand. From 1 to 3.6 ft, the soil was dark brown silty clay with metal components. At 3 ft, a black lens with metal components was observed, and VOA and glass samples were collected (BPL-7 3'-3.5', BPL-7 3'-3.5'). A light grey lens was observed from 4 to 5 ft. From 5 to 5.5 ft, the soil was light brown silty sandy clay, probably weathered Chatsworth Formation. From 5.5 to 6 ft, light brown silty sandstone (Chatsworth Formation) was encountered.

Trench BPL-8**04/08/87****14:30 — 15:00**

The trench was approximately 8 ft long and 5 ft deep. VOA and glass samples were collected at the surface (BPL-8 6"-12", BPL-8 surface). The top foot of soil was composed of very light brown silty sand. From 1 to 2.5 ft, the soil was a cohesive, moist, medium brown, silty clay. From 2.5 to 3.5 ft, the soil was a cohesive dark grey, sandy clay with slight hydrogen sulfide odor. VOA and glass samples were collected at 3 ft (BPL-8 3.0'-3.5', BPL-8 3.0'-3.5'). From 3.5 to 4 ft, the soil was composed of a slightly moist, medium brown, silty sandy clay; from 4 to 5 ft was a light brown silty sand with Chatsworth Formation sandstone at the bottom.

Trench BPU-1 (Upper Cell)**04/01/87****15:10 — 15:20**

The trench was approximately 4 ft long and 1 ft deep. The very shallow soil was composed of medium brown silty sand with Chatsworth Formation silty sandstone underneath. No samples were collected because of the shallowness of the soil.

Trench BPU-2**04/02/87****8:45 — 8:55**

The trench was approximately 5 ft long and 1.5 ft deep. A glass sample was collected at the surface (BPU-2 surface). The shallow soil was composed of very light brown, dry, silty sand with Chatsworth Formation silty sandstone underneath.

Trench BPU-3**04/02/87****8:55 — 9:20**

The trench was approximately 5 ft long and 3 ft deep. VOA and glass samples were collected from the surface (BPU-3 6"-12", BPU-3 .5'-1'). The soil in the top 0.5 ft was mottled, light to medium brown, silty sand with some dark stains on the surface. From 0.5 to 2 ft, the soil was a medium brown silty clay with metal components. From 2 to 2.5 ft, the soil was a light brown, silty clay. A glass sample was collected of a white, crystalline substance found at 2 ft (BPU-3 2'). At 2.5 ft, VOA and glass samples were collected (BPU-3 2.5', BPU-3 2.5'). From 2.5 to 3 ft, the soil was a medium brown clay.

Trench BPU-4**04/02/87****9:20 — 9:40**

The trench was approximately 8 ft long and 3 ft deep. A glass sample was collected at the surface. The top 0.5 ft of soil was light brown, silty sand. From 0.5 to 3 ft, the soil was a medium brown, silty clay with some small areas of white crystalline powder. At 3 ft, Chatsworth Formation light brown silty sandstone was encountered. Glass and VOA samples were collected at 3 ft (BPU-4 3', BPU-4 3').

Trench BPU-5**04/02/87****9:45 — 10:00**

The trench was approximately 5 ft long and 3 ft deep. A glass sample was collected from the surface (BPU-5 surface). The top 1.5 ft of soil was a light brown, silty sand. From 1.6 ft to total depth was dark brown silty clay, underlain by the light brown silty sandstone of the Chatsworth Formation.

Trench BPU-6**04/02/87****10:05 — 10:18**

The trench was approximately 7 ft long and 4.5 ft deep. The trench was cut into the berm between the upper and lower cells, and no components were unearthed. A glass sample was collected at the surface (BPU-6 surface). The soil was composed of a dark brown silty clay.

Trench BPW-1 (Western Cell)**04/02/87****10:40 — 11:00**

The trench was approximately 35 ft long and from 1 to 2.5 ft deep. The soil was a medium brown, sandy silty clay underlain by weathered and unweathered Chatsworth Formation. The soil appeared undisturbed, and no samples were collected.

Trench BPW-2**04/02/87****11:05 — 11:40**

The trench was approximately 21 ft long and 5 ft deep. A glass sample was collected at the surface (BPW-2 surface). The soil from the surface to 4 ft below the surface was medium brown, dry, cohesive silty clay with darker mottling and some components. At 1.5 ft below the surface, a whitish substance was observed. At 4 ft, VOA and glass samples were collected (BPW-2 f', BPW-2 4'). From 4 to 5 ft, the soil was dry medium reddish brown, silty clay with no mottling.

Trench BPW-3**04/02/87****13:15 — 13:40**

The trench was approximately 30 ft long and 5 ft deep. Metal components and barrels were exposed during excavation. The soil was very mottled and consisted of mixed grey clay, weathered Chatsworth Formation silty sand, and some medium brown silty clay. The soil was saturated with water in places. There was a natural organic odor. There was rust staining in the soil from numerous pipes and flattened barrels. VOA and glass samples were collected

at 4.5 ft (BPW-3 4.5', BPW-3 4.5'). A glass surface sample was collected approximately 10 ft southeast of BPW-3 in some black, possibly oil stained soil (BPW-3 surface).

Trench BPW-4**04/02/87****13:50 — 14:05**

The trench was approximately 35 ft long and from 1.5 to 3 ft deep. The soil appeared to be undisturbed, dry cohesive, medium brown silty clay underlain by light brown, silty sand Chatsworth Formation. No samples were collected.

Trench BPW-5**04/02/87****15:10 — 15:30**

The trench was approximately 20 ft long and 4 to 5 ft deep. The soil was a rust stained medium brown, silty clay. Large tanks and other components were exposed during excavation. VOA and glass samples were collected 3 ft below the surface (BPW-5 3', BPW-5 3').

