

REMEDIAL INVESTIGATION

AT THE

GLOBAL LANDFILL SITE

OLD BRIDGE (T), MIDDLESEX (C), NEW JERSEY



NJDEPE TERM CONTRACT X-113

PREPARED FOR

**NEW JERSEY DEPARTMENT OF
ENVIRONMENTAL PROTECTION AND ENERGY**

555763



TASK 3
SAMPLING REPORT
APPENDICES B-M
JUNE 1992

URS
CONSULTANTS, INC.
G1418

APPENDIX B

LOCATIONAL SURVEY DATA FOR SAMPLING POINTS

TABLE B-1

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
MW-1A	588677^	2106212^	55.63	57.98	57.82
MW-2A	587929^	2107388^	7.30	8.85	8.56
MW-2S	587935^	2107407^	6.33	8.82	8.74
MW-3A	587425.60	2107197.38	11.88	13.41	13.26
MW-3S	587412.00	2107200.80	11.74	14.83	14.32
MW-4A	586645^	2106633^	8.95	10.43	10.27
MW-4S	586619^	2106665^	7.41	10.12	10.11
MW-5D	586759^	2106122^	5.71	8.31	7.90
MW-5S	586752^	2106073^	7.78	9.31	9.13
MW-6D	587805^	2105472^	11.87	14.70	14.58
MW-6S	587830^	2105481^	12.39	15.37	15.12
MW-7D	588149^	2105612^	14.51	17.25	17.01
MW-7S	588162^	2105601^	14.40	16.45	16.27
MW-8D	588256^	2106857^	21.54	23.04	22.85
MW-8S	588255^	2106872^	21.58	23.56	23.29
MW-9S	588150^	2105134^	18.05	19.41	19.14

TABLE B-1 (Continued)

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
B-8	588212.63	2105402.38	14.68	NR	NR
B-9	588050.87	2105592.99	16.74	NR	NR
B-10	588069.03	2105537.58	15.99	NR	NR
B-11	588431.08	2106585.77	23.97	NR	NR
SG-1	586631.34	2107182.76	7.48	@ 0.00	Top of Gauge
SG-2	587800.31	2107742.91	5.37	@ 0.00	Top of Gauge
S-1	587865.72	2107460.80	NR	NR	NR
S-2	588670^^	2108389^^	NR	NR	NR
S-3	588999^^	2109238^^	NR	NR	NR
S-4	587217.01	2105634.38	NR	NR	NR
S-5	586782.66	2106029.68	NR	NR	NR
S-6	586561.38	2106634.61	NR	NR	NR
S-7	586752.69	2107198.47	NR	NR	NR
S-8	588026.30	2107431.29	NR	NR	NR
S-9	586664.68	2107340.93	NR	NR	NR
S-10	584077^^	2106696^^	NR	NR	NR

TABLE B-1 (Continued)

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
A1	587473.78	2106819.23	NR	NR	NR
A2	588053.88	2106558.70	NR	NR	NR
A3	587860.01	2106180.99	NR	NR	NR
A4	586903.31	2106515.73	NR	NR	NR
A5	587815.61	2106981.62	NR	NR	NR
A6	587708.00	2106559.62	NR	NR	NR
A7	587572.10	2106183.42	NR	NR	NR
A8	587504.15	2105995.31	NR	NR	NR

Legend/Abbreviations

^ Scaled from a map in Killam (1989)
 ^^ Located on aerial photograph using physical features
 * New Jersey State Plane Coordinates
 ** Well Abandoned and Sealed
 B Boring
 SG Stream Gauge

S Surface Water/Sediment Sampling Location
 SS Surface Soil Sampling Location
 LS Leachate Seep Sampling Location
 WB Surveyed Wetland Boundary
 NR Not Required
 MW Monitoring Well
 A Air Sampling Location (Flux Chamber)

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):

2 9 - 2 6 4 9 5 -

This number must be permanently affixed to the well casing.

Longitude (one-half of a second):

West 74°-17'-17.0"

Latitude (one-half of a second):

North 40°-26'-51"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

16.91

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:

14.24

Owners Well Number (As shown on application or plans):

MW - 10SR

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSED

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation): 2 9 - 2 6 2 5 8 -
This number must be permanently affixed to the well casing.

Longitude (one-half of a second): West 74°-17'-09.5"

Latitude (one-half of a second): North 40°-26'-50.0"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot): 28.37

Source of elevation datum (benchmark, etc.) New Jersey Geodetic Control Survey (NJGSC)
If an alternate datum has been approved by the Department, identify here and give approximated elevation: Elev. 115.33 (FRED-4)

Approx. Elevation: 25.48

Owners Well Number (As shown on application or plans): MW - 12S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


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ORIGINAL EMBOSSED

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 5 9 -

Longitude (one-half of a second):

West 74°-16'-57.5"

Latitude (one-half of a second):
Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

North 40°-26'-38.5"

12.40

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:

9.86

Owners Well Number (As shown on application or plans):

MW - 14D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


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Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
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PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSED

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 6 0 -

Longitude (one-half of a second):

West 74°-17'-11.5"

Latitude (one-half of a second):
Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

North 40°-26'-41.0"

14.89

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:

12.16

Owners Well Number (As shown on application or plans):

MW - 15D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSED

APPENDIX C

SOIL GAS SURVEY DATA

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
50	0	BL	10.0	ND	ND	ND	3	5:06	5-11-91	C&D concrete and metal
75	0	BL	>2000	0.6	ND	100	3	4:51	5-11-91	C&D
75	30	R	>2000	ND	ND	100	3	4:57	5-11-91	
75	60	R	ND	ND	ND	ND	3	5:02	5-11-91	C&D concrete and metal
100	0	BL	105	ND	ND	ND	3	4:45	5-11-91	Sandy soil
100	30	L	>1200	ND	ND	12	3	7:55	5-12-91	Dry sandy soil
100	30	R	ND	ND	ND	ND	3	4:41	5-11-91	Sandy soil
125	0	BL	>2000	ND	ND	60	3	4:22	5-11-91	Sandy soil
125	30	L	22 (1)	ND	ND	ND	2	8:09	5-12-91	Refusal 7x road c&d
125	30	R	ND	ND	ND	ND	3	4:26	5-11-91	Sandy soil
125	60	R	4.5	ND	ND	ND	3	4:35	5-11-91	Sandy soil
150	0	BL	>2000	ND	ND	60	3	4:16	5-11-91	Sandy soil
150	30	L	20	ND	ND	ND	2	8:19	5-12-91	Refusal 3x road c&d
150	30	R	ND	ND	ND	ND	3	4:10	5-11-91	Sandy soil
175	0	BL	0.2	ND	ND	ND	3	3:55	5-11-91	Sandy fill wood and concrete
175	30	L	>2000	ND	ND	35	2	8:29	5-12-91	Refusal 3x road c&d
175	60	L	>2000 (2)	0.4	ND	23	3	8:39	5-12-91	Dry sandy gravel rock frag
175	30	R	ND	ND	ND	ND	3	4:01	5-11-91	Sandy soil
200	0	BL	>2000	ND	ND	100	3	3:42	5-11-91	Sandy soil
200	30	L	30	ND	ND	ND	3	9:02	5-12-91	Dry sandy gravel rock frag
200	60	L	10	0.2	ND	ND	3	8:49	5-12-91	Dry sandy gravel rock frag
200	30	R	30	ND	ND	ND	3	3:35	5-11-91	Mounded sand
225	0	BL	ND	ND	ND	ND	2	3:11	5-11-91	Water at 2.5'-3'
225	30	L	26	ND	ND	ND	3	9:10	5-12-91	Sandy moist soil
225	60	L	130	0.3	ND	ND	3	9:16	5-12-91	Sandy moist soil
225	30	R	>2000	ND	12.0	100	3	3:15	5-11-91	Mounded sand
250	0	BL	0.6	ND	ND	ND	3	3:00	5-11-91	Sandy cover fill
250	30	L	>2000	ND	ND	100	3	9:40	5-12-91	Sandy moist soil
250	60	L	>2000	0.1	ND	55	2	9:34	5-12-91	Refusal 3x road c&d
250	90	L	>2000	ND	ND	47	3	9:25	5-12-91	Sandy moist soil
250	30	R	320	ND	ND	ND	3	3:06	5-11-91	Mounded soil
275	0	BL	ND	ND	ND	ND	3	2:54	5-11-91	Sand cover fill concrete
275	30	L	>2000 (3)	ND	ND	19	3	9:46	5-12-91	Sandy moist soil
275	60	L	>2000	1.2	28	100	3	9:52	5-12-91	Black sludge came up on probe; Refusal 2x road, sulfide odor

(1) - Ambient = 5 ppm
(2) - Ambient = 20 ppm

(3) - Ambient = 4.5 ppm

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
425	150	L	>2000	ND	ND	100	2	2:30	5-12-91	Near road refusal 3x fill
425	30	R	>2000	ND	ND	4	3	12:01	5-11-91	Fill present
450	0	BL	>2000	ND	ND	55	3	11:25	5-11-91	Open hole measure .5' blgs., rocks and bricks on surface
450	30	L	0.4	ND	ND	ND	3	3:28	5-12-91	Sandy and fill; wood & concrete
450	60	L	18	ND	ND	ND	3	3:24	5-12-91	Sandy and fill; wood & concrete
450	90	L	>2000	ND	ND	26	3	3:15	5-12-91	Sandy and fill; wood & concrete
450	120	L	ND	ND	ND	ND	3	3:05	5-12-91	Sandy and fill; wood & concrete
450	150	L	>2000	ND	ND	100	3	2:55	5-12-91	Sandy and fill; wood & concrete
450	180	L	>2000	ND	ND	100	2	2:45	5-12-91	Near road, refusal 3x fill
450	30	R	>2000	ND	ND	100	3	11:32	5-11-91	Open hole measure .5' blgs., rocks and bricks on surface
450	60	R	600	ND	ND	2	3	11:45	5-11-91	Probe at 3'
475	0	BL	>2000	ND	ND	ND	3	10:56	5-11-91	Debris: bricks, wood, metal; Sandy moist soil
475	30	L	0.4	0.1	ND	ND	3	3:32	5-12-91	Sandy and fill; debris wood concrete
475	60	L	0.2	ND	ND	ND	3	3:36	5-12-91	Sandy and fill; debris wood concrete
475	90	L	>2000	0.2	ND	100	3	3:42	5-12-91	Sandy and fill; debris wood concrete
475	120	L	>2000	ND	ND	ND	3	3:50	5-12-91	Sandy moist soil
475	150	L	2.2	ND	ND	ND	3	3:56	5-12-91	Sandy moist soil
475	180	L	>2000	ND	ND	100	3	4:01	5-12-91	Sandy moist soil
475	30	R	0.8	ND	ND	ND	3	10:51	5-11-91	Moist, sandy
475	60	R	0.2	ND	ND	ND	3	10:45	5-11-91	Moist, sandy
475	90	R	ND	ND	ND	ND	3	10:38	5-11-91	Moist, sandy
500	0	BL	0.1	ND	ND	ND	3	10:18	5-11-91	Moist, sandy
500	30	L	2.2	0.4	ND	ND	3	4:46	5-12-91	Fill: wood, metal, concrete
500	60	L	ND	ND	ND	ND	3	4:40	5-12-91	Fill: wood, metal, concrete
500	90	L	11.0	ND	ND	ND	3	4:30	5-12-91	Fill: wood, metal, concrete
500	120	L	>2000	ND	ND	100	3	4:25	5-12-91	Sandy moist soil
500	150	L	>2000	0.4	ND	100	3	4:15	5-12-91	Sandy moist soil
500	180	L	>2000	ND	ND	30	3	4:10	5-12-91	Sandy moist soil
500	210	L	25.0	ND	ND	ND	3	4:06	5-12-91	Tar-like black material at 2'
500	30	R	ND	ND	ND	ND	3	10:25	5-11-91	Moist, sandy
500	60	R	ND	ND	ND	ND	3	10:30	5-11-91	Moist, sandy
500	90	R	ND	ND	ND	ND	3	10:35	5-11-91	Moist, sandy
525	0	BL	8.2	ND	ND	ND	3	10:10	5-11-91	Moist, sandy
525	30	L	2.4	0.1	ND	ND	3	4:50	5-12-91	Sandy soil fill c&d
525	60	L	ND	ND	ND	ND	3	4:54	5-12-91	Sandy soil fill c&d
525	90	L	1200	ND	ND	10	3	4:57	5-12-91	Sandy soil fill c&d
525	120	L	>2000	0.1	ND	100	3	5:00	5-12-91	Sandy soil fill c&d

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
625	60	L	0.4	ND	ND	ND	3	11:08	5-13-91	Sandy moist soil fill
625	90	L	ND	ND	ND	ND	3	11:15	5-13-91	Sandy moist soil fill
625	120	L	>2000	ND	ND	ND	3	11:19	5-13-91	Sandy moist soil fill
625	150	L	>2000	1.0	ND	100	3	11:25	5-13-91	Sandy moist soil fill
625	180	L	>2000	1.0	ND	100	3	11:31	5-13-91	Black material on bottom 1" of probe
625	210	L	>2000	ND	ND	100	3	11:50	5-13-91	Sandy moist soil
625	240	L	>2000	ND	ND	100	3	12:02	5-13-91	Sandy moist soil;debris
625	270	L	1130	4.1	2.2	100	3	12:05	5-13-91	Sandy moist soil;debris
650	0	BL	ND	ND	ND	ND	3	9:15	5-11-91	Sandy, moist, very firm soil
650	30	L	3.2	ND	ND	ND	3	12:56	5-13-91	Sandy moist soil fill
650	60	L	17.0	ND	ND	ND	3	12:50	5-13-91	Sandy moist soil
650	90	L	4.8	ND	ND	ND	3	12:42	5-13-91	Sandy moist soil
650	120	L	200	ND	ND	ND	3	12:36	5-13-91	Sandy moist soil
650	150	L	>2000	1.0	ND	100	3	12:34	5-13-91	Sandy moist soil;water at 2.5-3'
650	180	L	>2000	0.2	ND	100	2	12:28	5-13-91	Sandy moist soil;water at 2.5-3'
650	210	L	>2000	0.8	ND	100	2	12:23	5-13-91	Sandy moist soil;water at 2.5-3'
650	240	L	140	2.4	ND	100	3	12:18	5-13-91	Sandy moist soil
650	270	L	1200	1.0	ND	100	3	12:14	5-13-91	Refusal 3x road
675	0	BL	1.4	ND	ND	ND	2	8:55	5-11-91	Water at 2.5-3.0' came up in pump
675	30	L	ND	ND	ND	ND	3	1:05	5-13-91	Sandy moist soil
675	60	L	ND	ND	ND	ND	3	1:10	5-13-91	Sandy moist soil
675	90	L	760	ND	1.5	ND	3	1:14	5-13-91	Sandy moist soil
675	120	L	20	ND	ND	ND	3	1:19	5-13-91	Sandy moist soil
675	150	L	>2000	1.0	ND	100	3	1:25	5-13-91	Sandy moist soil
675	180	L	>2000	1.8	ND	100	3	1:30	5-13-91	Sandy moist soil
675	210	L	>2000	ND	ND	37	3	1:34	5-13-91	Sandy moist soil fill;tar on surface
675	240	L	>2000	ND	ND	34	3	1:38	5-13-91	Sandy moist soil
675	270	L	>2000	ND	ND	100	2	1:43	5-13-91	Tar-like substance;refusal 2'
675	30	R	0.8	ND	ND	ND	3	9:03	5-11-91	Sandy moist soil
700	0	BL	1.2	ND	ND	ND	2	8:40	5-11-91	Water at 2.5-3.0' came up in pump
700	30	L	ND	ND	ND	ND	2	7:10	5-14-91	Water at 2" ambient
700	60	L	2.0	ND	ND	ND	3	7:06	5-14-91	Wet sand
700	90	L	0.6	ND	ND	ND	3	7:03	5-14-91	Wet sand
700	120	L	ND	ND	ND	ND	3	6:59	5-14-91	Wet sand
700	150	L	ND	ND	ND	ND	3	6:54	5-14-91	Wet sand
700	180	L	32	ND	ND	ND	3	6:48	5-14-91	Dry hard sand
700	210	L	>2000	ND	ND	ND	3	1:53	5-13-91	Sandy moist soil fill

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
775	180	L	2.0	ND	ND	ND	ambient	9:15	5-14-91	Water at 4" ambient
775	210	L	74	ND	ND	ND	ambient	9:17	5-14-91	Water at 2" ambient
775	240	L	>1000	ND	ND	ND	3	9:24	5-14-91	Wet sand
775	270	L	>1000 (12)	0.1	1.5	100	3	9:30	5-14-91	Moist sand/rock
775	300	L	>1000	ND	ND	63	2	9:35	5-14-91	Refusal 3x road
775	30	R	0.4	ND	ND	ND	3	7:49	5-11-91	Sandy moist soil
775	60	R	2.9	ND	ND	ND	3	7:56	5-11-91	Sandy moist soil
800	0	BL	ND	ND	ND	ND	3	7:34	5-11-91	Sandy, very moist
800	30	L	ND	ND	ND	ND	ambient	10:19	5-14-91	Saturated sand
800	60	L	ND	ND	ND	ND	ambient	10:17	5-14-91	Saturated sand
800	90	L	ND	ND	ND	ND	ambient	10:15	5-14-91	Saturated sand
800	120	L	ND	ND	ND	ND	ambient	10:13	5-14-91	Saturated sand
800	150	L	0.2	ND	ND	ND	ambient	10:11	5-14-91	Saturated sand
800	180	L	0.2	ND	ND	ND	ambient	10:08	5-14-91	3" of surface water ambient
800	210	L	0.5 (13)	ND	ND	ND	3	10:04	5-14-91	Wet sand
800	240	L	7 (14)	ND	ND	ND	3	9:58	5-14-91	Moist sand/fill
800	270	L	>1000	ND	ND	43	2	9:52	5-14-91	Wet sand/concrete
800	300	L	4.0 (15)	ND	ND	ND	3	9:46	5-14-91	Wet sand/rock
800	30	R	ND	ND	ND	ND	3	8:28	5-10-91	Sandy moist soil
800	60	R	ND	ND	ND	ND	3	8:22	5-10-91	Sandy moist soil
825	30	L	ND	ND	ND	ND	ambient	10:21	5-14-91	Saturated sand
825	60	L	ND	ND	ND	ND	ambient	10:22	5-14-91	Saturated sand
825	90	L	ND	ND	ND	ND	ambient	10:23	5-14-91	Saturated sand
825	120	L	18	ND	ND	ND	ambient	10:25	5-14-91	Saturated sand
825	150	L	ND	ND	ND	ND	ambient	10:27	5-14-91	Saturated sand
825	180	L	2.3	ND	ND	ND	ambient	10:29	5-14-91	4" of standing water - saturated sand
825	210	L	0.5	ND	ND	ND	3	10:31	5-14-91	
825	240	L	12	ND	ND	ND	3	10:33	5-14-91	Moist sand
825	270	L	>1000	ND	ND	27	2	10:38	5-14-91	Moist sand
825	300	L	130	ND	ND	ND	3	10:42	5-14-91	Moist sand
825	30	R	ND	ND	ND	ND	3	8:10	5-10-91	Sandy moist soil
825	60	R	ND	ND	ND	ND	3	8:15	5-10-91	Sandy moist soil
825	0	BL	ND	ND	ND	ND	3	8:01	5-10-91	Sandy moist soil
850	0	BL	ND	ND	ND	ND	3	8:06	5-10-91	Sandy moist soil

(12) - Ambient = 2.2 ppm

(13) - Ambient = 2.6 ppm

(14) - Ambient = 3.4 ppm

(15) - Ambient = 3.0 ppm

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
900	60	R	2.0	ND	ND	ND	3	7:05	5-10-91	Sandy moist soil
900	90	R	ND	ND	ND	ND	3	6:48	5-10-91	Sandy moist soil
925	0	BL	ND	ND	ND	ND	2	6:08	5-10-91	Water at 2.5' pumped up tube
925	30	L	0.3	ND	ND	ND	3	1:09	5-14-91	Dry sand
925	60	L	1.0	0.2	ND	ND	ambient	1:12	5-14-91	Saturated sand
925	90	L	0.4	ND	ND	ND	ambient	1:14	5-14-91	Saturated sand
925	120	L	ND	ND	ND	ND	ambient	1:16	5-14-91	Swamp (6" water)
925	150	L	ND	ND	ND	ND	ambient	1:17	5-14-91	Swamp (6" water)
925	180	L	ND	ND	ND	ND	ambient	1:18	5-14-91	Swamp (6" water)
925	210	L	3.6	ND	ND	ND	3	1:20	5-14-91	Wet sand
925	240	L	100	3.2	ND	ND	2	1:22	5-14-91	Refusal 3x - 2'
925	30	R	2.0/ND	ND	ND	ND	3	6:15	5-10-91	Sandy moist soil
925	60	R	9.0	ND	ND	ND	3	6:20	5-10-91	Sandy moist soil
925	90	R	10.0	ND	ND	ND	3	6:35	5-10-91	Sandy moist soil
925	125	R	ND	ND	ND	ND	3	6:41	5-10-91	Debris: wood, metal
950	0	BL	0.8	ND	ND	ND	3	6:04	5-10-91	Very Sandy moist soil
950	30	L	>1000	ND	ND	ND	3	1:44	5-14-91	Wet sand
950	60	L	60	ND	ND	ND	ambient	1:41	5-14-91	Saturated sand
950	90	L	12	ND	ND	ND	ambient	1:39	5-14-91	Saturated sand
950	120	L	ND	ND	ND	ND	ambient	1:38	5-14-91	Saturated sand
950	150	L	>1000	ND	ND	ND	3	1:34	5-14-91	Dry sand
950	180	L	22	ND	ND	ND	3	1:30	5-14-91	Dry sand
950	210	L	ND	ND	ND	ND	3	1:28	5-14-91	Dry soil/sand
950	30	R	1.3	ND	ND	ND	2	6:00	5-10-91	Water at 2.5' pumped up tube
950	60	R	0.4	ND	ND	ND	3	5:53	5-10-91	Sandy moist soil
950	90	R	0.8	ND	ND	ND	3	5:48	5-10-91	Sandy moist soil
950	120	R	1.0	ND	ND	ND	3	5:44	5-10-91	Sandy moist soil
975	0	BL	2.3	ND	ND	ND	3	5:00	5-10-91	Sandy moist soil
975	30	L	0.4	ND	ND	ND	3	2:14	5-14-91	Dry sand
975	60	L	0.3	ND	ND	ND	3	2:20	5-14-91	Wet sand
975	90	L	>1000	ND	ND	4	3	2:23	5-14-91	Wet sand
975	120	L	>1000	ND	ND	46	ambient	2:27	5-14-91	Saturated sand
975	150	L	>1000	ND	ND	100	ambient	2:32	5-14-91	Saturated sand
975	180	L	ND	ND	ND	ND	ambient	2:35	5-14-91	Moist fill
975	30	R	33.0	ND	ND	ND	3	5:10	5-10-91	Sandy moist soil
975	60	R	11.0	ND	ND	ND	3	5:14	5-10-91	Sandy moist soil
975	90	R	2.6	ND	ND	ND	3	5:18	5-10-91	Sandy moist soil

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
1050	90	R	10.2	ND	ND	ND	3	2:25	5-9-91	Sandy moist soil
1050	120	R	0.8	ND	ND	ND	3	2:20	5-9-91	Sandy moist soil
1050	150	R	450	ND	ND	ND	3	2:14	5-9-91	Sandy moist soil
1050	180	R	0.8	ND	ND	ND	3	2:08	5-9-91	Sandy moist soil
1050	210	R	0.4	ND	ND	ND	3	1:58	5-9-91	Sandy moist soil
1075	0	BL	0.6	ND	ND	ND	3	12:35	5-9-91	Sandy moist soil
1075	30	L	>1000	ND	ND	ND	ambient	4:15	5-14-91	Swamp (2" water)
1075	60	L	64	ND	ND	ND	3	3:59	5-14-91	Moist sand
1075	90	L	0.4	ND	ND	ND	3	3:56	5-14-91	Moist sand
1075	120	L	0.2	ND	ND	ND	3	3:53	5-14-91	Moist sand
1075	30	R	2.1	0.1	ND	ND	3	12:45	5-9-91	Sandy moist soil
1075	60	R	2.6	ND	ND	ND	3	12:55	5-9-91	Sandy moist soil
1075	90	R	4.9	ND	ND	ND	3	1:08	5-9-91	Sandy moist soil
1075	120	R	>2000	ND	28	100	3	1:16	5-9-91	Sandy moist soil
1075	150	R	32	ND	ND	ND	3	1:37	5-9-91	Sandy moist soil
1075	180	R	180	ND	ND	ND	3	1:45	5-9-91	Sandy moist soil
1075	210	R	0.2	ND	ND	ND	3	1:49	5-9-91	Sandy moist soil
1100	0	BL	>1000	ND	ND	ND	0.66	12:28	5-9-91	Debris: wood concrete; water at 1 probe at 8"
1100	30	L	>1000	0.2	6.5	100	3	4:10	5-14-91	Saturated sand
1100	60	L	0.4	ND	ND	ND	3	4:04	5-14-91	Moist sand
1100	30	R	0.3	ND	ND	ND	3	12:21	5-9-91	Sandy moist soil
1100	60	R	72	ND	ND	ND	3	12:10	5-9-91	Sandy moist soil
1100	90	R	4.0	ND	ND	ND	3	11:55	5-9-91	Sandy moist soil
1100	120	R	ND	ND	ND	ND	3	11:35	5-9-91	Sandy moist soil
1100	150	R	ND	ND	ND	ND	3	11:20	5-9-91	Sandy moist soil
1100	180	R	0.8	0.1	ND	ND	3	11:10	5-9-91	Sandy moist soil
1100	210	R	3.9	ND	ND	ND	3	10:45	5-9-91	Sandy moist soil

APPENDIX D

TERRAIN CONDUCTIVITY SURVEY REPORT

**TERRAIN CONDUCTIVITY SURVEY
GLOBAL LANDFILL SITE
OLD BRIDGE, MIDDLESEX COUNTY
NEW JERSEY**

Prepared for:

**URS Consultants, Inc.
282 Delaware Avenue
Buffalo, NY 14202**

Prepared by:

**Hager-Richter Geoscience, Inc.
8 Industrial Way - D10
Salem, New Hampshire 03079**

**File 89D13
May, 1991**

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

3. The location of the edge of fill along the terrain conductivity profiles extending into the marsh is not clear due to the high conductivity saltwater present in the marsh. Except for scattered surface metal, the generally smooth variation of the in-phase component of the terrain conductivity data in the salt marsh implies that little or no buried metal is present beyond the edge of the marsh.

4. Three profiles in the vicinity of the 1984 southeast slope failure indicate that fill material might be present in the saltwater marsh in this area.

5. The terrain conductivity data for two profiles indicate that a slight topographic berm in the marsh southwest of the landfill is likely constructed of landfill material.

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- Figure 18. Terrain Conductivity Survey Line 10A.
- Figure 19. Terrain Conductivity Survey Line 11.
- Figure 20. Terrain Conductivity Survey Line 12.
- Figure 21. Terrain Conductivity Survey Line 13.
- Figure 22. Terrain Conductivity Survey Line 14.
- Figure 23. Terrain Conductivity Survey Line 15.
- Figure 24. Terrain Conductivity Survey Line 16.
- Figure 25. Terrain Conductivity Survey Line 17.
- Figure 26. Terrain Conductivity Survey Line 18.
- Figure 27. Terrain Conductivity Survey Line 19.

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pleted at the Hager-Richter offices. Original data and field notes reside in the Hager-Richter files and will be retained for a minimum of three years.

2. EQUIPMENT AND PROCEDURES

2.1 General

2.1.1 Field Work. We used a Geonics EM31-DL terrain conductivity meter for the terrain conductivity survey. The EM31-DL is an induction type unit that measures terrain conductivity without ground electrodes or contact. The EM31-DL is calibrated to read ground conductivity directly in millimhos per meter (mmhos/meter) with a resolution of 2% of full scale and an accuracy of 1 mmho/meter. The nominal depth of earth sampled by the EM31-DL is about 18 feet. The data are recorded on a digital data logger and transferred to a computer at the end of each field day.

Two components of the induced magnetic field measured by the EM31-DL are recorded: (1) the quadrature-phase component; and (2) the in-phase component. The quadrature-phase component is a measure of the average terrain conductivity of the subsurface materials located between the receiver and transmitter of the EM31-DL. The in-phase component is a sensitive indicator of the presence of conductive metal objects; however, the exact identification of the object cannot be determined from the terrain conductivity data alone.

2.1.2 Data Analysis and Interpretation. The EM31-DL data are plotted in either profile format or as contour maps, depending on the density of the data. At sites free of metal objects and other cultural interference, the terrain conductivity measured at a particular location is controlled by the subsurface fluid. The instrument response is more affected by near-surface material than by deeper material. In cases where the terrain conductivity meter is directly over a buried metal target, the apparent conductivity reading may be a negative number.

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3. RESULTS AND DISCUSSION

3.1 Areal Survey Northwest of the Landfill

Figure 2 shows contoured terrain conductivity data for the areal survey region northwest of the landfill mound. The station locations are indicated.

Striking features of the terrain conductivity contour map are:

1. relatively high and strongly variable conductivity in the southeast part of the area;
2. relatively low values of terrain conductivity in the northwest part of the survey area;
3. a sharp northeast trending gradient between the regions of relatively high and low terrain conductivity.

The location of the steep terrain conductivity gradient does not coincide with the toe of the landfill mound, indicating that fill material extends north of the toe of the slope. Elevated terrain conductivity values southward of the steep gradient imply highly conductive material in the subsurface. The black circular features are anomalies likely caused by near surface conductive metal objects, some of which could be drums.

In contrast, the area to the northwest exhibits generally low terrain conductivity, with values between 10 and 20 mmhos/meter. The data suggest that little or no fill material is present in that area. The somewhat elevated terrain conductivity compared to the background measurements may be due to a shallower water table in the survey area and/or conductive leachate. However, the contour patterns do not indicate the presence of discrete leachate plumes. In addition, there is no evidence in the terrain conductivity data of sludge pits in the survey area.

A contour map of the data for the in-phase component of terrain conductivity is shown in Figure 3. The in-phase component is used primarily for locating subsurface metal objects. The relatively small circular negative anomalies, e.g., (8+25, 2+70 LT) are caused by anomalous readings at one or two consecutive stations along a survey line and indicate the presence of conduc-

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ing, decreased terrain conductivity off the fill, cannot be used to determine the edge of fill for the profiles extending into the saltwater marsh at the Global Landfill Site. Our basis for estimating the edge of fill along profiles TCSL 2, 4, 7, 8, 10A, and 11 (Figures 4, 5, 6, 10, 14, 15, 18, 19) is the point at which both the terrain conductivity and the in-phase components level off somewhat and exhibit a relatively smooth and small variation between points. Many of the profiles exhibit high and low "spikes," most commonly near the landfill end of the line, indicating the presence of buried conductive metal typical of landfills. The "spikes" located elsewhere along some of the profiles are caused by metal debris scattered along the survey lines. In many cases, however, the location of the edge of fill cannot be determined from the terrain conductivity data (TCSL 1, 1A, 2A, 3, 3A, 9, 10, 12, 13, 14, 15, and 18).

Profiles TCSL 5, 6, and, 6A (Figures 11, 12 and 13) are located in the vicinity of the 1984 slope failure along the southeast side of the landfill. There is no contrast in terrain conductivity values along these lines with which to locate the edge of fill; in fact, highly variable terrain conductivity and in-phase component values suggest that fill material is likely present along the entire length of each line.

A concentration of metal and demolition debris occurs from 220 feet to the end of TCSL 12 (Figure 20) and from about 175 feet to the end of TCSL 13 (Figure 21) and produces the highly variable terrain conductivity measurements at the ends of the profiles. The two areas of debris correlate with a low berm shown on the Site Plan (Plate 1), and which we infer is composed of fill.

As mentioned above, the data for TCSL 16, 17, and 19 (Figures 24, 25, and 27) exhibit the typical pattern for terrain conductivity profiles oriented perpendicular to a landfill and clearly indicate the location of the edge of fill. The southern ends of the profiles exhibit terrain conductivity values as high as 230 mmhos/meter, indicating the presence of highly conductive buried material. The values along the northern part of these lines are near background and generally indicate that little or no buried metallic material is present along the lines.

TCSL 16, 17, and 18 are located in the region of the areal terrain conductivity survey and correlate well with the data collected for the areal survey (Figures 2 and 3). The high and/or low "spikes" measured along the profiles, particularly near the

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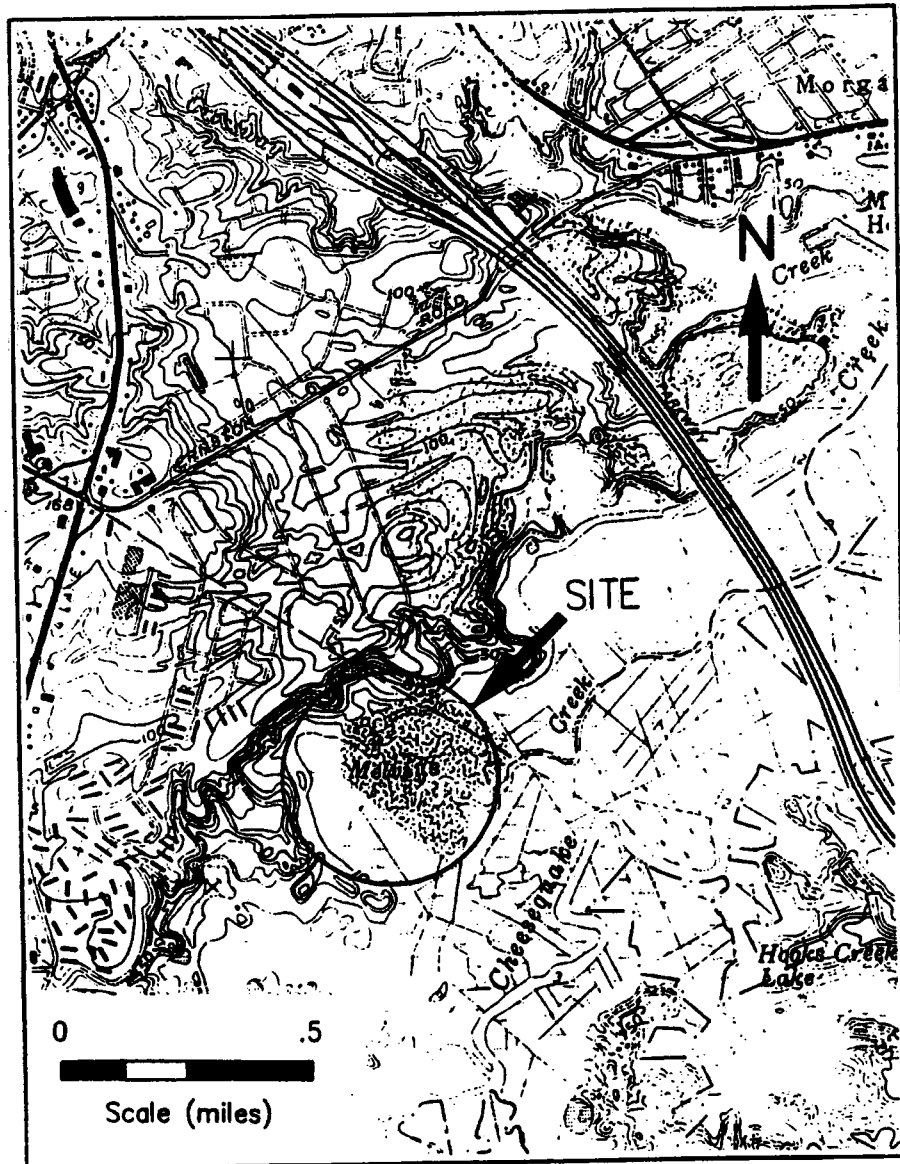


Figure 1. General location of the Global Landfill Site.