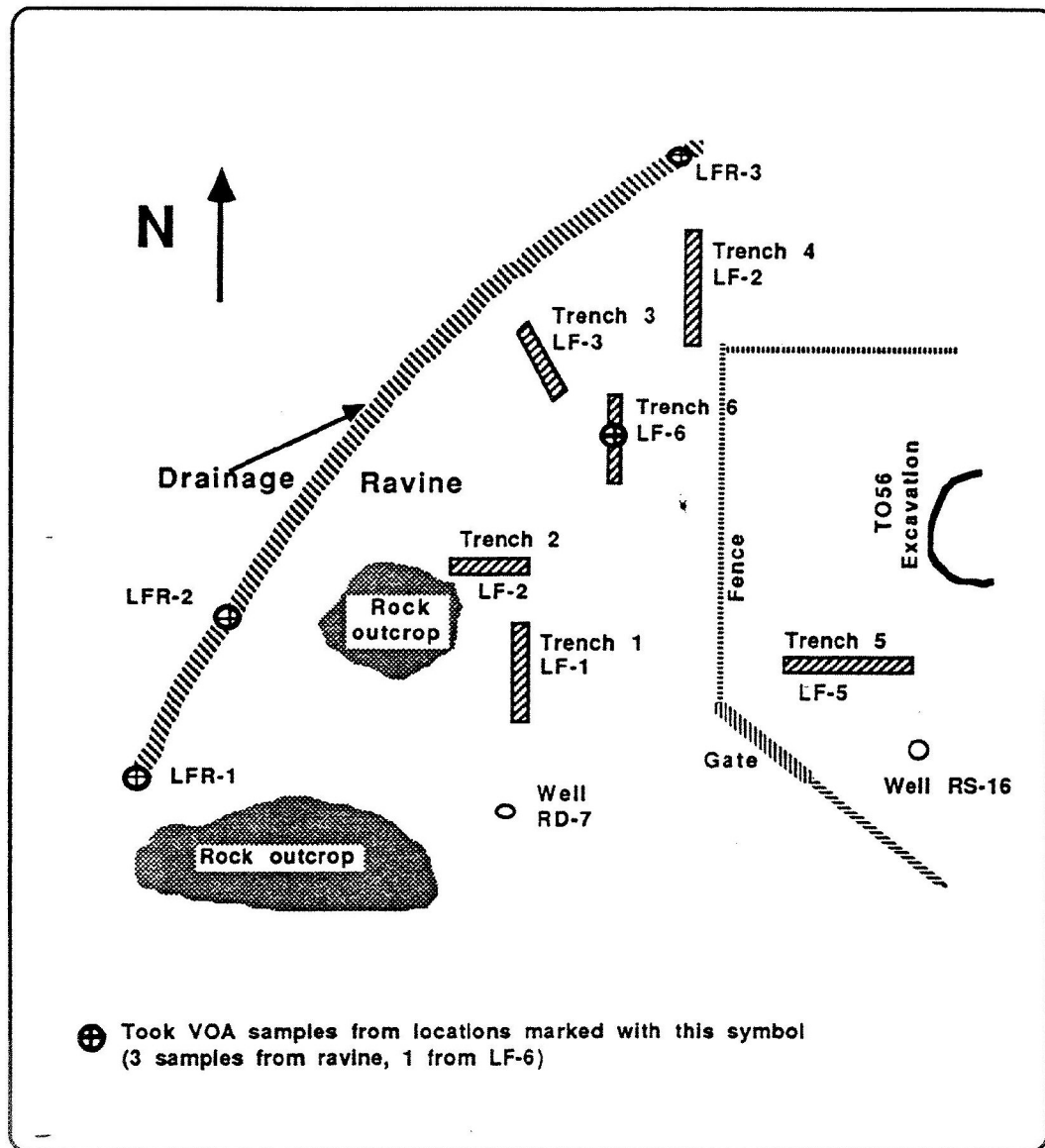


Figure A3.1. Landfill Sketch Map

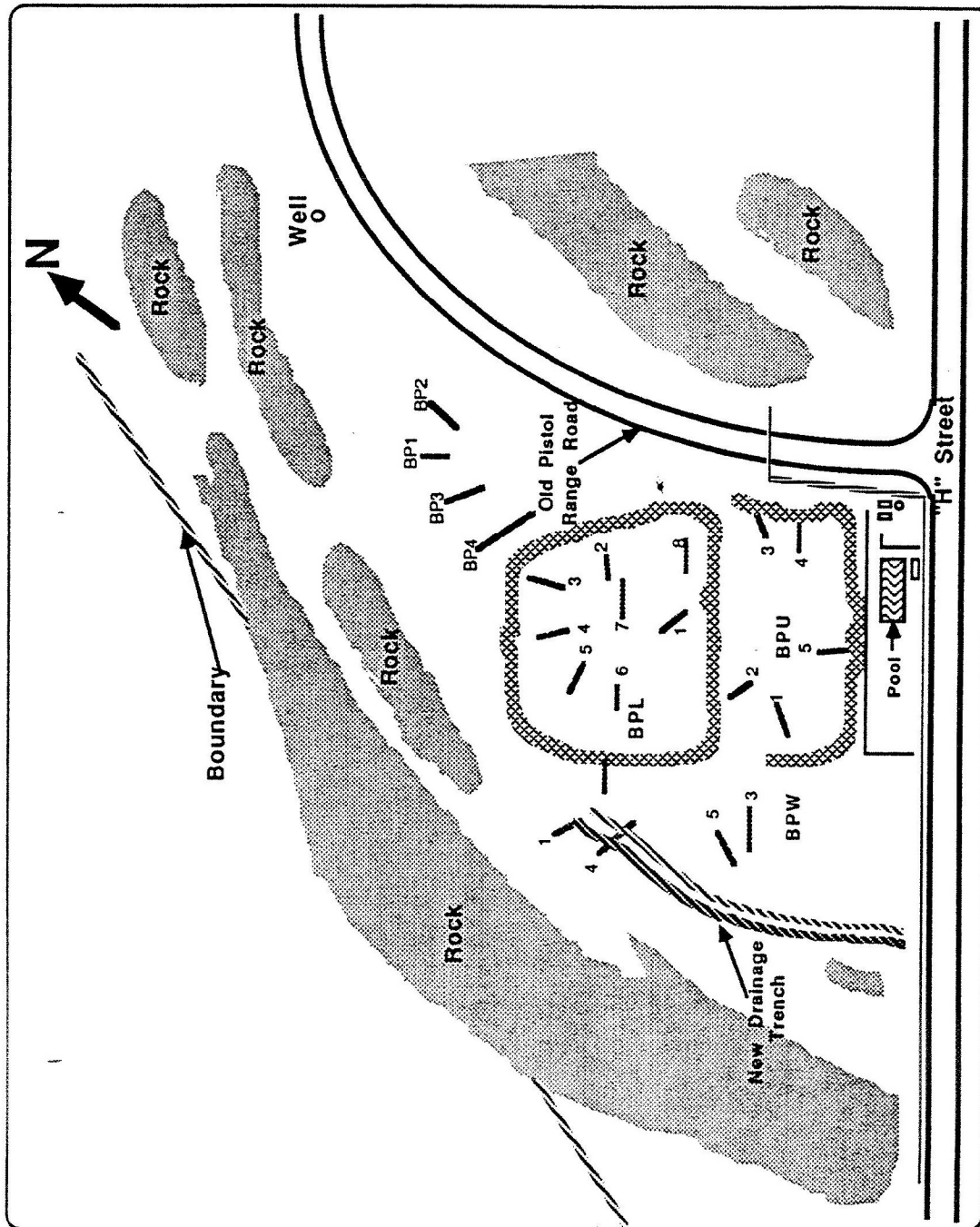


Figure A3.2. Burn Pit — T-886 Characterization Effort

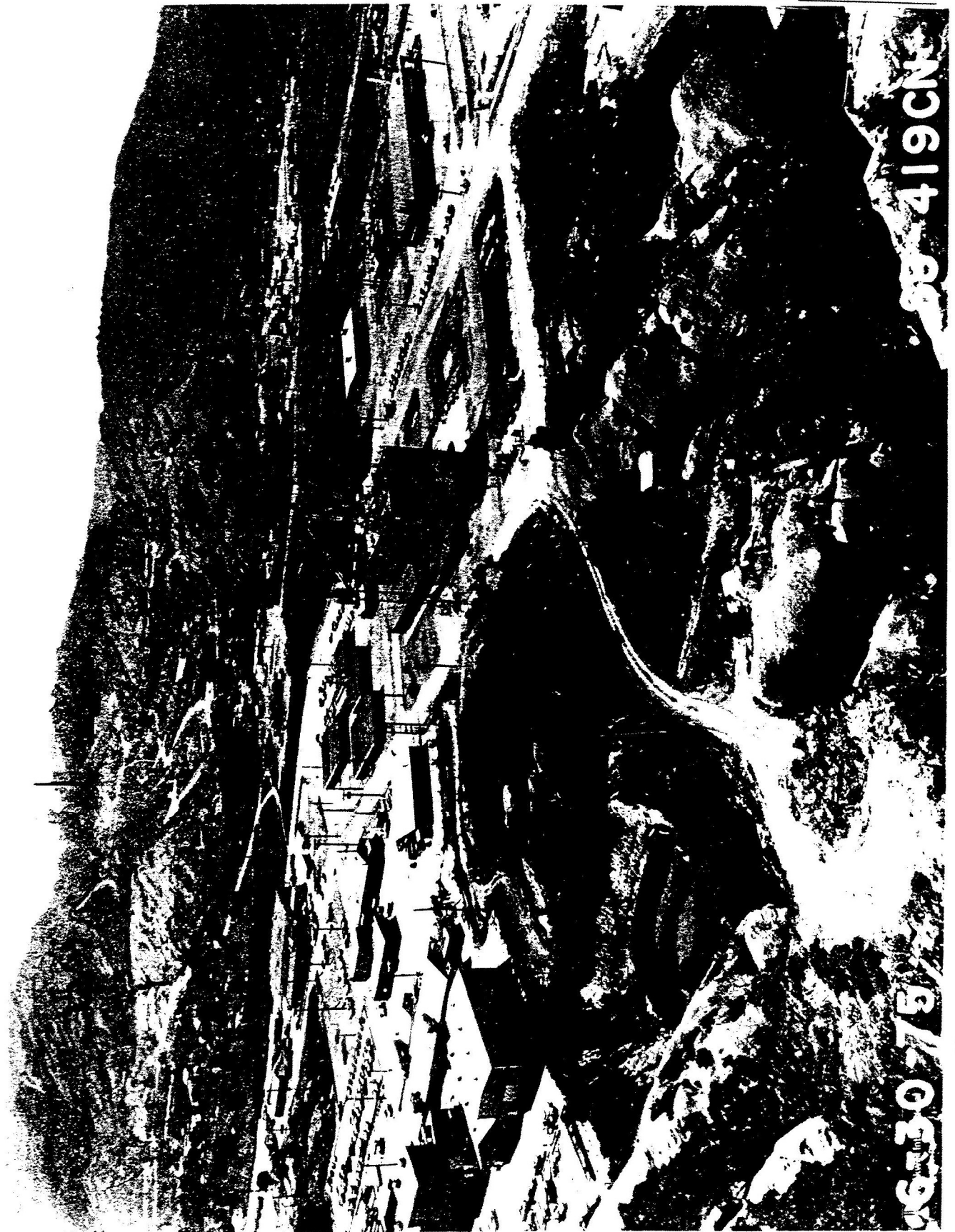


Figure A3.3. Historical View of Landfill at DOE-Optioned Area of SSFL (1975)

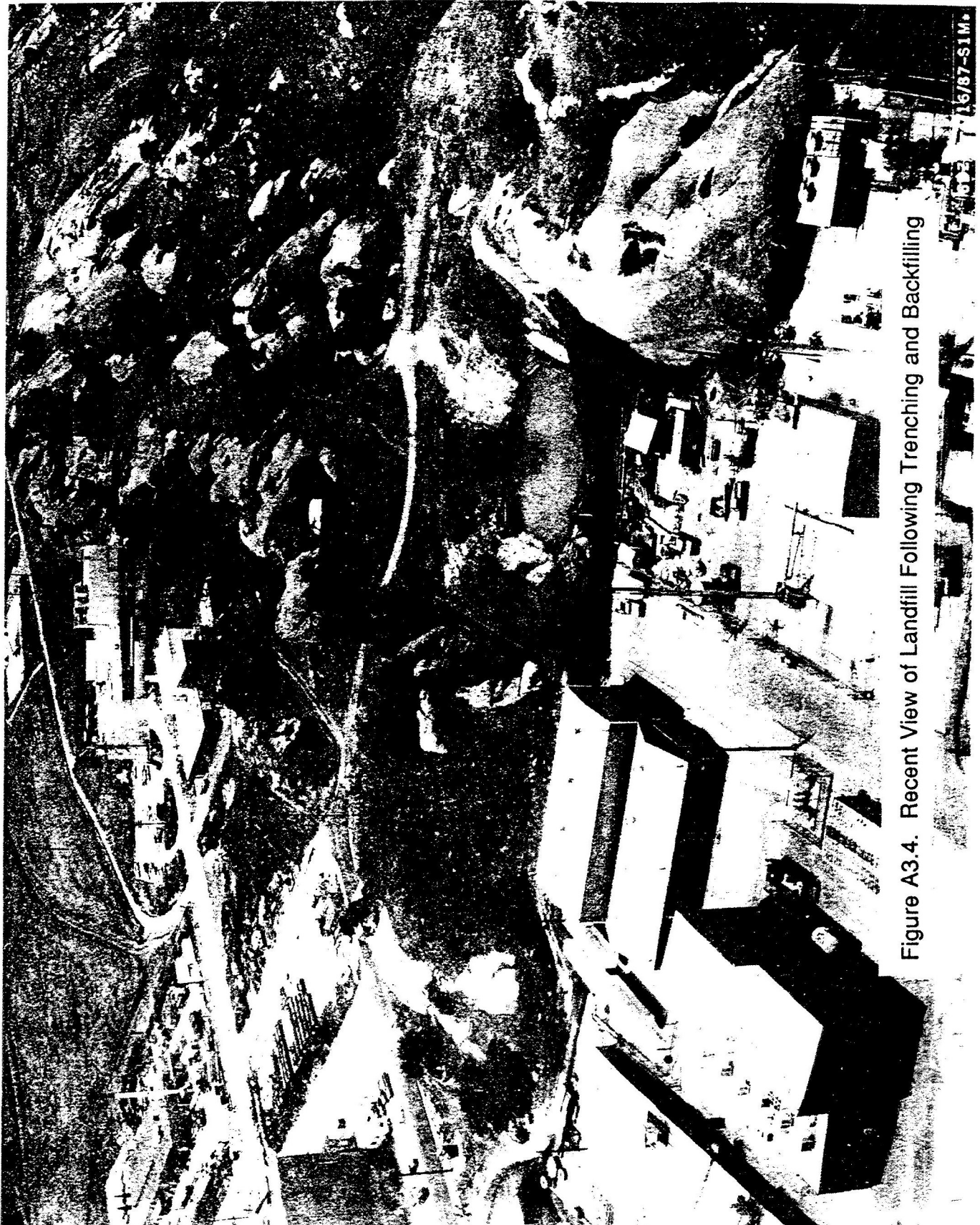
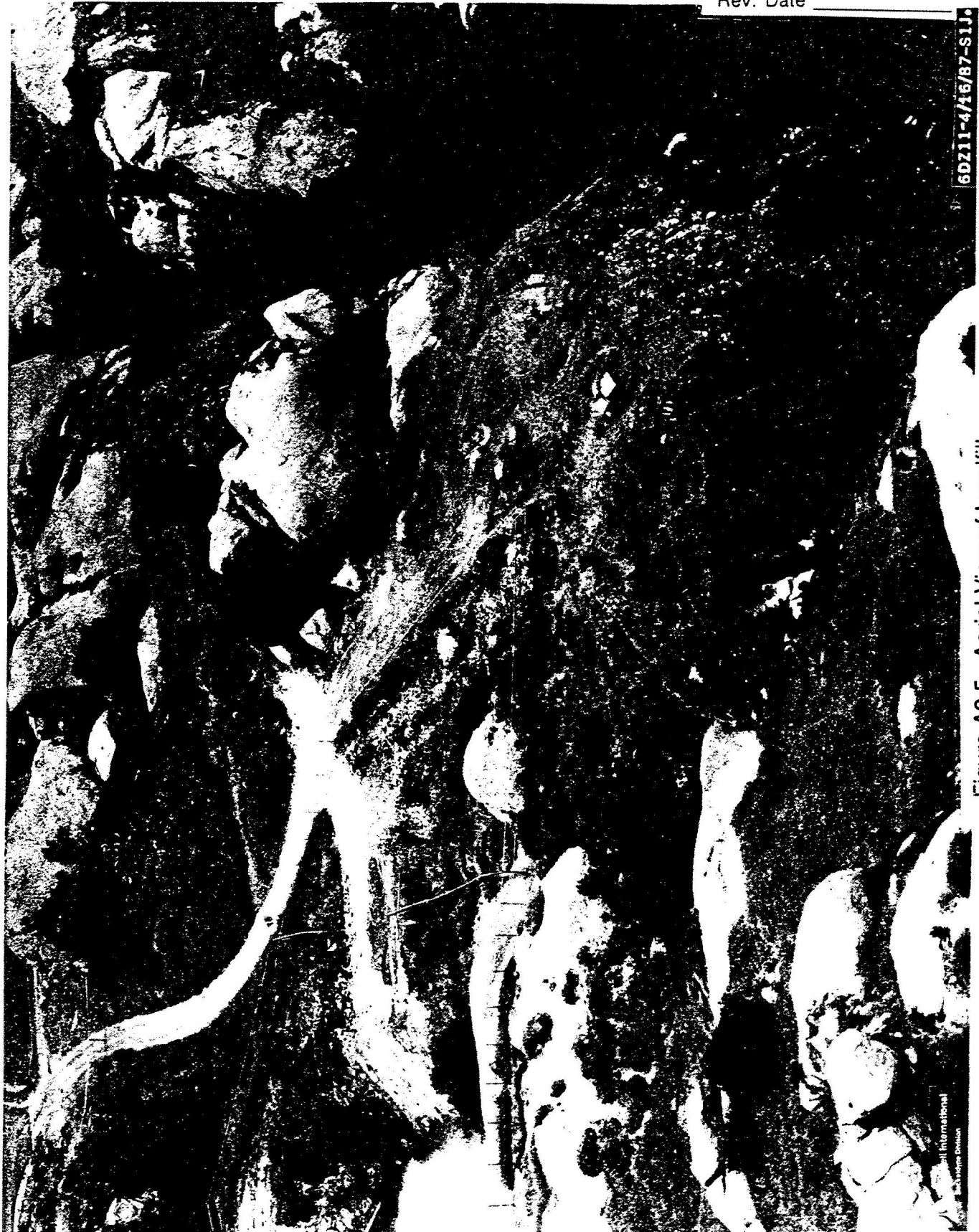


Figure A3.4. Recent View of Landfill Following Trenching and Backfilling



6DZ11-4/16/B7-S1J

Figure A3.5. Aerial View of Landfill

International
Engineering Division



Figure A3.6. Aerial View of Trenches for Soil Sampling
at the SSFL, Area IV Burn Pit

6DZ11-4/16/87-S1B

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Rev. Date _____

**Selected Ground Photos
Taken During Trenching Operations**

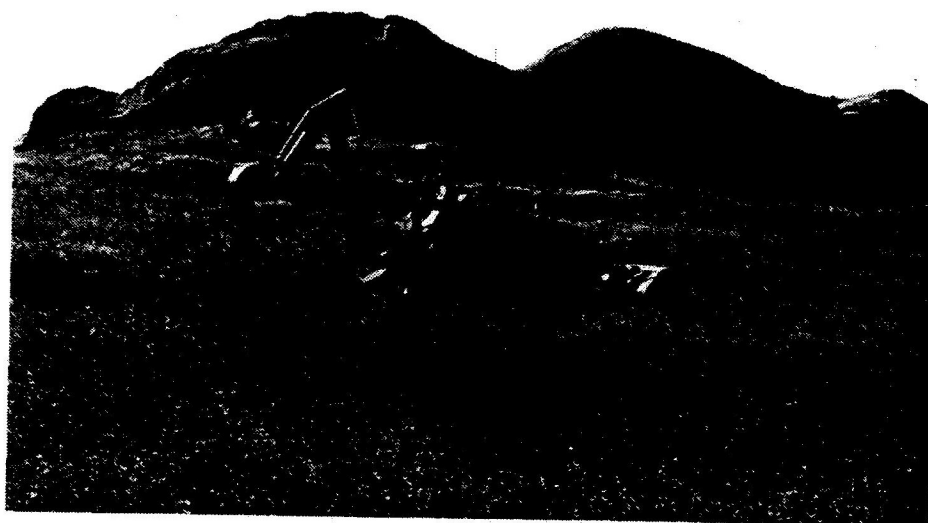


Figure A3.7. Backhoe in Position at SSFL for Trenching Operation



Figure A3.8. Trenching Operation

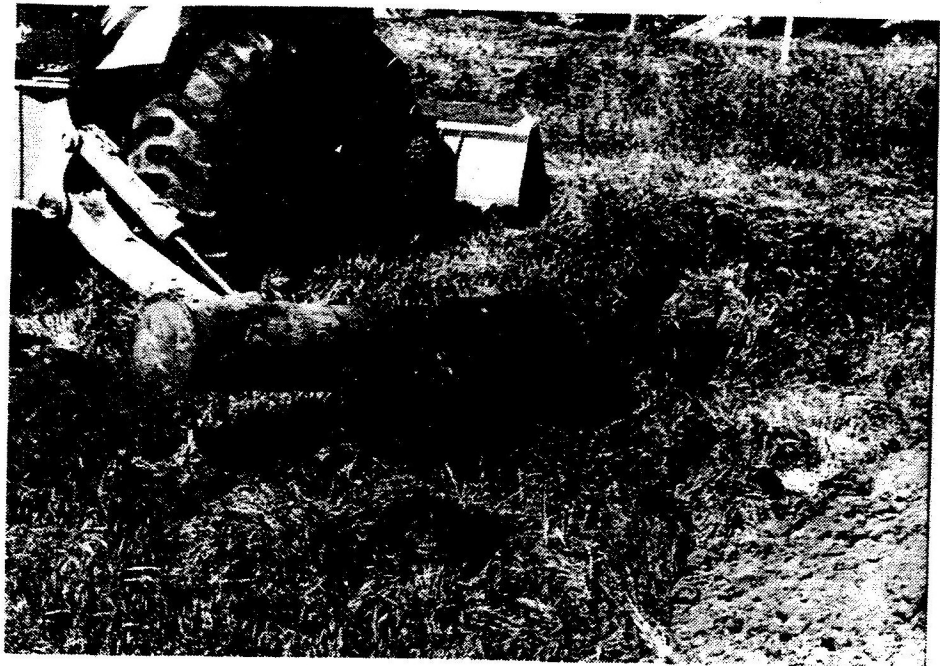


Figure A3.9. Buried Component Removed
During Burn Pit Trenching Operation

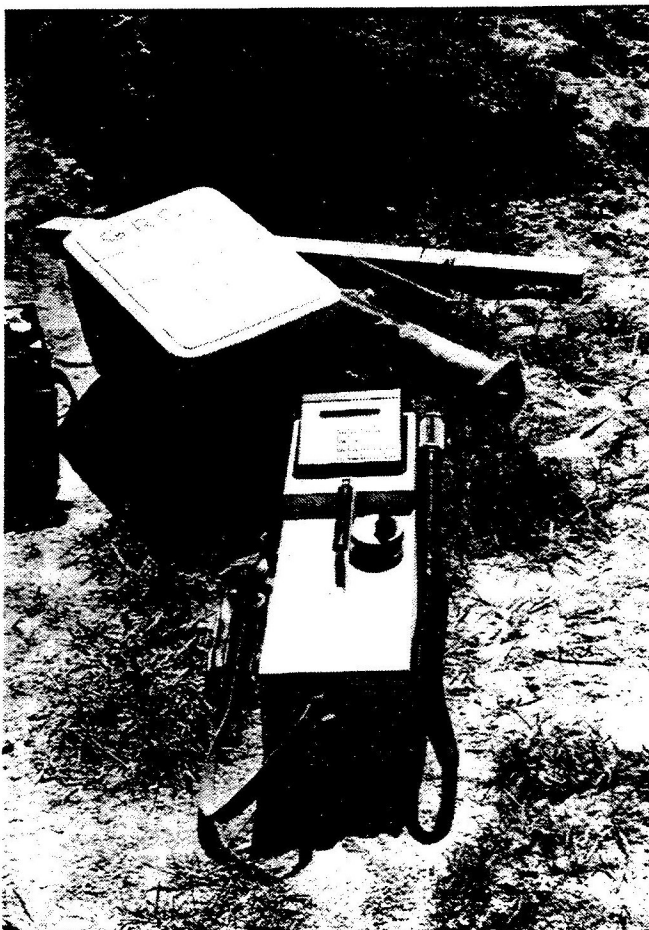


Figure A3.10. Miran 1B Sniffer
for Field Survey of Soil Samples



Figure A3.11. Monitoring While Workers Obtain Soil Samples



Figure A3.12. Workers' Shoes Being Checked for Radiation



Figure A3.13. View of Burn Pit



Figure A3.14. View of Landfill
Trenching Operation



Figure A3.15. Landfill Deep Trenching Operation

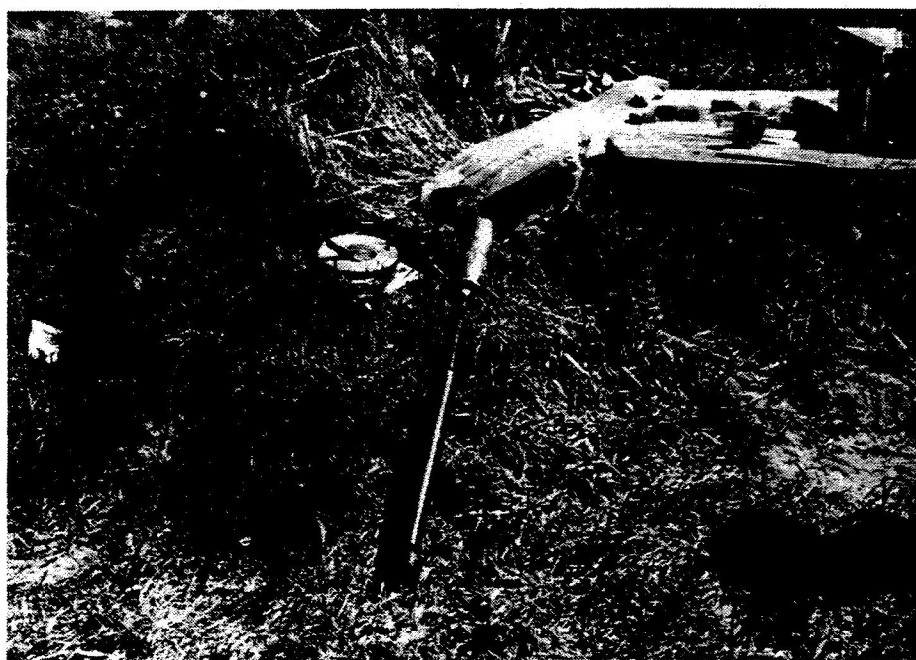


Figure A3.16. Brass Soil Sampler



Figure A3.17. Soil Sampling
Operation at the Burn Pit



Figure A3.18. Soil Sampling Containers and Freezer Chest



Figure A3.19. Brass Sampling Device and Miscellaneous Monitoring Equipment and Sampling Items