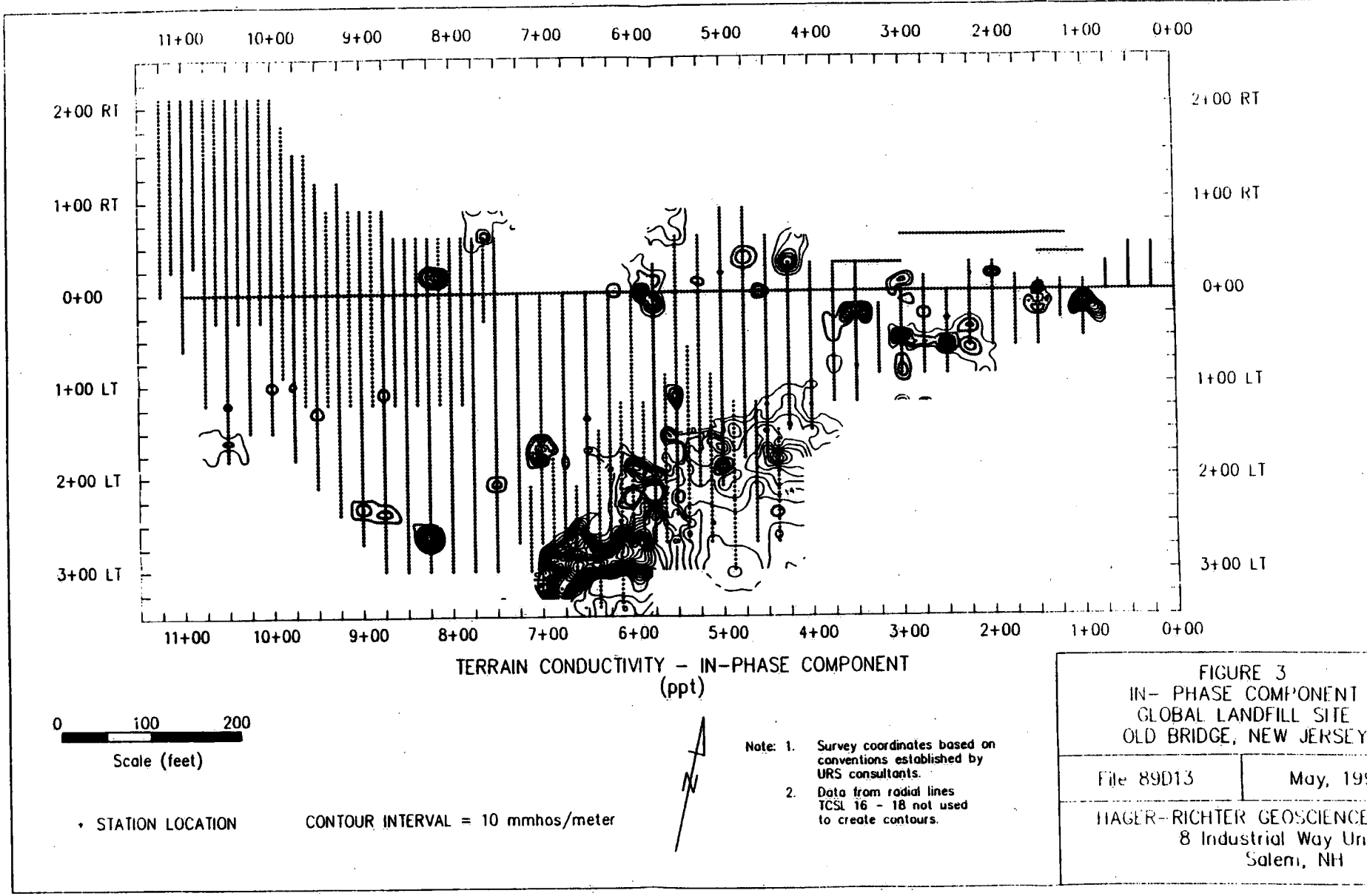


FIGURE 3
IN-PHASE COMPONENT
GLOBAL LANDFILL SITE
OLD BRIDGE, NEW JERSEY

File 89D13	May, 1991
HAGER-RICHTER GEOSCIENCE, INC. 8 Industrial Way Unit 1-10 Salem, NH 03079	

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Global Landfill Site
Old Bridge, New Jersey
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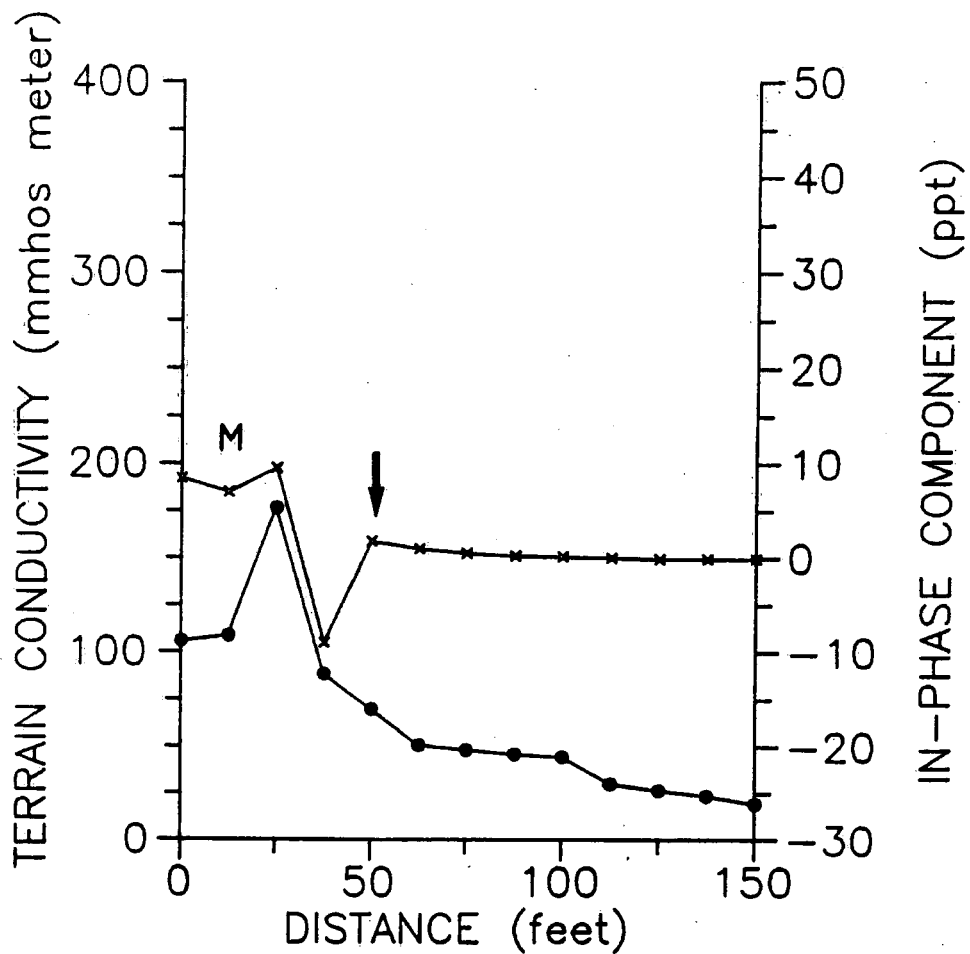


Figure 5. Terrain Conductivity Survey Line 1A. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

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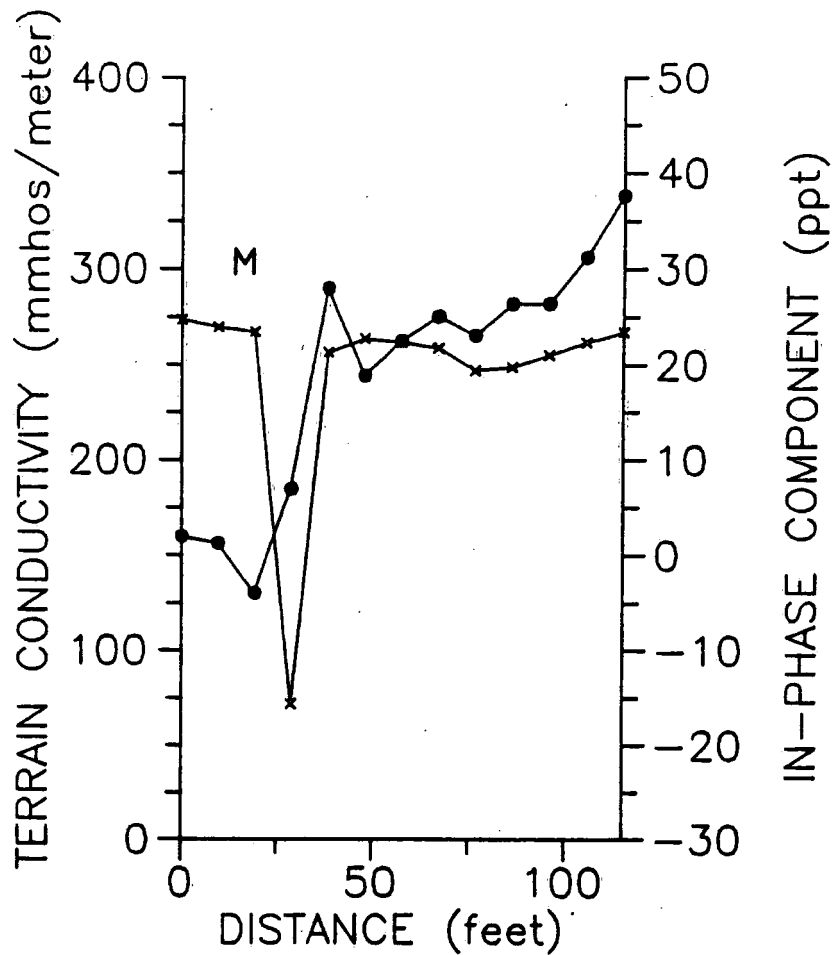


Figure 7. Terrain Conductivity Survey Line 2A. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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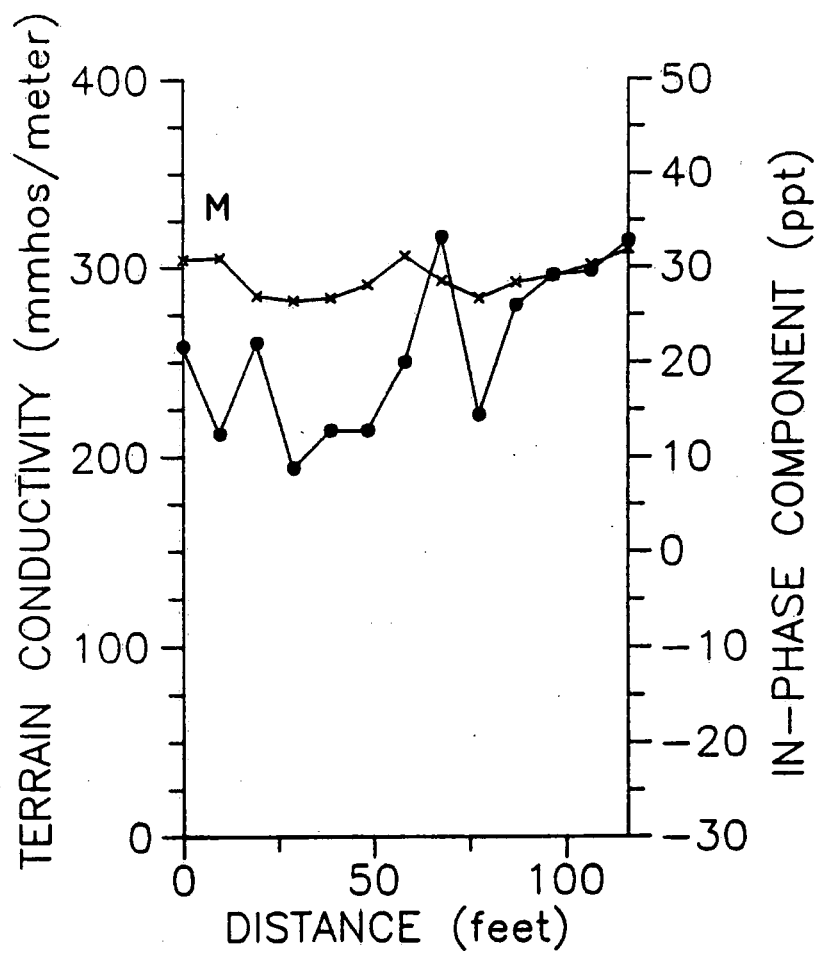


Figure 9. Terrain Conductivity Survey Line 3A. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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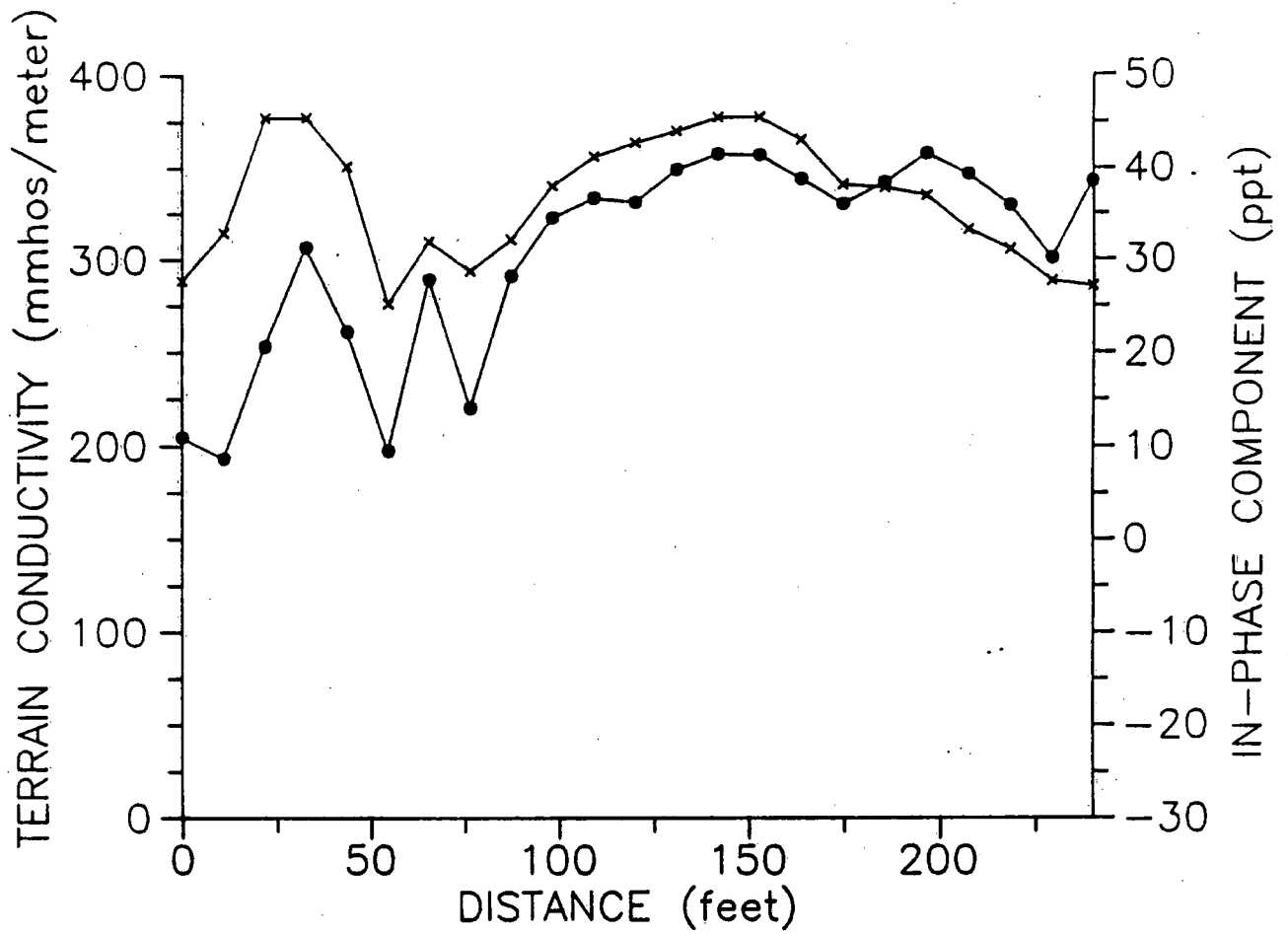


Figure 11. Terrain Conductivity Survey Line 5. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

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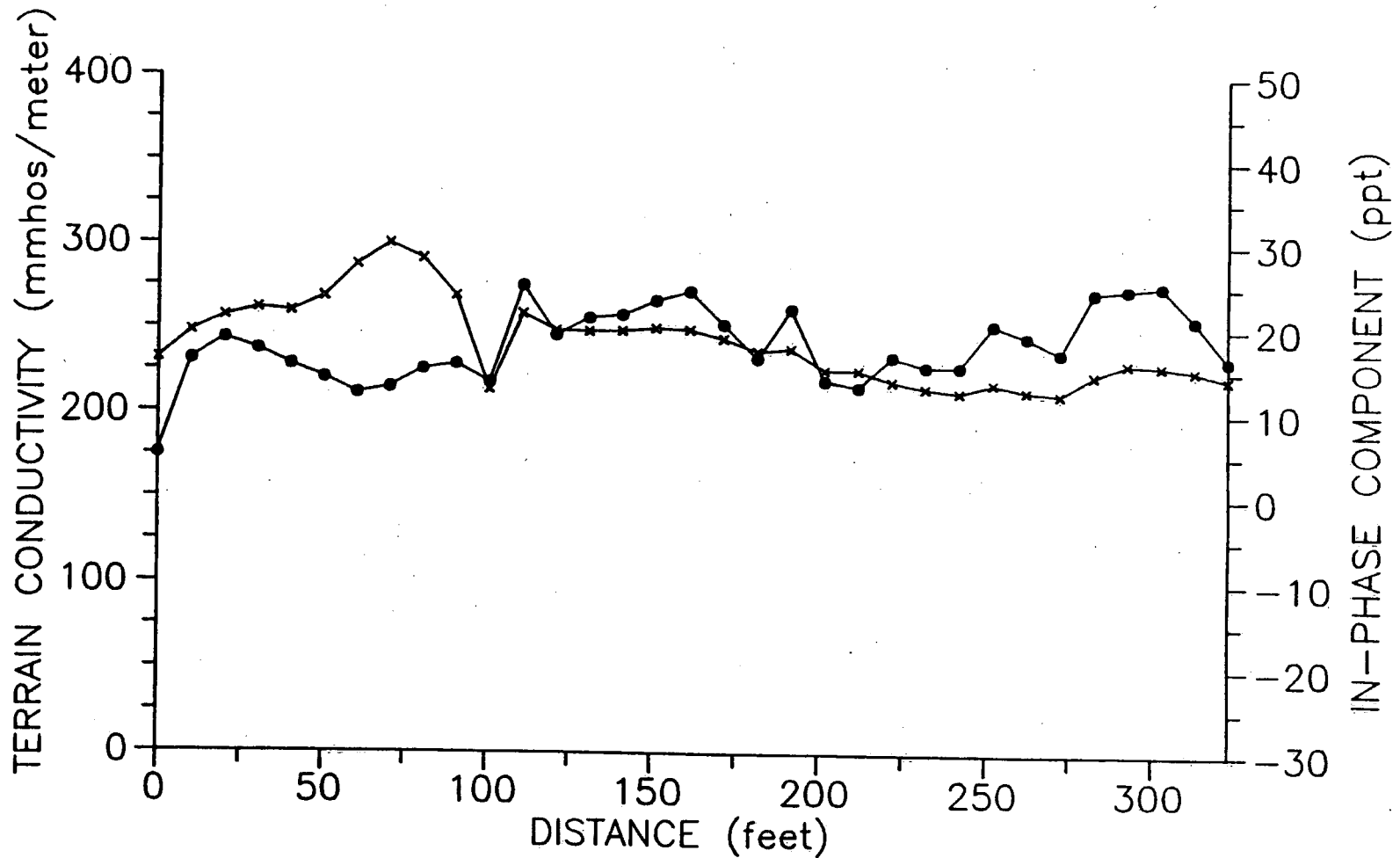


Figure 13. Terrain Conductivity Survey Line 6A. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

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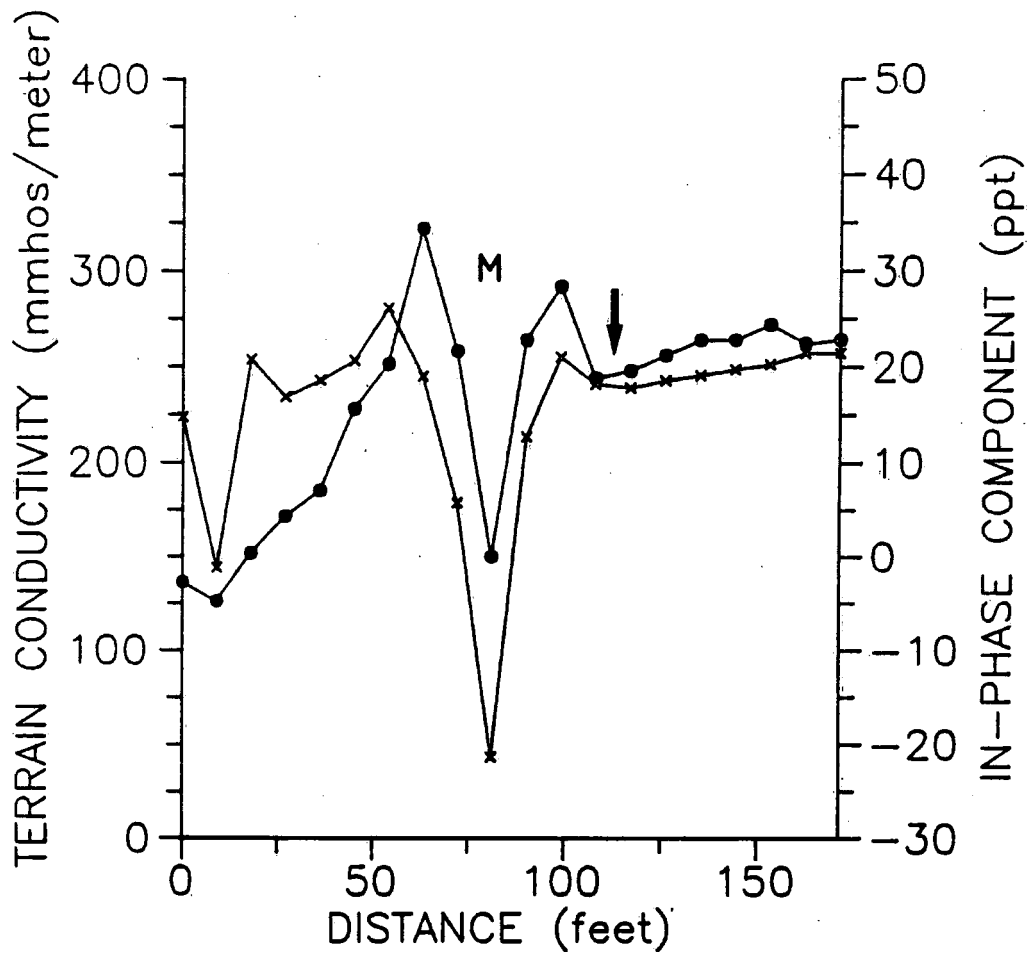


Figure 15. Terrain Conductivity Survey Line 8. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

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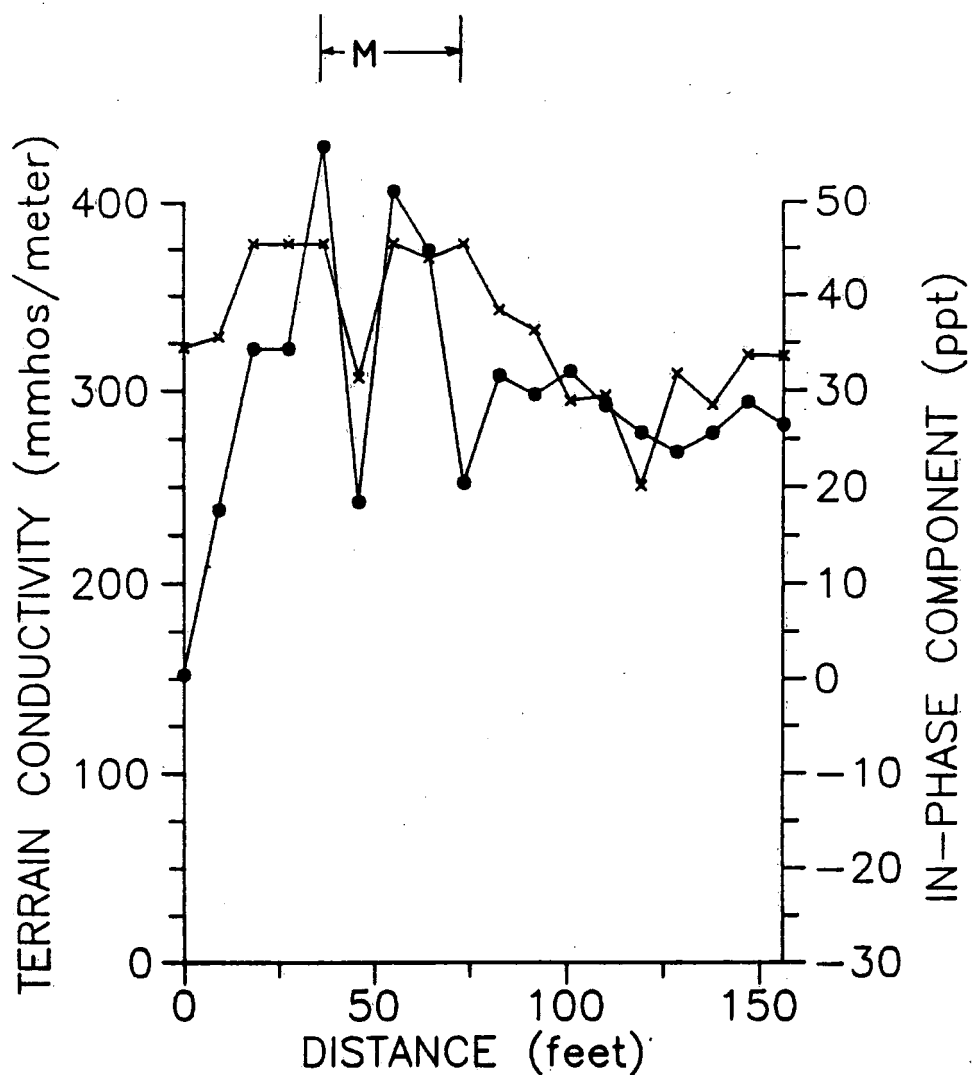


Figure 17. Terrain Conductivity Survey Line 10. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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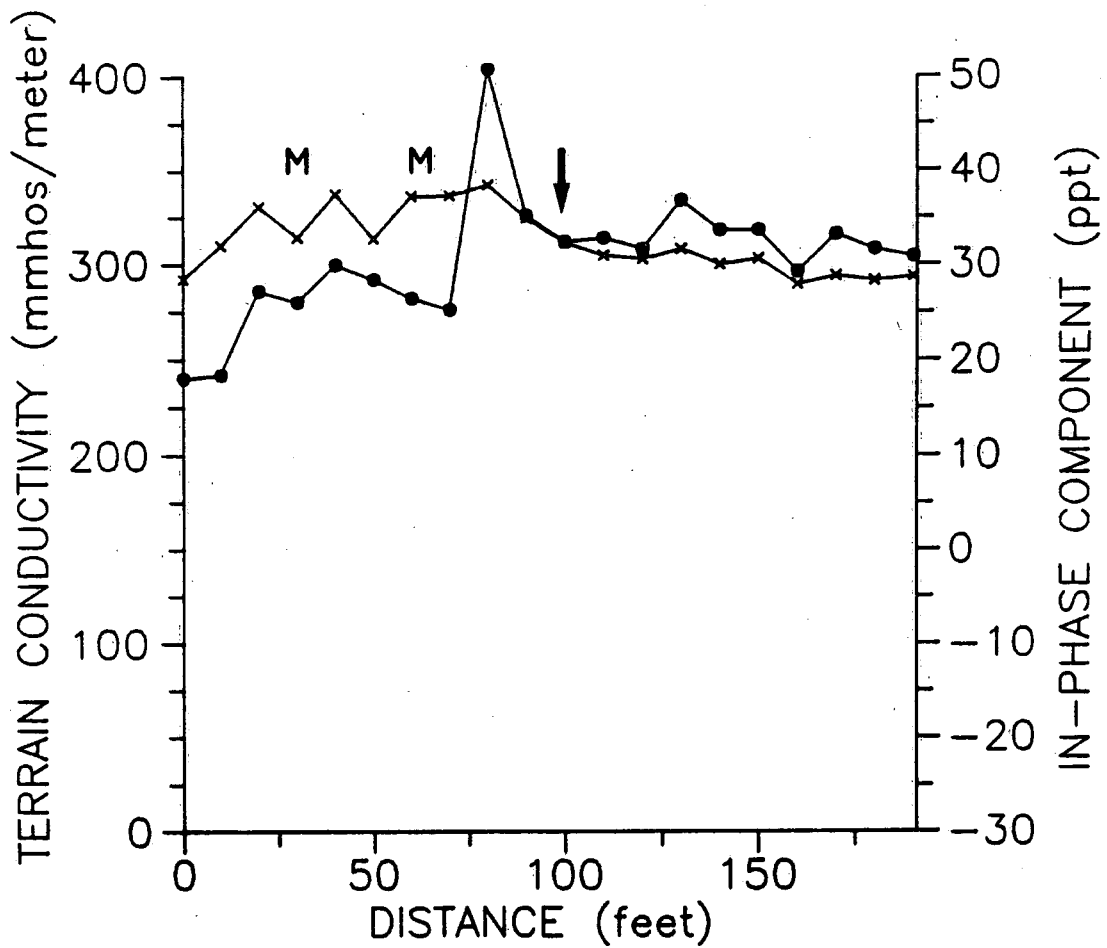


Figure 19. Terrain Conductivity Survey Line 11. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

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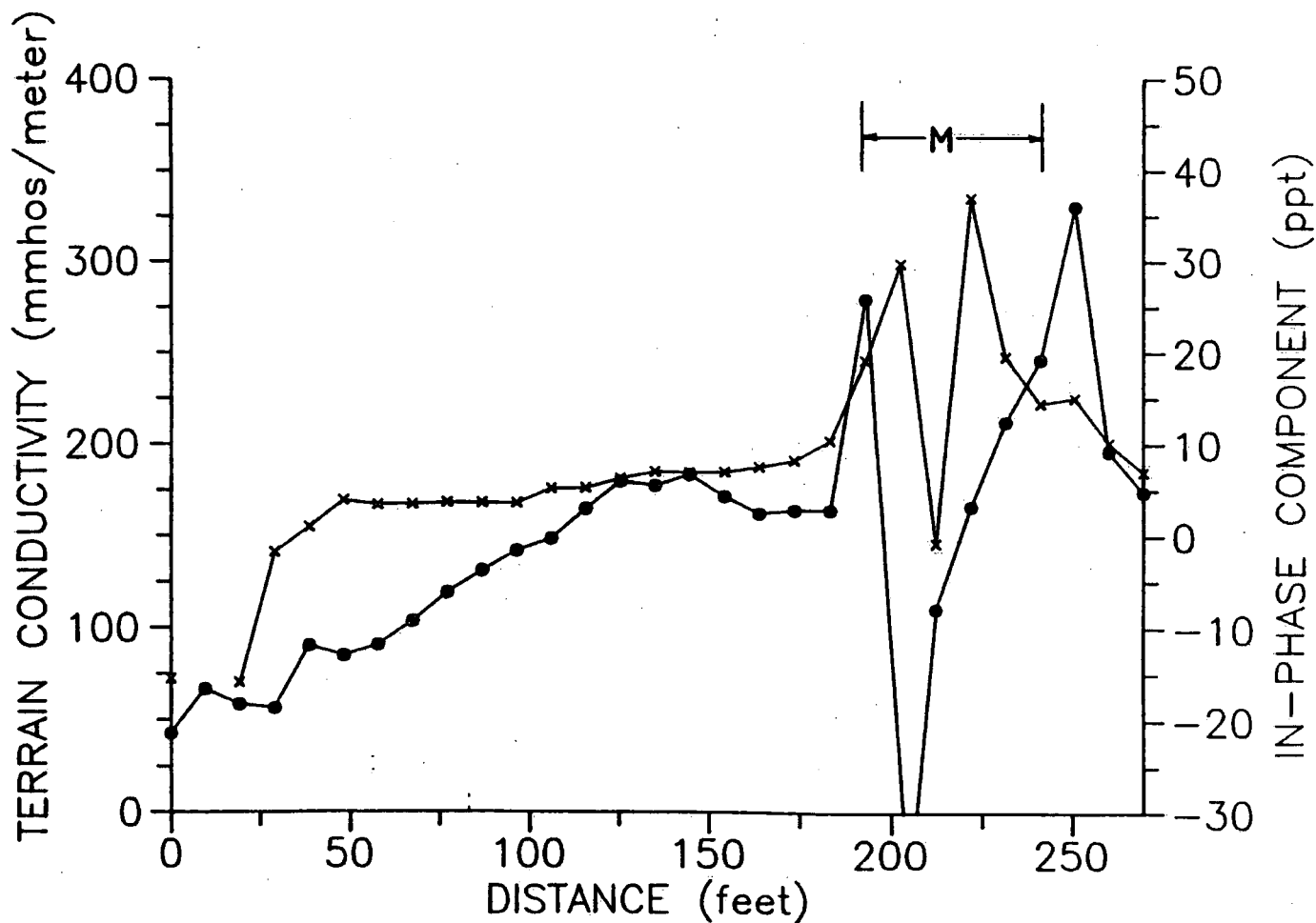


Figure 21. Terrain Conductivity Survey Line 13. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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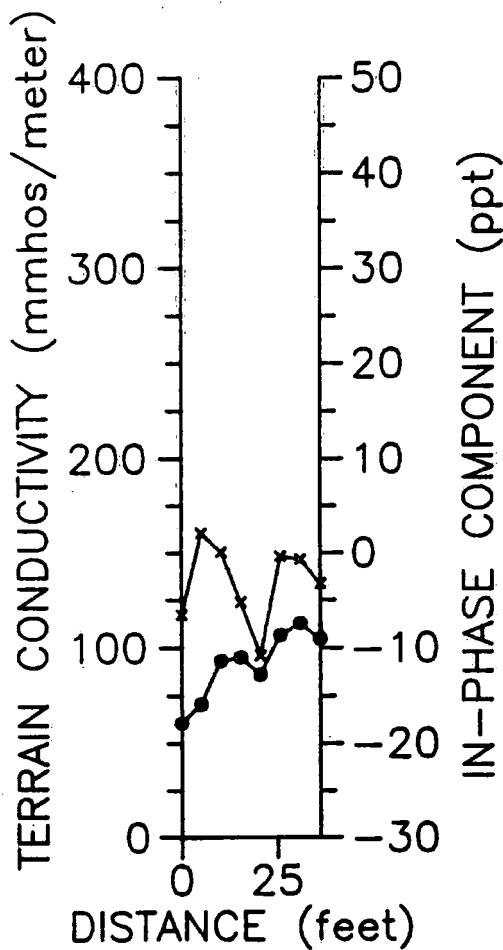


Figure 23. Terrain Conductivity Survey Line 15. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

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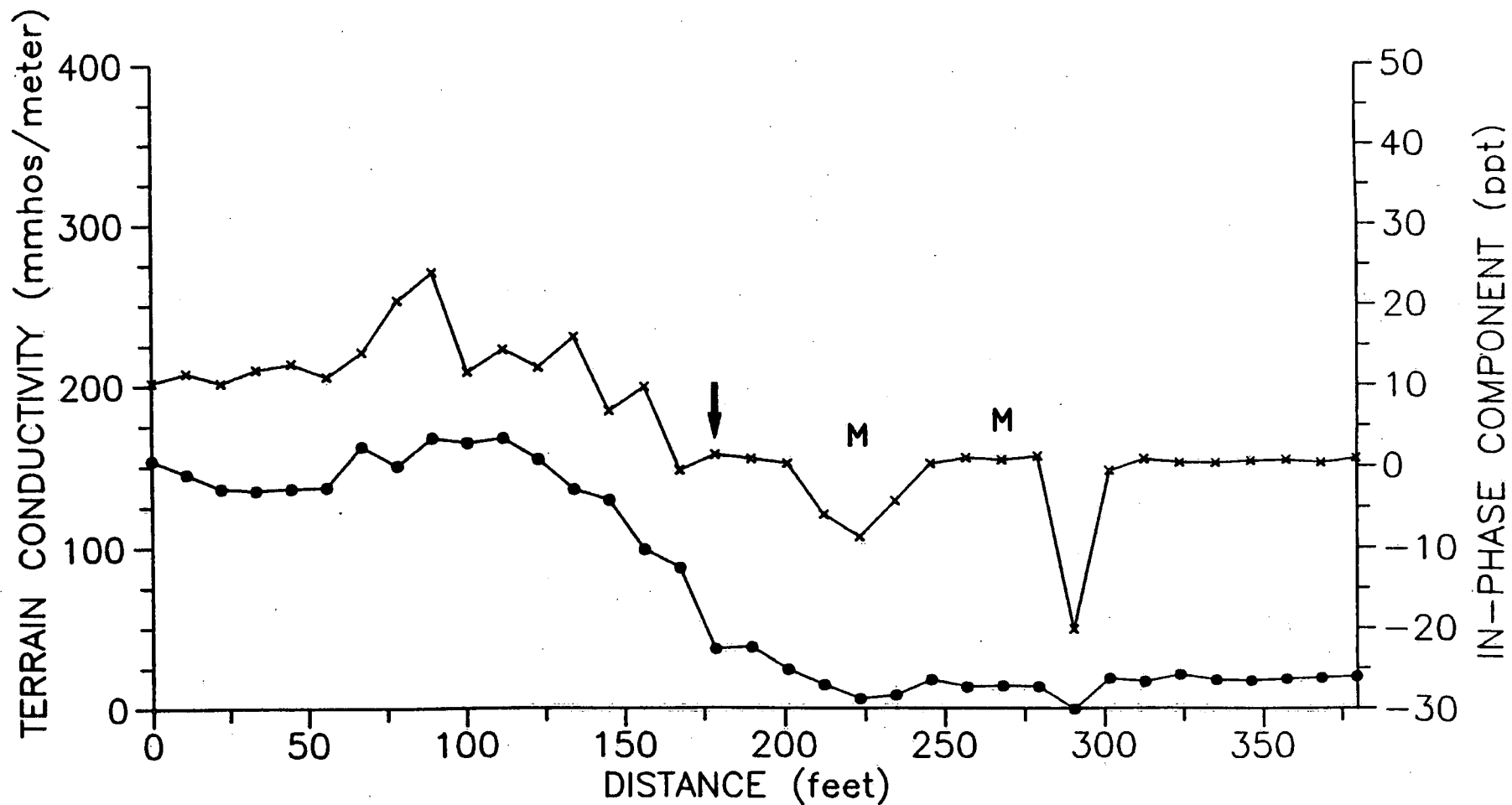


Figure 25. Terrain Conductivity Survey Line 17. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

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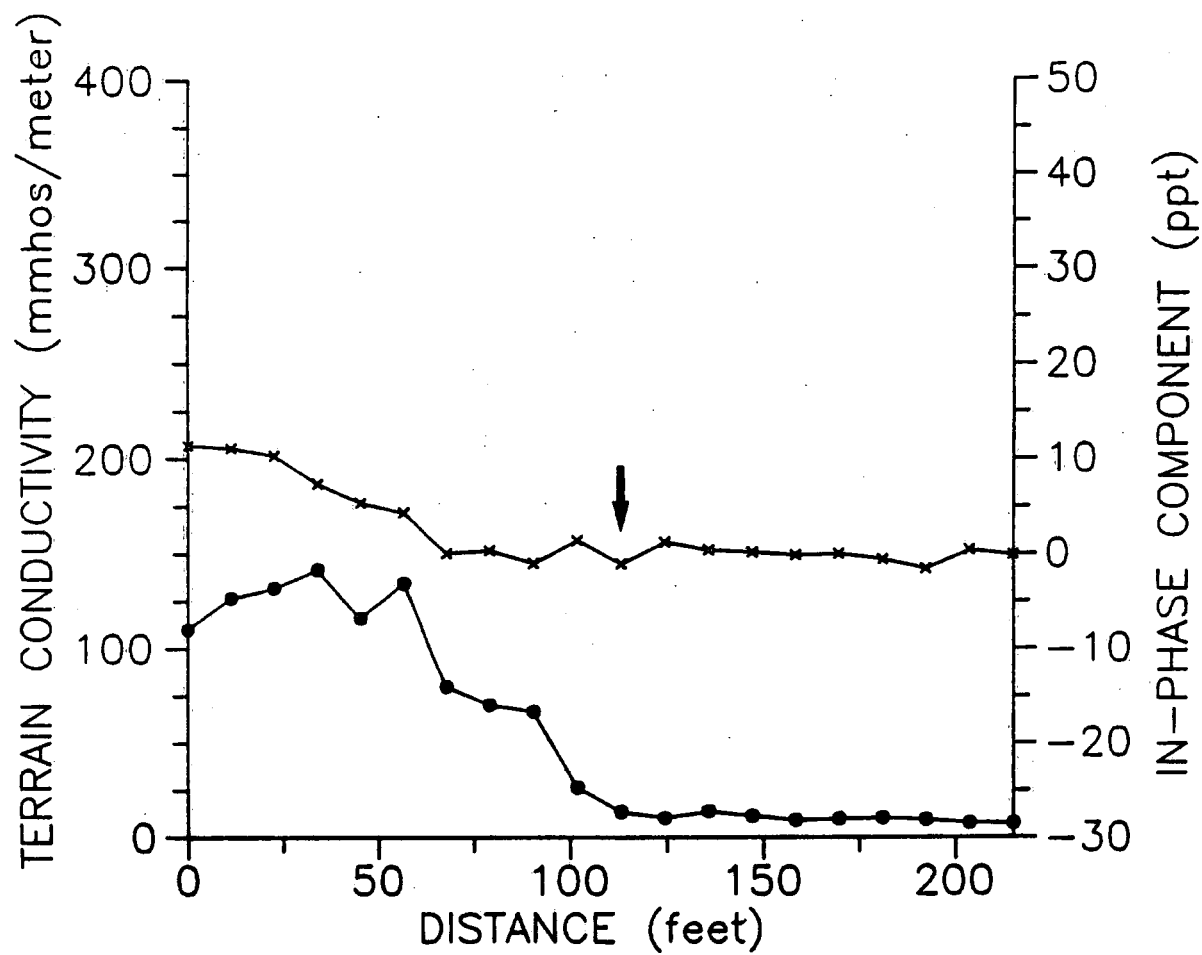


Figure 27. Terrain Conductivity Survey Line 19. Dots represent terrain conductivity, X's represent In-phase Component. Arrow marks approximate location of edge of fill.