Appendix A4

Burn Pit Radiation Survey of Soil Samples

Appendix A4 — Sheet 1

DATA SHEET

Soil Samples T-886
Salve Can -

Badger, F.H.
Page 1 of 6

Sample	Depth	Sample Date	Time	Weight (grams)	R/A		Notes
BP-1	3-5' Pile	3/31/87	10:45	29.8	OK ⁺		
BP-1A	3-5' Pile	3/31/87	10:45	27.6	OK		
BP-2	Pile	3/31/87	11:20	20.5	OK		
BP-2A	Bottle	3/31/87	11:20	37.4	OK		
BP-3	12" Top	3/31/87		24.6	OK		
BP-3A	Bottom	3/31/87		18.5	OK		
BP-3B	Pile	3/31/87		31.3	OK		
BP-3C	Pile	3/31/87		27.0	OK		
BP-4	200' Silt	3/21/87	PM	32.8	OK		Wet
BP-4A	Wet Pile	3/31/87		30.1	OK		
BPL-1	Surface	4/1/87		33.2			
BPL-1A	1 Foot	4/1/87		39.0			
BPL-1B	1 Foot	4/1/87		19.1		17x10" 44g C-137	"Hot lens" area
BPL-1C	VOR	4/1/87		115.	OK		
BPL-2	1.5 FT	4/1/87		9.2			
BPL-2A	3.5-4 ft	4/1/87		36.2			
BPL-2B	4 FT	4/1/87	09:45	22.0			
BPL-2C	5 1/2 - 6 VOA	4/1/87		32.6	OK		
BPL-3	6-12" VOA	4/1/87		17.0	OK		
BPL-3A	3.5 FT	4/1/87		17.3			
BPL-3B	6 FT	4/1/87		47.9			
BPL-3C	Apex	4/1/87		33.7			
BPL-4	C-15	4/1/87	11:35	33.5			
BPL-4A	7.5-5" VOA	4/1/87		33.8	OK		
BPL-5	6-12" VOA	4/1/87	13:15	19.8	OK		
BPL-5A	4.5' VOA	4/1/87		33.8	OK		
BPL-6	VOA	4/1/87	13:35	19.6	OK		
BPL-6A	3'	4/1/87		28.2			50 g/m
BPL-7	6-12" VOA	4/1/87	13:55	30.0	OK		
BPL-7A	3'-4" VOA	4/1/87	14:05	33.3	OK		
BPL-8	6-12"	4/1/87	14:30	37.7			
BPL-8A	7.5" VOA	4/1/87	14:40	30.5	OK		

Appendix A4 — Sheet 2

DATA SHEET

Soil Sample: T-886
Salve CanBadger F.H.
Page 2 of 6

Sample	Depth in	Sample Date	Sample Time	Weight (grams)	R/A		Notes
BPU-2	surf	4/2/87	8:45	27.2			
BPU-3	6" 12" VOA	4/2/87	8:55	29.1	OK	wt. 1.7 x 10 ⁻⁶ g 15% Al/gm	
BPU-4	East Can	4/2/87	09:25	16.7			
BPU-4A	3" VOA	4/2/87	09:25	19.3	OK		
BPU-4B	1.5" VOA	4/2/87	09:35	31.5			
BPU-5	6"	4/2/87	09:55	29.2			
BPU-6	6"	4/2/87		24.8			
BPU-6A	4"	4/2/87		32.0			Soil - Berum
BPW							
BPW-2	Surf - 6"	4/2/87	11:00	17.7			
BPW-2	4"	4/2/87	11:10	23.1			
BPW-3	6"	4/2/87		12.6			
BPW-3	4 1/2" VOA	4/2/87	13:30	18.5	OK		green clay
BPW-5	2.5' VOA	4/2/87	14:30	25.0	OK		

Appendix A4 — Sheet 3

Badger

Page 3 of 6

DATA SHEET

Sample and description	Nomenclature	> 400 grams			Date	Time	R/A *
LF55	Plastic Bag	12' H deep 12' T in from Stake	RB	3/31/87	8:10	OK	
LF64	Plastic Bag	(NOS)	RB	3/31/87	9:20	OK	
LF65	Plastic Bag	(NOS)	RB	3/31/87	9:20	OK	
LF56	Plastic Bag	12' H deep 12' T in from Stake	RB	3/31/87	8:40	OK	
BP-14	Born P.T. Plastic bag	(NOS)	RB	3/31/87	10:50	OK	
BP-15	BP Plastic Bag	(NOS)	RB	3/31/87	10:50	OK	
BP-22	BP Plastic Bag	(NOS)	RB	3/31/87	12:45	OK	
BP-23	BP Plastic Bag	(NOS)	RB	3/31/87	12:45	OK	
BP-32	BP Plastic Bag	(NOS)	RB	3/31/87	—	OK	
BP-33	BP Plastic Bag	(NOS)	RB	3/31/87	1:30	OK	
BP-42	BP Plastic Bag	(NOS)	RB	3/31/87	2:20	OK	
BP-43	BP Plastic Bag	(NOS)	RB	3/31/87	2:20	OK	
1602 Jar Samples							
BPU-2	Surface	SSFL 8640, G.F. (NOS)	1.4 x 10 ⁻⁴ m	4/2/87	8:45	OK	
BPU-4	Surface	SSFL 8640, G.F. (NOS)	1.4 x 10 ⁻⁴ m	4/2/87	9:30	OK	
BPW-2	Surface	SSFL 8640, G.F. (NOS)		4/2/87	11:05	OK	
~ 1000ml Jar Samples							
BP-21	6' deep 8' from Stake	(NOS)		3/31/87	12:35 PM	OK	
BP-31	7' deep 9' from Stake	(NOS)		3/31/87	1:32	OK	
BP-41	4' deep 15' from Stake	(NOS)		3/31/87	2:05 PM	OK	

* OK - Sealed Container with Two 1000 gm NaI crystals. A Meter and sealed on Hot Purification

Experiments Gamma Spectrometer and Natural activity only detected.

FORM 40 - REV. 12-64

FORM 401 REV. 12-84

HDMSe00264040

Appendix A4 — Sheet 4

DATA SHEET

Badger

Page 4 of 6

Sample Nomenclature and Description	Approximate Weight (g)	Date	Time	R/A
40Z Sample Jars				
LF-11 8 FT deep 25 ft in from stake	193	3/30/87	2:50 PM	OK
LF-12 8 FT deep 25 ft in from stake	172	3/30/87	3:50 PM	OK
LF-13 8 FT deep 25 ft in from stake	177	3/30/87	2:50 PM	OK
LF-21 10 FT deep 8 ft in from stake		3/30/87	2:00 PM	OK
LF-22 10 FT deep 8 ft in from stake	176	3/31/87	2:00 PM	OK
LF-23 10 ft deep 8 ft in from stake	202	3/30/87	2:00 PM	OK
LF-31 12 FT deep 6 ft in from stake	165	3/30/87	2:15 PM	OK
LF-32 12 ft deep 6 ft in from stake	176	3/30/87	2:15 PM	OK
LF-33 12 ft deep 6 ft in from stake	190	3/30/87	2:15 PM	OK
LF-34 Surface sample 3 ft in from stake	13	3/30/87	2:00 PM	OK
LF-41 7 ft deep 5 ft in from stake	193	3/30/87	2:40 PM	OK
LF-42 7 ft deep 5 ft in from stake	179	3/30/87	2:40 PM	OK
LF-43 7 ft deep 5 ft in from stake	174	3/30/87	2:40 PM	OK
LF-51 12.5 ft deep 12 ft in from stake	214	3/30/87	3:25 PM	OK
LF-52 12.5 ft deep 12 ft in from stake	245	3/30/87	3:25 PM	OK
LF-53 12.5 ft deep 12 ft in from stake	256	3/30/87	3:25 PM	OK
LF-54 2 FT deep 10 ft in from stake	231	3/30/87	3:25 PM	OK
LF-61 9'2 FT deep 6'2 in from stake	206	3/31/87	9:15 AM	OK
LF-62 9'2 FT deep 6'2 in from stake	187	3/31/87	9:15 AM	OK
LF-63 9'2 FT deep 6'2 in from stake	203	3/31/87	9:15 AM	OK
BP-11 6' - deep 13' from stake	176	3/31/87	10:50 AM	OK
BP-12 6' - deep 13' from stake	167	3/31/87	10:50 AM	OK
BP-13 6' - deep 13' from stake	184	3/31/87	10:50 AM	OK

Appendix A4 — Sheet 5

DATA SHEET

Bodger

Page 5 of 6

Sample Nomenclature and Description					Date	Time	R/R
16 02 Jar Samples - Exceeds 400g.							
BPL-1 Surface DBH					4/1/87	—	Cs ¹³⁷ 9
BPL-1 3 feet BBH					4/1/87	08:50	OK
BPL-2 Surface DBH					4/1/87	09:15	Cs ¹³⁷ 2.1
BPL-3 Surface DBH					4/1/87	11:05	Cs ¹³⁷ 29.2
BPL-3 3.5 Feet DBH					4/1/87	11:20	Cs ¹³⁷ 13.8
BPL-4 0.5' - 1.0' DBH					4/1/87	11:35	Cs ¹³⁷ 9.3
BPL-4 4.5' - 5' DBH					4/1/87	11:45	Cs ¹³⁷ 0.9
BPL-5 Surface 8640 SSFL G.F					4/1/87	12:15	Cs ¹³⁷ 4.2
BPL-5 4.0' SSFL 8640 G.F					4/1/87	13:30	OK
BPL-6 Surface SSFL 8640 G.F					4/1/87	13:40	Cs ¹³⁷ 1.5
BPL-7 Surface SSFL 8640 G.F					4/1/87	13:55	Cs ¹³⁷ 0.4
BPL-7 3.0' - 3.5' SSFL 8640 G.F					4/1/87	14:05	Cs ¹³⁷ 0.67
BPL-8 Surface SSFL 8640 G.F					4/1/87	14:30	Cs ¹³⁷ 4.28
BPL-8 3.0' - 3.5' SSFL 8640 G.F					4/1/87	14:40	OK
BPU-3 0.5' - 1.0' SSFL 8640 G.F					4/2/87	8:55	Cs ¹³⁷ 4.0
BPU-3 - 2' SSFL 8640 G.F					4/2/87	9:10	OK
BPU-3 2.5' SSFL 8640 G.F					4/2/87	9:15	OK
BPU-4 3.0' SSFL 8640 G.F					4/2/87	9:40	OK
BPU-5 Surface SSFL 8640 G.F					4/2/87	10:00	OK
BPU-6 Surface SSFL 8640 G.F					4/2/87	10:18	OK
BPW-2 4' SSFL 8640 G.F					4/2/87	11:15	OK
BPW-3 SE Surface SSFL 8640 G.F					4/2/87	—	OK
BPW-3 4.5' SSFL 8640 G.F					4/2/87	12:30	OK
BPW-5 3' SSFL 8640 G.F					4/2/87	14:35	OK

Appendix A4 — Sheet 6

Bo. d. o. r.