APPENDIX E

SOIL BORING LOGS

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO.

MW-3S

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 11.74

GROUND WATER: 3.5' BGS

DATE STARTED: 5/30/91

DATE TIME LEV TYPE

DATE FINISHED: 5/30/91

CAS. SAMP CORE TUBE

DRILLER: Jeff Marchesi

DIA. 2"

GEOLOGIST: Robert Kreuzer

WT. 140#

REVIEWED BY: BP & DL

FALL 30"

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE					DESCRIPTION				REMARKS			
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS					
	.....	S-1	SS	1 2	80	Tan	Loose	MEDIUM SAND, some silt, (Landfill cover)	SP	Moist			
	.....			4 3									
	.....	S-2	SS	1 2	60								
	.....			3 1						Wet @ 3.5'			
5	.....	S-3	SS	3 2	0								
	.....			1 1									
	XXXXXX	S-4	SS	3 5	30	Black	Dense	FILL: wood, plastic, and paper in sandy matrix						
	XXXXXX			15 24										
	XXXXXX	S-5	SS	5 6	5						Medium Dense			
10	XXXXXX			5 4										
	XXXXXX	S-6	SS	5 13	5									
	XXXXXX			12 8										
	XXXXXX	S-7	SS	4 2	8									
	~.~.~			2 3		Dark Gray	Soft	SANDY SILT; some clay	ML					
15	END OF BORING													
20														
25														
30														
35														
38														

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

PROJECT NO.
BORING NO.

35226
MW-3S

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 18.53

GROUND WATER: Wet @ 6'

CAS. SAMP CORE TUBE

DATE STARTED: 6/11/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 6/11/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
	.....	S-1	SS	2 8	40	Tan	Med. Dense	MEDIUM SAND (cover)	SP	Dry
	XXXX			6 8		Black	Very Loose	FILL: wood, plastic, & paper		Moist
	XXXX	S-2	SS	50/6"	0					
	XXXX									
5	XXXX	S-3	SS	1/12"	0					
	XXXX			1/12"						Wet @ 6'
	~.~.~	S-4	SS	1 1	100	Gray	Loose	SILTY MEDIUM SAND	SM	2" Clayey Sand seam @ 9'
	~.~.~			1 1						
	~.~.~	S-5	SS	1 1	100					
10	~.~.~			2 3						
	.....	S-6	SS	5 4	75	Tan	Loose	MEDIUM SAND, some silt	SW	
	.....			3 7						
15	END OF BORING							Boring completed at 14 feet.		
20										
25										
30										
35										
38										

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO.

MW-13

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 3

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 105.31'

GROUND WATER: Water @ 74.5'

CAS. SAMP CORE TUBE

DATE STARTED: 6/6/91

DATE TIME LEV TYPE TYPE

SS

DATE FINISHED: 6/7/91

DIA.

2"

DRILLER: Jeff Marchesi

WT.

140#

GEOLOGIST: Robert Kreuzer

FALL

30"

REVIEWED BY: BP & DL

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS		
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS			
	|||||	S-1	SS	12	20	80	Brown	Dense	Top 6" - top soil (silty)	OL	o Dry	
				20	20		Tan	Dense	MEDIUM SAND, some silt.	SW		
	: : : : :	S-2	SS	14	18	60						o Moist
				19	15							
5	: : : : :	S-3	SS	10	14	70						
				16	16							
	: : : : :	S-4	SS	14	14	80						
				14	12							
	: : : : :	S-5	SS	14	15	90						
				17	12							
10	: : : : :	S-6	SS	7	13	60						
				15	19							
	: : : : :	S-7	SS	14	13	80						
				18	28							
15	: : : : :	S-8	SS	30	34	60	Orange-Brown		Coarse sand, some gravel.		o Iron Cemented Seams (1/2 - 3/4") from 7-10'	
				22	14							
	~.~.	S-9	SS	9	9	100	Orange-Brown	Med. Dense	SILTY MEDIUM SAND	SM		
				9	10							
	~.~.	S-10	SS	7	7	100						
				9	14							
20	~.~.	S-11	SS	7	10	90	Orange-Brown	Med. Dense	MEDIUM SAND, trace to some silt	SW/SM		
				10	10							
	: : : : :	S-12	SS	12	12	85	Gray					
				14	12							
25	: : : : :	S-13	SS	5	10	95	Orange-Brown					
				14	22							
	: : : : :	S-14	SS	15	15	80						
				18	23							
	: : : : :	S-15	SS	8	14	95	Gray					
				16	16							
30	: : : : :	S-16	SS	10	12	80	Tan					
				12	12							
	: : : : :	S-17	SS	18	18	90						
				18	18							
35	: : : : :	S-18	SS	10	18	100	Orange-Brown	Dense	MEDIUM SAND, some silt and clay			
				20	25							
	: : : : :	S-19	SS	24	30	65		Very Dense				
				30	32							
38	: : : : :											

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

PROJECT NO.

35226

BORING NO.

MW-13

PROJECT: Global Landfill RI/FS

SHEET NO. 2 OF

2

CLIENT: NJDEP

JOB NO. :

35226

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
40	~.~.	S-17	SS	4	2	100	Light Gray	Med. Dense	SILTY SAND, trace clay.	SM
	7			13						
45	~.~.	S-18	SS	6	8	100	Black	Very Dense	SANDY SILT, trace clay.	ML
	25			45						
	~.~.	S-19	SS	18	42	100				
	~.~.			65	65					
	~.~.	S-20	SS	16	25	70	Gray	Dense	SILTY SAND, trace clay.	SM
	~.~.			20	13					
50	.....	S-21	SS	5	4	75	Brown and Gray	Loose	MEDIUM SAND, some silt, trace clay.	SW
	.....			6	15					
	.....	S-22	SS	15	13	80		Medium Dense		
	.....			11	14					
55	.....	S-23	SS	9	6	20				
	.....			5	6					
	End of Boring								Boring completed at 55 feet.	
60										

COMMENTS

APPENDIX B

LOCATIONAL SURVEY DATA FOR SAMPLING POINTS

TABLE B-1

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
MW-1A	588677^	2106212^	55.63	57.98	57.82
MW-2A	587929^	2107388^	7.30	8.85	8.56
MW-2S	587935^	2107407^	6.33	8.82	8.74
MW-3A	587425.60	2107197.38	11.88	13.41	13.26
MW-3S	587412.00	2107200.80	11.74	14.83	14.32
MW-4A	586645^	2106633^	8.95	10.43	10.27
MW-4S	586619^	2106665^	7.41	10.12	10.11
MW-5D	586759^	2106122^	5.71	8.31	7.90
MW-5S	586752^	2106073^	7.78	9.31	9.13
MW-6D	587805^	2105472^	11.87	14.70	14.58
MW-6S	587830^	2105481^	12.39	15.37	15.12
MW-7D	588149^	2105612^	14.51	17.25	17.01
MW-7S	588162^	2105601^	14.40	16.45	16.27
MW-8D	588256^	2106857^	21.54	23.04	22.85
MW-8S	588255^	2106872^	21.58	23.56	23.29
MW-9S	588150^	2105134^	18.05	19.41	19.14

TABLE B-1 (Continued)

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
MW-10S**	588156.97	2105374.41	13.83	NR	NR
MW-10SR	588162.73	2105374.79	14.24	17.53	16.91
MW-11S	588218.15	2105786.44	18.53	21.57	21.53
MW-12S	588071.87	2105943.76	25.48	28.76	28.37
MW-13S	588971.97	2105448.72	105.31	108.35	108.30
MW-14D	586928.63	2106890.81	9.86	12.49	12.40
MW-14S	586923.30	2106883.79	9.67	12.75	12.26
MW-15D	587157.83	2105796.38	12.16	14.95	14.89
MW-15S	587169.72	2105786.45	11.11	14.10	13.86
B-1	588384.67	2105978.57	22.22	NR	NR
B-2	588408.62	2106106.45	24.16	NR	NR
B-3	588386.82	2105311.49	19.92	NR	NR
B-4	588437.63	2105940.89	23.44	NR	NR
B-5	588195.60	2105688.27	15.12	NR	NR
B-6	588360.03	2105599.60	16.92	NR	NR
B-7	588235.01	2105320.37	16.36	NR	NR

TABLE B-1 (Continued)

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
B-8	588212.63	2105402.38	14.68	NR	NR
B-9	588050.87	2105592.99	16.74	NR	NR
B-10	588069.03	2105537.58	15.99	NR	NR
B-11	588431.08	2106585.77	23.97	NR	NR
SG-1	586631.34	2107182.76	7.48	@ 0.00	Top of Gauge
SG-2	587800.31	2107742.91	5.37	@ 0.00	Top of Gauge
S-1	587865.72	2107460.80	NR	NR	NR
S-2	588670^^	2108389^^	NR	NR	NR
S-3	588999^^	2109238^^	NR	NR	NR
S-4	587217.01	2105634.38	NR	NR	NR
S-5	586782.66	2106029.68	NR	NR	NR
S-6	586561.38	2106634.61	NR	NR	NR
S-7	586752.69	2107198.47	NR	NR	NR
S-8	588026.30	2107431.29	NR	NR	NR
S-9	586664.68	2107340.93	NR	NR	NR
S-10	584077^^	2106696^^	NR	NR	NR

TABLE B-1 (Continued)

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
SS-1	588453.29	2106563.33	NR	NR	NR
SS-2	588250.95	2106019.00	NR	NR	NR
SS-3	588370.57	2105355.02	NR	NR	NR
SS-4	588586.10	2105248.67	NR	NR	NR
SS-5	588837.72	2105276.07	NR	NR	NR
LS-1	587220.52	2105780.61	NR	NR	NR
LS-2	586757.44	2106357.84	NR	NR	NR
LS-3	586913.92	2106992.65	NR	NR	NR
LS-4	587729.47	2107249.06	NR	NR	NR
LS-5	588150.47	2106886.31	NR	NR	NR
WB-1	588447.18	2106945.98	NR	NR	NR
WB-2	588683.55	2107557.07	NR	NR	NR
WB-3	590446.77	2108982.17	NR	NR	NR
WB-4	587666.32	2105131.92	NR	NR	NR
WB-5	586940.96	2105267.62	NR	NR	NR
WB-6	586530.03	2105969.00	NR	NR	NR

TABLE B-1 (Continued)

SAMPLE LOCATION COORDINATES & ELEVATIONS

SAMPLE	NORTHING*	EASTING*	ELEVATION (FEET ABOVE MEAN SEA LEVEL)		
			GROUND	CASING	RISER
A1	587473.78	2106819.23	NR	NR	NR
A2	588053.88	2106558.70	NR	NR	NR
A3	587860.01	2106180.99	NR	NR	NR
A4	586903.31	2106515.73	NR	NR	NR
A5	587815.61	2106981.62	NR	NR	NR
A6	587708.00	2106559.62	NR	NR	NR
A7	587572.10	2106183.42	NR	NR	NR
A8	587504.15	2105995.31	NR	NR	NR

Legend/Abbreviations

^ Scaled from a map in Killam (1989)
 ^^ Located on aerial photograph using physical features
 * New Jersey State Plane Coordinates
 ** Well Abandoned and Sealed
 B Boring
 SG Stream Gauge

S Surface Water/Sediment Sampling Location
 SS Surface Soil Sampling Location
 LS Leachate Seep Sampling Location
 WB Surveyed Wetland Boundary
 NR Not Required
 MW Monitoring Well
 A Air Sampling Location (Flux Chamber)

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 5 3 -

Longitude (one-half of a second):

West 74°-16'-53.5"

Latitude (one-half of a second):

North 40°-26'-43.5"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

14.32

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:

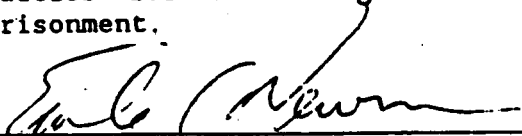
11.74

Owners Well Number (As shown on application or plans):

MW - 3S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman

PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388

PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSE

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 4 9 5 -

Longitude (one-half of a second):

West 74°-17'-17.0"

Latitude (one-half of a second):

North 40°-26'-51"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

16.91

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)"

Approx. Elevation:

14.24

Owners Well Number (As shown on application or plans):

MW - 10SR

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSED

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):

2 9 - 2 6 2 5 7

This number must be permanently affixed to the well casing.

Longitude (one-half of a second):

West 74°-17'-11.5"

Latitude (one-half of a second):

North 40°-26'-51.5"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

21.53

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:

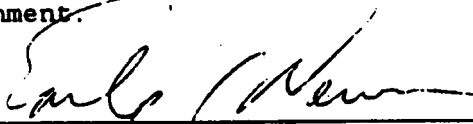
18.53

Owners Well Number (As shown on application or plans):

MW - 11S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman

PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

GS 31388

PROFESSIONAL LAND SURVEYOR'S LICENSE #

ORIGINAL EMBOSS

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation): 2 9 - 2 6 2 5 8 -
This number must be permanently affixed to the well casing.

Longitude (one-half of a second): West 74°-17'-09.5"

Latitude (one-half of a second): North 40°-26'-50.0"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot): 28.37

Source of elevation datum (benchmark, etc.) New Jersey Geodetic Control Survey (NJGSC)
If an alternate datum has been approved by the Department, identify here and give approximated elevation: Elev. 115.33 (FRED-4)

Approx. Elevation: 25.48

Owners Well Number (As shown on application or plans): MW - 12S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSED

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 5 5 -

Longitude (one-half of a second):

West 74°-17'-16.0"

Latitude (one-half of a second):

North 40°-26'-59.0"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

108.30

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:


105.31

Owners Well Number (As shown on application or plans):

MW - 13S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSE

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 5 9 -

Longitude (one-half of a second):

West 74°-16'-57.5"

Latitude (one-half of a second):
Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

North 40°-26'-38.5"

12.40

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:

9.86

Owners Well Number (As shown on application or plans):

MW - 14D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

SEAL

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

ORIGINAL EMBOSSED

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 5 2 -

Longitude (one-half of a second):

West 74°-16'-57.5"

Latitude (one-half of a second):

North 40°-26'-38.5"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

12.26

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:

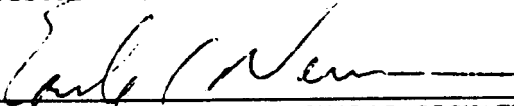
9.67

Owners Well Number (As shown on application or plans):

MW - 14S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSE

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 6 0 -

Longitude (one-half of a second):

West 74°-17'-11.5"

Latitude (one-half of a second):
Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

North 40°-26'-41.0"

14.89

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:


12.16

Owners Well Number (As shown on application or plans):

MW - 15D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSED

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: New Jersey Department of Environmental Protection and Energy
Name of Facility: Global Landfill Site
Location: Old Bridge, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Bureau of Water Allocation):
This number must be permanently affixed to the well casing.

2 9 - 2 6 2 5 4

Longitude (one-half of a second):

West 74°-17'-12.0"

Latitude (one-half of a second):

North 40°-26'-41.0"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot):

13.86

Source of elevation datum (benchmark, etc.)
If an alternate datum has been approved by the Department, identify here and give approximated elevation:

New Jersey Geodetic Control Survey (NJGSC)

Elev. 115.33 (FRED-4)

Approx. Elevation:


11.11

Owners Well Number (As shown on application or plans):

MW - 15S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Earle C. Newman
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

GS 31388
PROFESSIONAL LAND SURVEYOR'S LICENSE #

SEAL

ORIGINAL EMBOSSE

APPENDIX C

SOIL GAS SURVEY DATA

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
50	0	BL	10.0	ND	ND	ND	3	5:06	5-11-91	C&D concrete and metal
75	0	BL	>2000	0.6	ND	100	3	4:51	5-11-91	C&D
75	30	R	>2000	ND	ND	100	3	4:57	5-11-91	
75	60	R	ND	ND	ND	ND	3	5:02	5-11-91	C&D concrete and metal
100	0	BL	105	ND	ND	ND	3	4:45	5-11-91	Sandy soil
100	30	L	>1200	ND	ND	12	3	7:55	5-12-91	Dry sandy soil
100	30	R	ND	ND	ND	ND	3	4:41	5-11-91	Sandy soil
125	0	BL	>2000	ND	ND	60	3	4:22	5-11-91	Sandy soil
125	30	L	22 (1)	ND	ND	ND	2	8:09	5-12-91	Refusal 7x road c&d
125	30	R	ND	ND	ND	ND	3	4:26	5-11-91	Sandy soil
125	60	R	4.5	ND	ND	ND	3	4:35	5-11-91	Sandy soil
150	0	BL	>2000	ND	ND	60	3	4:16	5-11-91	Sandy soil
150	30	L	20	ND	ND	ND	2	8:19	5-12-91	Refusal 3x road c&d
150	30	R	ND	ND	ND	ND	3	4:10	5-11-91	Sandy soil
175	0	BL	0.2	ND	ND	ND	3	3:55	5-11-91	Sandy fill wood and concrete
175	30	L	>2000	ND	ND	35	2	8:29	5-12-91	Refusal 3x road c&d
175	60	L	>2000 (2)	0.4	ND	23	3	8:39	5-12-91	Dry sandy gravel rock frag
175	30	R	ND	ND	ND	ND	3	4:01	5-11-91	Sandy soil
200	0	BL	>2000	ND	ND	100	3	3:42	5-11-91	Sandy soil
200	30	L	30	ND	ND	ND	3	9:02	5-12-91	Dry sandy gravel rock frag
200	60	L	10	0.2	ND	ND	3	8:49	5-12-91	Dry sandy gravel rock frag
200	30	R	30	ND	ND	ND	3	3:35	5-11-91	Mounded sand
225	0	BL	ND	ND	ND	ND	2	3:11	5-11-91	Water at 2.5'-3'
225	30	L	26	ND	ND	ND	3	9:10	5-12-91	Sandy moist soil
225	60	L	130	0.3	ND	ND	3	9:16	5-12-91	Sandy moist soil
225	30	R	>2000	ND	12.0	100	3	3:15	5-11-91	Mounded sand
250	0	BL	0.6	ND	ND	ND	3	3:00	5-11-91	Sandy cover fill
250	30	L	>2000	ND	ND	100	3	9:40	5-12-91	Sandy moist soil
250	60	L	>2000	0.1	ND	55	2	9:34	5-12-91	Refusal 3x road c&d
250	90	L	>2000	ND	ND	47	3	9:25	5-12-91	Sandy moist soil
250	30	R	320	ND	ND	ND	3	3:06	5-11-91	Mounded soil
275	0	BL	ND	ND	ND	ND	3	2:54	5-11-91	Sand cover fill concrete
275	30	L	>2000 (3)	ND	ND	19	3	9:46	5-12-91	Sandy moist soil
275	60	L	>2000	1.2	28	100	3	9:52	5-12-91	Black sludge came up on probe; Refusal 2x road, sulfide odor

(1) - Ambient = 5 ppm

(3) - Ambient = 4.5 ppm

(2) - Ambient = 20 ppm

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
275	90	L	640	0.1	ND	20	2.5	10:02	5-12-91	Refusal 3x debris
300	0	BL	ND	ND	ND	ND	3	2:44	5-11-91	
300	30	L	>2000 (4)	ND	ND	ND	3	10:25	5-12-91	Sandy moist soil
300	60	L	>2000 (5)	ND	ND	100	3	10:16	5-12-91	Used jack to remove slam bar
300	90	L	>2000 (6)	0.1	ND	100	3	10:10	5-12-91	Black sludge on probe at 2'
300	30	R	>2000	0.2	25.3	ND	3	2:37	5-11-91	Odor noticed from pump exhaust
325	0	BL	ND	ND	ND	ND	3	2:31	5-11-91	Sandy soil fill
325	30	L	1000	ND	ND	ND	3	10:40	5-12-91	Sandy moist soil
325	60	L	500 (7)	0.1	ND	20	2.5	10:52	5-12-91	Black sludge on slam bar at 2.5-3'
325	90	L	22	ND	ND	ND	2.5	10:58	5-12-91	Refusal 3x road; rock and debris
325	30	R	ND	ND	ND	ND	3	2:25	5-11-91	Sandy soil fill
350	0	BL	ND	ND	ND	ND	3	1:59	5-11-91	Sandy soil fill
350	30	L	>2000	0.1	ND	53	3	11:41	5-12-91	Sandy moist soil
350	60	L	1000	ND	ND	12	3	11:30	5-12-91	Sandy moist soil
350	90	L	>2000 (8)	ND	ND	100	3	11:15	5-12-91	Sandy moist soil
350	120	L	>2000	ND	ND	100	2	11:05	5-12-91	Refusal 3x road; rock and debris
350	30	R	>2000	10.2	ND	100	3	2:15	5-11-91	Sandy soil fill
375	0	BL	5.8	ND	ND	ND	3	1:55	5-11-91	Sandy soil fill
375	30	L	2.3	ND	ND	ND	2	11:55	5-12-91	Refusal 3x road
375	60	L	ND	ND	ND	ND	2	12:01	5-12-91	Wet area water at 2.5'
375	90	L	600	ND	ND	ND	3	12:08	5-12-91	Sandy and fill
375	120	L	120	0.2	ND	ND	3	12:15	5-12-91	Sandy and fill
375	30	R	>2000	ND	ND	ND	3	1:39	5-11-91	Sandy soil fill
400	0	BL	0.8	ND	ND	ND	3	1:20	5-11-91	Fill present
400	30	L	12	0.6	ND	17	3	1:44	5-12-91	Sandy moist soil fill
400	90	L	>2000	ND	ND	100	3	1:35	5-12-91	Sandy moist soil fill
400	120	L	ND	ND	ND	ND	3	1:28	5-12-91	Sandy moist soil fill
400	150	L	>2000 (9)	ND	ND	100	3	1:20	5-12-91	Hard to drive road; used jack
400	30	R	ND	ND	ND	ND	3	1:35	5-11-91	Fill present
425	0	BL	700	ND	ND	ND	3	12:07	5-11-91	Fill present
425	30	L	32	11.0	ND	32	2	1:50	5-12-91	Refusal 2x; hard near road
425	60	L	200	ND	ND	37	3	2:05	5-12-91	Sandy moist soil fill
425	90	L	>2000	0.2	ND	36	3	2:10	5-12-91	Sandy moist soil fill
425	120	L	1000	ND	ND	100	3	2:15	5-12-91	Sandy moist soil fill

(4) - Ambient = 1.2 ppm

(5) - Ambient = 2.5 ppm

(6) - Ambient = 3.4 ppm

(7) - Ambient = 4.8 ppm

(8) - Ambient = 1.6 ppm

(9) - Ambient = 2 ppm

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
425	150	L	>2000	ND	ND	100	2	2:30	5-12-91	Near road refusal 3x fill
425	30	R	>2000	ND	ND	4	3	12:01	5-11-91	Fill present
450	0	BL	>2000	ND	ND	55	3	11:25	5-11-91	Open hole measure .5' blgs., rocks and bricks on surface
450	30	L	0.4	ND	ND	ND	3	3:28	5-12-91	Sandy and fill; wood & concrete
450	60	L	18	ND	ND	ND	3	3:24	5-12-91	Sandy and fill; wood & concrete
450	90	L	>2000	ND	ND	26	3	3:15	5-12-91	Sandy and fill; wood & concrete
450	120	L	ND	ND	ND	ND	3	3:05	5-12-91	Sandy and fill; wood & concrete
450	150	L	>2000	ND	ND	100	3	2:55	5-12-91	Sandy and fill; wood & concrete
450	180	L	>2000	ND	ND	100	2	2:45	5-12-91	Near road, refusal 3x fill
450	30	R	>2000	ND	ND	100	3	11:32	5-11-91	Open hole measure .5' blgs., rocks and bricks on surface
450	60	R	600	ND	ND	2	3	11:45	5-11-91	Probe at 3'
475	0	BL	>2000	ND	ND	ND	3	10:56	5-11-91	Debris: bricks, wood, metal; Sandy moist soil
475	30	L	0.4	0.1	ND	ND	3	3:32	5-12-91	Sandy and fill; debris wood concrete
475	60	L	0.2	ND	ND	ND	3	3:36	5-12-91	Sandy and fill; debris wood concrete
475	90	L	>2000	0.2	ND	100	3	3:42	5-12-91	Sandy and fill; debris wood concrete
475	120	L	>2000	ND	ND	ND	3	3:50	5-12-91	Sandy moist soil
475	150	L	2.2	ND	ND	ND	3	3:56	5-12-91	Sandy moist soil
475	180	L	>2000	ND	ND	100	3	4:01	5-12-91	Sandy moist soil
475	30	R	0.8	ND	ND	ND	3	10:51	5-11-91	Moist, sandy
475	60	R	0.2	ND	ND	ND	3	10:45	5-11-91	Moist, sandy
475	90	R	ND	ND	ND	ND	3	10:38	5-11-91	Moist, sandy
500	0	BL	0.1	ND	ND	ND	3	10:18	5-11-91	Moist, sandy
500	30	L	2.2	0.4	ND	ND	3	4:46	5-12-91	Fill: wood, metal, concrete
500	60	L	ND	ND	ND	ND	3	4:40	5-12-91	Fill: wood, metal, concrete
500	90	L	11.0	ND	ND	ND	3	4:30	5-12-91	Fill: wood, metal, concrete
500	120	L	>2000	ND	ND	100	3	4:25	5-12-91	Sandy moist soil
500	150	L	>2000	0.4	ND	100	3	4:15	5-12-91	Sandy moist soil
500	180	L	>2000	ND	ND	30	3	4:10	5-12-91	Sandy moist soil
500	210	L	25.0	ND	ND	ND	3	4:06	5-12-91	Tar-like black material at 2'
500	30	R	ND	ND	ND	ND	3	10:25	5-11-91	Moist, sandy
500	60	R	ND	ND	ND	ND	3	10:30	5-11-91	Moist, sandy
500	90	R	ND	ND	ND	ND	3	10:35	5-11-91	Moist, sandy
525	0	BL	8.2	ND	ND	ND	3	10:10	5-11-91	Moist, sandy
525	30	L	2.4	0.1	ND	ND	3	4:50	5-12-91	Sandy soil fill c&d
525	60	L	ND	ND	ND	ND	3	4:54	5-12-91	Sandy soil fill c&d
525	90	L	1200	ND	ND	10	3	4:57	5-12-91	Sandy soil fill c&d
525	120	L	>2000	0.1	ND	100	3	5:00	5-12-91	Sandy soil fill c&d

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
525	150	L	>2000	ND	ND	100	3	5:04	5-12-91	Sandy soil fill c&d
525	180	L	>2000	ND	ND	100	3	5:08	5-12-91	Sandy soil fill c&d
525	210	L	>2000	ND	ND	100	3	5:16	5-12-91	Sandy soil fill c&d
525	30	R	2.2	ND	ND	ND	3	10:06	5-11-91	Very moist
525	60	R	ND	ND	ND	ND	3	9:59	5-11-91	Sandy moist soil
525	90	R	ND	ND	ND	ND	3	9:55	5-11-91	Sandy moist soil
550	30	L	0.4	ND	ND	ND	2	8:52	5-13-91	Refusal 3x near road
550	60	L	ND	ND	ND	ND	3	8:46	5-13-91	Sandy and fill
550	90	L	1200	ND	ND	8	3	8:40	5-13-91	Sandy and fill
550	120	L	>2000	ND	ND	100	3	8:33	5-13-91	Sandy and fill
550	150	L	>2000	ND	ND	100	3	8:27	5-13-91	Sandy and fill
550	180	L	>2000	ND	ND	ND	3	8:18	5-13-91	Sandy and fill
550	210	L	1600	ND	ND	16	3	8:11	5-13-91	Sandy and fill
550	240	L	>2000	ND	ND	31	3	8:05	5-13-91	Sandy and fill
550	60	R	0.8	ND	ND	ND	3	9:48	5-11-91	Fill on surface wood, metal concrete, 2 offsets
575	0	BL	400	ND	ND	ND	3	9:36	5-11-91	Sandy moist soil
575	30	L	0.8	ND	ND	ND	3	8:58	5-13-91	Sandy hard soil
575	60	L	ND	ND	ND	ND	3	9:03	5-13-91	Sandy moist soil
575	90	L	3.8	ND	ND	ND	3	9:08	5-13-91	Sandy moist soil
575	120	L	>2000	ND	ND	100	3	9:12	5-13-91	Sandy moist soil
575	150	L	>2000	ND	ND	100	3	9:15	5-13-91	Sandy moist soil
575	180	L	>2000	ND	ND	100	3	9:18	5-13-91	Sandy moist soil
575	210	L	>2000	0.1	7.2	100	3	9:23	5-13-91	Sandy moist soil
575	240	L	>2000	ND	ND	ND	3	9:30	5-13-91	Sandy soil tar present on surface
575	30	R	ND	ND	ND	ND	3	9:44	5-11-91	Sandy moist soil
600	0	BL	450	ND	ND	ND	3	9:30	5-11-91	Sandy moist soil
600	30	L	ND	ND	ND	ND	3	10:59	5-13-91	Sandy moist soil fill
600	60	L	0.8	ND	ND	ND	3	10:54	5-13-91	Sandy moist soil fill
600	90	L	140	ND	ND	ND	3	10:48	5-13-91	Sandy moist soil fill
600	120	L	>2000	1.0	ND	100	3	10:40	5-13-91	Sandy moist soil fill
600	150	L	>2000	2.0	ND	100	3	10:35	5-13-91	Sandy moist soil fill
600	180	L	>2000	2.0	ND	100	3	10:30	5-13-91	Black material on bottom 2" of probe
600	210	L	>2000	0.6	ND	100	3	10:24	5-13-91	Sandy and fill
600	240	L	>2000	ND	ND	100	3	10:18	5-13-91	Sandy and fill
600	270	L	>2000	ND	ND	100	3	10:10	5-13-91	Sandy soil tar present on surface
625	0	BL	0.2	ND	ND	ND	3	9:25	5-11-91	Sandy moist soil
625	30	L	ND	ND	ND	ND	3	11:03	5-13-91	Sandy moist soil fill

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
625	60	L	0.4	ND	ND	ND	3	11:08	5-13-91	Sandy moist soil fill
625	90	L	ND	ND	ND	ND	3	11:15	5-13-91	Sandy moist soil fill
625	120	L	>2000	ND	ND	ND	3	11:19	5-13-91	Sandy moist soil fill
625	150	L	>2000	1.0	ND	100	3	11:25	5-13-91	Sandy moist soil fill
625	180	L	>2000	1.0	ND	100	3	11:31	5-13-91	Black material on bottom 1" of probe
625	210	L	>2000	ND	ND	100	3	11:50	5-13-91	Sandy moist soil
625	240	L	>2000	ND	ND	100	3	12:02	5-13-91	Sandy moist soil;debris
625	270	L	1130	4.1	2.2	100	3	12:05	5-13-91	Sandy moist soil;debris
650	0	BL	ND	ND	ND	ND	3	9:15	5-11-91	Sandy, moist, very firm soil
650	30	L	3.2	ND	ND	ND	3	12:56	5-13-91	Sandy moist soil fill
650	60	L	17.0	ND	ND	ND	3	12:50	5-13-91	Sandy moist soil
650	90	L	4.8	ND	ND	ND	3	12:42	5-13-91	Sandy moist soil
650	120	L	200	ND	ND	ND	3	12:36	5-13-91	Sandy moist soil
650	150	L	>2000	1.0	ND	100	3	12:34	5-13-91	Sandy moist soil;water at 2.5-3'
650	180	L	>2000	0.2	ND	100	2	12:28	5-13-91	Sandy moist soil;water at 2.5-3'
650	210	L	>2000	0.8	ND	100	2	12:23	5-13-91	Sandy moist soil;water at 2.5-3'
650	240	L	140	2.4	ND	100	3	12:18	5-13-91	Sandy moist soil
650	270	L	1200	1.0	ND	100	3	12:14	5-13-91	Refusal 3x road
675	0	BL	1.4	ND	ND	ND	2	8:55	5-11-91	Water at 2.5-3.0' came up in pump
675	30	L	ND	ND	ND	ND	3	1:05	5-13-91	Sandy moist soil
675	60	L	ND	ND	ND	ND	3	1:10	5-13-91	Sandy moist soil
675	90	L	760	ND	1.5	ND	3	1:14	5-13-91	Sandy moist soil
675	120	L	20	ND	ND	ND	3	1:19	5-13-91	Sandy moist soil
675	150	L	>2000	1.0	ND	100	3	1:25	5-13-91	Sandy moist soil
675	180	L	>2000	1.8	ND	100	3	1:30	5-13-91	Sandy moist soil
675	210	L	>2000	ND	ND	37	3	1:34	5-13-91	Sandy moist soil fill;tar on surface
675	240	L	>2000	ND	ND	34	3	1:38	5-13-91	Sandy moist soil
675	270	L	>2000	ND	ND	100	2	1:43	5-13-91	Tar-like substance;refusal 2'
675	30	R	0.8	ND	ND	ND	3	9:03	5-11-91	Sandy moist soil
700	0	BL	1.2	ND	ND	ND	2	8:40	5-11-91	Water at 2.5-3.0' came up in pump
700	30	L	ND	ND	ND	ND	2	7:10	5-14-91	Water at 2" ambient
700	60	L	2.0	ND	ND	ND	3	7:06	5-14-91	Wet sand
700	90	L	0.6	ND	ND	ND	3	7:03	5-14-91	Wet sand
700	120	L	ND	ND	ND	ND	3	6:59	5-14-91	Wet sand
700	150	L	ND	ND	ND	ND	3	6:54	5-14-91	Wet sand
700	180	L	32	ND	ND	ND	3	6:48	5-14-91	Dry hard sand
700	210	L	>2000	ND	ND	ND	3	1:53	5-13-91	Sandy moist soil fill