Page 6 of 6

DATA SHEET

VOA Samples

[illegible]

Appendix A5
Miran 1B Air Sampling

In support of the trenching work performed at the SSFL Area IV Landfill and Sodium Burn Pit sites, Health, Safety & Environment sampled air in and around the trench site as work progressed. The instrument used for this air sampling was the Miran 1B Portable Ambient Air Analyzer. The Miran 1B is a single-beam infrared spectrophotometer with preprogrammed library of 116 compounds (see following literature). The Miran instrument was used in the "Analyze" mode which selectively reads a given preprogrammed wavelength characteristic of the selected compound of interest. For this study, nine compounds were chosen for analysis based on their relatively high (or reasonable) probability of being present at the two dig sites. The relative likelihood of finding these compounds at either site was based on personal accounts of personnel familiar with the operations of these areas while actively used.

Significant air levels of the nine target chemicals were found in only one of the trenches, BPL-2, located at the Sodium Burn Pit site. The results of the analysis were as follows:

Compound Analyzed		Level Detected, ppm
1.	Ammonia	40
2.	Toluene	68
3.	Tetrahydrofuran	40
4.	1,1,1-trichloroethane	N.D.
5.	Trichloroethylene	N.D.
6.	Methylene chloride	N.D.
7.	Ethanolamine	22
8.	Carbon tetrachloride	10
9.	Hydrazine	0.5*

*The hydrazine level was detected using a Draeger colorimetric tube and is likely the result of positive interference from ammonia.

All of the above levels were detectable only within the trench; personnel outside the trenches were not exposed to levels of these compounds considered harmful.

Miran 1B information
 (Sheet 1 of 5)

Instruction

MI
 611-093
 April 1985

**MIRAN 1B
 PORTABLE AMBIENT AIR ANALYZER**

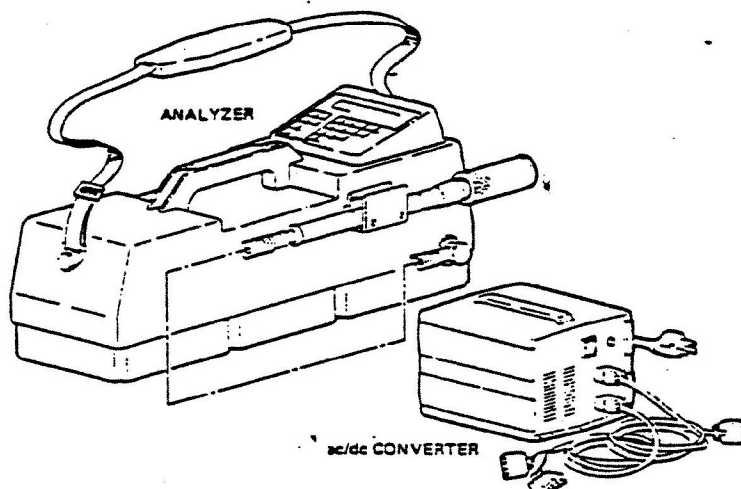


Figure 1. MIRAN 1B Portable Ambient Air Analyzer

INTRODUCTION	1
General Description	1
Standard Specifications	1
INSTRUMENT CHECKOUT	1
Unpacking	1
Instrument Identification	1
Shoulder-Strap Adjustment	3
Use of Filters	3
Initial Setup and Checkout Procedure	3
DISPLAY AND KEYBOARD SUMMARY	5
Display	5
Description	5
Keyed-In Data	5
Cursor	5
Left-Character Symbol	5
Right-Character Symbol	5
Bar Graph	6
Keyboard	6
Function Keys	6
Command Keys	6
Alphanumeric Keys	6

Miran 1B information (Sheet 2 of 5)

MI 611-093
Page 1

INTRODUCTION

General Description

The MIRAN 1B Portable Ambient Air Analyzer is a single-beam infrared spectrometer. It consists of a portable gas analyzer and a separate ac/dc converter as shown in Figure 1. Analyzer portability is provided by an internal nickel-cadmium battery pack. The ac/dc converter allows the analyzer to be powered from an ac supply. It is also used to recharge the battery pack.

The gas analyzer monitors the air in workplace environments to warn personnel if toxic gases are present. It is pre-programmed to measure many of these gases. The analyzer is also user-programmable to measure other gases. Pre-programmed gases are in the analyzer's "fixed library"; user-programmed gases are in the analyzer's "user library".

A microprocessor automatically controls the spectrometer, averages the measurement signal, and calculates absorbance values. Analysis results can be displayed either in parts per million (ppm) or absorbance units (AU).

Standard Specifications

Measurement Range

Concentration: 0 to 99 999 ppm
Absorbance: 0.000 to 2.000 AU.

Measurable Gases

Fixed Library: See Appendix.

User Library: User-programmable to measure up to 10 additional gases.

Output: Digital readout of concentration (ppm), absorbance (AU), or analysis parameters. A connector is provided for 0 to 10 V analog readout of wavelength scan.

Power Requirements (ac/dc converter):

120 V, +10%, -15% at 60 \pm 3 Hz; or
220 V, +10%, -15% at 50 \pm 3 Hz.

Power consumption: 70 W maximum.

Battery Pack

Type: Nickel-cadmium.

Operating Time: Up to 4 hours.

Recharge Time: Between 14 and 16 hours after complete discharge.

Alarms

Operator Error: Single beep

Concentration Alarm*: Upper-limit mode or Geiger-counter mode, as selected.

INSTRUMENT CHECKOUT

Unpacking

Remove the instrument from its shipping container and check it for visible damage. If instrument has been damaged, notify the carrier immediately and request an inspection report. Obtain a signed copy of the report from the carrier. Check the contents of the shipping package against Table 1; there should be one of each item. Immediately report any shortages to Foxboro.

" CAUTION "

To avoid damaging the MIRAN 1B Analyzer during transportation, use original packing. Package all components in same manner as they were when shipped from factory.

Instrument Identification

The data plate is located on the inside of the access door as shown in Figure 2. To open access door, turn latch 1/4 turn counter-clockwise (latch will spring forward); swing door up to open position.

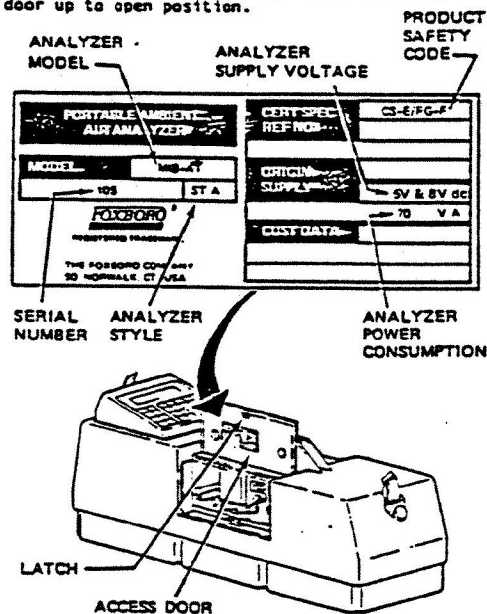


Figure 2. Typical Data Plate

*In upper-limit mode, a series of beeps of constant frequency will be sounded when alarm set point is exceeded. In Geiger-counter mode, beeps of increasing frequency are sounded as alarm set point is approached; beeps of constant maximum frequency are sounded when set point has been exceeded.

Miran 1B information
(Sheet 3 of 5)

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Page A-1APPENDIXFIXED LIBRARY

The following table lists all compounds that are in the fixed library.

Table A-1. Compounds in Fixed Library

COMPOUND	ALPHANUMERIC NAME	RANGE OF CALIBRATION (ppm)	WAVELENGTH (μm)
Acetaldehyde	ACTALD	0 to 400	9.26
Acetic Acid	ACETA	0 to 50	8.72
Acetone	ACETON	0 to 2000	8.48
Acetonitrile	ACETCN	0 to 200	9.68
Acetophenone	ACTOPN	0 to 100	10.70
Acetylene	C2H2	0 to 200	3.05
Acetylene Tetrabromide	ACNBR4	0 to 200	8.99
Acrylonitrile	ACRCN	0 to 20 and 0 to 100	10.67
Ammonia	NH3	0 to 100 and 0 to 500	10.95
Aniline	ANILIN	0 to 20	9.53
Benzaldehyde	BZALDH	0 to 500	8.58
Benzene	BNZENE	0 to 50 and 0 to 200	9.93
Benzyl Chloride	BZCL	0 to 100	9.54
Bromoform	CHBR3	0 to 10	8.96
Butadiene	BUTDEN	0 to 2000	11.10
Butane	BUTANE	0 to 200 and 0 to 2000	10.55
2-Butanone (MEK)	MEK	0 to 250 and 0 to 1000	8.79
Butyl Acetate	BUTAC	0 to 300 and 0 to 600	8.33
n-Butyl Alcohol	BUOH	0 to 200 and 0 to 1000	9.70
Carbon Dioxide	CO2	0 to 2000	4.72
Carbon Disulfide	CS2	0 to 50	4.70
Carbon Monoxide	CO	0 to 100 and 0 to 250	4.76
Carbon Tetrachloride	CCL4	0 to 20 and 0 to 200	12.76
Chlorobenzene	CLBZ	0 to 150	9.40
Chlorobromomethane	CLBRME	0 to 500	8.39
Chlorodifluoromethane	F22	0 to 1000	9.20
Chloroform	CHCL3	0 to 100 and 0 to 500	13.12
m-Cresol	CRESOL	0 to 20	8.88
Cumene	CUMENE	0 to 100	9.90
Cyclohexane	CYHXM	0 to 500	3.41
Cyclopentane	CYPNTN	0 to 500	11.40
Diborane	B2H6	0 to 10	3.83
m-Dichlorobenzene	MCL2BZ	0 to 150	9.47
o-Dichlorobenzene	OCL2BZ	0 to 100	13.55
p-Dichlorobenzene	PCL2BZ	0 to 150	9.30
Dichlorodifluoromethane (R-12)	F12	0 to 5 and 0 to 800	9.30
1,1-Dichloroethane	110CE	0 to 200	9.64
1,2-Dichloroethylene	CL2ETE	0 to 500	12.30
Dichloroethyl Ether	CL2ETH	0 to 50	9.05
Dichloromonofluoromethane (R-21)	F21	0 to 1000	9.50

Miran 1B information
(Sheet 4 of 5)

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Page A-2

Table A-1. Compounds in Fixed Library (Cont.)