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
700	240	L	>2000	0.1	3.0	20	3	1:49	5-13-91	Sandy moist soil fill
700	270	L	>2000	0.1	ND	100	3	1:46	5-13-91	Sandy moist soil fill
700	30	R	32	ND	ND	ND	3	8:28	5-11-91	Sandy moist soil
725	0	BL	5.4	ND	ND	ND	3	8:14	5-11-91	Water at 2-2.5' came up in pump
725	30	L	ND	ND	ND	ND	2	7:12	5-14-91	Water at 2" ambient
725	60	L	ND	ND	ND	ND	2	7:15	5-14-91	Water at 2" ambient
725	90	L	3.0	ND	ND	ND	3	7:18	5-14-91	Wet sand
725	120	L	0.4	0.1	ND	ND	3	7:22	5-14-91	Wet sand
725	150	L	0.3	ND	ND	ND	3	7:26	5-14-91	Wet sand
725	180	L	3.0	ND	ND	ND	3	7:30	5-14-91	Wet sand
725	210	L	0.2 (10)	ND	ND	ND	3	7:33	5-14-91	Wet sand
725	240	L	>1000 (11)	ND	ND	>100	3	7:38	5-14-91	Wet sand
725	270	L	1.1	ND	ND	ND	2	7:44	5-14-91	Wet sand and concrete
725	300	L	>1000	ND	ND	>100	2	7:54	5-14-91	Dry sand (road)
725	30	R	3.1	ND	ND	ND	3	8:22	5-11-91	Sandy moist soil
750	0	BL	3.2	ND	ND	ND	2	8:10	5-11-91	Water at 2.5' came up in pump
750	30	L	ND	ND	ND	ND	ambient	8:54	5-14-91	Water at 1" ambient
750	60	L	ND	ND	ND	ND	ambient	8:50	5-14-91	Water at 1" ambient
750	90	L	>1000	0.1	ND	ND	ambient	8:46	5-14-91	Water at 1" ambient
750	120	L	24	ND	ND	ND	ambient	8:40	5-14-91	Water at 3" ambient
750	150	L	0.4	3.2	ND	ND	ambient	8:35	5-14-91	Water at 2" ambient
750	180	L	100	ND	ND	ND	3	8:27	5-14-91	Wet sand
750	210	L	>1000	ND	ND	8	3	8:18	5-14-91	Wet sand
750	240	L	>1000	ND	ND	>100	3	8:14	5-14-91	Wet sand
750	270	L	>1000	ND	ND	>100	3	8:07	5-14-91	Wet sand
750	300	L	>1000	ND	ND	ND	2	8:01	5-14-91	Wet sand (road)
750	30	R	ND	ND	ND	ND	3	8:06	5-11-91	Sandy moist soil
750	60	R	ND	ND	ND	ND	3	8:02	5-11-91	Sandy moist soil
775	0	BL	0.2	ND	ND	ND	3	7:42	5-11-91	Sandy, very moist
775	30	L	ND	0.1	ND	ND	ambient	9:01	5-14-91	Surface water ambient
775	60	L	ND	ND	ND	ND	ambient	9:05	5-14-91	Water at 2" ambient
775	90	L	45	ND	ND	ND	ambient	9:07	5-14-91	Water at 2" ambient
775	120	L	0.2	0.1	ND	ND	ambient	9:10	5-14-91	Water at 2" ambient
775	150	L	ND	ND	ND	ND	ambient	9:13	5-14-91	Water at 2" ambient

(10) - Ambient = 2.2 ppm

(11) - Ambient = 2.2 ppm

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
775	180	L	2.0	ND	ND	ND	ambient	9:15	5-14-91	Water at 4" ambient
775	210	L	74	ND	ND	ND	ambient	9:17	5-14-91	Water at 2" ambient
775	240	L	>1000	ND	ND	ND	3	9:24	5-14-91	Wet sand
775	270	L	>1000 (12)	0.1	1.5	100	3	9:30	5-14-91	Moist sand/rock
775	300	L	>1000	ND	ND	63	2	9:35	5-14-91	Refusal 3x road
775	30	R	0.4	ND	ND	ND	3	7:49	5-11-91	Sandy moist soil
775	60	R	2.9	ND	ND	ND	3	7:56	5-11-91	Sandy moist soil
800	0	BL	ND	ND	ND	ND	3	7:34	5-11-91	Sandy, very moist
800	30	L	ND	ND	ND	ND	ambient	10:19	5-14-91	Saturated sand
800	60	L	ND	ND	ND	ND	ambient	10:17	5-14-91	Saturated sand
800	90	L	ND	ND	ND	ND	ambient	10:15	5-14-91	Saturated sand
800	120	L	ND	ND	ND	ND	ambient	10:13	5-14-91	Saturated sand
800	150	L	0.2	ND	ND	ND	ambient	10:11	5-14-91	Saturated sand
800	180	L	0.2	ND	ND	ND	ambient	10:08	5-14-91	3" of surface water ambient
800	210	L	0.5 (13)	ND	ND	ND	3	10:04	5-14-91	Wet sand
800	240	L	7 (14)	ND	ND	ND	3	9:58	5-14-91	Moist sand/fill
800	270	L	>1000	ND	ND	43	2	9:52	5-14-91	Wet sand/concrete
800	300	L	4.0 (15)	ND	ND	ND	3	9:46	5-14-91	Wet sand/rock
800	30	R	ND	ND	ND	ND	3	8:28	5-10-91	Sandy moist soil
800	60	R	ND	ND	ND	ND	3	8:22	5-10-91	Sandy moist soil
825	30	L	ND	ND	ND	ND	ambient	10:21	5-14-91	Saturated sand
825	60	L	ND	ND	ND	ND	ambient	10:22	5-14-91	Saturated sand
825	90	L	ND	ND	ND	ND	ambient	10:23	5-14-91	Saturated sand
825	120	L	18	ND	ND	ND	ambient	10:25	5-14-91	Saturated sand
825	150	L	ND	ND	ND	ND	ambient	10:27	5-14-91	Saturated sand
825	180	L	2.3	ND	ND	ND	ambient	10:29	5-14-91	4" of standing water - saturated sand
825	210	L	0.5	ND	ND	ND	3	10:31	5-14-91	
825	240	L	12	ND	ND	ND	3	10:33	5-14-91	Moist sand
825	270	L	>1000	ND	ND	27	2	10:38	5-14-91	Moist sand
825	300	L	130	ND	ND	ND	3	10:42	5-14-91	Moist sand
825	30	R	ND	ND	ND	ND	3	8:10	5-10-91	Sandy moist soil
825	60	R	ND	ND	ND	ND	3	8:15	5-10-91	Sandy moist soil
825	0	BL	ND	ND	ND	ND	3	8:01	5-10-91	Sandy moist soil
850	0	BL	ND	ND	ND	ND	3	8:06	5-10-91	Sandy moist soil

(12) - Ambient = 2.2 ppm

(13) - Ambient = 2.6 ppm

(14) - Ambient = 3.4 ppm

(15) - Ambient = 3.0 ppm

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
850	30	L	ND	ND	ND	ND	ambient	11:20	5-14-91	Saturated sand
850	60	L	ND	ND	ND	ND	ambient	11:13	5-14-91	Saturated
850	90	L	ND	ND	ND	ND	ambient	11:11	5-14-91	Surface water ambient
850	120	L	100	ND	ND	ND	ambient	11:08	5-14-91	Surface water ambient
850	150	L	ND	ND	ND	ND	ambient	11:05	5-14-91	Surface water ambient
850	180	L	ND	ND	ND	ND	ambient	11:03	5-14-91	Water at 6" ambient
850	210	L	>1000	ND	ND	ND	3	11:00	5-14-91	Moist sand/rock
850	240	L	>1000	ND	ND	100	3	10:55	5-14-91	Moist sand/rock
850	270	L	90	ND	ND	ND	2	10:52	5-14-91	Moist sand/rock
850	300	L	100	0.2	ND	ND	2	10:48	5-14-91	Moist sand/rock
850	30	R	1.0	ND	ND	ND	3	7:54	5-10-91	Sandy moist soil
850	60	R	ND	ND	ND	ND	3	7:47	5-10-91	Sandy moist soil
875	0	BL	1.8	ND	1.0	ND	3	7:20	5-10-91	Sandy moist soil
875	30	L	13	ND	ND	ND	3	12:15	5-14-91	Moist sand
875	60	L	ND	ND	ND	ND	ambient	12:19	5-14-91	Saturated sand
875	90	L	ND	ND	ND	ND	ambient	12:21	5-14-91	Saturated sand
875	120	L	70	ND	ND	ND	ambient	12:23	5-14-91	Saturated sand
875	150	L	ND	ND	ND	ND	ambient	12:24	5-14-91	Swamp (6" water)
875	180	L	ND	ND	ND	ND	ambient	12:25	5-14-91	Swamp (6" water)
875	210	L	ND	ND	ND	ND	ambient	12:26	5-14-91	Swamp (6" water)
875	240	L	>1000	ND	ND	49	3	12:28	5-14-91	Moist sand
875	270	L	>1000	ND	ND	100	3	12:33	5-14-91	Moist sand
875	300	L	>1000	0.1	ND	ND	2	12:41	5-14-91	Dry sand/rock
875	30	R	0.8	ND	ND	ND	3	7:26	5-10-91	Sandy moist soil
875	60	R	0.6	ND	ND	ND	3	7:35	5-10-91	Sandy moist soil
875	90	R	ND	ND	ND	ND	3	7:42	5-10-91	Sandy moist soil
900	0	BL	3.8	ND	1.0	ND	3	7:13	5-10-91	Sandy moist soil
900	30	L	3.2	ND	ND	ND	3	1:03	5-14-91	Dry sand
900	60	L	ND	ND	ND	ND	ambient	1:00	5-14-91	Water at 4"
900	90	L	ND	ND	ND	ND	ambient	12:59	5-14-91	Saturated
900	120	L	ND	ND	ND	ND	ambient	12:58	5-14-91	Swamp (6" water)
900	150	L	ND	ND	ND	ND	ambient	12:57	5-14-91	Swamp (6" water)
900	180	L	ND	ND	ND	ND	ambient	12:56	5-14-91	Swamp (6" water)
900	210	L	160	ND	ND	ND	3	12:55	5-14-91	Saturated
900	240	L	0.6	ND	ND	ND	3	12:51	5-14-91	Wet sand
900	270	L	>1000	ND	ND	100	2	12:45	5-14-91	Dry sand/rock
900	30	R	6.2	ND	ND	ND	3	7:09	5-10-91	Sandy moist soil

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. **MW-15D**

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 2

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 12.16'

GROUND WATER: Water @ 6.0'

CAS. SAMP CORE TUBE DATE STARTED: 6/3/91

DATE TIME LEV. TYPE TYPE

DATE FINISHED: 6/5/91

DIA. 2" DRILLER: Jeff Marchesi

WT. 140# GEOLOGIST: Robert Kreuzer

FALL 30" REVIEWED BY: BP & DL

DEPTH FT	STRATA	SAMPLE					DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS		
	XXXXXX	S-1	SS	3 5	10	Tan	Loose	MEDIUM SAND, some silt (Landfill cover)	SP		
	XXXXXX			7 9		Black					
	XXXXXX	S-2	SS	7 6	15			FILL: wood, brick, roofing shingles, concrete		Moist	
	XXXXXX			10 26							
5	XXXXXX	S-3	SS	15 22	10					HNu = .2 ppm	
	XXXXXX			46 26							
	XXXXXX	S-4	SS	6 5	25					Wet	
	XXXXXX			4 9							
	XXXXXX										
10	XXXXXX										
	XXXXXX	S-5	SS	1 1	10						
	XXXXXX			1 1							
	XXXXXX										
15						Gray	Soft	PEAT: medium sand and silt	PT	o 80% Organics	
		S-6	SS	5 2	60						
				1 3							
		S-7	SS	2 1	0						
				3 3							
20		S-8	SS	2 1	0						
				1 1							
		S-9	SS	5 6	25		Med. Stiff				
				4 4							
25	~|~|~|	S-10	SS	3 3	0	Gray	Med. Stiff	ORGANIC RICH SILT: some silt and clay	OL	o Abundant Roots & Organic Matter	
	~|~|~|			3 3							
	~|~|~|	S-11	SS	5 3	75						
	~|~|~|			1 3							
	.....	S-12	SS	6 7	40	Lt. Gray	Med. Dense	MEDIUM SAND, some silt	SW	
	.....			7 8						
30	.....	S-13	SS	7 9	95					
	.....			9 6						
	.....	S-14	SS	4 3	40	Orange Brown				
	.....			4 9						
	.....	S-15	SS	11 7	80					
35	.....			6 5						
	.....	S-16	SS	12 28						
	.....	S-17	SS	22 22	60		Dense			1/2-1 1/2" Clay Seams From 37-43'
38	.....									

COMMENTS HNu readings taken from Split Spoons.

PROJECT NO.
BORING NO.

35226
MW-15D

PROJECT: Global Landfill RI/FS

SHEET NO. 2 OF

2

CLIENT: NJDEP

JOB NO. :

35226

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
40	~.~.	S-17	SS	4	2	100	Light	Med. Dense	SILTY SAND, trace clay.	SM
	7			13	Gray					
45	~.~.	S-18	SS	6	8	100	Black	Very Dense	SANDY SILT, trace clay.	ML
	25			45						
	~.~.	S-19	SS	18	42	100	Gray	Dense	SILTY SAND, trace clay.	SM
	65			65						
50	~.~.	S-20	SS	16	25	70	Brown and Gray	Loose	MEDIUM SAND, some silt, trace clay.	SW
	20			13						
	.....	S-21	SS	5	4	75	Gray	Medium Dense		
	6			15						
	.....	S-22	SS	15	13	80				
	11			14						
55	.....	S-23	SS	9	6	20				
	5			6						
60	End of Boring								Boring completed at 55 feet.	

COMMENTS

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. **MW-14D**

PROJECT: **Global Landfill RI/FS**

SHEET NO. **1 OF 2**

CLIENT: **NJDEP**

JOB NO. : **35226**

BORING CONTRACTOR: **Empire Soils Investigations**

GROUND ELEVATION: **9.67'**

GROUND WATER: **Water @ 5.5'**

CAS. SAMP CORE TUBE

DATE STARTED: **5/29/91**

DATE TIME LEV TYPE TYPE

DATE FINISHED: **6/3/91**

DIA.

SS

DRILLER: **Jeff Marchesi**

WT.

140#

GEOLOGIST: **Robert Kreuzer**

FALL

30"

REVIEWED BY: **BP & DL**

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
	.....	S-1	SS	1 2	65	Orange	Very	MEDIUM SAND, some silt.	SP	o Moist
	.....			3 4		Brown	Loose	(Landfill cover)		
	XXXXXX					Black	Loose	FILL: wood and paper in sandy matrix.		
5	XXXXXX									o Wet @ 5.5'
	XXXXXX	S-2	SS	6 5	30					
	XXXXXX			4 4						
	XXXXXX									
10	XXXXXX									
		S-3	SS	2 1	60	Dark	Very	PEAT: medium sand and silt	PT	o 80% Organics
				1 1		Gray	Soft			
	|~|~|~|	S-4	SS	1 1	90	Dark	Very	ORGANIC RICH SILT, some silt and clay	OL	o Roots and fibers o HNu = 12ppm
15	|~|~|~|			1 WH		Gray	Soft			
	|~|~|~|	S-5	SS	2 1	10					
	|~|~|~|			WH 1						
	|~|~|~|	S-6	SS	WH WH	100					
	|~|~|~|			WH WH						
	|~|~|~|	S-7	SS	WH WH	0	Gray	Very	CLAYEY SILT; trace fine sand.	OL/ML	o H2S odor o Roots and fibers
20	|~|~|~|			WH WH			Soft			
	|~|~|~|	S-8	SS	WH WH	95					
	|~|~|~|			WH WH						
	|~|~|~|	S-9	SS	2 1	45					
	|~|~|~|			WH WH						
25	|~|~|~|	S-10	SS	2 3	5					
	|~|~|~|			4 4						
	|~|~|~|	S-11	SS	WH WH	100					
	|~|~|~|			WH WH						
	|~|~|~|	S-12	SS	WH WH	100					o A few shells
30	|~|~|~|			WH WH						
	|~|~|~|	S-13	SS	WH WH	100					
	|~|~|~|			WH WH						
	|~|~|~|	S-14	SS	WH WH	100					
	|~|~|~|			WH WH						
35	|~|~|~|	S-15	SS	WH WH	100					
	|~|~|~|			WH WH						
	|~|~|~|	S-16	SS	1 3	100	Gray	Med. Stiff			
38	~.~.~			6 9		Lt. Gray	Med. Dense	SILTY SAND, trace clay	SM	

COMMENTS Two wells were installed at this location including: MW-14D and MW-14S. HNu readings taken from split spoons.

PROJECT NO.
BORING NO.

35226
MW-14D

PROJECT: Global Landfill RI/FS

SHEET NO. 2 OF 3

CLIENT: NJDEP

JOB NO. : 35226

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
40	S-20	SS	10 25	80	Orange- Brown	Very Dense	MEDIUM SAND	SW	o Moist
			35 25						
	S-21	SS	12 22	95	Gray	Dense	Some clay, trace silt		
			28 28						
45	S-22	SS	12 14	100	Orange- Brown	Very Dense	Some silt		
			18 18						
	S-23	SS	8 12	100	Gray	Very Dense	Some silt		
			15 18						
50	S-24	SS	22 31	70	Orange- Brown	Very Dense	Some silt		
			36 34						
					Gray	Very Dense	SILTY FINE SAND	SM	
									
55	S-25	SS	7 14	100	Orange- Brown	Very Dense	MEDIUM SAND, some silt	SW	
			19 22						
					Gray	Very Dense	Trace clay		
									
60	S-26	SS	13 19	100	Orange- Brown	Very Dense	MEDIUM SAND, some silt	SW	
			30 31						
					Gray	Very Dense	MEDIUM SAND, some silt	SW	
									
65	S-27	SS	7 13	100	Orange- Brown	Very Dense	MEDIUM SAND, some silt	SW	
			26 37						
	S-28	SS	29 50/5.5"	100	Gray	Very Dense	Trace clay		
									
70	S-29	SS	12 25	100	Orange- Brown	Very Dense	MEDIUM SAND, some silt	SW	
			50/6"						
					Gray	Very Dense	Trace clay		
									
75					Orange- Brown	Very Dense	MEDIUM SAND, some silt	SW	o Water @ 74.5'
									

COMMENTS

PROJECT NO.
BORING NO.

35226
MW-13

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO.

MW-13

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 3

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 105.31'

GROUND WATER: Water @ 74.5'

CAS. SAMP CORE TUBE

DATE STARTED: 6/6/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 6/7/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

DEPTH FT	STRATA	SAMPLE					DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS		
	|||||	S-1	SS	12	20	80	Brown	Dense	Top 6" - top soil (silty)	OL	o Dry
				20	20		Tan	Dense	MEDIUM SAND, some silt.	SW	
	: : : : :	S-2	SS	14	18	60					o Moist
				19	15						
5	: : : : :	S-3	SS	10	14	70					o Iron Cemented Seams (1/2 - 3/4") from 7-10'
				16	16						
	: : : : :	S-4	SS	14	14	80					
				14	12						
	: : : : :	S-5	SS	14	15	90					
				17	12						
10	: : : : :	S-6	SS	7	13	60			Trace silt		
				15	19						
	: : : : :	S-7	SS	14	13	80					
				18	28						
15	: : : : :	S-8	SS	30	34	60	Orange-Brown		Coarse sand, some gravel.		
				22	14						
	~ ~ .	S-9	SS	9	9	100	Orange-Brown	Med. Dense	SILTY MEDIUM SAND	SM	o Iron Cemented Seams (1/4 - 1/2") from 17-18' and 19-20'
				9	10						
20	~ ~ .	S-10	SS	7	7	100					
				9	14						
	: : : : :	S-11	SS	7	10	90	Orange-Brown	Med. Dense	MEDIUM SAND, trace to some silt	SW/SM	o Very Moist
				10	10		Gray				o 1/4" clay seams 23.5-24'
25	: : : : :	S-12	SS	12	12	85					
				14	12						
	: : : : :	S-13	SS	5	10	95	Orange-Brown				o Iron Cemented Seams 27.5-28'
				14	22		Gray				o 1/8-1/4" clay seams.
30	: : : : :	S-14	SS	15	15	80					
				18	23						
	: : : : :	S-15	SS	8	14	95					
				16	16						
	: : : : :	S-16	SS	10	12	80	Tan				
				12	12						
	: : : : :	S-17	SS	18	18	90					
				18	18						
35	: : : : :	S-18	SS	10	18	100	Orange-Brown	Dense	MEDIUM SAND, some silt and clay		o Clay Seams
				20	25						
38	: : : : :	S-19	SS	24	30	65					o Moist
				30	32						

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

PROJECT NO.
BORING NO.

35226
MW-13

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO.

MW-12S

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 25.48'

GROUND WATER: Wet @ 6'

CAS. SAMP CORE TUBE

DATE STARTED: 6/11/91

DATE TIME LEV TYPE TYPE SS

DATE FINISHED: 6/11/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
	~.~.~	S-1	SS	3 4	30	Tan	Loose	SILTY MEDIUM SAND (Landfill cover)	SP	o H2S odor o HNu = .4 ppm o Wet @ 6'
	~.~.~			2 3						
	~.~.~	S-2	SS	4 3	5	Tan	Loose	SILTY MEDIUM SAND, mixed with plastic fill	SM	
	~.~.~			3 2						
5	XXXX	S-3	SS	5 5	0	Black	Loose/ Med. Dense	FILL: black silty		
	XXXX			7 7						
	XXXX	S-4	SS	5 4	0					
	XXXX			3 3						
	XXXX	S-5	SS	7 7	15			FILL: wood and plastic in sandy matrix		
10	XXXX			8 10						
	XXXX									
	XXXX	S-6	SS	4 4	0					
	XXXX			4 4						
15	XXXX									
	XXXX	S-7	SS	8 10	10					
	XXXX			10 12						
	XXXX	S-8	SS	3 3	10					
	XXXX			4 4						
20	XXXX					Orange	Med. Dense	MEDIUM SAND, some silt	SW	
	.....	S-9	SS	9 8	20	Brown			
	.....			6 6					
	END OF BORING							Boring completed at 22 feet.		
25										
30										
35										
38										

COMMENTS HNu readings taken from split spoons.

PROJECT NO.
BORING NO.

35226
MW-12S

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO.: 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 18.53

GROUND WATER: Wet @ 6'

CAS. SAMP CORE TUBE

DATE STARTED: 6/11/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 6/11/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS	
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS		
	S-1	SS	2	8	40	Tan	Med. Dense	MEDIUM SAND (cover)	SP	Dry Moist
	XXXX			6	8		Black	Very Loose	FILL: wood, plastic, & paper		
	XXXX	S-2	SS	50/6"		0					Wet @ 6' 2" Clayey Sand seam @ 9'
	XXXX										
5	XXXX	S-3	SS	1/12"		0					
	XXXX			1/12"							
	~.~.~	S-4	SS	1	1	100	Gray	Loose	SILTY MEDIUM SAND	SM	
	~.~.~			1	1						
	~.~.~	S-5	SS	1	1	100					
10	~.~.~			2	3						
	.....	S-6	SS	5	4	75	Tan	Loose	MEDIUM SAND, some silt	SW
	.....			3	7					
15	END OF BORING								Boring completed at 14 feet.		
20											
25											
30											
35											
38											

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 14.24

GROUND WATER: Wet @ 1.5'

CAS. SAMP CORE TUBE

DATE STARTED: 6/10/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 6/10/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION			CLASS USCS	REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY REQ %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION		
	.....	S-1	SS	1 2	75	Tan	Loose	MEDIUM SAND, some silt, trace clay	SW	Moist Wet @ 1.5'
	.....			6 8						
	.....	S-2	SS	6 6	50					
	.....			3 3						
5	~.~.~	S-3	SS	3 8	40	Dark Gray	Med. Dense	SILTY MEDIUM SAND, trace clay	SM	
	~.~.~			10 10						
	~.~.~	S-4	SS	3 3	50		Loose			
	~.~.~			3 4						
10	.....	S-5	SS	2 2	60	Orange Brown	Loose	MEDIUM SAND, some silt,	SW	
	.....			1 2						
									
	.....	S-6	SS	2 2	70					
	.....			2 4						
15	END OF BORING							Boring completed at 14.0 feet		
20										
25										
30										
35										
38										

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 11.74

GROUND WATER: 3.5' BGS

CAS. SAMP CORE TUBE

DATE STARTED: 5/30/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 5/30/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE					DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS		
	S-1	SS	1 2	80	Tan	Loose	MEDIUM SAND, some silt, (Landfill cover)	SP	Moist Wet @ 3.5'	
	.....			4 3						
	.....	S-2	SS	1 2	60					
	.....			3 1						
5	.....	S-3	SS	3 2	0					
	.....			1 1						
	XXXXXX	S-4	SS	3 5	30						Black	Dense	FILL: wood, plastic, and paper in sandy matrix
	XXXXXX			15 24							
	XXXXXX	S-5	SS	5 6	5						
10	XXXXXX			5 4							
	XXXXXX	S-6	SS	5 13	5	Medium Dense					
	XXXXXX			12 8							
	XXXXXX	S-7	SS	4 2	8						
	~.~.~			2 3		Dark Gray	Soft	SANDY SILT; some clay	ML		
15	END OF BORING									Boring completed at 14.0 feet	
20											
25											
30											
35											
38											

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

APPENDIX E

SOIL BORING LOGS

Terrain Conductivity Survey
 Global Landfill Site
 Old Bridge, New Jersey
 File 89D13 May, 1991

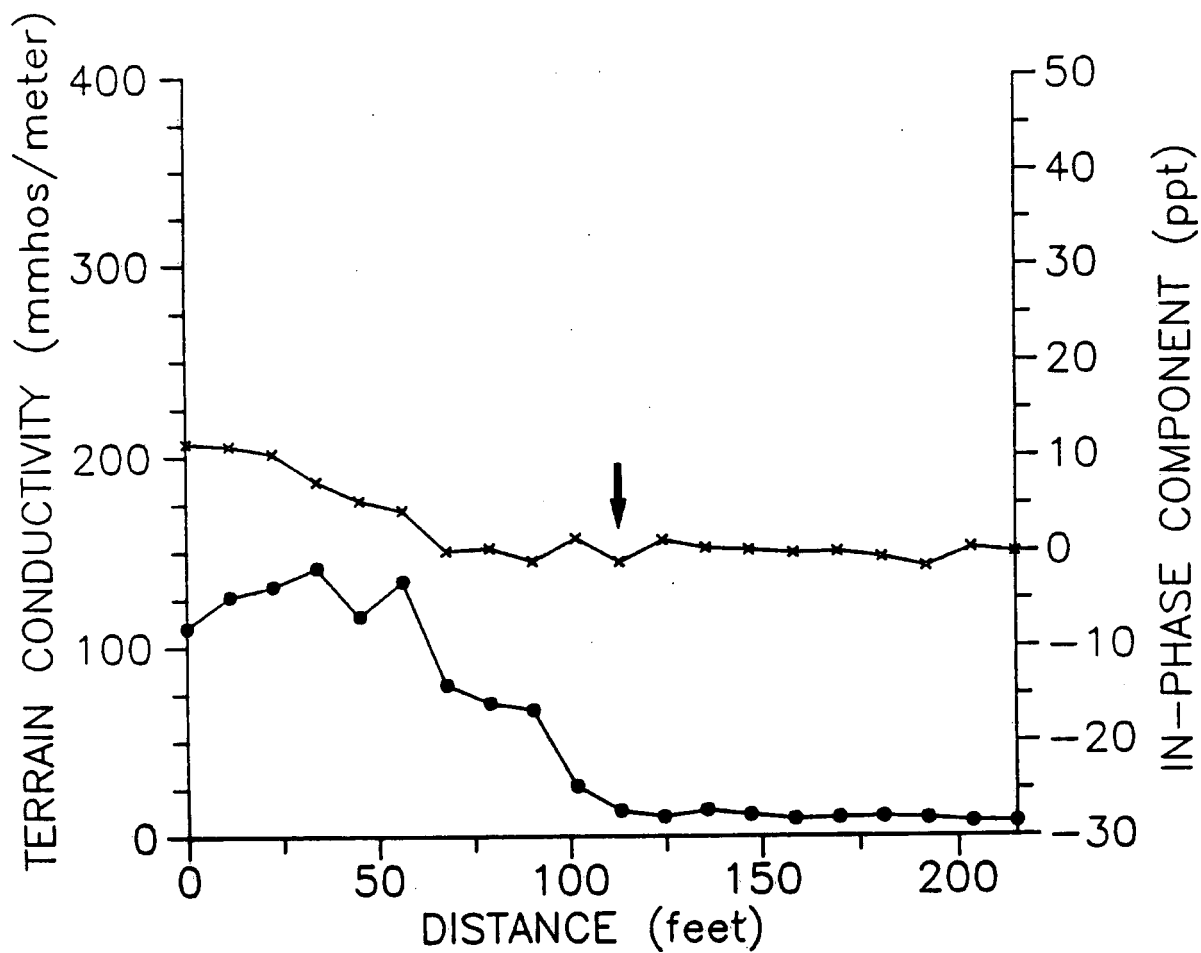


Figure 27. Terrain Conductivity Survey Line 19. Dots represent terrain conductivity, X's represent In-phase Component. Arrow marks approximate location of edge of fill.

Terrain Conductivity Survey
Global Landfill Site
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File 89D13 May, 1991

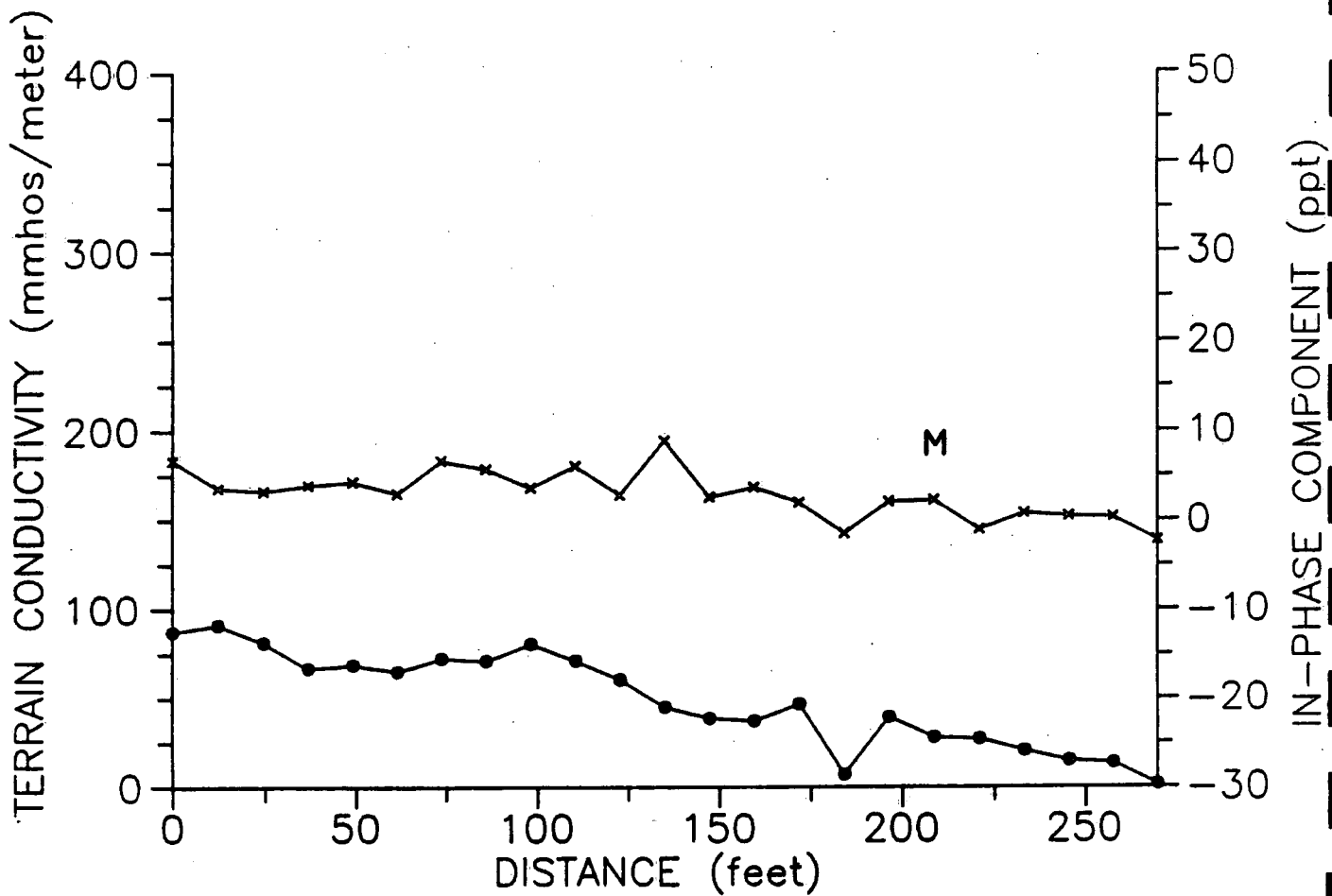


Figure 26. Terrain Conductivity Survey Line 18. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

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Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

HAGER-RICHTER
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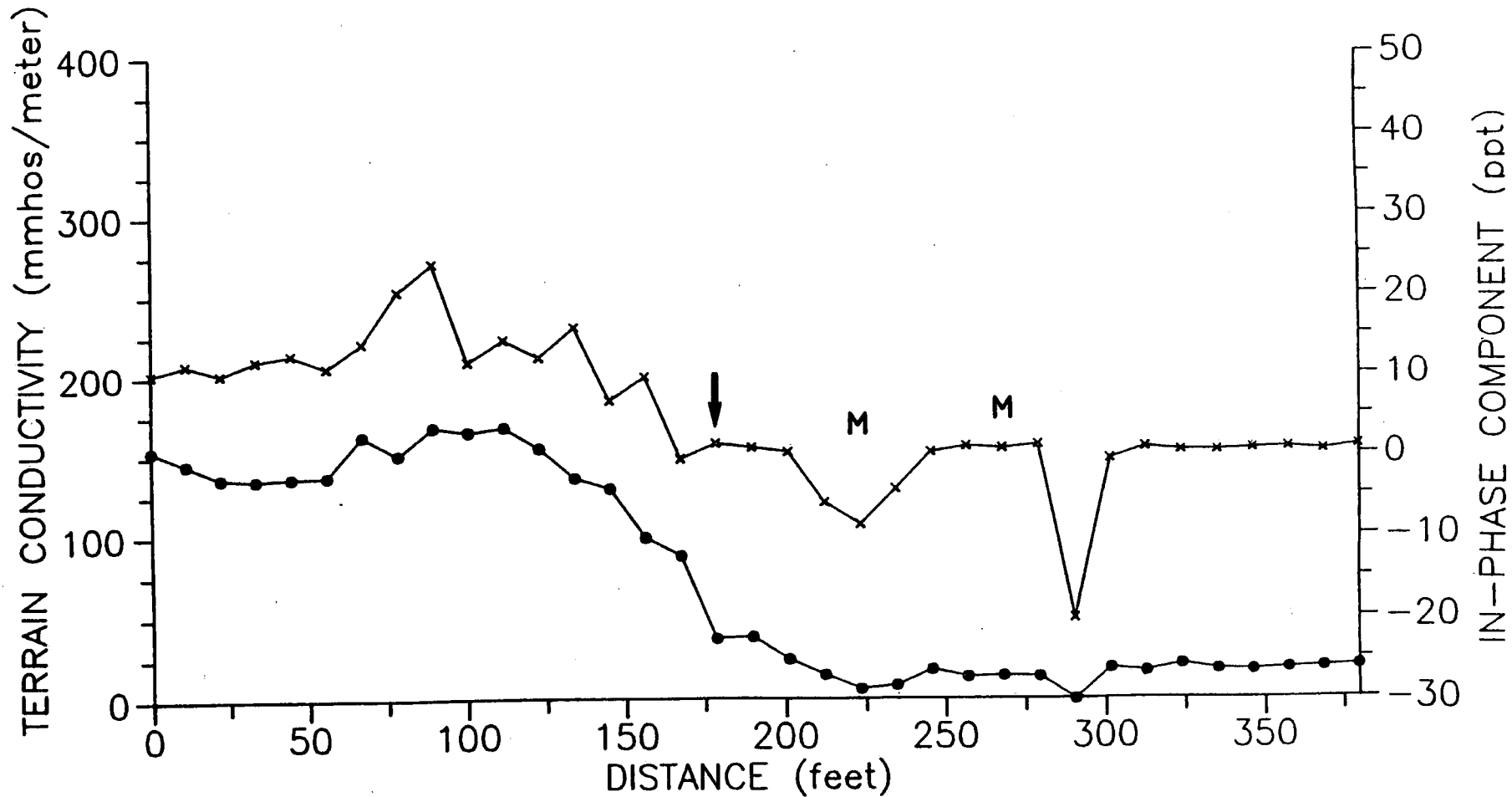


Figure 25. Terrain Conductivity Survey Line 17. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

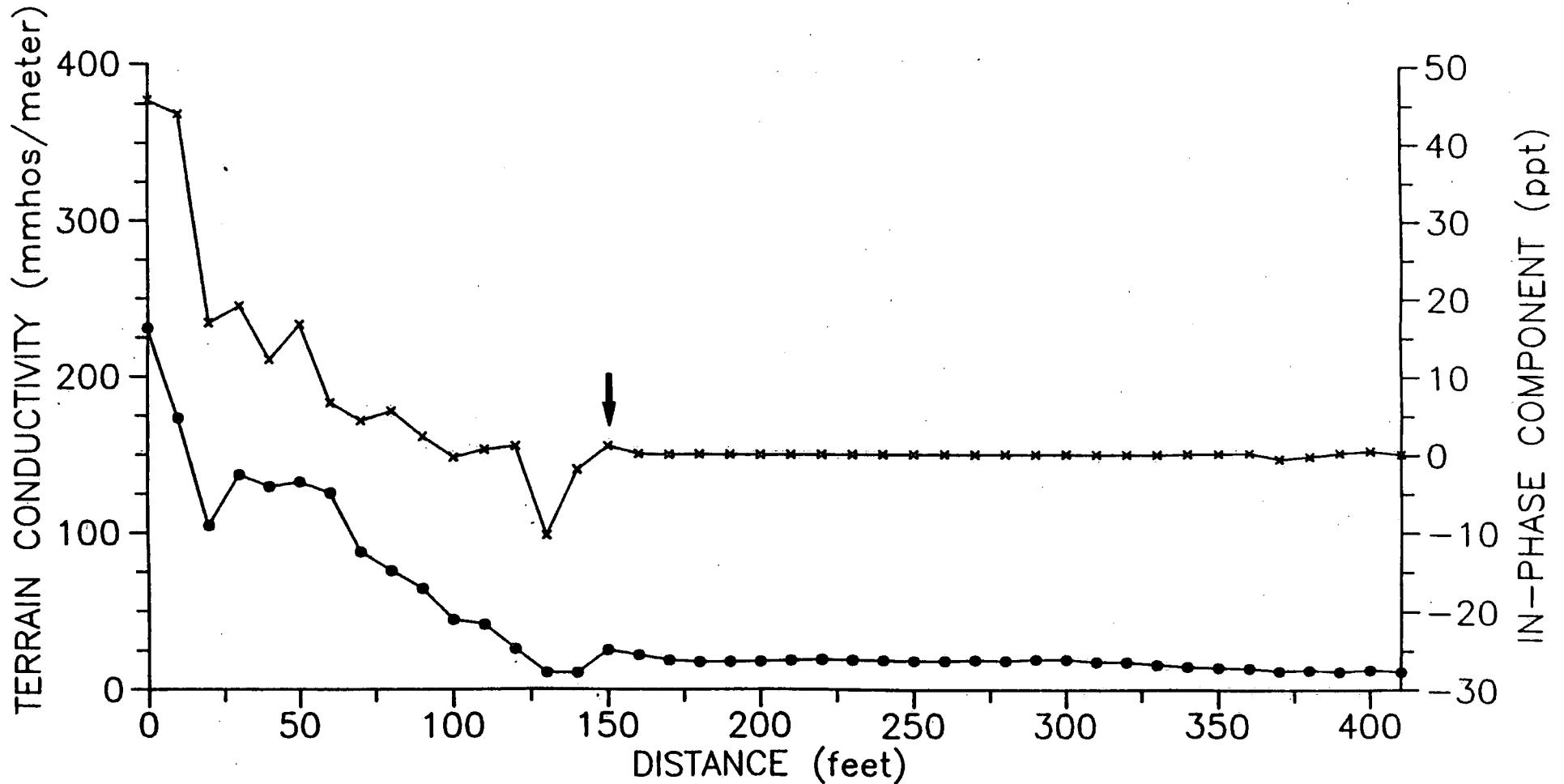


Figure 24. Terrain Conductivity Survey Line 16. Dots represent terrain conductivity, X's represent In-phase Component. Arrow marks approximate location of edge of fill.

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

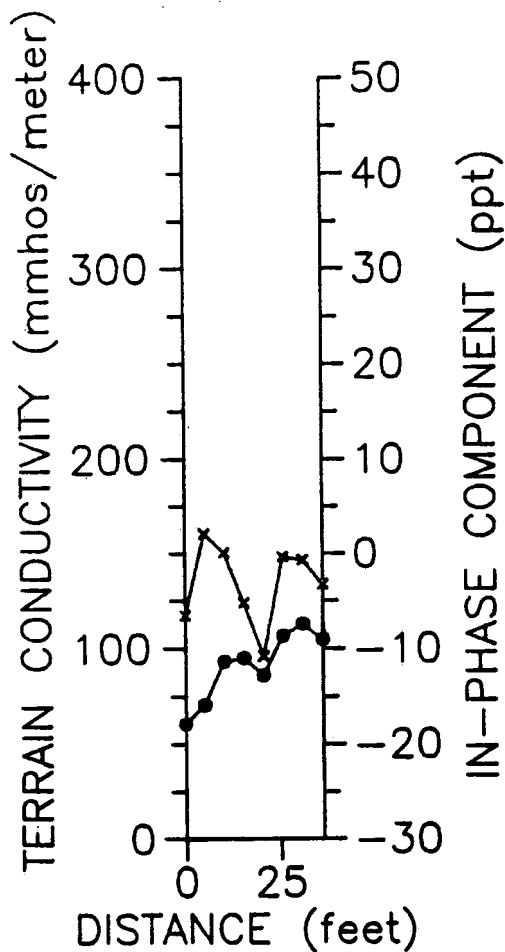


Figure 23. Terrain Conductivity Survey Line 15. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

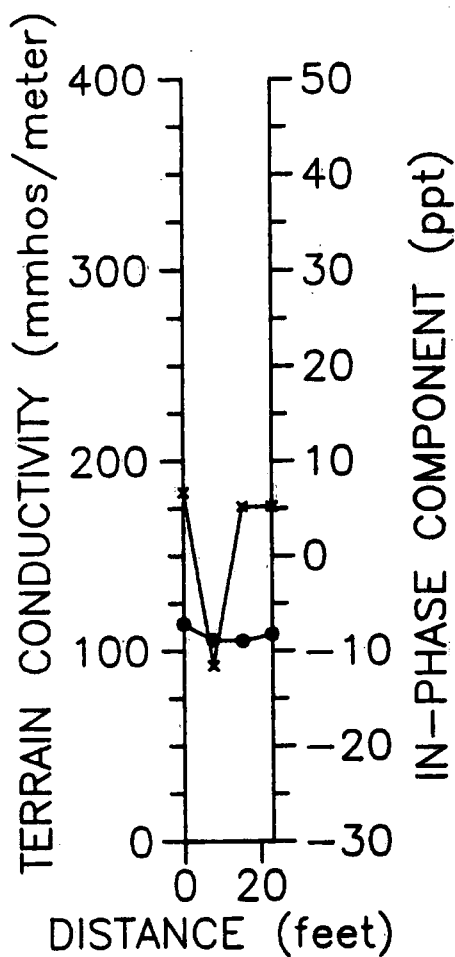


Figure 22. Terrain Conductivity Survey Line 14. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

Terrain Conductivity Survey
Global Landfill Site
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HAGER-RICHTER
GEOSCIENCE, INC.

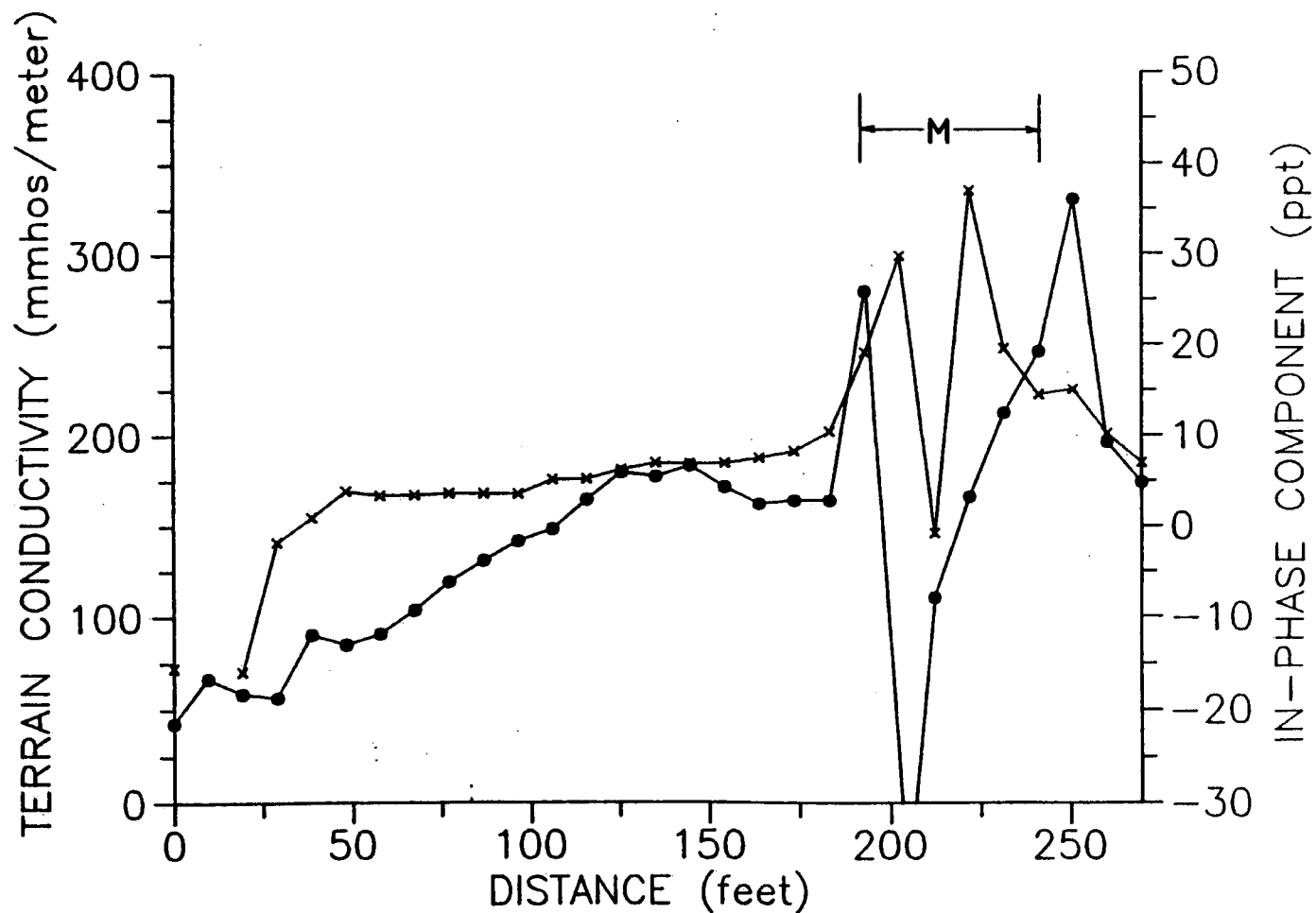


Figure 21. Terrain Conductivity Survey Line 13. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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HAGER-RICHTER
 GEOSCIENCE, INC.

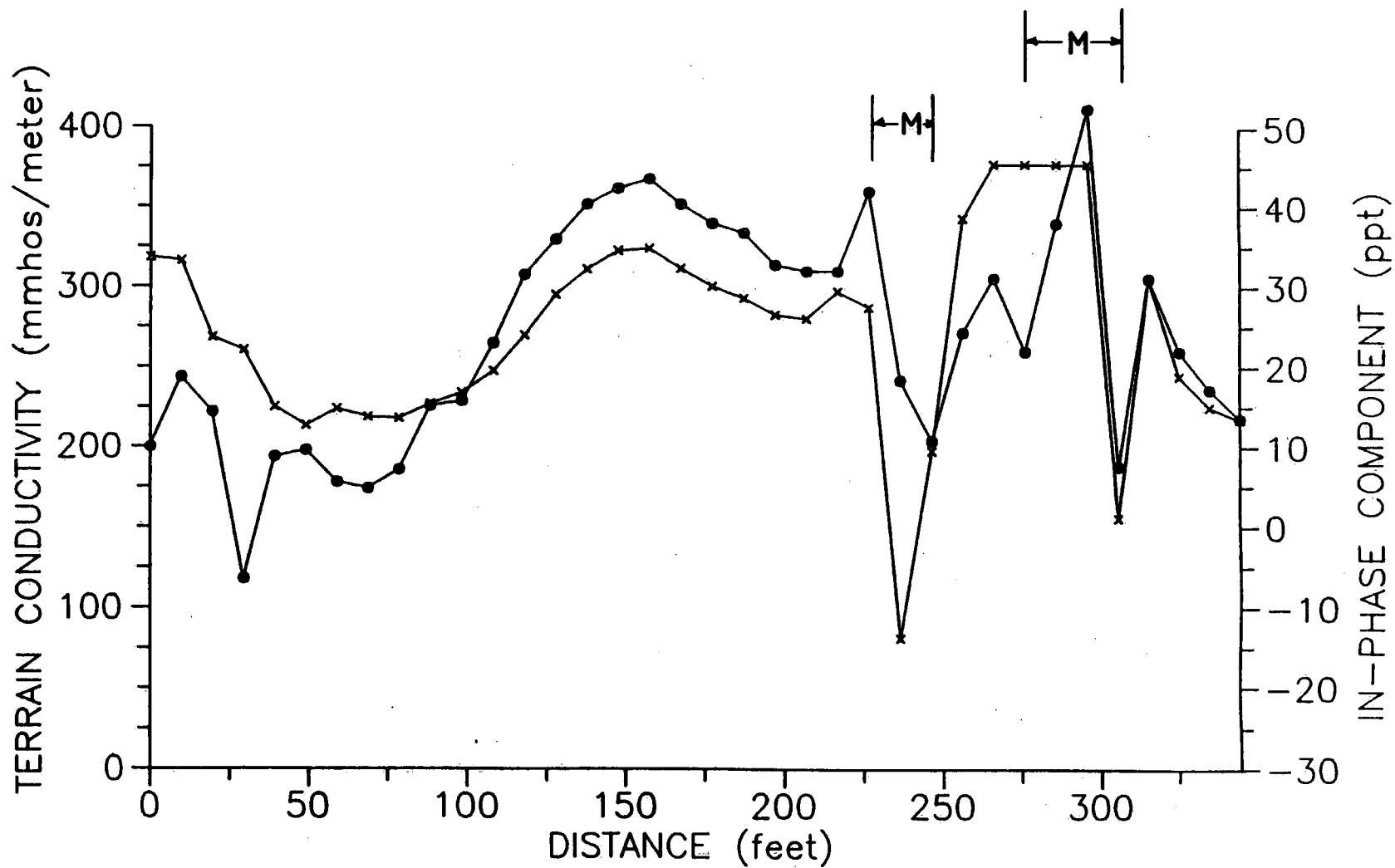


Figure 20. Terrain Conductivity Survey Line 12. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data

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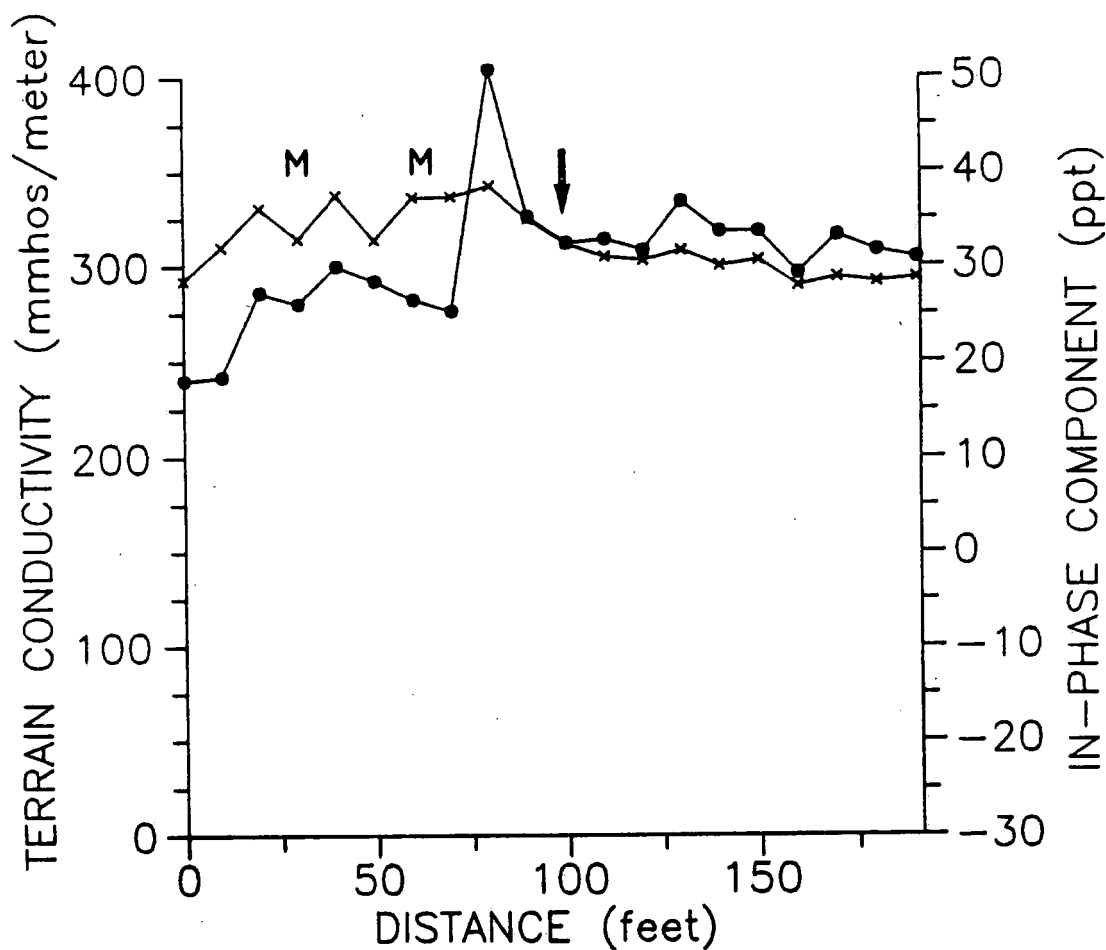


Figure 19. Terrain Conductivity Survey Line 11. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

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Global Landfill Site
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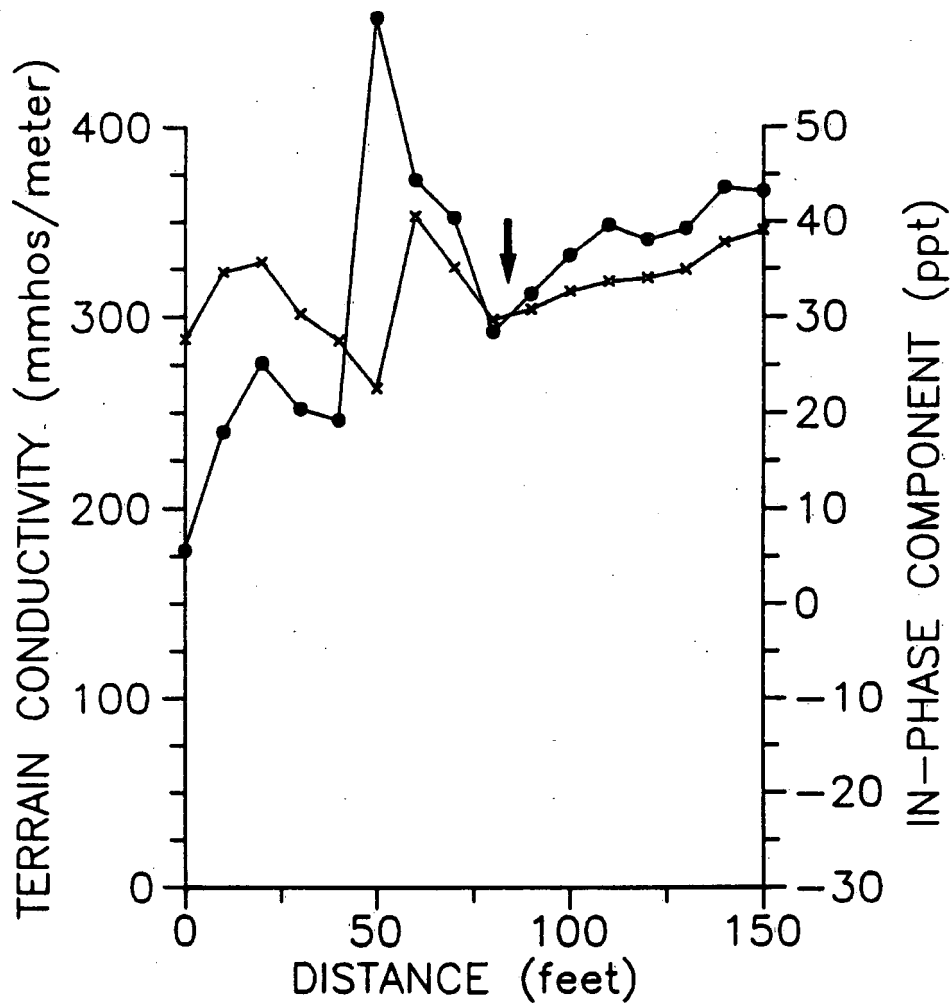


Figure 18. Terrain Conductivity Survey Line 10A. Dots represent terrain conductivity, X's represent In-phase Component. Arrow marks approximate location of edge of fill.

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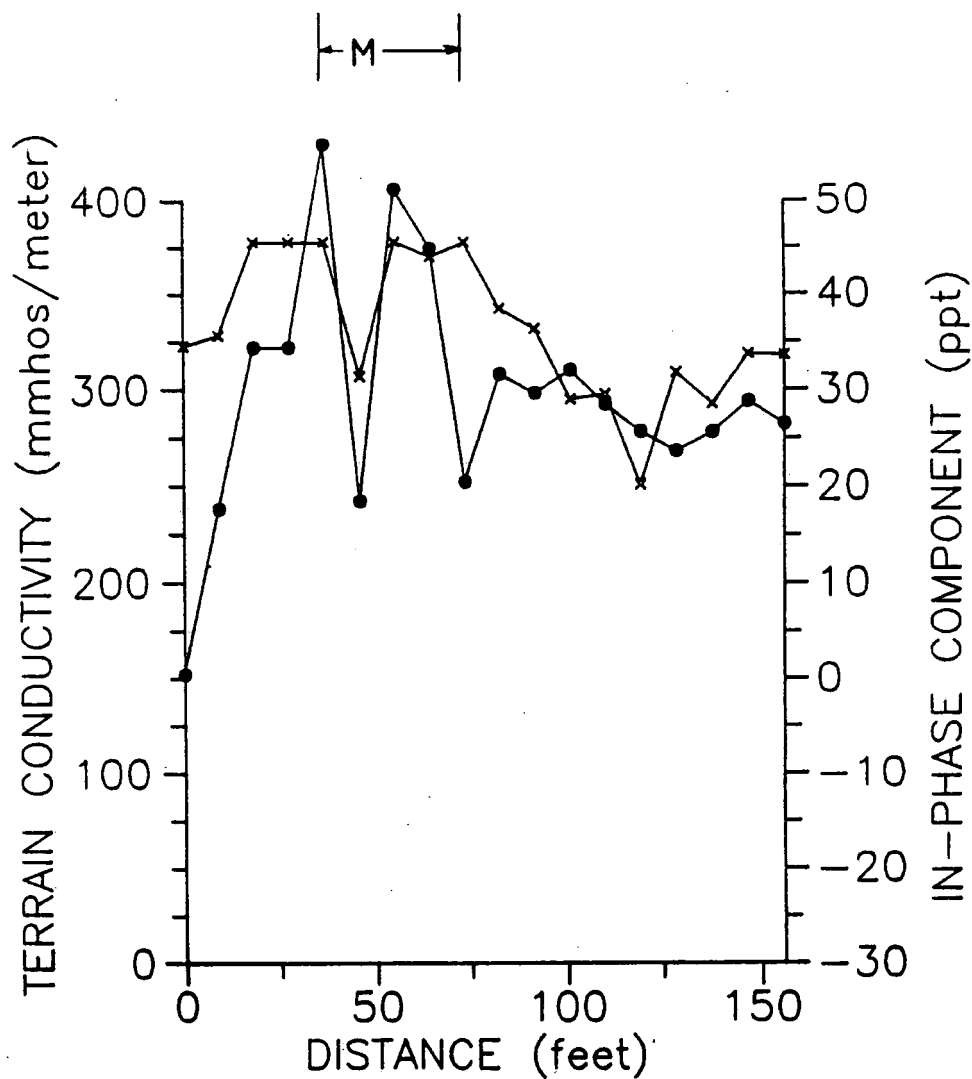


Figure 17. Terrain Conductivity Survey Line 10. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

Terrain Conductivity Survey
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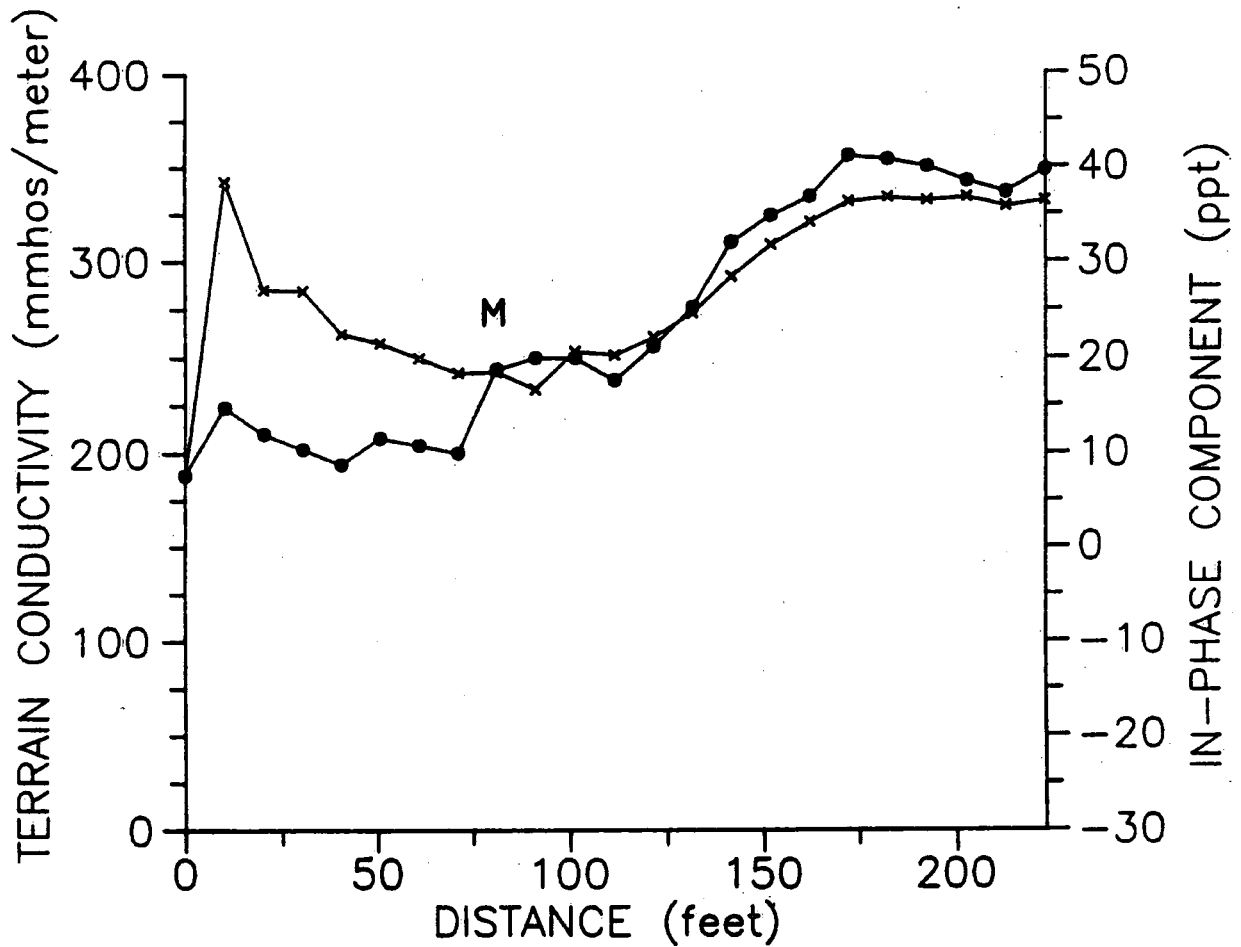


Figure 16. Terrain Conductivity Survey Line 9. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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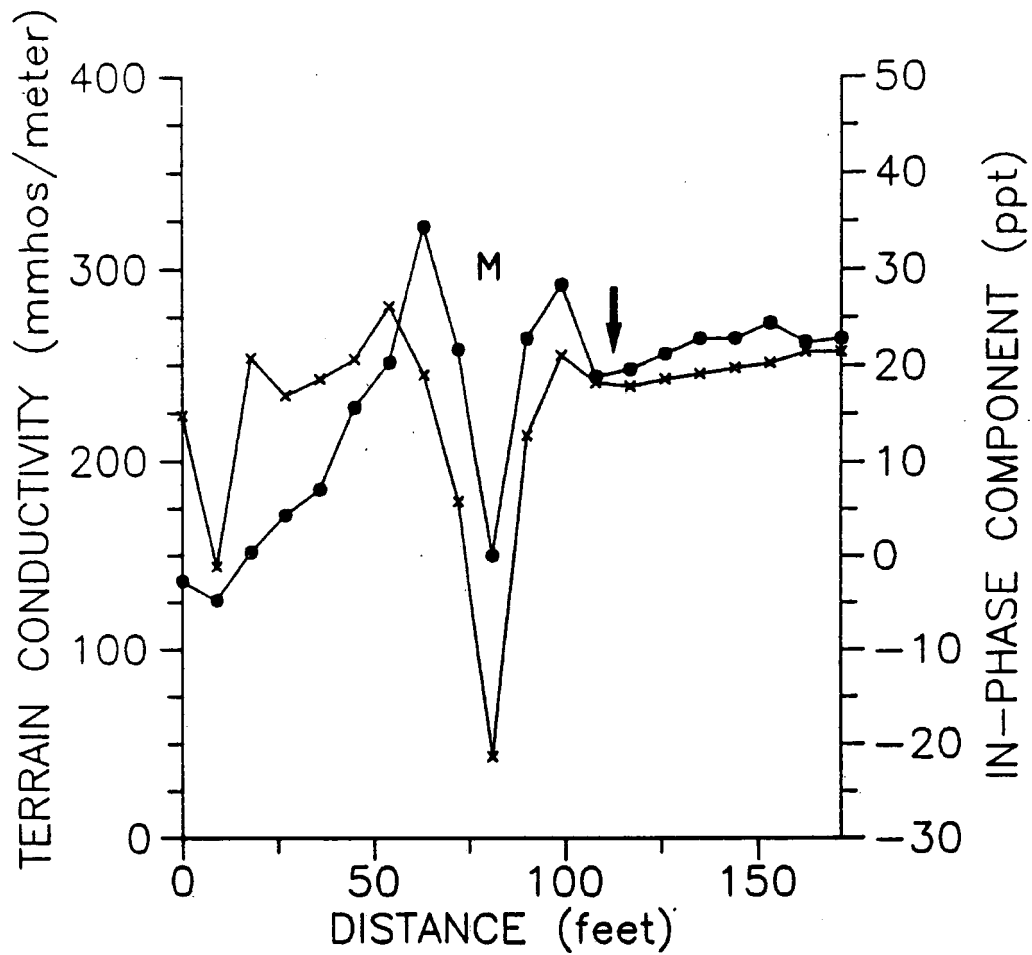


Figure 15. Terrain Conductivity Survey Line 8. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

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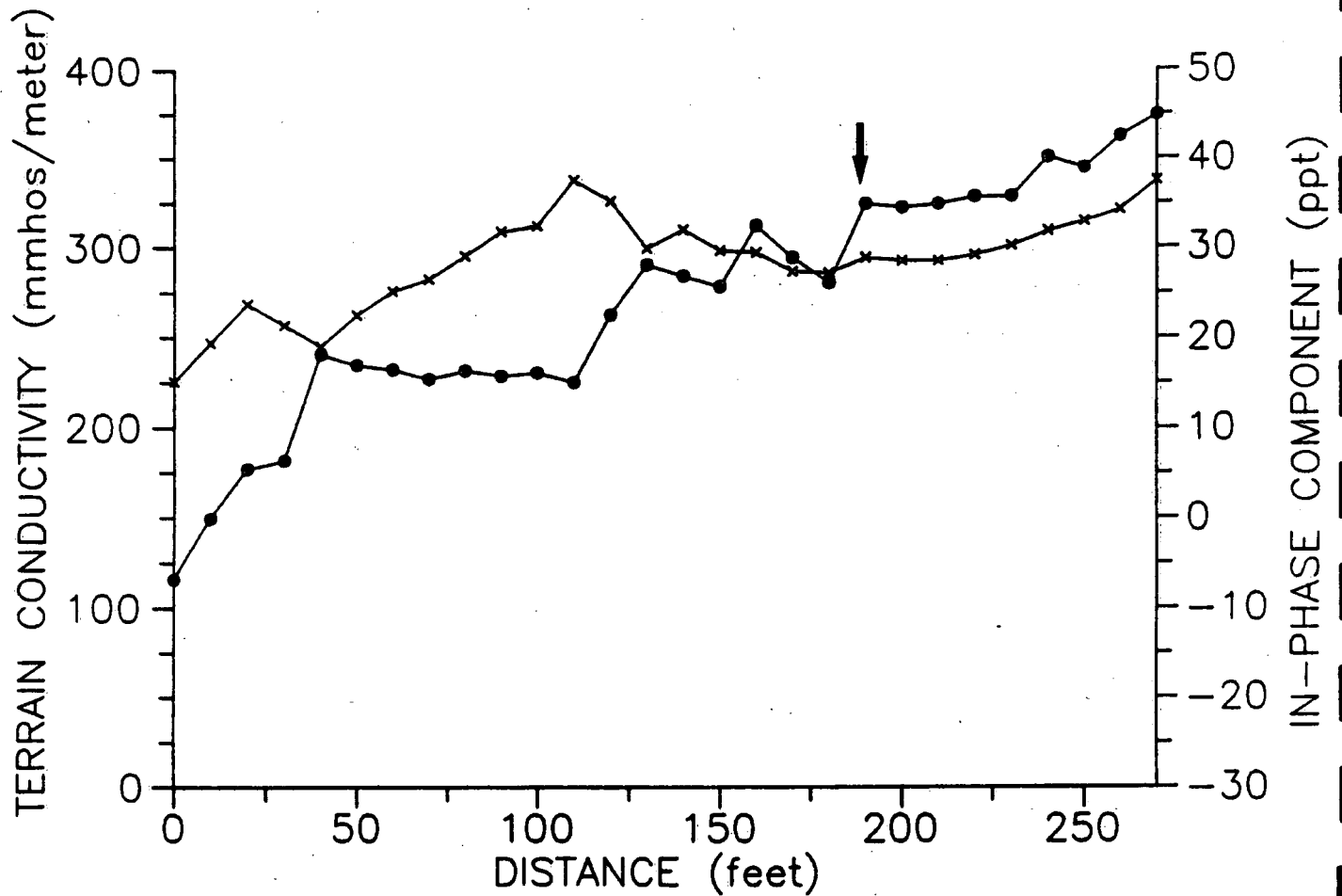


Figure 14. Terrain Conductivity Survey Line 7. Dots represent terrain conductivity, X's represent In-phase Component. Arrow marks approximate location of edge of fill.