COMPOUND	ALPHANUMERIC NAME	RANGE OF CALIBRATION (ppm)	WAVELENGTH (μ m)
Dichlorotetrafluoroethane (R-114)	F114	0 to 1000	8.67
Diethylamine	ET2NH2	0 to 50	8.99
Dimethylacetamide	DMAC	0 to 50	10.10
Dimethylamine	ME2NH2	0 to 50	8.79
Dimethylformamide	DMF	0 to 50	9.36
Dioxane	DIOXAN	0 to 100 and 0 to 500	9.06
Enflurane	ENFLRN	0 to 10 and 0 to 100	8.96
Ethane	ETHANE	0 to 1000	12.20
Ethanolamine	ETOHNM	0 to 100	12.93
2-Ethoxyethyl Acetate	CELAC	0 to 200	8.89
Ethyl Acetate	ETAC	0 to 400 and 0 to 1000	8.32
Ethyl Alcohol	ETOH	0 to 1000 and 0 to 2000	9.67
Ethylbenzene	ETBZN	0 to 200	9.90
Ethyl Chloride	ETCL	0 to 1500	10.50
Ethylene	ETHYLN	0 to 100	10.70
Ethylene Dibromide	ETBR2	0 to 10 and 0 to 50	8.68
Ethylene Dichloride	ETCL2	0 to 100	8.37
Ethylene Oxide	ETO	0 to 10 and 0 to 100	3.30
Ethyl Ether	ETHER	0 to 1000 and 0 to 2000	9.03
Fluorotrichloromethane (R-11)	F11	0 to 2000	10.96
Formaldehyde	HCHO	0 to 20	3.56
Formic Acid	FORMIC	0 to 20	9.36
Halothane	HALTHN	0 to 10 and 0 to 100	12.46
Heptane	HEPTAN	0 to 1000	3.40
Hexane	HEXANE	0 to 1000	3.39
Hydrazine	HYDZ	0 to 100	10.67
Hydrogen Cyanide	HCN	0 to 20	3.03
Hydrogen Fluoride	HF	0 to 50	2.62
Isoflurane	ISOFLN	0 to 10 and 0 to 100	8.84
Isopropyl Alcohol	IPA	0 to 1000 and 0 to 2000	8.94
Isopropyl Ether	IPETH	0 to 1000	9.12
Methane	METHAN	0 to 100 and 0 to 1000	7.70
Methoxyflurane	MOXYFLN	0 to 10 and 0 to 100	12.10
Methyl Acetate	MEAC	0 to 500	9.7
Methyl Acetylene	MEACEN	0 to 1000 and 0 to 5000	3.0
Methyl Acrylate	MEACRY	0 to 50	8.57
Methyl Alcohol	MEOH	0 to 500 and 0 to 1000	9.70
Methylamine	MENH2	0 to 50	3.36
Methyl Bromide	MEBR	0 to 50	7.60
Methyl Cellosolve	MECEL	0 to 50	9.62

Miran 1B information
(Sheet 5 of 5)

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Page A-3

Table A-1. Compounds in Fixed Library (Cont.)

COMPOUND	ALPHANUMERIC NAME	RANGE OF CALIBRATION (ppm)	WAVELENGTH (μm)
Methyl Chloride	MECL	0 to 200 and 0 to 1000	13.59
Methyl Chloroform	111TCE	0 to 500	9.39
Methylene Chloride	MECL2	0 to 1000	13.47
Methyl Iodide	MEI	0 to 40	3.36
Methyl Mercaptan	MESH	0 to 100	3.38
Methyl Methacrylate	MEMAC	0 to 250	8.80
Morpholine	MORPH	0 to 50	9.20
Nitric Oxide	NTRCOX	0 to 100	5.38
Nitrobenzene	NO2BZ	0 to 20	11.94
Nitrogen Dioxide	NO2	0 to 10	6.24
Nitromethane	NO2ME	0 to 200	3.37
Nitrous Oxide	N2O	0 to 100 and 0 to 2000	4.68
Octane	OCTANE	0 to 100 and 0 to 1000	3.40
Pentane	PENTAN	0 to 1500	3.39
Perchloroethylene	PERC	0 to 200 and 0 to 500	11.10
Phosgene	PHOSGN	0 to 5	11.98
Propane	PROPAN	0 to 2000	3.37
n-Propyl Alcohol	PROPOH	0 to 500	9.60
Propylene Oxide	PRENOX	0 to 200	12.16
Pyridine	PYR	0 to 100	9.90
Styrene	STYRN	0 to 200 and 0 to 500	11.10
Sulfur Dioxide	SO2	0 to 100 and 0 to 250	9.00
Sulfur Hexafluoride	SF6	0 to 5 and 0 to 500	10.80
1,1,2,2-Tetrachloro-1,2-difluoroethane (R-112)	F112	0 to 2000	9.90
1,1,2,2-Tetrachloroethane	CL4ETA	0 to 50	8.60
Tetrahydrofuran	THF	0 to 500	9.40
Toluene	TLUENE	0 to 1000	13.89
Total Hydrocarbons	TOTHYD	0 to 1000	3.39
1,1,2-Trichloroethane	CL3ETA	0 to 50	10.90
Trichloroethylene	TRI	0 to 200 and 0 to 2000	10.84
1,1,2-Trichloro-1,2,2-Trifluoroethane (R-113)	F113	0 to 2000	8.70
Trifluoromonobromomethane (R-13B1)	F13B1	0 to 1000	8.54
Vinyl Acetate	VAC	0 to 10	8.42
Vinyl Chloride	VCL	0 to 20	11.30
Vinylidene Chloride	VDC	0 to 20	9.40
Xylene (Xylol)	XYLOL	0 to 200 and 0 to 2000	13.20

Appendix B
Sample Analysis Data

Appendix B1

**Analytical Laboratory Reports —
Volatile Organic Compounds Recovered
from Landfill Well RD-7 Water**

Appendix B1 — Sheet 1 of 8

#0048

CLAYTON ENVIRONMENTAL CONSULTANTS, INC.EPA METHOD 624
PURGEABLE ORGANICS

Sample I.D.: RD-7 Lab No. 870343-02
 Date Sampled: 03/09/87
 Samples Received: 03/11/87
 Samples Analyzed: 03/17/87
 Sample Matrix: Water Detection Limit Factor = 1

Compound	Concentration µg/L (ppb)	Additional Compound	Concentration µg/L (ppb)
Chloromethane	<1	Freon 113	<1
Bromomethane	<1	m-xylene	<2
Vinyl chloride	<1	o-, p-xylene	<2
Chloroethane	<1		
Methylene chloride	<8		
Trichlorofluoromethane	13		
1,1-dichloroethene	<1		
1,1-dichloroethane	<1		
Trans-1,2-dichloroethene	1		
Chloroform	<1		
1,2-dichloroethane	<1		
1,1,1-trichloroethane	<1		
Carbon tetrachloride	<1		
Bromodichloromethane	<1		
1,2-dichloropropane	<3		
Cis-1,3-dichloropropene	<1		
Trichloroethene	25		
Benzene	<1		
Dibromochloromethane	<1		
1,1,2-trichloroethane	<1		
Trans-1,3-dichloropropene	<1		
2-chloroethylvinylether	<1		
Bromoform	<1		
1,1,2,2-tetrachloroethane	<1		
Tetrachloroethene	<1		
Toluene	<1		
Chlorobenzene	<1		
Ethylbenzene	<2		
1,3-dichlorobenzene	<3		
1,2-dichlorobenzene and/or	<3		
1,4-dichlorobenzene	<3		

ND = Not Detected

Appendix B1 — Sheet 2 of 8

GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORTLOG NUMBER
8703.216

TO: G. Matsushita, ext. 5726, MS LB07

DEPT/GROUP: 541

cc: S. Lafflam, R. Jensen, N. Fujikawa, A. Nelson

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >C1812::D3

DATE DUE: 23 Mar 1987

SAMPLED BY: S. Dickens, Groundwater Resources Consultants, Inc.

SAMPLE DESCRIPTION: WELL RD-7

SAMPLED ON: 09 Mar 1987

AT: 13:00 hrs

Quarterly Samples

VOLATILE ORGANIC COMPOUND RESULTS, ug/liter

Analysis date and time: 3/18/87 22:29

Acetone	ND	<20
Benzene	ND	<1
Bromodichloromethane	ND	<1
Bromoform	ND	<1
Bromomethane	ND	<1
Carbon Tetrachloride	ND	<1
Chlorobenzene	ND	<1
Chloroethane	ND	<1
2-Chloroethylvinyl ether	ND	<1
Chloroform	ND	<1
Chloromethane	ND	<1
Dibromochloromethane	ND	<1
1,2-Dichlorobenzene	ND	<4
1,3-Dichlorobenzene	ND	<4
1,4-Dichlorobenzene	ND	<4
1,1-Dichloroethane	ND	<1
1,2-Dichloroethane	ND	<1
1,1-Dichloroethene	ND	<1
trans 1,2-Dichloroethene	ND	<1
1,2-Dichloropropane	ND	<1
cis-1,3-Dichloropropene	ND	<1
trans-1,3-Dichloropropene	ND	<1
Ethyl benzene	ND	<1
Freon-TF	ND	<1
Isopropanol	ND	<20
Methylene chloride	ND	<1
1,1,2,2-Tetrachloroethane	ND	<1
Tetrachloroethene	ND	<1
Toluene	ND	<1
1,1,1-Trichloroethane	ND	<1
1,1,2-Trichloroethane	ND	<1
Trichloroethene	53	<1
Trichlorofluoromethane	ND	<1
Vinyl chloride	ND	<1

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

- NOTES: 1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
 2) TR means the pollutant was detected but was below the quantification level for Method 8240.
 3) ^^ Quantification based on upon comparison of total ion count of the compound with that of the nearest internal standard.
 4) ** Exceeds notification level in parenthesis.