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HAGER-RICHTER
GEOSCIENCE, INC

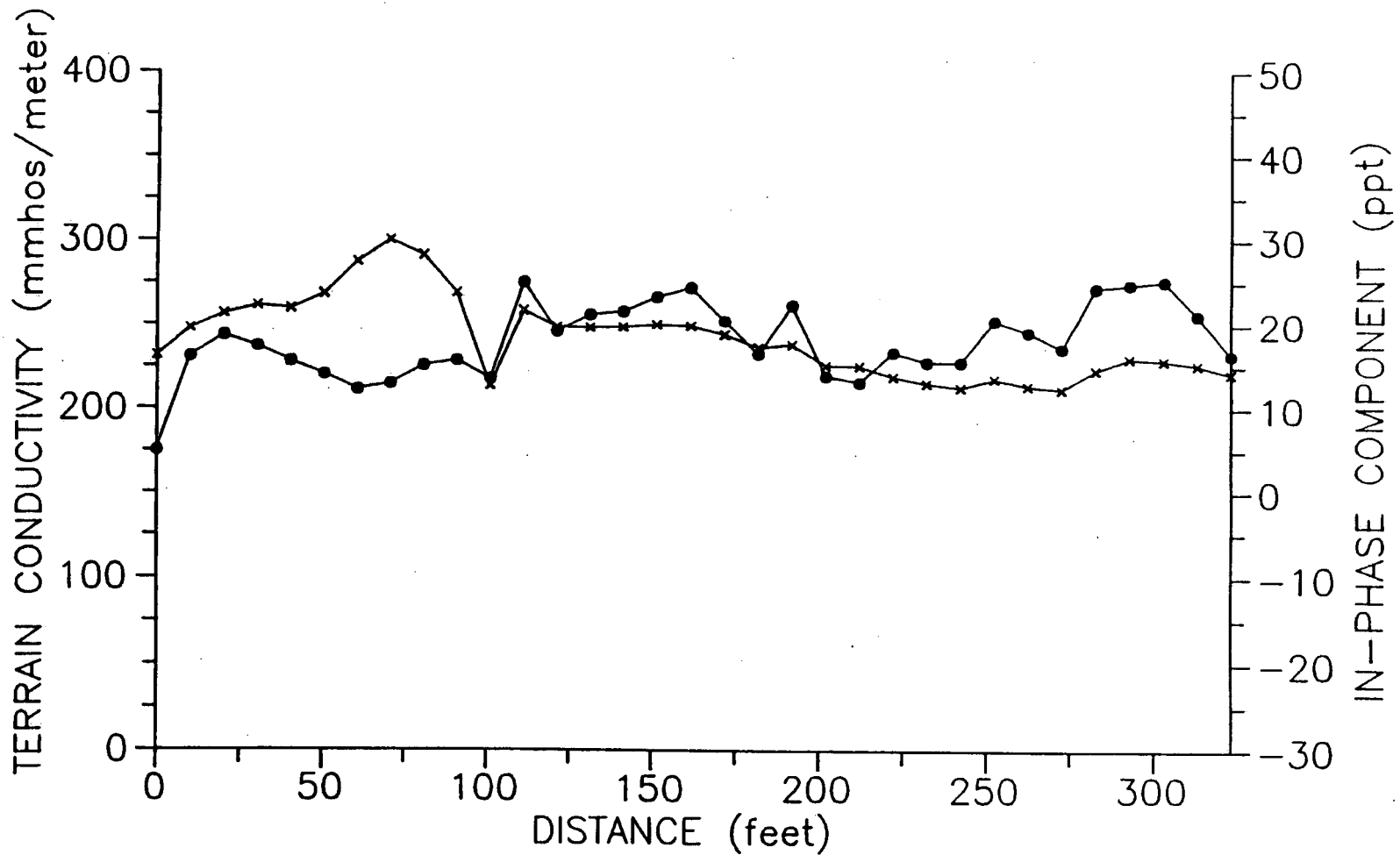


Figure 13. Terrain Conductivity Survey Line 6A. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

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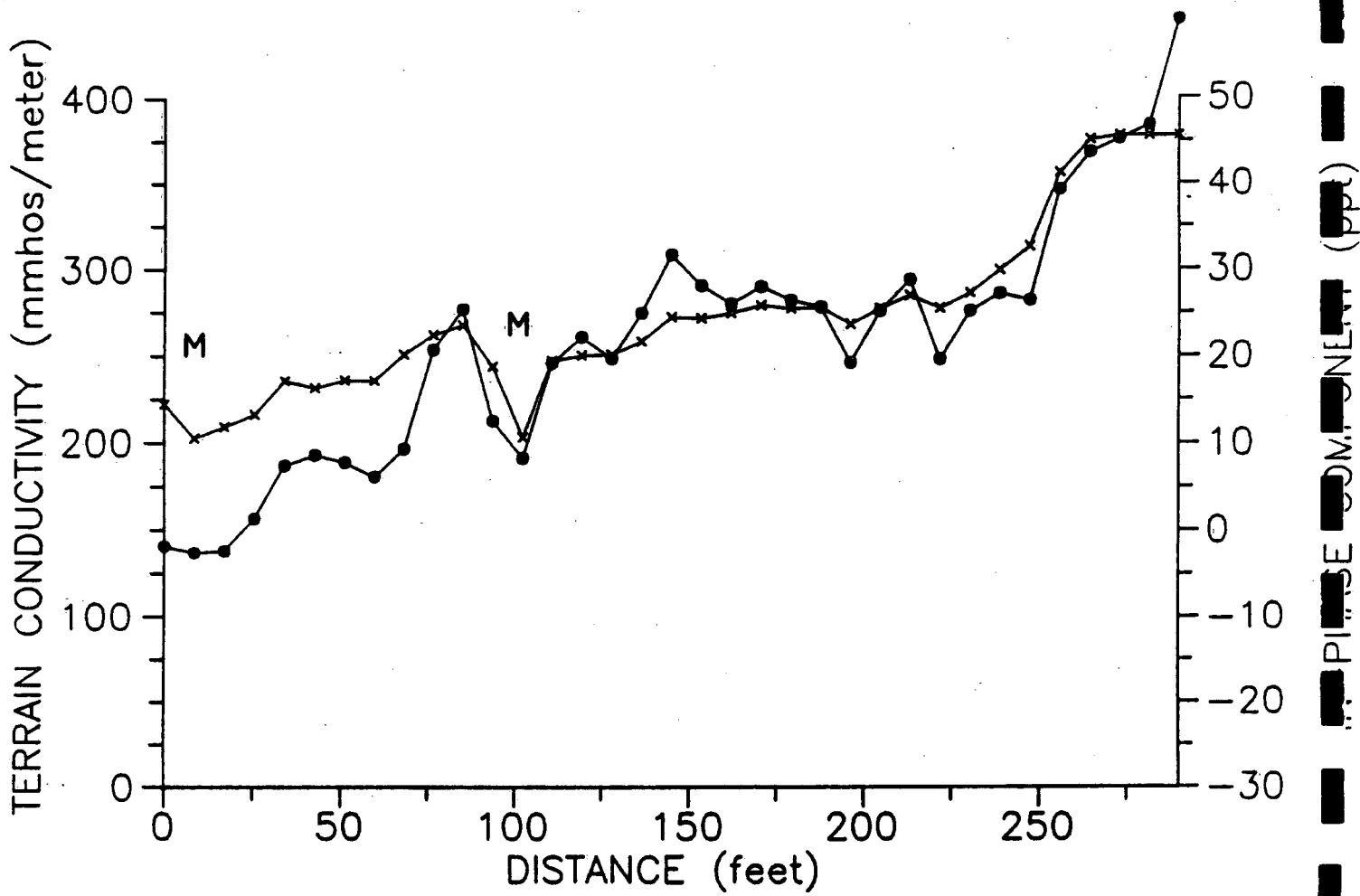


Figure 12. Terrain Conductivity Survey Line 6. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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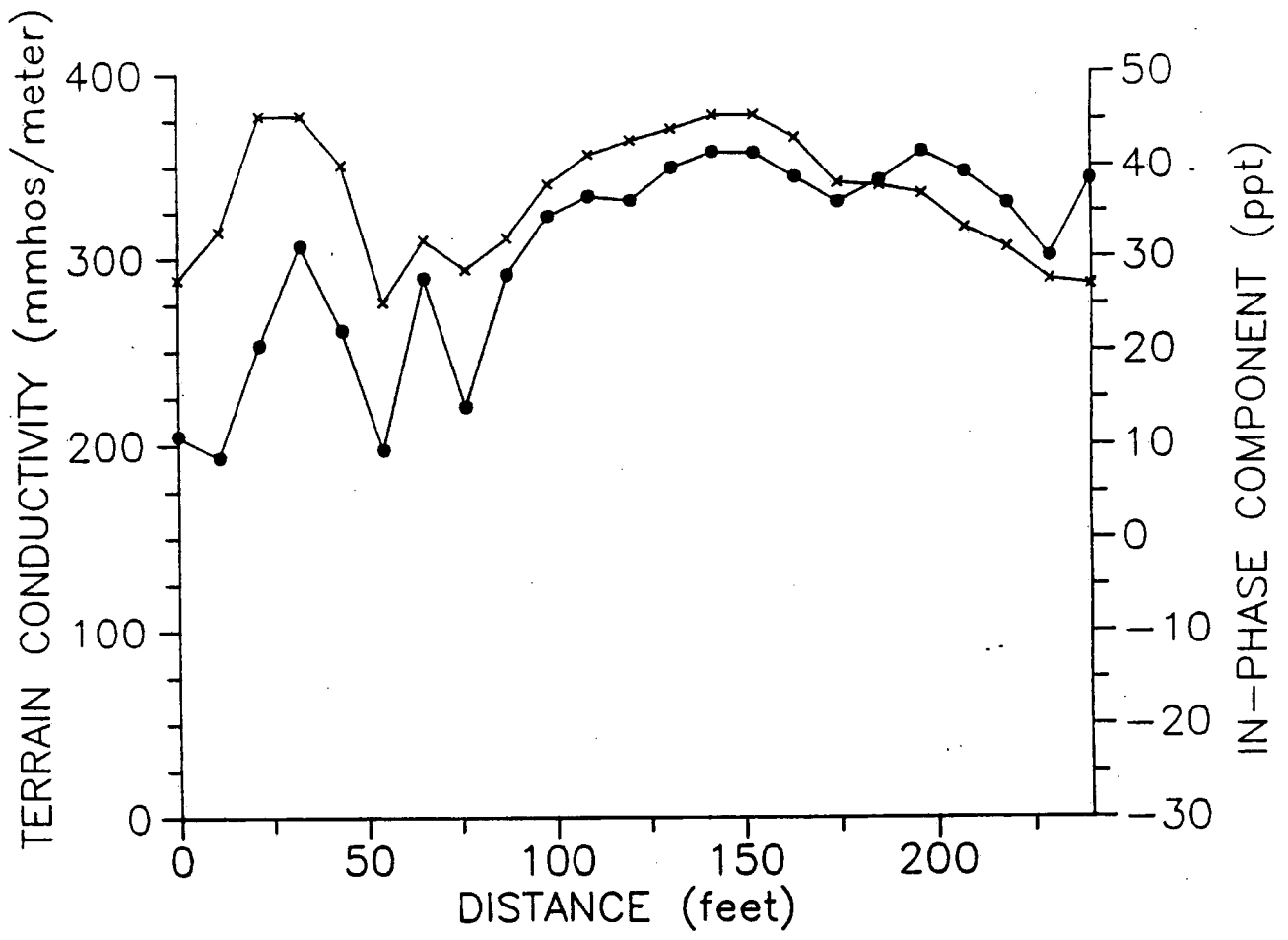


Figure 11. Terrain Conductivity Survey Line 5. Dots represent terrain conductivity, X's represent In-phase Component. Edge of fill not detected in terrain conductivity data.

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Global Landfill Site
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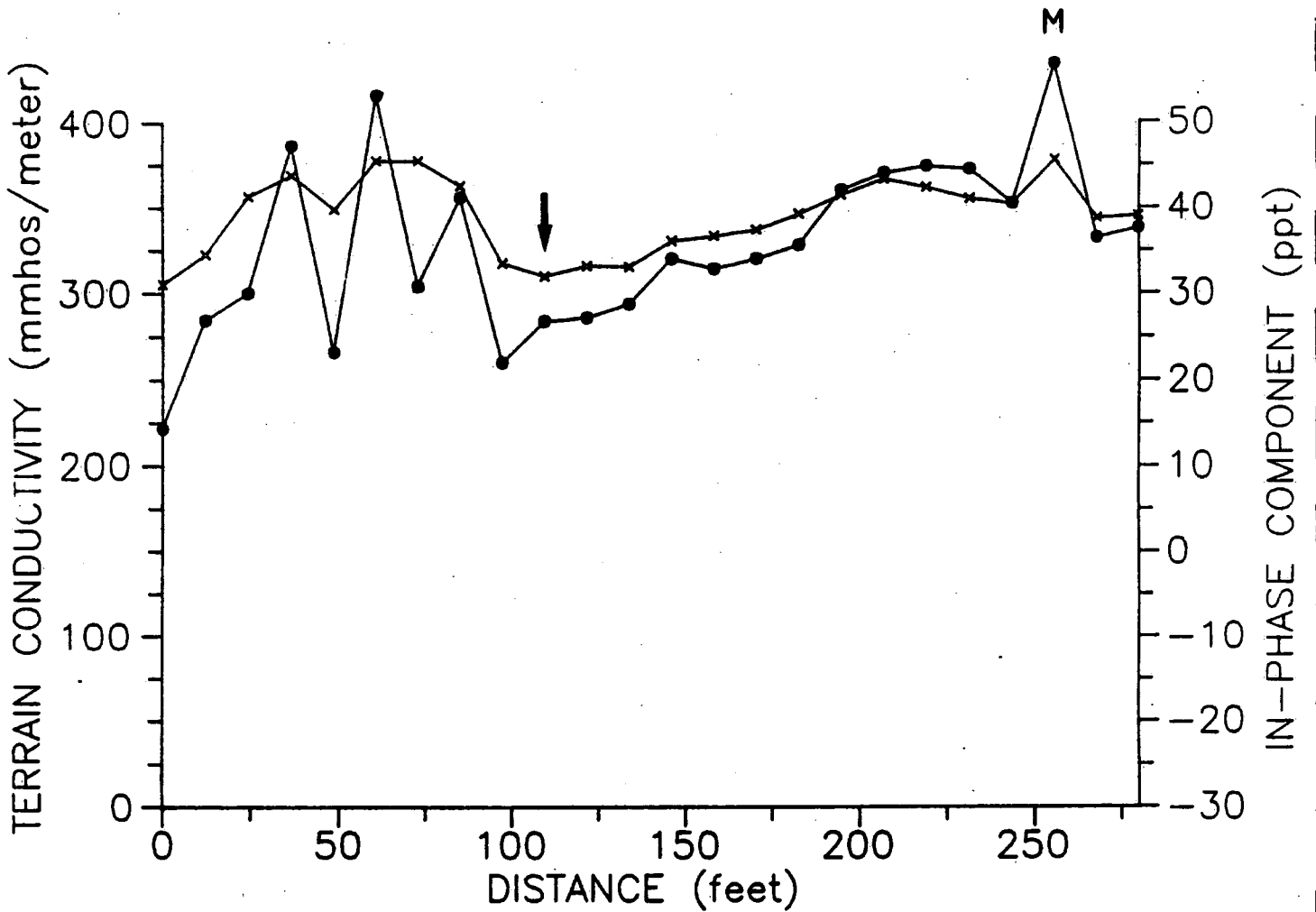


Figure 10. Terrain Conductivity Survey Line 4. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

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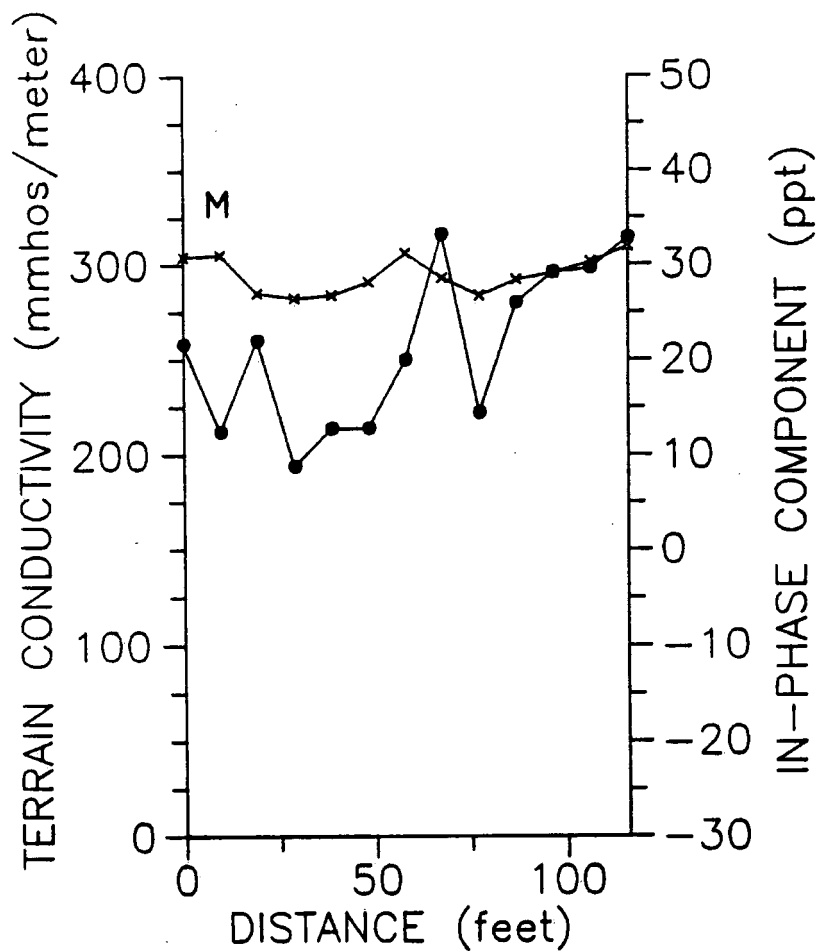


Figure 9. Terrain Conductivity Survey Line 3A. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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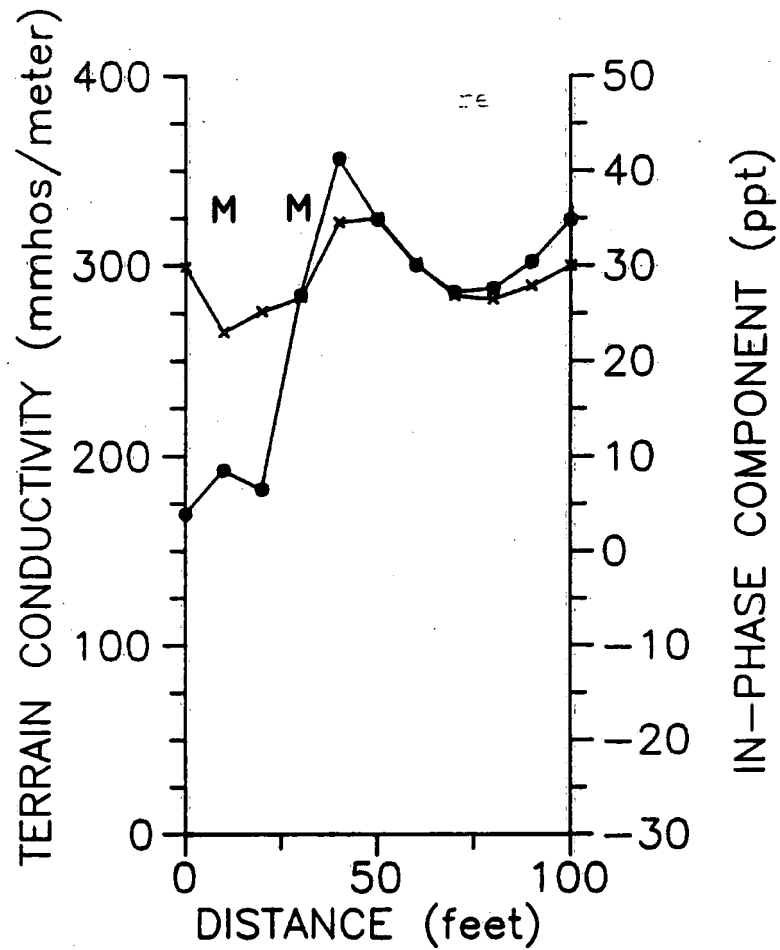


Figure 8. Terrain Conductivity Survey Line 3. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

Terrain Conductivity Survey
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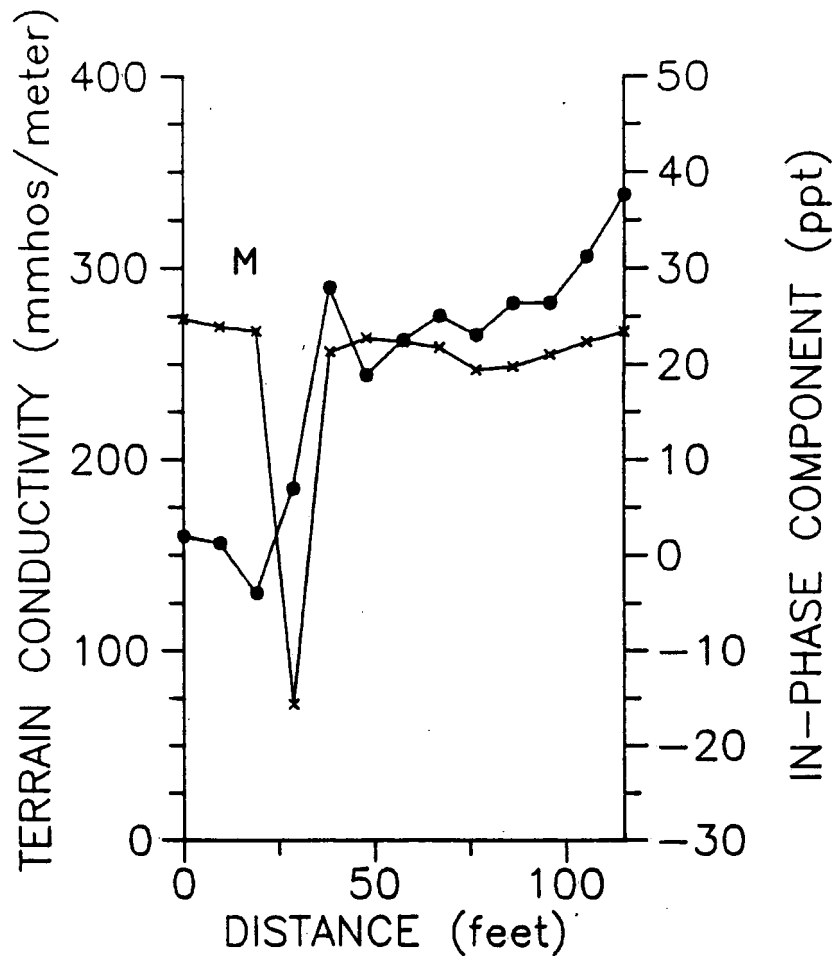


Figure 7. Terrain Conductivity Survey Line 2A. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Edge of fill not detected in terrain conductivity data.

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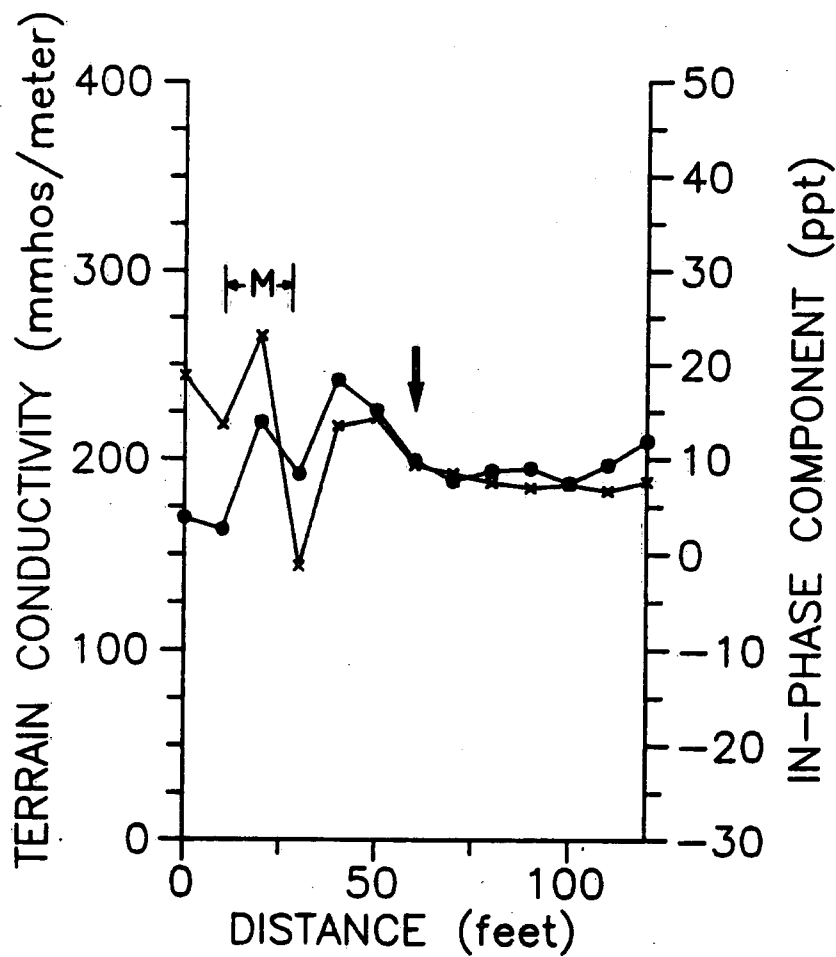


Figure 6. Terrain Conductivity Survey Line 2. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

Terrain Conductivity Survey
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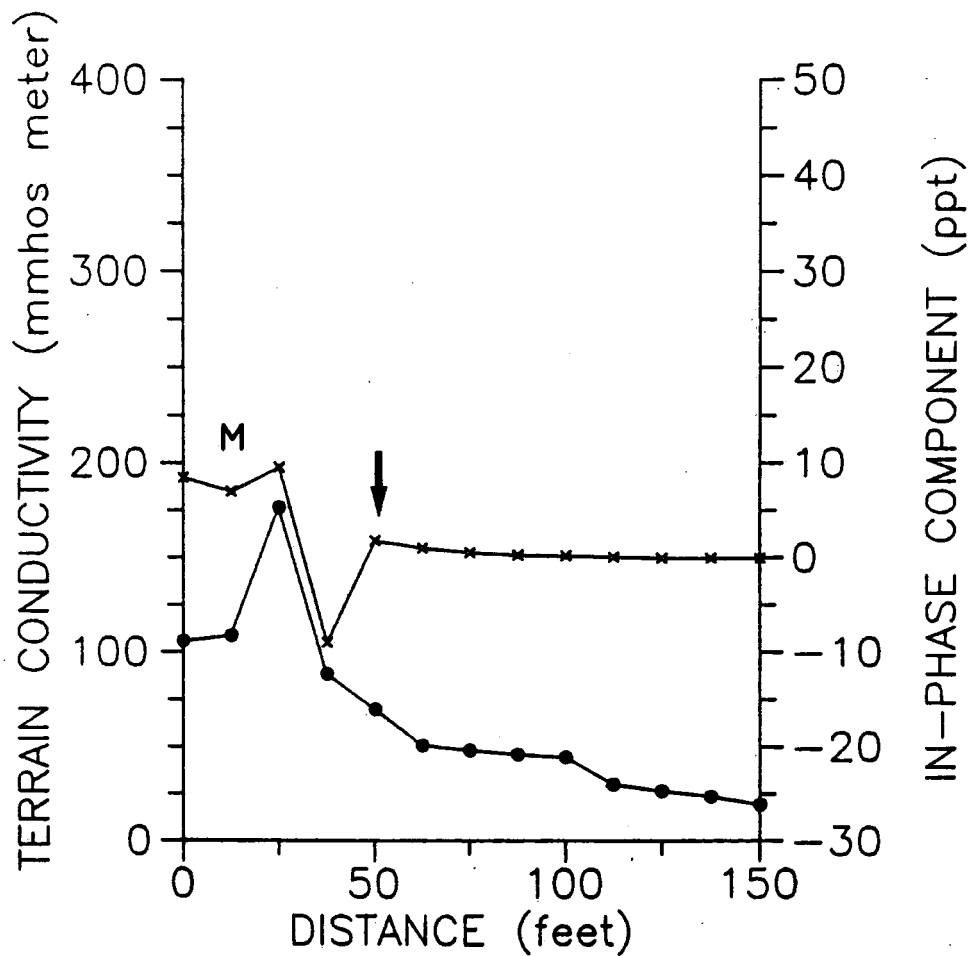


Figure 5. Terrain Conductivity Survey Line 1A. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

Terrain Conductivity Survey
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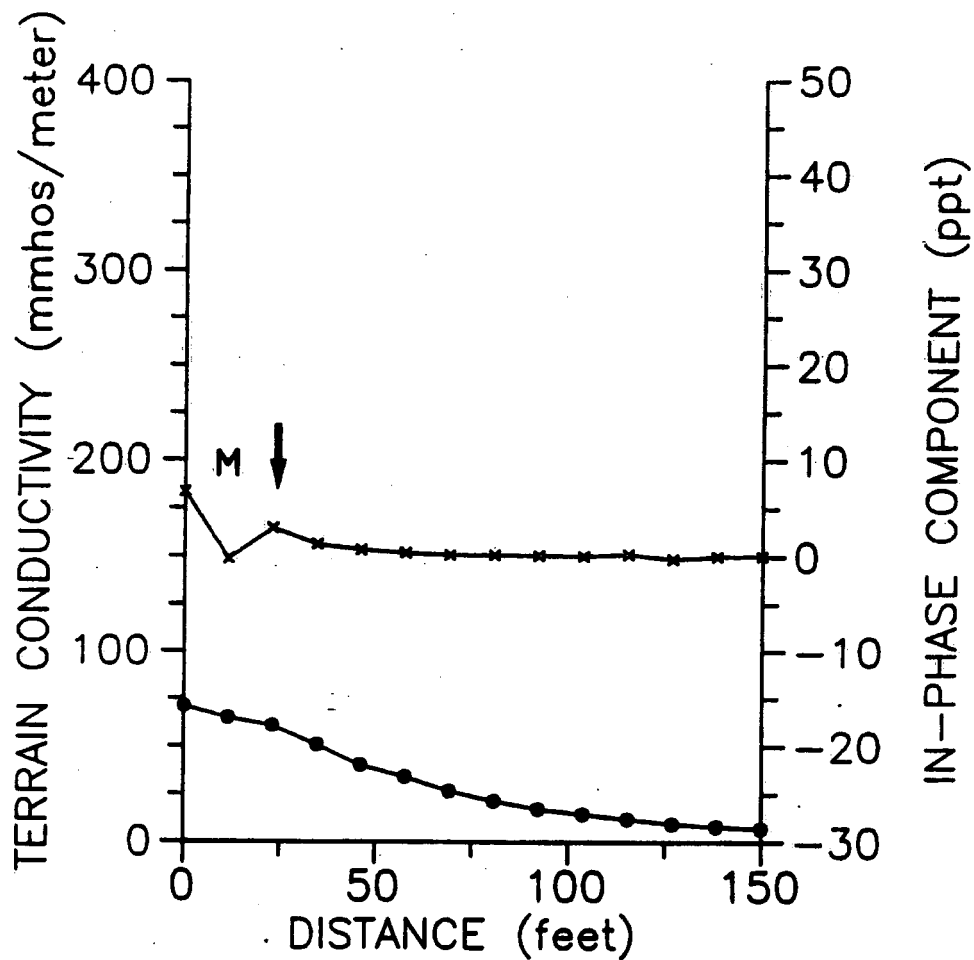


Figure 4. Terrain Conductivity Survey Line 1. Dots represent terrain conductivity, X's represent In-phase Component. "M" marks location of surface metal. Arrow marks approximate location of edge of fill.

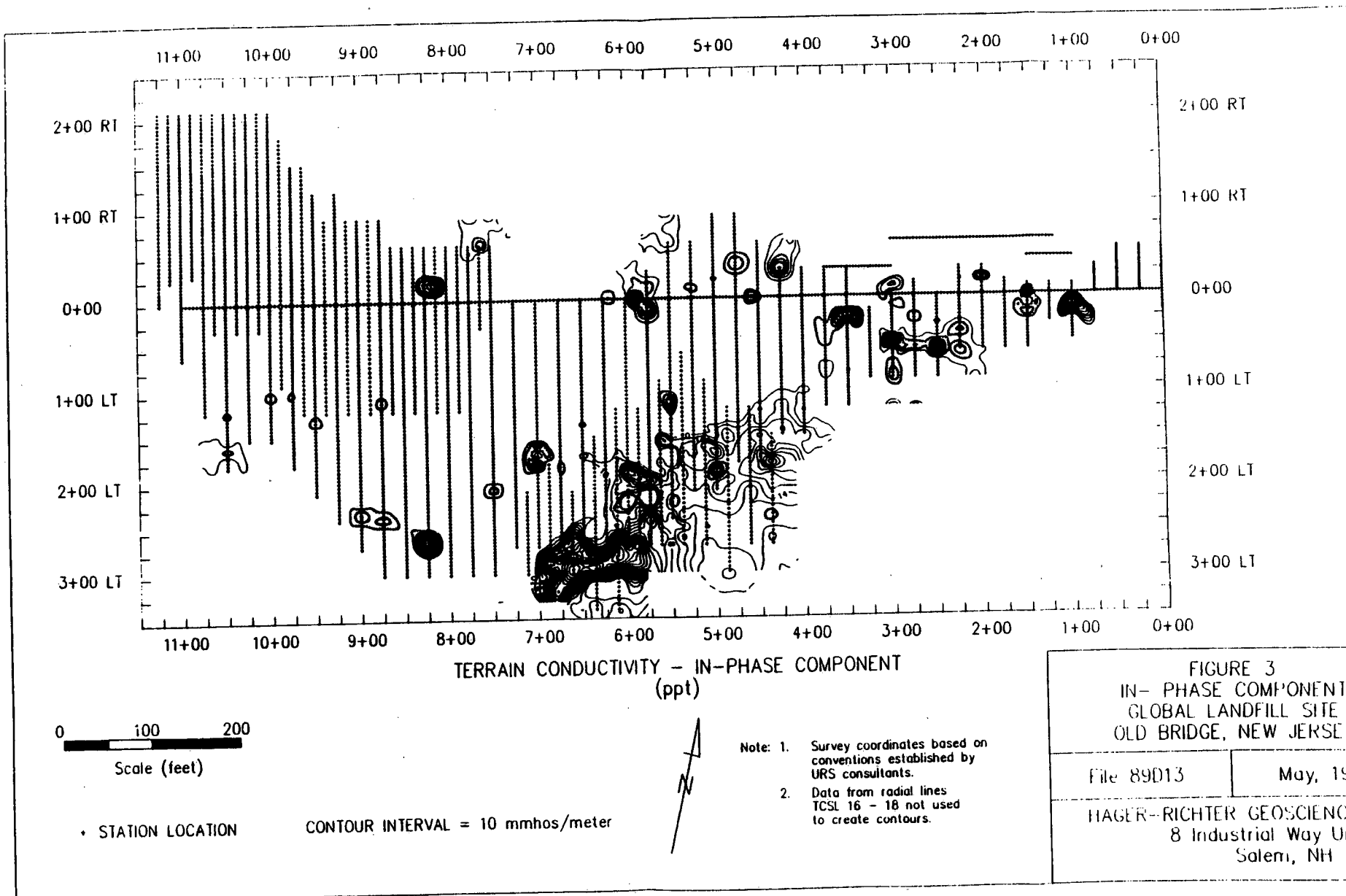
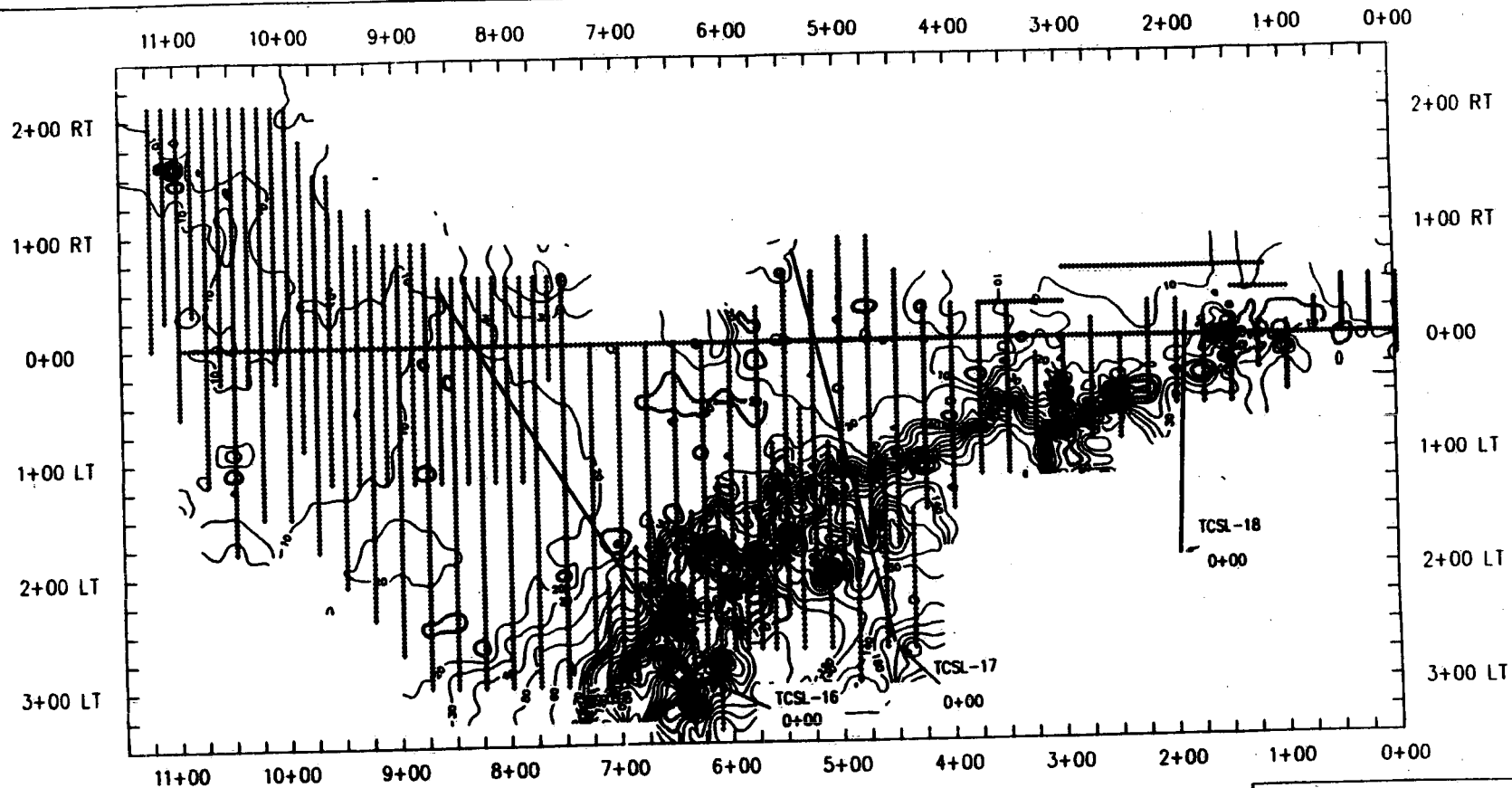


FIGURE 3
IN-PHASE COMPONENT
GLOBAL LANDFILL SITE
OLD BRIDGE, NEW JERSEY

File 89D13 May, 1991

HAGER-RICHTER GEOSCIENCE, INC.
8 Industrial Way Unit 1-11
Salem, NH 03079



TERRAIN CONDUCTIVITY
(mmhos/meter)

0 100 200

Scale (feet)

• STATION LOCATION

CONTOUR INTERVAL = 10 mmhos/meter



- Note: 1. Survey coordinates based on conventions established by URS consultants.
2. Data from rodial lines TCSL 16 - 18 not used to create contours.