APPROVED: _____

Manager

Beverly E. Hurt
SSFL Analytical Chemistry

Appendix B1 — Sheet 3 of 8

CLAYTON ENVIRONMENTAL CONSULTANTS, INC.7230-ZS
GRC RocketdyneEPA METHOD 501
PURGEABLE HALOCARBONS

Sample I.D.: RD-7 CEC Lab No.: 861265-03

Samples Received: 12/12/86

Samples Analyzed: 12/13/86

Sample Matrix: Water Detection Limit Factor = 1

Compound	Concentration ug/L (ppb)	Additional Compound	Concentration ug/L (ppb)
Chloromethane	ND	*Freon 113	ND
Bromomethane	ND		
Vinyl chloride	ND		
Chloroethane	ND		
Methylene chloride	ND		
1,1-dichloroethene	ND		
1,1-dichloroethane	ND		
Trans-1,2-dichloroethene	ND		
Chloroform	ND		
1,2-dichloroethane	ND		
1,1,1-trichloroethane	ND		
Carbon tetrachloride	ND		
Bromodichloromethane	ND		
1,2-dichloropropane	ND		
Cis-1,3-dichloropropane	ND		
Trichloroethene	26		
Dibromochloromethane	ND		
1,1,2-trichloroethane	ND		
trans 1,3-dichloropropane	ND		
2-chloroethylvinylether	ND		
Bromoform	ND		
Tetrachloroethene	ND		
1,1,2,2-tetrachloroethane	ND		
Chlorobenzene	ND		
1,3-dichlorobenzene	ND		
1,2-dichlorobenzene	ND		
1,4-dichlorobenzene	ND		
Dichlorodifluoromethane	ND		
Trichlorofluoromethane	ND		

ND = Not Detected

L601.FRM (12/12/86)

Appendix B1 — Sheet 4 of 8

GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORTLOG NUMBER
8607.083

TO: Environmental Control Unit, ext. 178-5726, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >G1008::D2

DATE DUE: 16 July 1986

SAMPLED BY: Jim Duffield of GRC

SAMPLE DESCRIPTION: WELL RD-7

SAMPLED ON: 03 July 1986

AT: 1410 hrs

SSFL Wells

VOLATILE ORGANIC COMPOUND	RESULTS, ug/liter
---------------------------	-------------------

Analysis date and time: 7/10/86 15:52

Acetone	ND <10
Benzene	ND <1
Bromodichloromethane	ND <1
Bromoform	ND <1
Bromomethane	ND <1
Carbon Tetrachloride	ND <1
Chlorobenzene	ND <1
Chloroethane	ND <1
2-Chloroethylvinyl ether	ND <1
Chloroform	ND <1
Chloromethane	ND <1
Dibromochloromethane	ND <1
1,2-Dichlorobenzene	ND <4
1,3-Dichlorobenzene	ND <4
1,4-Dichlorobenzene	ND <4
1,1-Dichloroethane	ND <1
1,2-Dichloroethane	ND <1
1,1-Dichloroethene	ND <1
trans 1,2-Dichloroethene	1.2 ND <1
1,2-Dichloropropane	ND <1
cis-1,3-Dichloropropane	ND <1
trans-1,3-Dichloropropane	ND <1
Ethyl benzene	ND <1
Freon-TF	3.6 ND <20
Isopropanol	ND <1
Methylene chloride	ND <1
1,1,2,2-Tetrachloroethane	ND <1
Tetrachloroethene	ND <1
Toluene	ND <1
1,1,1-Trichloroethane	ND <1
1,1,2-Trichloroethane	ND <1
Trichloroethene	20.7 ND <1
Trichlorofluoromethane	ND <1
Vinyl chloride	ND <1

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240. Due to instrumental problems, the results DO NOT MEET the required QUALITY CONTROL criteria.

- NOTES: 1) ND means the pollutant was not detected and hence not quantified using EPA approved methodology.
 2) TR means the pollutant was detected but was below the quantification level for Method 8240.
 3) ^^ Quantification based on upon comparison of total ion count of the compound with that of the nearest internal standard.
 4) ** Exceeds notification level in parenthesis.

APPROVED: _____

N. S. Fujikawa
Manager

 SSFL Analytical Chemistry

Appendix B1 — Sheet 5 of 8

GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORTLOG NUMBER
8608.083

TO: Gene Matsushita, ext. 5726, mail stop LB07

DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >H2107::D3

DATE DUE: 14 Aug 1986

SAMPLED BY: J. Duffield, Groundwater Resources Consultants, Inc.

SAMPLE DESCRIPTION: WELL RD-7

SAMPLED ON: 06 Aug 1986

AT: 20:10 hrs

RD Series Wells

VOLATILE ORGANIC COMPOUND RESULTS, ug/liter

Analysis date and time: 8/21/86 21:21

Acetone	ND	<20
Benzene	ND	<1
Bromodichloromethane	ND	<1
Bromoform	ND	<1
Bromomethane	ND	<1
Carbon Tetrachloride	ND	<1
Chlorobenzene	ND	<1
Chloroethane	ND	<1
2-Chloroethylvinyl ether	ND	<1
Chloroform	ND	<1
Chloromethane	ND	<1
Dibromochloromethane	ND	<1
1,2-Dichlorobenzene	ND	<4
1,3-Dichlorobenzene	ND	<4
1,4-Dichlorobenzene	ND	<4
1,1-Dichloroethane	ND	<1
1,2-Dichloroethane	ND	<1
1,1-Dichloroethene	ND	<1
trans 1,2-Dichloroethene	ND	<1
1,2-Dichloropropene	ND	<1
cis-1,3-Dichloropropene	ND	<1
trans-1,3-Dichloropropene	ND	<1
Ethyl benzene	ND	<1
Freon-TF	13	
Isopropanol	ND	<20
Methylene chloride	ND	<1
1,1,2,2-Tetrachloroethane	ND	<1
Tetrachloroethene	ND	<1
Toluene	ND	<1
1,1,1-Trichloroethane	ND	<1
1,1,2-Trichloroethane	ND	<1
** Trichloroethene	** 27	(5.0 UG/L)
Trichlorofluoromethane	ND	<1
Vinyl chloride	ND	<1

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240. The sample did not meet all of the quality control criteria required by SW-846 and the results may not be used for regulatory compliance purposes.

- NOTES: 1) ND means the pollutant was not detected and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) ^^ Quantification based on upon comparison of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED:

MADIT

Bessie L. L. L.

Appendix B1 — Sheet 6 of 8

TABLE D-50

RESULTS OF ANALYSES FOR COMMON ION CONSTITUENTS IN
WATER SAMPLES COLLECTED FROM CHATSWORTH FORMATION WELL RD-7

CONSTITUENT (milligrams per liter)	DATE SAMPLED
	<u>07-08-86</u>
Calcium.....	119
Magnesium.....	17
Sodium.....	37
Potassium.....	3.8
Carbonate.....	0
Bicarbonate.....	328
Chloride.....	46.0
Sulfate.....	100
Nitrate.....	12.0
Fluoride.....	0.32
Boron.....	-0.10
Silica.....	23
TDS @ 180°C (lab).....	550
EC @ 25°C (lab).....	780
pH (field).....	—
Temperature, °C (field).....	—
Laboratory.....	EC

EC = EC Laboratories

(-) = Less than; numerical value is the Limit of Detection for that compound

(—) = Analysis not performed

GROUNDWATER RESOURCES CONSULTANTS, INC

Appendix B1 — Sheet 7 of 8

TABLE E-50

RESULTS OF ANALYSES FOR TRACE METAL CONSTITUENTS AND CYANIDE
IN WATER SAMPLES COLLECTED FROM CHATSWORTH FORMATION WELL RD-7

CONSTITUENT (milligrams per liter)	DATE SAMPLED
	07-03-86
Antimony.....	- 1.0
Arsenic.....	- 0.01
Barium.....	- 0.5
Beryllium.....	- 0.01
Cadmium.....	- 0.005
Chromium (total).....	- 0.01
Copper.....	- 0.9
Iron.....	- 0.5
Lead.....	- 0.01
Manganese.....	0.1
Mercury.....	- 0.0002
Molybdenum.....	- 0.1
Nickel.....	- 0.05
Selenium.....	- 0.005
Silver.....	- 0.01
Strontium.....	0.2
Thallium.....	- 0.5
Zinc.....	0.98
Cyanide.....	—
Laboratory.....	EC

(-) = Less than; numerical value is the Limit of Detection for that compound

(—) = Analysis not performed

GROUNDWATER RESOURCES CONSULTANTS INC

Appendix B1 — Sheet 8 of 8

TABLE F-53
RESULTS OF ANALYSES FOR EPA PRIORITY VOLATILE ORGANIC COMPOUNDS
IN WATER SAMPLES COLLECTED FROM CHATSWORTH FORMATION MONITOR WELL FD-7

ORGANIC COMPOUND (micrograms per liter)	DATE SAMPLED.....				
	01-23-86	07-08-86	07-02-86	08-06-86	08-06-86
Acrolein.....	—	—	—	—	—
Acrylonitrile.....	—	—	—	—	—
Benzene.....	-1	-1	-1	-1	-1
Bromodichloromethane.....	-1	-1	-1	-1	-1
Bromoforn.....	-1	-1	-1	-1	-1
Bromoethane.....	-1	-1	-1	-1	-1
Carbon tetrachloride.....	-1	-1	-1	-1	-1
Chlorobenzene.....	-1	-1	-1	-1	-1
Chloroethane.....	-1	-1	-2	-2	-1
2-Chloroethylvinyl ether.....	-1	-1	-1	-1	-1
Chloroforn.....	-1	-1	-1	-1	-1
Chloromethane.....	-1	-1	-1	-1	-1
Dibromochloromethane.....	-1	-1	-1	-1	-1
1,1-Dichloroethane.....	-1	-1	-1	-1	-1
1,2-Dichloroethane.....	-1	-1	-1	-1	-1
1,1-Dichloroethylene.....	-1	-1	-1	-1	-1
Trans-1,2-Dichloroethylene.....	-1	1	3	-1	-1
1,2-Dichloropropane.....	-1	-1	-3	-3	-1
1,3-Dichloropropylene.....	-1	-1	-1	-1	-1
Ethylbenzene.....	-2	-1	-2	-2	-1
Methylene chloride.....	-2	-1	-1	-1	-1
1,1,2,2-Tetrachloroethane.....	-1	-1	-1	-1	-1
Tetrachloroethylene.....	-1	-1	-1	-1	-1
1,1,1-Trichloroethane.....	-1	-1	-1	-1	-1
1,1,2-Trichloroethane.....	-1	-1	-1	-1	-1
Trichloroethylene.....	16	21	130	24	27
Toluene.....	13	-1	8	-1	-1
Vinyl chloride.....	-1	-1	-1	-1	-1
Laboratory.....	McKesson	SSFL*	McKesson	McKesson	SSFL*

McKesson = McKesson Environmental Services

SSFL = Santa Susana Field Laboratory Analytical Unit

(-) = Less than; numerical value represents the Limit of Detection for that compound

(—) = Analysis not reported

* = Uses EPA Methods 5030 & 8240

GROUNDWATER RESOURCES CONSULTANTS, INC.

Appendix B2
SSFL Analytical Chemistry Reports
of Analytical Results — Landfill Soil Samples

Appendix B2 — Sheet 1 of 8

GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORTLOG NUMBER
8703.452
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07

DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >00806::01

DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.

SAMPLE DESCRIPTION: LFR-1

SAMPLED ON: 30 March 1987

AT: 14:27 hrs

Soil Sample

VOLATILE ORGANIC COMPOUND RESULTS, mg/kg

Analysis date and time: 4/08/87 14:54 Quant. dil. factor = .0340

Acetone	ND <0.60
Benzene	ND <0.03
Bromodichlormethane	ND <0.03
Bromoform	ND <0.03
Bromomethane	ND <0.03
Carbon Tetrachloride	ND <0.03
Chlorobenzene	ND <0.03
Chloroethane	ND <0.03
2-Chloroethylvinyl ether	ND <0.03
Chloroform	ND <0.03
Chloromethane	ND <0.03
Dibromochlormethane	ND <0.03
1,2-Dichlorobenzene	ND <0.10
1,3-Dichlorobenzene	ND <0.10
1,4-Dichlorobenzene	ND <0.10
1,1-Dichloroethane	ND <0.03
1,2-Dichloroethane	ND <0.03
1,1-Dichloroethene	ND <0.03
trans 1,2-Dichloroethene	ND <0.03
1,2-Dichloropropane	ND <0.03
cis-1,3-Dichloropropene	ND <0.03
trans-1,3-Dichloropropene	ND <0.03
Ethyl benzene	ND <0.03
Freon-TF	ND <0.03
Isopropanol	ND <0.60
Methylene chloride	ND <0.03
1,1,2,2-Tetrachloroethane	ND <0.03
Tetrachloroethene	ND <0.03
Toluene	ND <0.03
1,1,1-Trichloroethane	ND <0.03
1,1,2-Trichloroethane	ND <0.03
Trichloroethene	ND <0.03
Trichlorofluoromethane	0.9
Vinyl chloride	ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

- NOTES: 1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
 2) TR means the pollutant was detected but was below the quantification level for Method 8240.
 3) * Quantification based on upon comparison of total ion count of the compound with that of the nearest internal standard.
 4) ** Exceeds notification level in parenthesis.

APPROVED: _____

M.D. Rhoten
ManagerSincerely R. Rhoten
SSFL Analytical Chemistry

Appendix B2 — Sheet 2 of 8

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8703.452

continued

page 2

LFR-1

ANALYTICAL RESULTS FOR 8703.452WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.4
NICKEL (SW846-7420), mg/l	0.1
CHROMIUM (SW846-7190), mg/l	ND<0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.2
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	73
NICKEL (SW846-7420), mg/kg	ND<5
CHROMIUM (SW846-7190), mg/kg	ND<5
CADMIUM (SW846-7130), mg/kg	ND<0.5
LEAD (SW846-7420), mg/kg	TR<10
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 EXTRACT)	7.4
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OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	76
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DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	ND<10
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POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	ND<0.1
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TERPHENYLS (ORTHO, META, & PARA), mg/kg (SW846-3550, MODIFIED)	ND<10
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BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10
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Appendix B2 — Sheet 3 of 8

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORTLOG NUMBER
8703.453
page 1 of 2

TO: S. Lafflam, ext. 6163, MS L807

DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >D0807::D1

DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.

SAMPLE DESCRIPTION: LFR-2

SAMPLED ON: 30 March 1987

AT: 14:41 hrs

Soil Sample

VOLATILE ORGANIC COMPOUND RESULTS, mg/kg

Analysis date and time: 4/08/87 15:52 Quant. dil. factor = .0300

Acetone	ND <0.60
Benzene	ND <0.03
Bromodichloromethane	ND <0.03
Bromoform	ND <0.03
Bromomethane	ND <0.03
Carbon Tetrachloride	ND <0.03
Chlorobenzene	ND <0.03
Chloroethane	ND <0.03
2-Chloroethylvinyl ether	ND <0.03
Chloroform	ND <0.03
Chloromethane	ND <0.03
Dibromochloromethane	ND <0.03
1,2-Dichlorobenzene	ND <0.10
1,3-Dichlorobenzene	ND <0.10
1,4-Dichlorobenzene	ND <0.10
1,1-Dichloroethane	ND <0.03
1,2-Dichloroethane	ND <0.03
1,1-Dichloroethene	ND <0.03
trans 1,2-Dichloroethene	ND <0.03
1,2-Dichloropropane	ND <0.03
cis-1,3-Dichloropropene	ND <0.03
trans-1,3-Dichloropropene	ND <0.03
Ethyl benzene	ND <0.03
Freon-TF	ND <0.03
Isopropanol	ND <0.60
Methylene chloride	ND <0.03
1,1,2,2-Tetrachloroethane	ND <0.03
Tetrachloroethene	ND <0.03
Toluene	ND <0.03
1,1,1-Trichloroethane	ND <0.03
1,1,2-Trichloroethane	ND <0.03
Trichloroethene	ND <0.03
Trichlorofluoromethane	ND <0.03
Vinyl chloride	ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

- NOTES: 1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
 2) TR means the pollutant was detected but was below the quantification level for Method 8240.
 3) ** Quantification based on upon comparison of total ion count of the compound with that of the nearest internal standard.
 4) ** Exceeds notification level in parenthesis.

APPROVED: _____

Manager

Beverly R. Curt
 SSFL Analytical Chemistry

Appendix B2 — Sheet 4 of 8

LFR-2

8703.453

continued

page 2

ANALYTICAL RESULTS FOR 8703.453

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.1
NICKEL (SW846-7420), mg/l	0.05
CHROMIUM (SW846-7190), mg/l	ND<0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.1
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	20
NICKEL (SW846-7420), mg/kg	27
CHROMIUM (SW846-7190), mg/kg	12
CADMIUM (SW846-7130), mg/kg	2
LEAD (SW846-7420), mg/kg	10
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 extract)	8.1
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OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	42
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DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	ND<10
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POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3050)	ND<0.1
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TERPHENYLS (ORTHO, META, & PARA), mg/kg	ND<10
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BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10
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Appendix B2 — Sheet 5 of 8

GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORTLOG NUMBER
8703.454
page 1 of 2

TO: S. Lafflam, ext. 6163, MS L807

DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >D0808::D1

DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.

SAMPLE DESCRIPTION: LFR-3

SAMPLED ON: 30 March 1987

AT: 14:53 hrs

Soil Sample

VOLATILE ORGANIC COMPOUND RESULTS, mg/kg

Analysis date and time: 4/08/87 17:44 Quant. dil. factor = .0300

Acetone	ND <0.60
Benzene	ND <0.03
Bromodichloromethane	ND <0.03
Bromoform	ND <0.03
Bromomethane	ND <0.03
Carbon Tetrachloride	ND <0.03
Chlorobenzene	ND <0.03
Chloroethane	ND <0.03
2-Chloroethylvinyl ether	ND <0.03
Chloroform	ND <0.03
Chloromethane	ND <0.03
Dibromochloromethane	ND <0.03
1,2-Dichlorobenzene	ND <0.10
1,3-Dichlorobenzene	ND <0.10
1,4-Dichlorobenzene	ND <0.10
1,1-Dichloroethane	ND <0.03
1,2-Dichloroethane	ND <0.03
1,1-Dichloroethene	ND <0.03
trans 1,2-Dichloroethene	ND <0.03
1,2-Dichloropropane	ND <0.03
cis-1,3-Dichloropropene	ND <0.03
trans-1,3-Dichloropropene	ND <0.03
Ethyl benzene	ND <0.03
Freon-TF	ND <0.03
Isopropanol	ND <0.60
Methylene chloride	ND <0.03
1,1,2,2-Tetrachloroethane	ND <0.03
Tetrachloroethene	ND <0.03
Toluene	ND <0.03
1,1,1-Trichloroethane	ND <0.03
1,1,2-Trichloroethane	ND <0.03
Trichloroethene	ND <0.03
Trichlorofluoromethane	ND <0.03
Vinyl chloride	ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

- NOTES: 1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) ** Quantification based on upon comparison of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M.D. [Signature]
ManagerBeverly K. [Signature]
SSFL Analytical Chemistry

Appendix B2 — Sheet 6 of 8

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LFR-3

8703.454

continued

page 2

ANALYTICAL RESULTS FOR 8703.454

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.2
NICKEL (SW846-7420), mg/l	ND<0.05
CHROMIUM (SW846-7190), mg/l	ND<0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.3
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	93
NICKEL (SW846-7420), mg/kg	12
CHROMIUM (SW846-7190), mg/kg	7
CADMIUM (SW846-7130), mg/kg	1
LEAD (SW846-7420), mg/kg	13
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 EXTRACT)	7.8
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OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	1100
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DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	ND<10
--	-------

POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	ND<0.1
--	--------

TERPHENYLS (ORTHO, META, & PARA), mg/kg	ND<10
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BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10
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Appendix B2 — Sheet 7 of 8

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORTLOG NUMBER
8703.475
page 1 of 2

TO: S. Lafflam, ext. 6163, MS L807

DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >D0810::D1

DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.

SAMPLE DESCRIPTION: LRF-6

SAMPLED ON: 31 March 1987

AT: 10:05 hrs

Soil Sample

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg
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Analysis date and time: 4/08/87 20:38 Quant. dil. factor = .0290

Acetone	ND <0.060
Benzene	ND <0.03
Bromodichloromethane	ND <0.03
Bromoform	ND <0.03
Bromomethane	ND <0.03
Carbon Tetrachloride	ND <0.03
Chlorobenzene	ND <0.03
Chloroethane	ND <0.03
2-Chloroethylvinyl ether	ND <0.03
Chloroform	ND <0.03
Chloromethane	ND <0.03
Dibromochloromethane	ND <0.03
1,2-Dichlorobenzene	ND <0.10
1,3-Dichlorobenzene	ND <0.10
1,4-Dichlorobenzene	ND <0.10
1,1-Dichloroethane	ND <0.03
1,2-Dichloroethane	ND <0.03
1,1-Dichloroethene	ND <0.03
trans 1,2-Dichloroethene	ND <0.03
1,2-Dichloropropane	ND <0.03
cis-1,3-Dichloropropene	ND <0.03
trans-1,3-Dichloropropene	ND <0.03
Ethyl benzene	ND <0.03
Freon-TF	ND <0.03
Isopropanol	ND <0.60
Methylene chloride	ND <0.03
1,1,2,2-Tetrachloroethane	ND <0.03
Tetrachloroethene	ND <0.03
Toluene	ND <0.03
1,1,1-Trichloroethane	ND <0.03
1,1,2-Trichloroethane	ND <0.03
Trichloroethene	ND <0.03
Trichlorofluoromethane	ND <0.03
Vinyl chloride	ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

- NOTES: 1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
 2) TR means the pollutant was detected but was below the quantification level for Method 8240.
 3) * Quantification based on upon comparison of total ion count of the compound with that of the nearest internal standard.
 4) ** Exceeds notification level in parenthesis.

APPROVED: _____

Manager

 SSFL Analytical Chemistry

Appendix B2 — Sheet 8 of 8

LFR-6

8703.475

continued

page 2

ANALYTICAL RESULTS FOR 8703.475

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.1
NICKEL (SW846-7420), mg/l	0.05
CHROMIUM (SW846-7190), mg/l	ND<0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	ND<0.1
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	34
NICKEL (SW846-7420), mg/kg	16
CHROMIUM (SW846-7190), mg/kg	8
CADMIUM (SW846-7130), mg/kg	1
LEAD (SW846-7420), mg/kg	8
MERCURY (SW846-7471), mg/kg	ND<0.1
pH (SW846-9040 1:1 EXTRACT)	7.3
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	500
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	ND<10
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	ND<0.1
TERPHENYLS (ORTHO, META, & PARA), mg/kg	ND<10
BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10

Appendix B3

**SSFL Analytical Chemistry Laboratory Reports —
Analyses of Burn Pit Area Soil Samples**