FIGURE 2
TERRAIN CONDUCTIVITY
GLOBAL LANDFILL SITE
OLD BRIDGE, NEW JERSEY

File 89D13

May, 1991

HAGER-RICHTER GEOSCIENCE, INC.
8 Industrial Way Unit 110
Salem, NH 03079

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

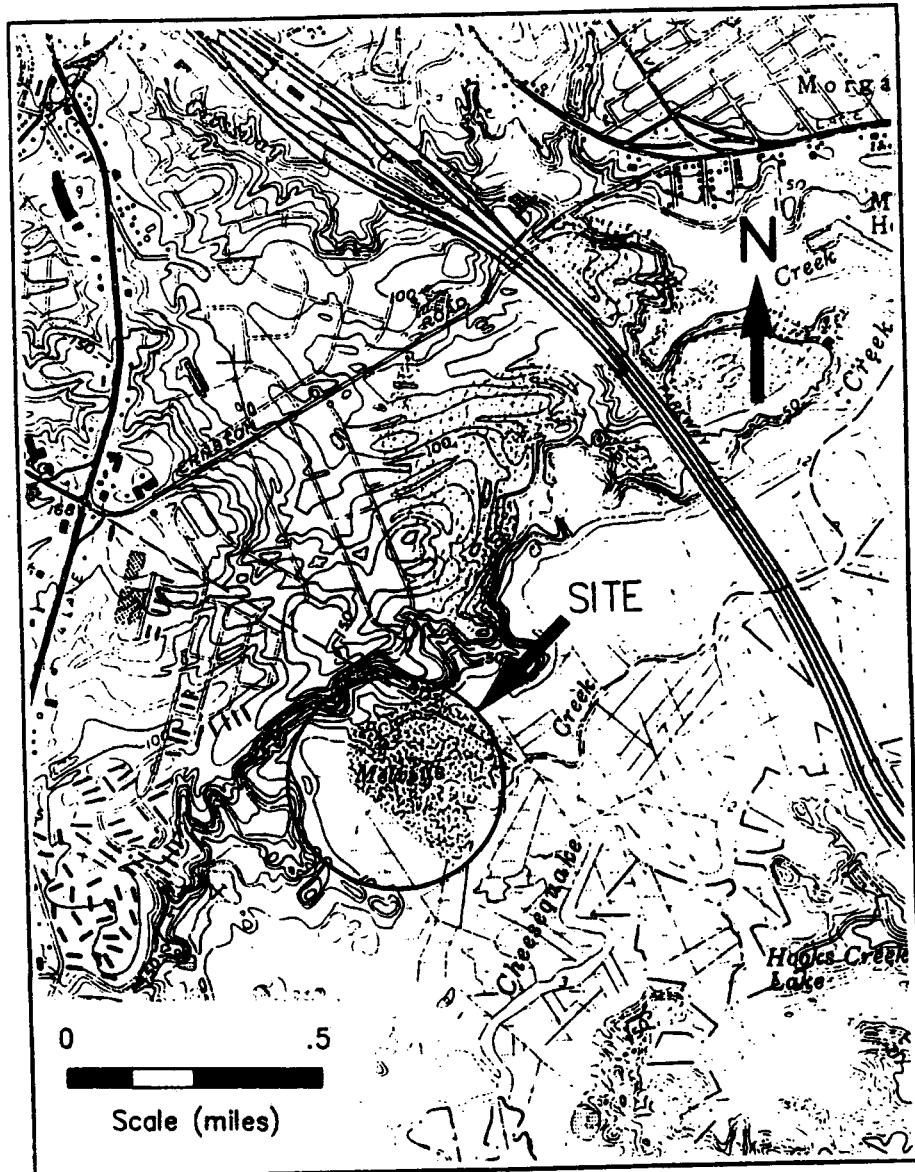


Figure 1. General location of the Global Landfill Site.

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
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southern end, are caused by buried metal objects and surface metal objects. The location of the edge of fill is not apparent in the data for TCSL 18 (Figure 26), however. The areal survey data in that area are limited, and the edge of fill may extend beyond the limits of the current survey.

4. CONCLUSIONS

Based on the terrain conductivity survey at the Global Landfill, we conclude:

1. Buried metallic objects, some of which could be drums, and other highly conductive materials are present in the area northwest of the landfill mound. A potential drum disposal area is located between 500 and 600 feet, 300LT. No evidence of sludge pits is present in the terrain conductivity data.
2. The location of the edge of fill is evident in the terrain conductivity data for the radial profiles in the northwestern part of the Site.
3. The location of the edge of fill along the terrain conductivity profiles extending into the marsh is not clear due to the highly conductive saltwater present in the marsh. Except for scattered surface metal, the generally smooth character of the data for the in-phase component of terrain conductivity in the salt marsh implies that little buried metal is present beyond the edge of the marsh.
4. Three profiles in the vicinity of the 1984 southeast slope failure indicate that fill material might be present in the saltwater marsh in this area.
5. The terrain conductivity data for two profiles indicate that a low topographic berm in the marsh southwest of the landfill is likely composed of landfill material.

Terrain Conductivity Survey
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ing, decreased terrain conductivity off the fill, cannot be used to determine the edge of fill for the profiles extending into the saltwater marsh at the Global Landfill Site. Our basis for estimating the edge of fill along profiles TCSL 2, 4, 7, 8, 10A, and 11 (Figures 4, 5, 6, 10, 14, 15, 18, 19) is the point at which both the terrain conductivity and the in-phase components level off somewhat and exhibit a relatively smooth and small variation between points. Many of the profiles exhibit high and low "spikes," most commonly near the landfill end of the line, indicating the presence of buried conductive metal typical of landfills. The "spikes" located elsewhere along some of the profiles are caused by metal debris scattered along the survey lines. In many cases, however, the location of the edge of fill cannot be determined from the terrain conductivity data (TCSL 1, 1A, 2A, 3, 3A, 9, 10, 12, 13, 14, 15, and 18).

Profiles TCSL 5, 6, and, 6A (Figures 11, 12 and 13) are located in the vicinity of the 1984 slope failure along the southeast side of the landfill. There is no contrast in terrain conductivity values along these lines with which to locate the edge of fill; in fact, highly variable terrain conductivity and in-phase component values suggest that fill material is likely present along the entire length of each line.

A concentration of metal and demolition debris occurs from 220 feet to the end of TCSL 12 (Figure 20) and from about 175 feet to the end of TCSL 13 (Figure 21) and produces the highly variable terrain conductivity measurements at the ends of the profiles. The two areas of debris correlate with a low berm shown on the Site Plan (Plate 1), and which we infer is composed of fill.

As mentioned above, the data for TCSL 16, 17, and 19 (Figures 24, 25, and 27) exhibit the typical pattern for terrain conductivity profiles oriented perpendicular to a landfill and clearly indicate the location of the edge of fill. The southern ends of the profiles exhibit terrain conductivity values as high as 230 mmhos/meter, indicating the presence of highly conductive buried material. The values along the northern part of these lines are near background and generally indicate that little or no buried metallic material is present along the lines.

TCSL 16, 17, and 18 are located in the region of the areal terrain conductivity survey and correlate well with the data collected for the areal survey (Figures 2 and 3). The high and/or low "spikes" measured along the profiles, particularly near the

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tive metal in the near subsurface. Where anomalous readings are measured at the same distance along adjacent lines, a wider distribution and/or larger concentration of metal is present. The anomaly located near (6+50, 3+00 LT) indicates the presence of a concentration of buried conductive metal objects, some of which could be drums. Identification of the objects cannot be made from terrain conductivity data alone. The anomaly is not likely due to the underground gas pipeline located approximately 25 feet south of the area. The location of the anomaly should be considered a potential drum disposal area.

3.2 Radial Profiles

The terrain conductivity data for the twenty-four lines oriented perpendicular to the toe of the landfill mound are presented in Figures 4-27. The locations of the profiles were selected by URS Consultants and are shown in Plate 1.

Terrain Conductivity Survey Lines (TCSL) 2-15 extend toward the saltwater marsh east, south, and west of the landfill. TCSL 16-18 extend from the toe of the landfill mound north across the region of the areal terrain conductivity survey (Figure 2). TCSL 1 and 19 extend toward the north between the areal survey region and the marsh.

Terrain conductivity surveys conducted at landfills generally exhibit the following features, some of which are commonly used to locate the edge of fill: 1) highly variable terrain conductivity values on the fill material caused by conductive metal objects in the fill; 2) generally high terrain conductivity values due to conductive material in the fill; and 3) smoothly varying and generally much decreased terrain conductivity values measured at stations off the fill.

At the Global Landfill Site, however, such features characterize only profiles located northwest of the landfill (TCSL 16, 17, and 19). For the profiles that extend toward the saltwater marsh, terrain conductivity levels do not decrease, probably due to the highly conductive saltwater. "Background" data obtained in a saltwater marsh one mile south of the Site, at Cheesequake Creek State Park, an area expected to be clean and undisturbed, are higher than data obtained on the landfill itself.

The usual criterion used to locate the edge of fill for most landfills, namely, the contrast between the sharply variable, elevated terrain conductivity on the fill and the smoothly vary-

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Old Bridge, New Jersey
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3. RESULTS AND DISCUSSION

3.1 Areal Survey Northwest of the Landfill

Figure 2 shows contoured terrain conductivity data for the areal survey region northwest of the landfill mound. The station locations are indicated.

Striking features of the terrain conductivity contour map are:

1. relatively high and strongly variable conductivity in the southeast part of the area;
2. relatively low values of terrain conductivity in the northwest part of the survey area;
3. a sharp northeast trending gradient between the regions of relatively high and low terrain conductivity.

The location of the steep terrain conductivity gradient does not coincide with the toe of the landfill mound, indicating that fill material extends north of the toe of the slope. Elevated terrain conductivity values southward of the steep gradient imply highly conductive material in the subsurface. The black circular features are anomalies likely caused by near surface conductive metal objects, some of which could be drums.

In contrast, the area to the northwest exhibits generally low terrain conductivity, with values between 10 and 20 mmhos/meter. The data suggest that little or no fill material is present in that area. The somewhat elevated terrain conductivity compared to the background measurements may be due to a shallower water table in the survey area and/or conductive leachate. However, the contour patterns do not indicate the presence of discrete leachate plumes. In addition, there is no evidence in the terrain conductivity data of sludge pits in the survey area.

A contour map of the data for the in-phase component of terrain conductivity is shown in Figure 3. The in-phase component is used primarily for locating subsurface metal objects. The relatively small circular negative anomalies, e.g., (8+25, 2+70 LT) are caused by anomalous readings at one or two consecutive stations along a survey line and indicate the presence of conduc-

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2.2 Site Specific

The terrain conductivity survey at the Global Landfill Site consisted of both an areal survey northwest of the landfill mound and 24 profiles radiating outward from the toe of the landfill mound. The locations of the terrain conductivity survey are shown in Plate 1.

For the northwest area, 4322 terrain conductivity stations were recorded automatically at 1 second intervals, roughly equivalent to a 4 foot station spacing, along lines spaced either 12.5 or 25 feet apart. This part of the Site was generally clear of surface metal.

Along the 24 terrain conductivity profiles, data were obtained at approximately 10-foot intervals from the 0+00 stake on the landfill end of the line. Surface metal was noted along the cut lines and in the reeds adjacent to the lines.

Background terrain conductivity data were measured along a 60-foot line west of the entrance road near the top edge of the sand borrow pit at the beginning and end of each field day. The values ranged from 5 to 10 mmhos/meter (-1.0 to 1.0 ppt for the in-phase component) and are judged to represent clean, natural conditions. These data were used to determine the natural background values that may be expected for the Site and to check for instrument drift.

To compare with measurements obtained in the saltwater marsh near the landfill, data were collected in the saltwater marsh near Hook's Creek Lake at Cheesequake Creek State Park, about one mile south of the Site. The "background" values obtained in the saltwater marsh varied from 400 to 450 mmhos/meter (43 to 45 ppt for the in-phase component).

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pleted at the Hager-Richter offices. Original data and field notes reside in the Hager-Richter files and will be retained for a minimum of three years.

2. EQUIPMENT AND PROCEDURES

2.1 General

2.1.1 Field Work. We used a Geonics EM31-DL terrain conductivity meter for the terrain conductivity survey. The EM31-DL is an induction type unit that measures terrain conductivity without ground electrodes or contact. The EM31-DL is calibrated to read ground conductivity directly in millimhos per meter (mmhos/meter) with a resolution of 2% of full scale and an accuracy of 1 mmho/meter. The nominal depth of earth sampled by the EM31-DL is about 18 feet. The data are recorded on a digital data logger and transferred to a computer at the end of each field day.

Two components of the induced magnetic field measured by the EM31-DL are recorded: (1) the quadrature-phase component; and (2) the in-phase component. The quadrature-phase component is a measure of the average terrain conductivity of the subsurface materials located between the receiver and transmitter of the EM31-DL. The in-phase component is a sensitive indicator of the presence of conductive metal objects; however, the exact identification of the object cannot be determined from the terrain conductivity data alone.

2.1.2 Data Analysis and Interpretation. The EM31-DL data are plotted in either profile format or as contour maps, depending on the density of the data. At sites free of metal objects and other cultural interference, the terrain conductivity measured at a particular location is controlled by the subsurface fluid. The instrument response is more affected by near-surface material than by deeper material. In cases where the terrain conductivity meter is directly over a buried metal target, the apparent conductivity reading may be a negative number.

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1. INTRODUCTION

Hager-Richter Geoscience, Inc. conducted a terrain conductivity survey at the Global Landfill Site, Old Bridge, Middlesex County, New Jersey for URS Consultants, Inc. of Buffalo, New York in May, 1991. The geophysical survey is part of a larger RI/FS by URS undertaken for the New Jersey Department of Environmental Protection.

The general location of the Site is shown in Figure 1. The northeast, southeast and southwest sides of the Site are bordered by wetlands formed by Cheesequake Creek. The northwest side of the landfill abuts a sand borrow pit. The surrounding area is residential. The Atlantic Ocean is located approximately three miles east of the Site.

The landfill mound is approximately 50 acres in size and ranges in elevation from 5 feet to 108 feet above sea level. The landfill is reported to contain municipal solid waste, bulky waste, vegetative waste, and dry industrial waste. In a previous study, drums containing hazardous materials were detected and subsequently removed from a 6.5 acre area adjacent to the northwest side of the landfill mound. In 1984, a slope failure occurred along the southeast side of the landfill mound, according to information provided by URS. Solid waste was exposed and approximately four acres of the adjacent saltwater marsh were filled with debris. A 42" underground gas pipeline is located at the base of the northwest side of the landfill.

The objectives of the terrain conductivity survey were: (1) to identify possible drum disposal locations and sludge pits in an area northwest of the landfill; and (2) to delineate the edge of fill along profiles perpendicular to the perimeter of the landfill mound.

Jeffrey Mann and Jon Puliafico of Hager-Richter Geoscience, Inc. conducted the terrain conductivity survey on May 14 and 15, 1991. URS established the survey grid and the survey conventions used in the northwest area of the Site, and designated the locations of the terrain conductivity profiles. Mr. David Sheppard and Mr. David Solly, Site representatives for URS, observed portions of the field work. All work was conducted under Level D personal protection. Data analysis and interpretation were com-

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

Figure 18.	Terrain Conductivity Survey Line	10A.
Figure 19.	Terrain Conductivity Survey Line	11.
Figure 20.	Terrain Conductivity Survey Line	12.
Figure 21.	Terrain Conductivity Survey Line	13.
Figure 22.	Terrain Conductivity Survey Line	14.
Figure 23.	Terrain Conductivity Survey Line	15.
Figure 24.	Terrain Conductivity Survey Line	16.
Figure 25.	Terrain Conductivity Survey Line	17.
Figure 26.	Terrain Conductivity Survey Line	18.
Figure 27.	Terrain Conductivity Survey Line	19.

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

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PLATES

Plate 1. Site Plan

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Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
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3. The location of the edge of fill along the terrain conductivity profiles extending into the marsh is not clear due to the high conductivity saltwater present in the marsh. Except for scattered surface metal, the generally smooth variation of the in-phase component of the terrain conductivity data in the salt marsh implies that little or no buried metal is present beyond the edge of the marsh.

4. Three profiles in the vicinity of the 1984 southeast slope failure indicate that fill material might be present in the saltwater marsh in this area.

5. The terrain conductivity data for two profiles indicate that a slight topographic berm in the marsh southwest of the landfill is likely constructed of landfill material.

Terrain Conductivity Survey
Global Landfill Site
Old Bridge, New Jersey
File 89D13 May, 1991

0. EXECUTIVE SUMMARY

Hager-Richter Geoscience, Inc. conducted a terrain conductivity survey at the Global Landfill Site, Old Bridge, New Jersey for URS Consultants, Inc. of Buffalo, New York in May, 1991. The geophysical survey was part of a larger RI/FS of the Site for the NJDEP. The objectives of the geophysical survey were: (1) to identify potential drum disposal locations and possible sludge pits in an area northwest of the landfill mound; and (2) to delineate the edges of the landfill.

An areal survey consisting of 4322 data stations was conducted northwest of the landfill mound. High terrain conductivity and numerous in-phase anomalies indicate that fill is present in the southwest part of the survey area. Some of the fill material could be drums. In the north and northwest parts of the survey area, scattered terrain conductivity anomalies indicate the presence of isolated metal objects. There is no evidence in the terrain conductivity data for the presence of sludge pits in the area surveyed.

Twenty-four terrain conductivity profiles, oriented radial to the landfill, were obtained to determine location of the edge of fill. On the east, south, and west sides of the landfill, the profiles extend toward a saltwater marsh. The location of the edge of the fill is readily apparent in the terrain conductivity data for the profiles on the northwest side of the landfill. Elsewhere, however, the edge of fill is not clearly defined due to the highly conductive saltwater in the marsh.

Based on the terrain conductivity survey at the Global Landfill, we conclude:

1. Buried metallic objects, some of which could be drums, and other highly conductive materials are present in the area northwest of the landfill mound. A potential drum disposal area is located near the center of the southern edge of the survey area. No evidence of sludge pits is present in the terrain conductivity data.

2. The location of the edge of fill is evident in the terrain conductivity data for the radial profiles in the northwestern part of the Site.

HAGER-RICHTER
GEOSCIENCE, INC

**TERRAIN CONDUCTIVITY SURVEY
GLOBAL LANDFILL SITE
OLD BRIDGE, MIDDLESEX COUNTY
NEW JERSEY**

Prepared for:

URS Consultants, Inc.
282 Delaware Avenue
Buffalo, NY 14202

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way - D10
Salem, New Hampshire 03079

File 89D13
May, 1991

PROJECT: Global Landfill RI/FS

SHEET NO. 2 OF

2

CLIENT: NJDEP

JOB NO. :

35226

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
40	.....	S-18	SS	12	22	50	Orange Brown	Dense	MEDIUM SAND, some silt	0 1/4 - 1 1/2" Clay Seams From 37-43'
				23	22					
									
	.....	S-19	SS	14	21	50				
	.....			22	24					
45	End of Boring								Boring completed at 44 feet.	
50										
55										
60										

COMMENTS _____

BORING NO. B-1

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 22.22'

GROUND WATER: Wet @ 7'

CAS. SAMP CORE TUBE

DATE STARTED: 6/12/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 6/12/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
	.....	S-1	SS	2 2	70	Tan	Very Loose	MEDIUM SAND (cover)	SP	o Dry o Moist o HNu = 1.4 ppm
	XXXX			35 28		Black	Dense	FILL: wood, paper, plastic, brick and concrete in sandy matrix		
	XXXX	S-2	SS	4 8	70					
	~ ~ ~ ~			12 20		Tan	Dense	SILTY MEDIUM SAND	SM	
5	~ ~ ~ ~	S-3	SS	5 7	80					o Wet @ 7'
	~ ~ ~ ~			13 21						
	~ ~ ~ ~	S-4	SS	15 32	80					
	~ ~ ~ ~			36 50		Very Dense		Some gravel.		
10	END OF BORING							Boring completed at 8 feet.		
								Head Space Results		
								Interval	OVA ppm	HNu ppm
								0-2'	ND	0.2
								2-4'	ND	0.6
15								4-6'	ND	0.2
								Environmental Sample - 2-4'		
20										
25										
30										
35										
38										

COMMENTS HNu readings taken from split spoons.

PROJECT NO.
BORING NO.

35226
B-1

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO.

B-2

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO.: 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 24.16'

GROUND WATER: Wet @ 5.5'

CAS. SAMP CORE TUBE

DATE STARTED: 6/13/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 6/13/91

DIA. 2"

DRILLER: Jeff Marchesi

WT. 140#

GEOLOGIST: Robert Kreuzer

FALL 30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS													
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS														
	S-1	SS	7	10	40	Tan	Med. Dense	MEDIUM SAND (cover)	SP	o Dry												
	XXXXX			10	10		Black	Med. Dense	FILL: wood, brick & cloth in sandy matrix		o Moist												
	XXXXX	S-2	SS	10	15	50																	
	XXXXX			8	10																		
5	~ ~ ~	S-3	SS	8	10	65	Gray	Med. Dense	SILTY SAND	SM	o HNu = 1.0 ppm												
	XXXXX			14	16		Black	Med. Dense	SANDY FILL, plastic		o Wet @ 5.5'												
	~ ~ ~	S-4	SS	8	12	80	Brown	Stiff	CLAYEY SILT, some sand	ML													
			20	24		Tan	Dense	MEDIUM SAND, some silt	SW													
10	END OF BORING								Boring completed at 8 feet.														
									Head Space Results <table border="1"> <thead> <tr> <th>Interval</th> <th>OVA ppm</th> <th>HNu ppm</th> </tr> </thead> <tbody> <tr> <td>0-2'</td> <td>ND</td> <td>1.0</td> </tr> <tr> <td>2-4'</td> <td>ND</td> <td>1.2</td> </tr> <tr> <td>4-6"</td> <td>ND</td> <td>4.6</td> </tr> </tbody> </table>			Interval	OVA ppm	HNu ppm	0-2'	ND	1.0	2-4'	ND	1.2	4-6"	ND	4.6
Interval	OVA ppm	HNu ppm																					
0-2'	ND	1.0																					
2-4'	ND	1.2																					
4-6"	ND	4.6																					
15									Environmental Sample - 4'-6' VOA Collected @ 4.5-5.0'														
20																							
25																							
30																							
35																							
38																							

COMMENTS HNu readings taken from split spoons.

PROJECT NO.
BORING NO.

35226
B-2

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 19.92'

GROUND WATER: Wet @ 4.5'

DATE STARTED: 6/14/91

DATE	TIME	LEV	TYPE	TYPE	CAS.	SAMP	CORE	TUBE
				DIA.		SS		
				WT.		140#		
				FALL		30"		

DATE FINISHED: 6/14/91

DRILLER: Jeff Marchesi

GEOLOGIST: Robert Kreuzer

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				CLASS USCS	REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION			
	.....	S-1	SS	2	4	85	Tan	Loose	MEDIUM SAND, some silt	SW	o Moist o Wet @ 4.5' o 300 lb. hammer
	.....			8	12			Med. Dense			
	.....	S-2	SS	13	21	90		Dense			
	XXXXXX			24	48		Black	Very Dense	FILL: granular material, wood & concrete		
5	XXXXXX	S-3	SS	18	21	30					
	XXXXXX			62	10						
	END OF BORING								Boring completed at 6 feet.		
10											
15											
20											
25											
30											
35											
38											

Head Space Results

Interval	OVA ppm	HNu ppm
0-2'	40	ND
2-4'	50	2.2

Environmental Sample - 2-4'

COMMENTS HNu readings taken from split spoons. no readings were detected above background.

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. **B-4**

PROJECT: **Global Landfill RI/FS**

SHEET NO. **1 OF 1**

CLIENT: **NJDEP**

JOB NO. : **35226**

BORING CONTRACTOR: **Empire Soils Investigations**

GROUND ELEVATION: **23.44'**

GROUND WATER: **Wet @ 5.5'**

CAS. SAMP CORE TUBE

DATE STARTED: **6/14/91**

DATE TIME LEV TYPE TYPE

DATE FINISHED: **6/14/91**

DIA. SS

DRILLER: **Jeff Marchesi**

WT. 140#

GEOLOGIST: **Robert Kreuzer**

FALL 30"

REVIEWED BY: **BP & DL**

*** POCKET PENETROMETER READING**

DEPTH FT	STRATA	SAMPLE					DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS		
	.....	S-1	SS	14	22	70	Tan	Dense	MEDIUM SAND (cover)	SP	o Petroleum odor o HNu = 0.6 ppm o Wet @ 5.5' o HNu = 0.4 ppm
	XXXXXX			26	56		Black	Loose	FILL: brick, concrete & wood in sandy matrix		
	XXXXXX	S-2	SS	3	3	75					
	XXXXXX			4	4						
5	XXXXXX	S-3	SS	6	6	85					
	~ ~ ~			8	8		Gray	Med. Dense	SILTY SAND	SM	
	END OF BORING								Boring completed at 6 feet.		
10											
15											
20											
25											
30											
35											
38											

Head Space Results

Interval	OVA ppm	HNu ppm
0-2'	1.6	0.4
2-4'	100	2.5
4-6'	95	1.0

Environmental Sample - 2-4'
VOA Collected @ 3'

COMMENTS **HNu readings taken from split spoons.**

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 15.12'

GROUND WATER: Wet @ 1' CAS. SAMP CORE TUBE

DATE STARTED: 6/13/91

DATE TIME LEV TYPE TYPE SS

DATE FINISHED: 6/13/91

DIA. 2"

DRILLER: Jeff Marchesi

WT.

GEOLOGIST: Robert Kreuzer

FALL

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION			CLASS USCS	REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION		
~.~.~	S-1	SS			25	Orange	Loose	Top 2-3" Peat Layer SILTY MEDIUM SAND	SM	o Wet @ 1' o HNu = 4.0 ppm o H2S Septic odor 2-4'
~.~.~						Brown				
~.~.~	S-2	SS			45	Tan-	Med. Dense			
~.~.~						Gray				
5	END OF BORING							Boring completed at 4 feet.		
10										
15										
20										
25										
30										
35										
38										

Head Space Results

Interval	OVA ppm	HNu ppm
0-2'	ND	0.2
2-4'	25	ND

Environmental Sample - 0-4'
VOA Collected from 18-24"

COMMENTS Boring Advanced using an electric Jackhammer & 2" split spoons. HNu readings taken from split spoons.

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. **B-6**

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 16.92'

GROUND WATER: Wet @ 4'	CAS.	SAMP	CORE	TUBE
DATE	TIME	LEV	TYPE	
			DIA.	SS
			WT.	140#
			FALL	30"

DATE STARTED: 6/13/91

DATE FINISHED: 6/13/91

DRILLER: Jeff Marchesi

GEOLOGIST: Robert Kreuzer

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS												
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS													
	S-1	SS	2 4	90	Orange Brown	Loose	MEDIUM SAND, some silt	SW	o Moist												
			6 8																		
	S-2	SS	12 13	95	Tan	Med. Dense			o Wet @ 4'												
			14 12																		
5	S-3	SS	10 10	100																	
			10 10																		
	END OF BORING							Boring completed at 6 feet.														
10								Head Space Results <table border="1"> <tr> <th>Interval</th> <th>OVA ppm</th> <th>HNu ppm</th> </tr> <tr> <td>0-2'</td> <td>ND</td> <td>ND</td> </tr> <tr> <td>2-4'</td> <td>ND</td> <td>ND</td> </tr> <tr> <td>4-6'</td> <td>ND</td> <td>ND</td> </tr> </table>	Interval	OVA ppm	HNu ppm	0-2'	ND	ND	2-4'	ND	ND	4-6'	ND	ND		
Interval	OVA ppm	HNu ppm																				
0-2'	ND	ND																				
2-4'	ND	ND																				
4-6'	ND	ND																				
15																						
20																						
25																						
30																						
35																						
38																						

COMMENTS HNu readings taken from split spoons, no readings were detected above background.

PROJECT NO.
BORING NO.

35226
B-6

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. **B-7**

PROJECT: **Global Landfill RI/FS**

SHEET NO. **1 OF 1**

CLIENT: **NJDEP**

JOB NO. : **35226**

BORING CONTRACTOR: **Empire Soils Investigations**

GROUND ELEVATION: **16.36'**

GROUND WATER: **Wet @ 6"**

CAS. SAMP CORE TUBE

DATE STARTED: **6/13/91**

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: **6/13/91**

DIA. 2"

DRILLER: **Jeff Marchesi**

WT.

GEOLOGIST: **Robert Kreuzer**

FALL

REVIEWED BY: **BP & DL**

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	
~.~.~	S-1	SS			90	Tan-Gray	Loose	Top 2-3" Peat Layer	SM	o Wet @ 6"
~.~.~								SILTY MEDIUM SAND		
~.~.~	S-2	SS			95		Med. Dense			
~.~.~										
5	END OF BORING							Boring completed at 4 feet.		
10										
15										
20										
25										
30										
35										
38										

Head Space Results

Interval	OVA ppm	HNu ppm
0-2'	800	0.2
2-4'	120	0.2

Environmental Sample - 0-2'
VOA Collected from 0-1'

COMMENTS **Boring Advanced using an electric Jackhammer & 2" split spoons. HNu readings taken from split spoons, no readings were detected above background.**

PROJECT NO. **35226**
BORING NO. **B-7**

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 14.68'

GROUND WATER: Wet @ Surface

CAS. SAMP CORE TUBE

DATE STARTED: 6/13/91

DATE TIME LEV TYPE

TYPE

SS

DATE FINISHED: 6/13/91

DIA.

2"

DRILLER: Jeff Marchesi

WT.

GEOLOGIST: Robert Kreuzer

FALL

REVIEWED BY: BP & DL

*** POCKET PENETROMETER READING**

DEPTH FT	STRATA	SAMPLE				RECOVERY RQD %	COLOR	DESCRIPTION		CLASS USCS	REMARKS								
		NO.	TYPE	BLOWS PER 6"				CONSISTENCY HARDNESS	MATERIAL DESCRIPTION										
~.~.~	S-1	SS			70	Tan-Gray	Loose	Top 2-3" Peat Layer	SM	o Wet @ Surface slight H2S odor									
~.~.~								SILTY MEDIUM SAND											
~.~.~	S-2	SS			60		Med. Dense												
~.~.~																			
5	END OF BORING							Boring completed at 4 feet.											
10																			
15								Head Space Results <table border="1"> <thead> <tr> <th>Interval</th> <th>OVA ppm</th> <th>HNu ppm</th> </tr> </thead> <tbody> <tr> <td>0-2'</td> <td>220</td> <td>ND</td> </tr> <tr> <td>2-4'</td> <td>120</td> <td>ND</td> </tr> </tbody> </table>	Interval	OVA ppm	HNu ppm	0-2'	220	ND	2-4'	120	ND		
Interval	OVA ppm	HNu ppm																	
0-2'	220	ND																	
2-4'	120	ND																	
20								Environmental Sample - 0-2' VOA Collected from 1'											
25																			
30																			
35																			
38																			

COMMENTS Boring Advanced using an electric Jackhammer & 2" split spoons. HNu readings taken from split spoons, no readings were detected above background.

PROJECT: Global Landfill RI/FS	SHEET NO. 1 OF 1
CLIENT: NJDEP	JOB NO.: 35226
BORING CONTRACTOR: Empire Soils Investigations	GROUND ELEVATION: 16.74'
GROUND WATER: Wet @ 3.75'	DATE STARTED: 6/12/91
DATE TIME LEV TYPE TYPE	DATE FINISHED: 6/12/91
	DRILLER: Jeff Marchesi
	GEOLOGIST: Robert Kreuzer
	REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE					DESCRIPTION				REMARKS									
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS											
	S-1	SS	2	12	70	Tan	Med. Dense	MEDIUM SAND (cover)	SP	o Moist o HNu = 0.2 ppm o Wet @ 3.75'									
	XXXX			11	12		Black		FILL: wood and roofing shingles											
	XXXX	S-2	SS	5	10	90														
	XXXX			15	42															
5	~.~.~	S-3	SS	32	8	10	Tan & Gray	Med. Dense	SILTY MEDIUM SAND	SM										
	~.~.~			7	6															
	~.~.~	S-4	SS	4	2	10														
	~.~.~			2	4															
10	END OF BORING								Boring completed at 8 feet.											
									Head Space Results <table border="1"> <thead> <tr> <th>Interval</th> <th>OVA ppm</th> <th>HNu ppm</th> </tr> </thead> <tbody> <tr> <td>0-2'</td> <td>ND</td> <td>ND</td> </tr> <tr> <td>2-4'</td> <td>ND</td> <td>ND</td> </tr> </tbody> </table>		Interval	OVA ppm	HNu ppm	0-2'	ND	ND	2-4'	ND	ND	
Interval	OVA ppm	HNu ppm																		
0-2'	ND	ND																		
2-4'	ND	ND																		
15																				
20																				
25																				
30																				
35																				
38																				

COMMENTS HNu readings taken from split spoons.

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO.

B-10

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 1

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 15.99'

GROUND WATER: Wet @ 3.5'

CAS. SAMP CORE TUBE

DATE STARTED: 6/13/91

DATE TIME LEV TYPE

TYPE SS

DATE FINISHED: 6/13/91

DIA.

2"

DRILLER: Jeff Marchesi

WT.

140#

GEOLOGIST: Robert Kreuzer

FALL

30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS			
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS				
	.....	S-1	SS	2 4	60	Tan	Loose	MEDIUM SAND, some silt				
	.....			6 15								
	.....	S-2	SS	15 32	70							
	XXXXXX			34 38									
5	XXXXXX	S-3	SS	25 5	30					Black	Dense	FILL: wood, shingles, tar paper	o Moist o Wet @ 3.5' o (300 lb hammer S-3)
	XXXXXX			5 8									
	XXXXXX	S-4	SS	6 7	40								
	XXXXXX			8 6									
	XXXXXX	S-5	SS	WH 24	0								
10	XXXXXX												
	XXXXXX	S-6	SS	WR WR	30								
	.....			2 3		Brown	Loose	MEDIUM SAND, some silt				
	END OF BORING							Boring completed at 12 feet.					
15													
20													
25													
30													
35													
38													

Head Space Results

Interval	OVA ppm	HNu ppm
0-2'	ND	ND
2-4'	ND	ND
4-6'	ND	ND
6-8'	ND	ND
8-10'	ND	ND
10-12'	ND	ND

Environmental Sample - 2-4'
VOA Collected @ 3'

COMMENTS HNu readings taken from split spoons.

PROJECT NO.

35226

BORING NO.

B-10

PROJECT: Global Landfill RI/FS

SHEET NO. 1 OF 2

CLIENT: NJDEP

JOB NO. : 35226

BORING CONTRACTOR: Empire Soils Investigations

GROUND ELEVATION: 23.97'

GROUND WATER: Wet @ 10'

CAS. SAMP CORE TUBE

DATE STARTED: 6/14/91

DATE TIME LEV TYPE TYPE

DATE FINISHED: 6/14/91

DIA.

2"

DRILLER: Jeff Marchesi

WT.

140#

GEOLOGIST: Robert Kreuzer

FALL

30"

REVIEWED BY: BP & DL

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE				DESCRIPTION				REMARKS		
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS			
	.....							Tan	Med. Dense	MEDIUM SAND	SP	
	XXXXXX									FILL: wood and cloth in sandy matrix		o Moist
	XXXXXX											
5	XXXXXX											
	XXXXXX	S-1	SS	3	6	40						o HNu = 8.0 ppm
	XXXXXX			10	9							
	XXXXXX											
	XXXXXX											o Wet @ 10'
10	XXXXXX											o HNu = 1.0 ppm
	XXXXXX	S-2	SS	7	5	10						
	XXXXXX			6	6							
	XXXXXX											
15	XXXXXX											
	XXXXXX	S-3	SS	10	6	20						
	XXXXXX			15	18							
	.....	S-4	SS	12	15	90	Tan	Med. Dense	MEDIUM SAND, some silt	SW		
	.....			17	17		Gray					
20	.....	S-5	SS	10	10	90						
	.....			5	8		Gray	Med. Dense	SILTY SAND	SM		o Roots
	.....	S-6	SS	6	9	95						
	.....			9	9		O.Brn	Med. Dense	MEDIUM SAND, some silt	SW		
	.....	S-7	SS	3	2	80	O.Brn	Soft	CLAYEY SILT, some sand	ML		
25	.....			1	1		Gray	Very Loose	MEDIUM SAND, some silt	SW		
	.....	S-8	SS	2	3	100	O.Brn	Loose	SILTY SAND, clay seams	SM		
	.....			4	5		Gray					
	.....	S-9	SS	6	6	100	Lt.Gray	Med. Dense	MEDIUM SAND, some silt	SW		
	.....			8	14		Orange					
30	.....	S-10	SS	2	3	100	Gray	Loose	SILTY SAND, seams of orange (1/4-1/2"), silty sand throughout	SM		
	.....			4	4							
	.....	S-11	SS	4	14	100		Med. Dense				
	.....			14	8							
	.....	S-12	SS	5	7	95	Orange-Brown	Med. Dense	MEDIUM SAND, some silt	SW		
35	.....			9	25			Very Dense				
	.....	S-13	SS	12	21	100						
	.....			25	29							
38	.....	S-14	SS	8	12	100						

COMMENTS HNu readings taken from split spoons.

PROJECT: Global Landfill RI/FS

SHEET NO. 2 OF

2

CLIENT: NJDEP

JOB NO. :

35226

DEPTH FT	STRATA	SAMPLE					DESCRIPTION			REMARKS	
		NO.	TYPE	BLOWS PER 6"		RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION		CLASS USCS
	.....	S-14	SS	17	20	100	Orange	Very Dense	MEDIUM SAND, some silt	SW	
40	.....	S-15	SS	9	12	100	Brown				
	.....			13	16						
	END OF BORING								Boring completed at 41 feet.		
45											
50											
55											
60											

COMMENTS

APPENDIX F

MONITORING WELL INSTALLATION REPORTS

DRILLING SUMMARY

Geologist:
Robert Kreuzer

Drilling Company:
Empire Soils

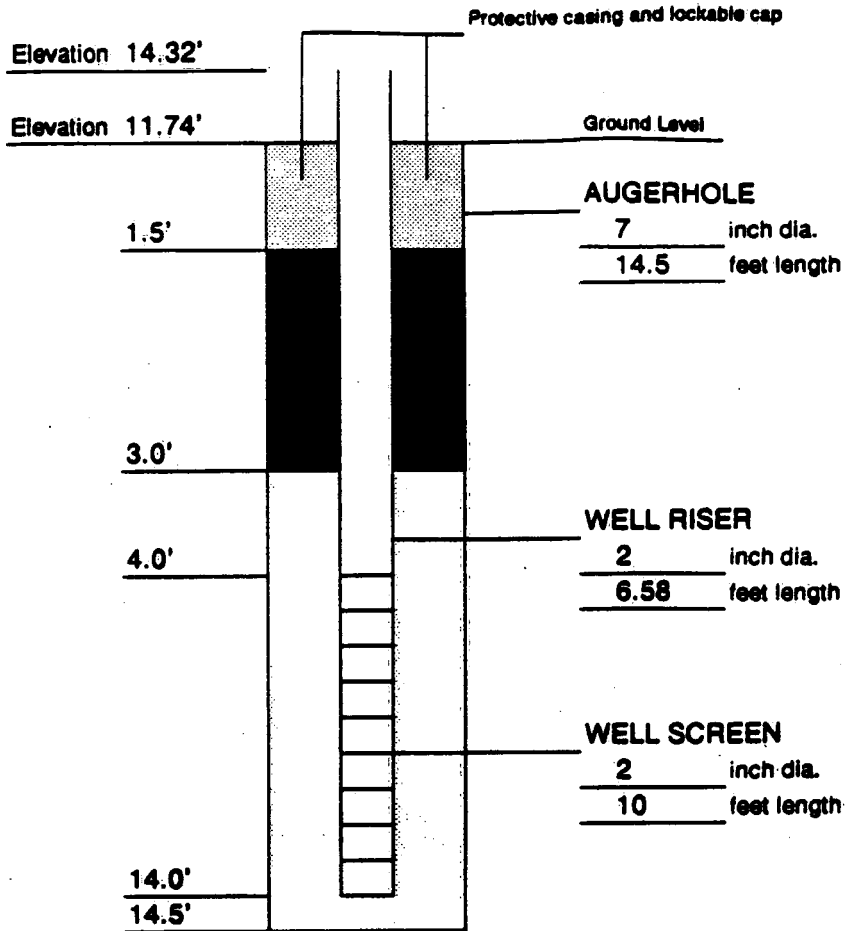
Driller:
Jeff Marchesi

Date:
5/30/91




GEOLOGIC LOG

depth(ft.)	lithology
0-6'	Sand, Medium, Some Silt,
6-13.5'	Fill, Wood Plastic & Paper in Sandy Matrix
13.5-14.5'	Sandy Silt, Some Clay

D
E
P
T
H



WELL DESIGN

<p>CASING MATERIAL</p> <p>Surface: Steel</p> <p>Monitor: PVC</p>		<p>SCREEN MATERIAL</p> <p>Type: PVC</p> <p>Slot Size: .010</p>		<p>SEAL MATERIAL</p> <p>Seal #1 Type Bentonite Pellets Setting: 1.5 - 3.0'</p> <p>Seal #2 Type None Setting:</p>	
<p>FILTER MATERIAL</p> <p>Type: #2 Silica Sand</p> <p>Setting: 3.0 - 14.5'</p>		<p>ROCK CORING</p> <p>Cored Interval: None</p> <p>Core Diameter: None</p> <p>Reamed Diameter: None</p>		<p>LEGEND</p> <p> Cement/Bentonite Grout</p> <p> Bentonite Seal</p> <p> Silica Sandpack</p>	
<p>Client: NJDEP</p>		<p>Project: Global RI/FS</p>		<p>Project No. 35226</p>	
<p>URS Consultants Inc.</p>		<p>Monitoring Well Construction Details</p>		<p>Well Number: MW-3S</p>	

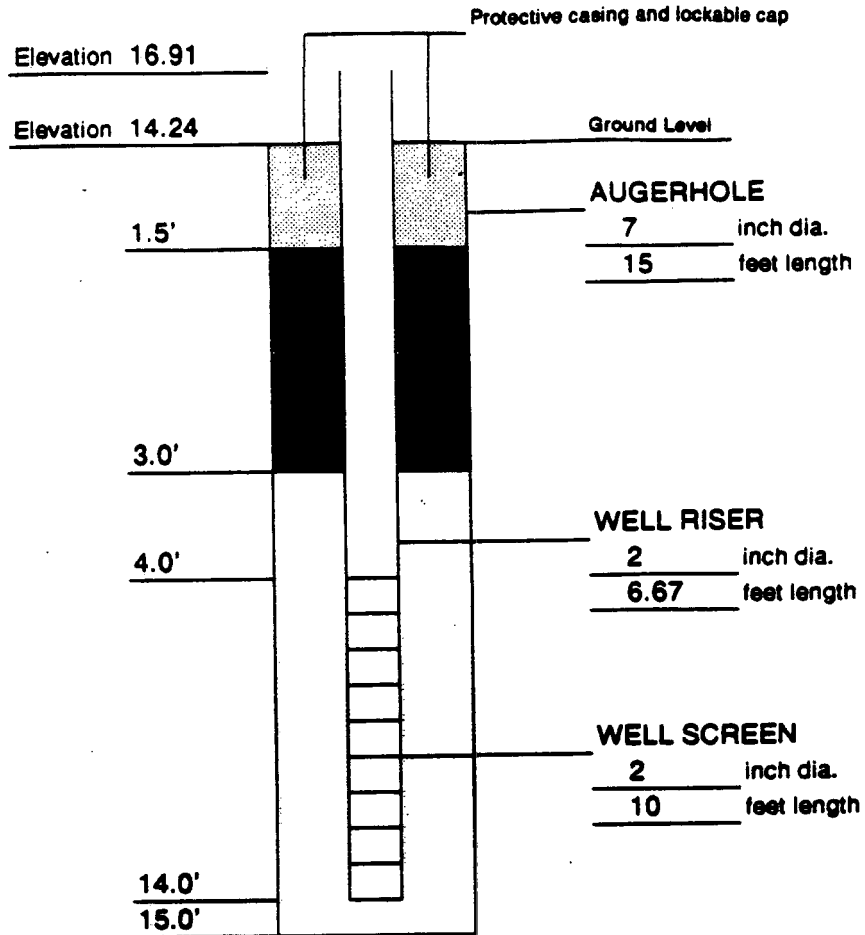
DRILLING SUMMARY

Geologist:
Robert Kreuzer
Drilling Company:
Empire Soils
Driller:
Richard Gurcynski
Date:
6/10/91



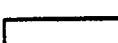
GEOLOGIC LOG

depth(ft.)	lithology
0-4'	Sand, Medium, Some Silt, Trace Clay
4-8'	Silty Sand, Medium, Trace Clay
8-15'	Sand, Medium, Some Silt,

DEPTH



WELL DESIGN

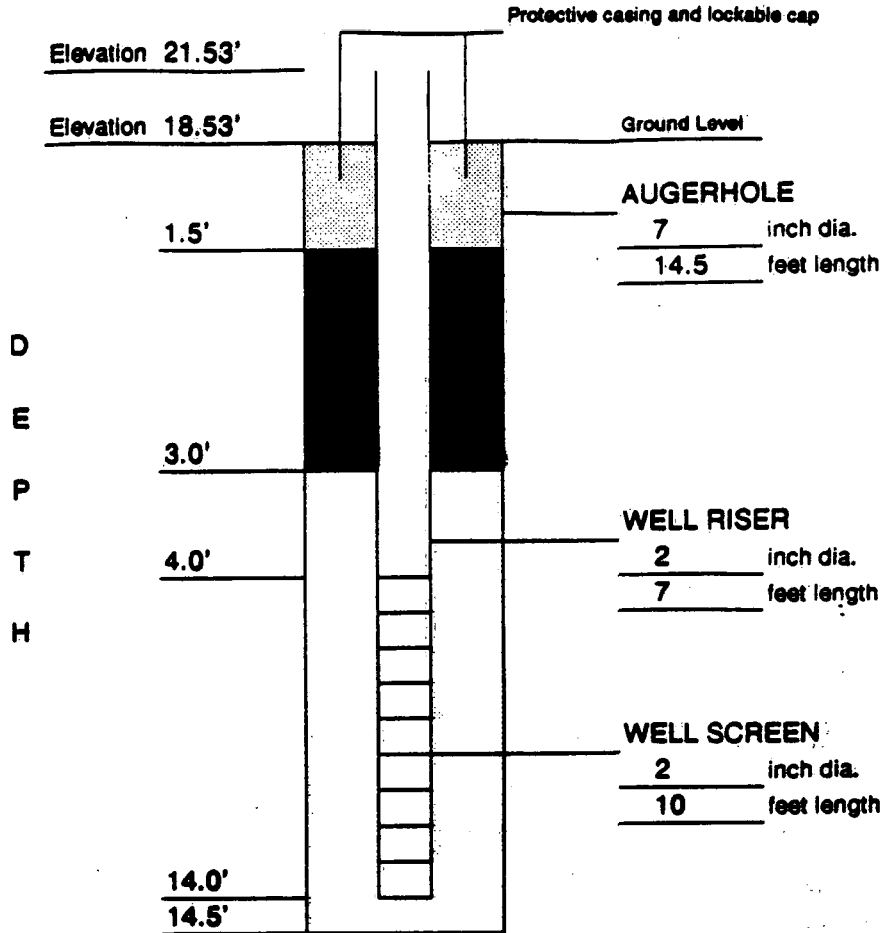
<p>CASING MATERIAL</p> <p>Surface: Steel</p> <p>Monitor: PVC</p>		<p>SCREEN MATERIAL</p> <p>Type: PVC</p> <p>Slot Size: .010</p>		<p>SEAL MATERIAL</p> <p>Seal #1 Type Bentonite Pellets Setting: 1.5 - 3.0'</p> <p>Seal #2 Type None Setting:</p>	
<p>FILTER MATERIAL</p> <p>Type: #2 Silica Sand</p> <p>Setting: 3.0 - 15'</p>		<p>ROCK CORING</p> <p>Cored Interval: None</p> <p>Core Diameter: None</p> <p>Reamed Diameter: None</p>		<p>LEGEND</p> <p> Cement/Bentonite Grout</p> <p> Bentonite Seal</p> <p> Silica Sandpack</p>	
<p>Client: NJDEP</p>		<p>Project: Global RI/FS</p>		<p>Project No. 35226</p>	
<p>URS Consultants Inc.</p>		<p>Monitoring Well Construction Details</p>		<p>Well Number: MW-10S(R)</p>	

DRILLING SUMMARY




Geologist:
Robert Kreuzer
Drilling Company:
Empire Soils
Driller:
Jeff Marches
Date:
6/11/90

GEOLOGIC LOG

depth(ft.)	lithology
0-1.5'	Medium Sand
1.5-6'	Fill, Wood Plastic & Paper
6-10'	Silty Sand Medium
10-14.5'	Sand, Medium, Some Silt



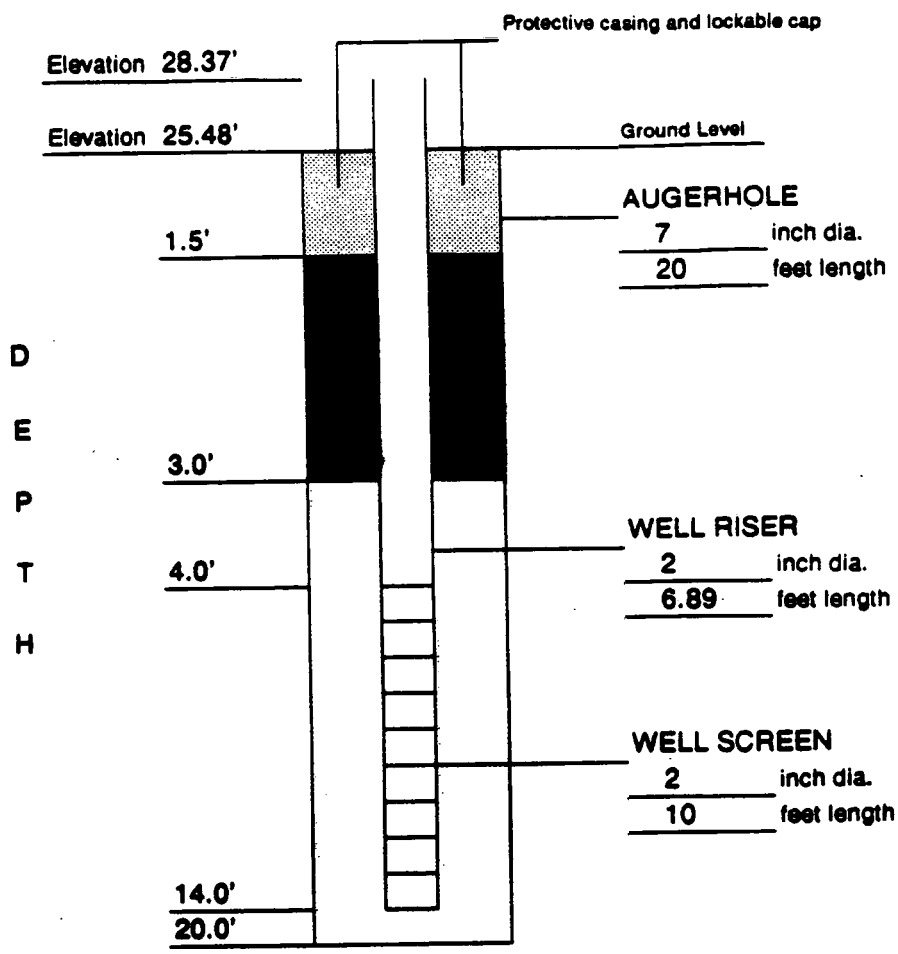
WELL DESIGN

<p>CASING MATERIAL</p> <p>Surface: Steel</p> <p>Monitor: PVC</p>		<p>SCREEN MATERIAL</p> <p>Type: PVC</p> <p>Slot Size: .010</p>		<p>SEAL MATERIAL</p> <p>Seal #1 Type Bentonite Pellets</p> <p>Setting: 1.5 - 3.0'</p> <p>Seal #2 Type None</p> <p>Setting:</p>	
<p>FILTER MATERIAL</p> <p>Type: #2 Silica Sand</p> <p>Setting: 3.0 - 14.5'</p>		<p>ROCK CORING</p> <p>Cored Interval: None</p> <p>Core Diameter: None</p> <p>Reamed Diameter: None</p>		<p>LEGEND</p> <p> Cement/Bentonite Grout</p> <p> Bentonite Seal</p> <p> Silica Sandpack</p>	
<p>Client: NJDEP</p>		<p>Project: Global RI/FS</p>		<p>Project No. 35226</p>	
<p>URS Consultants Inc.</p>		<p>Monitoring Well Construction Details</p>		<p>Well Number: MW-11 S</p>	

DRILLING SUMMARY
 Geologist:
 Robert Kreuzer
 Drilling Company:
 Empire Soils
 Driller:
 Jeff Marchesi
 Date:
 6/11/91

GEOLOGIC LOG

depth(ft.)	lithology
0-2'	Silty Sand
2-20'	Fill, Wood & Plastic in Sandy Matrix
20-22'	Sand, Med., Some Silt



WELL DESIGN

<i>CASING MATERIAL</i>		<i>SCREEN MATERIAL</i>		<i>SEAL MATERIAL</i>	
Surface:	Steel	Type:	PVC	Seal #1 Type	Bentonite Pellets
Monitor:	PVC	Slot Size:	.010	Setting:	1.5 - 3.0'
				Seal #2 Type	None
				Setting:	
<i>FILTER MATERIAL</i>		<i>ROCK CORING</i>		<i>LEGEND</i>	
Type:	#2 Silica Sand	Cored Interval:	None		Cement/Bentonite Grout
Setting:	3.0 - 20'	Core Diameter:	None		Bentonite Seal
		Reamed Diameter:	None		Silica Sandpack
Client:	NJDEP	Project:	Global RI/FS	Project No. 35226	
URS Consultants Inc.		Monitoring Well Construction Details		Well Number: MW-12S	



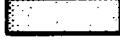
DRILLING SUMMARY

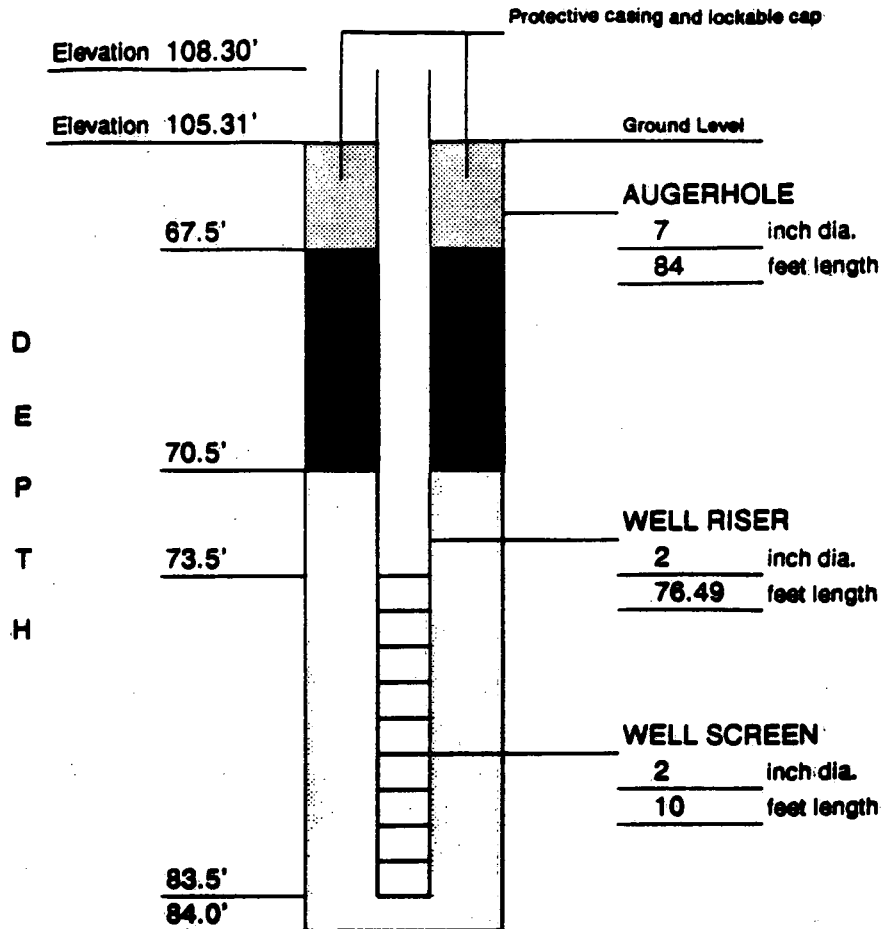
Geologist:
Robert Kreuzer
Drilling Company:
Empire Soils
Driller:
Jeff Marchesi
Date:
6/7/90

GEOLOGIC LOG

depth(ft.)	lithology
0-84'	Alternating Layers of Medium Sands And Silty Sands

WELL DESIGN

CASING MATERIAL		SCREEN MATERIAL		SEAL MATERIAL	
Surface:	Steel	Type:	PVC	Seal #1 Type:	Bentonite Pellets
Monitor:	PVC	Slot Size:	.010	Setting:	
FILTER MATERIAL		ROCK CORING		LEGEND	
Type:	#2 Silica Sand	Cored Interval:	None		Cement/Bentonite Grout
Setting:	70.5 - 84'	Core Diameter:	None		Bentonite Seal
		Reamed Diameter:	None		Silica Sandpack
Client:	NJDEP	Project:	Global RI/FS	Project No. 35226	
URS Consultants Inc.		Monitoring Well Construction Details		Well Number: MW-13	



DRILLING SUMMARY

Geologist:
Robert Kreuzer

Drilling Company:
Empire Soils

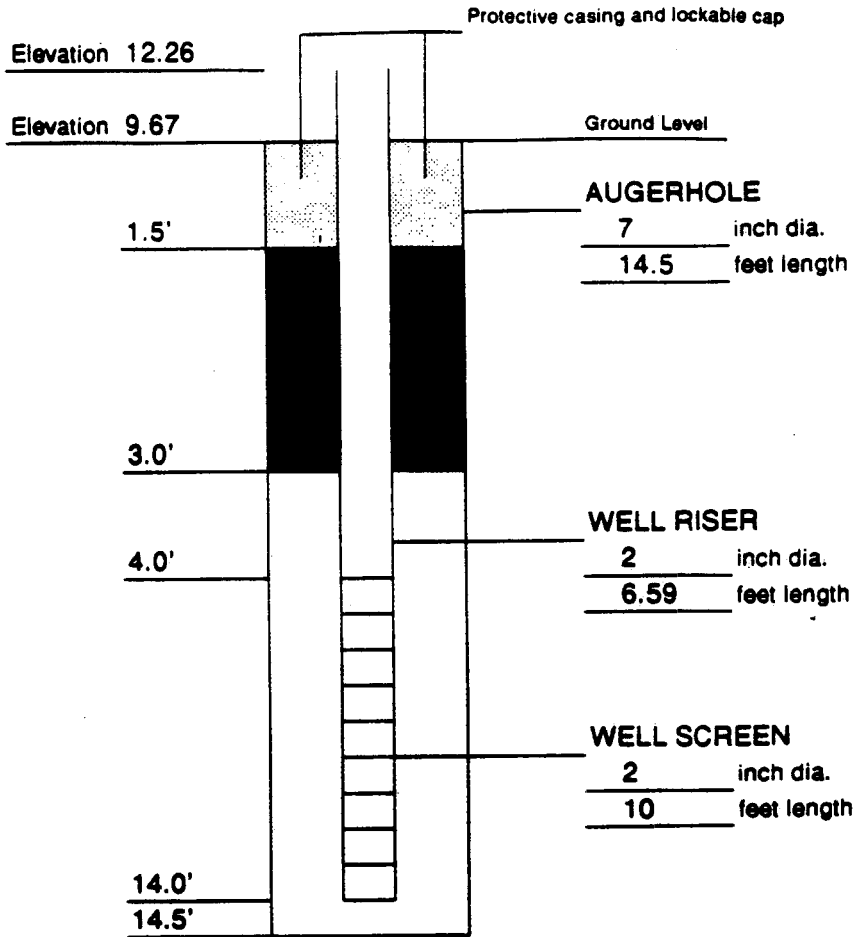
Driller:
Jeff Marches

Date:
5/30/90




GEOLOGIC LOG

depth(ft.)	lithology
0-2'	Medium Sand Cover
2-10'	Fill, Wood & Paper in Sandy Matrix
10-12'	Peat
12-14.5'	Organic Silt, Some Sand & Clay

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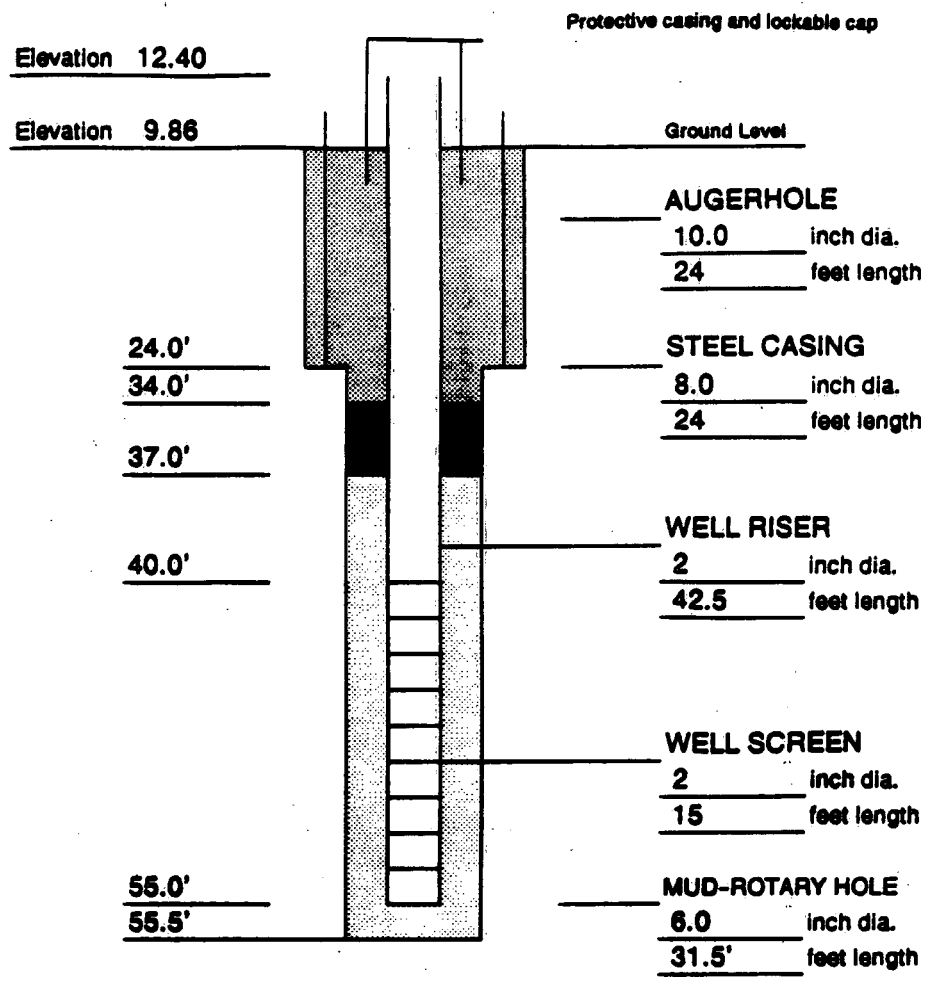


WELL DESIGN

<p>CASING MATERIAL</p> <p>Surface: Steel</p> <p>Monitor: PVC</p>		<p>SCREEN MATERIAL</p> <p>Type: PVC</p> <p>Slot Size: .010</p>		<p>SEAL MATERIAL</p> <p>Seal #1 Type Bentonite Pellets Setting: 1.5 - 3.0'</p> <p>Seal #2 Type None Setting:</p>	
<p>FILTER MATERIAL</p> <p>Type: #2 Silica Sand</p> <p>Setting: 3.0 - 14.5'</p>		<p>ROCK CORING</p> <p>Cored Interval: None</p> <p>Core Diameter: None</p> <p>Reamed Diameter: None</p>		<p>LEGEND</p> <p> Cement/Bentonite Grout</p> <p> Bentonite Seal</p> <p> Silica Sandpack</p>	
<p>Client: NJDEP</p> <p>URS Consultants Inc.</p>		<p>Project: Global RI/FS</p> <p>Monitoring Well Constuction Details</p>		<p>Project No. 35226</p> <p>Well Number: MW-14S</p>	

DRILLING SUMMARY
Geologist:
 Robert Kreuzer
Drilling Company:
 Empire Soils
Driller:
 Jeff Marchasi
Date:
 6/03/91

GEOLOGIC LOG	
depth(ft.)	lithology
0-2'	Sandy Cover
2-10'	Fill
10-12'	Peat
12-18'	Organic Silt
18-37'	Clayey Silt
37-55'	Sand



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	SEAL MATERIAL
Surface: Steel	Type: PVC	Seal #1 Type: Bentonite Pellets Setting: 34.0 - 37.0'
Monitor: PVC	Slot Size: .010 inches	Seal #2 Type: None Setting:

FILTER MATERIAL	PRIMARY CASING	LEGEND
Type: #2 Silica Sand	Cased Interval: 0.0 - 24.0'	Cement/Bentonite Grout
Setting: 37.0 - 55.5'	Casing Diameter: 8 - inch I.D.	Bentonite Seal
	Casing Material: Steel	Silica Sandpack

Client: NJDEP	Project: Global RI/FS	Project No.: 35226
URS Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-14D

DRILLING SUMMARY

Geologist:
Robert Kreuzer

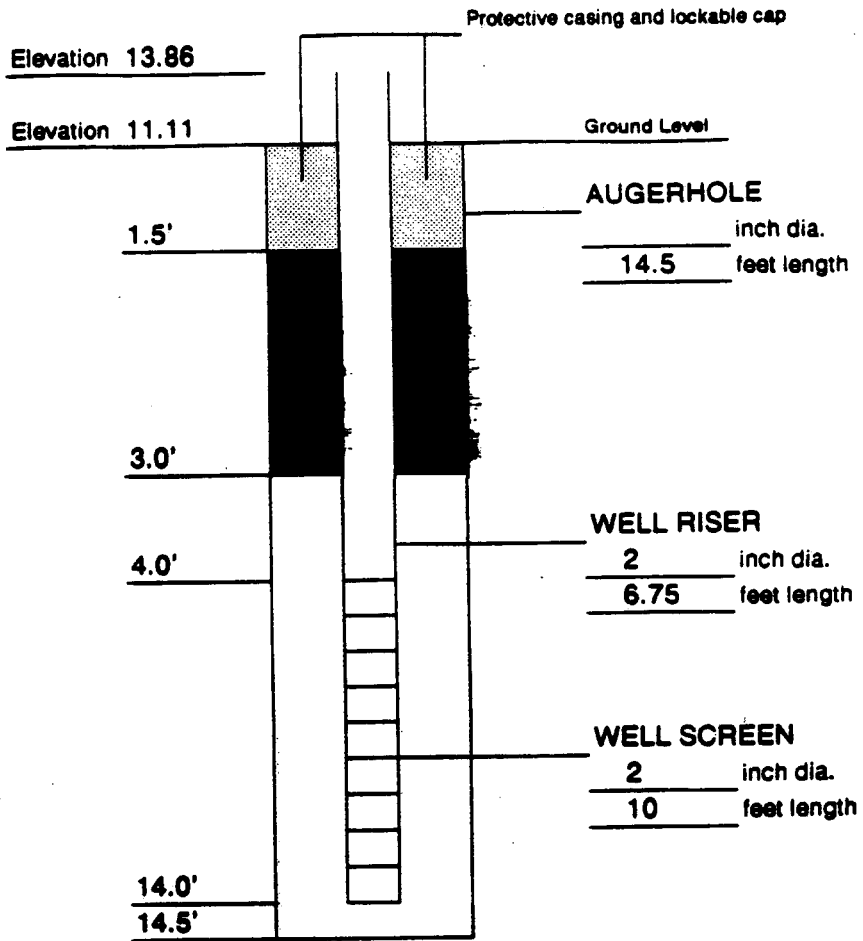
Drilling Company:
Empire Soils

Driller:
Jeff Marchesi

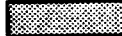

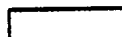
Date:
6/5/90

GEOLOGIC LOG

depth(ft.)	lithology
0-1'	Sand, Some Silt
1-13'	Fill; Wood Brick, Roofing Shingles Concrete
13-14.5'	Peat; Med. Sand & Silt



WELL DESIGN

<p>CASING MATERIAL</p> <p>Surface: Steel</p> <p>Monitor: PVC</p>		<p>SCREEN MATERIAL</p> <p>Type: PVC</p> <p>Slot Size: .010</p>		<p>SEAL MATERIAL</p> <p>Seal #1 Type Bentonite Pellets Setting: 1.5 - 3.0'</p> <p>Seal #2 Type None Setting:</p>	
<p>FILTER MATERIAL</p> <p>Type: #2 Silica Sand</p> <p>Setting: 3.0 - 14.5'</p>		<p>ROCK CORING</p> <p>Cored Interval: None</p> <p>Core Diameter: None</p> <p>Reamed Diameter: None</p>		<p>LEGEND</p> <p> Cement/Bentonite Grout</p> <p> Bentonite Seal</p> <p> Silica Sandpack</p>	
<p>Client: NJDEP</p>		<p>Project: Global RI/FS</p>		<p>Project No. 35226</p>	
<p>URS Consultants Inc.</p>		<p>Monitoring Well Construction Details</p>		<p>Well Number: MW-15S</p>	

DRILLING SUMMARY

Geologist:
Robert Kreuzer

Drilling Company:
Empire Soils



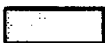
Driller:
Jeff Marchasi

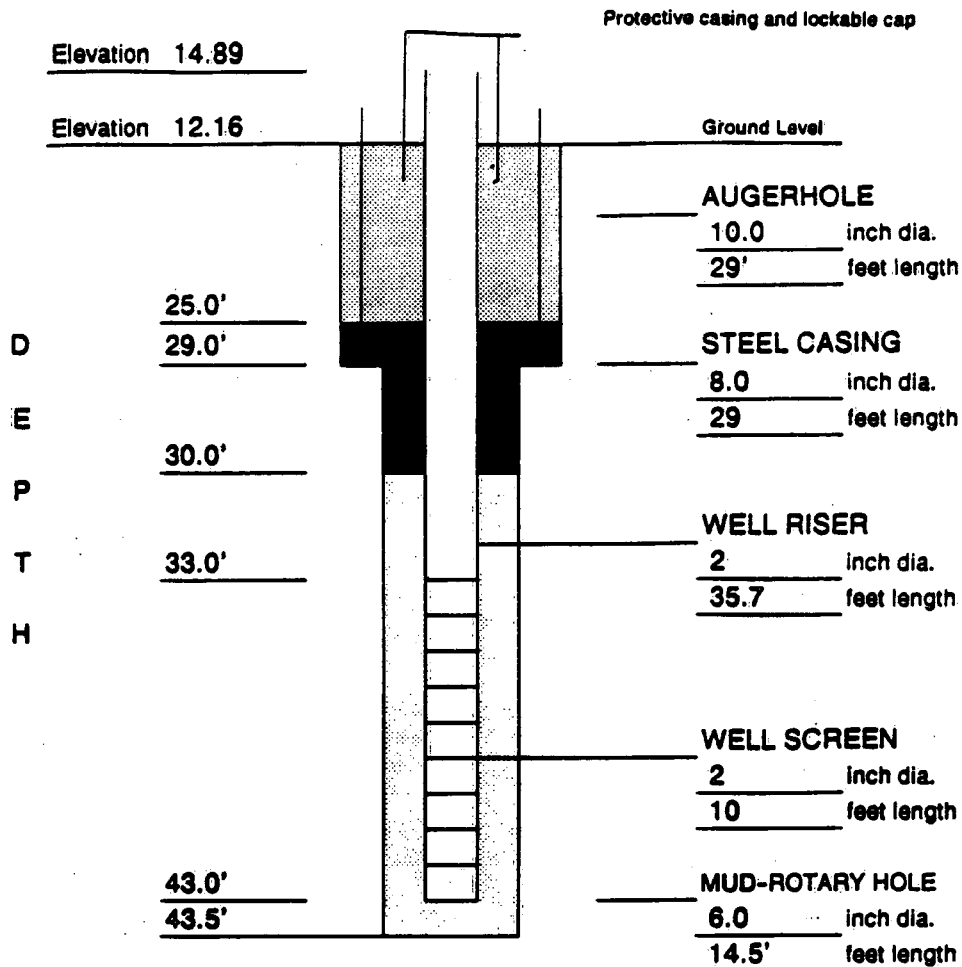
Date:
6/05/91

GEOLOGIC LOG

depth(ft.)	lithology
0-1'	Sandy Cover
1-13'	
2-30'	Fill
13-23'	
30-44'	Peat
23-27'	
44-54'	Organic Silt
27-43.5'	
44-54'	Sand

WELL DESIGN

<p>CASING MATERIAL</p> <p>Surface: Steel</p> <p>Monitor: PVC</p>		<p>SCREEN MATERIAL</p> <p>Type: PVC</p> <p>Slot Size: .010 inches</p>		<p>SEAL MATERIAL</p> <p>Seal #1 Type: Bentonite Pellets</p> <p>Setting: 25.0 - 30.0'</p> <p>Seal #2 Type: None</p> <p>Setting:</p>	
<p>FILTER MATERIAL</p> <p>Type: #2 Silica Sand</p> <p>Setting: 30.0 - 43.5'</p>		<p>PRIMARY CASING</p> <p>Cased Interval: 0.0 - 29.0'</p> <p>Casing Diameter: 8 - inch I.D.</p> <p>Casing Material: Steel</p>		<p>LEGEND</p> <p> Cement/Bentonite Grout</p> <p> Bentonite Seal</p> <p> Silica Sandpack</p>	
<p>Client: NJDEP</p>		<p>Project: Global RI/FS</p>		<p>Project No.: 35226</p>	
<p>URS Consultants Inc.</p>		<p>Monitoring Well Construction Details</p>		<p>Well Number: MW-15D</p>	



APPENDIX G

WELL DEVELOPMENT AND PURGING REPORTS

WELL DEVELOPMENT LOGS



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: B. KREUZER
 DATE: 6.26.91 / 6.27.91

WELL NO.: <u>MW-35</u>	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.58</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.35</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>1.50</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (16.58 - 7.35) = 4.50 \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	(INT) 0	5	10	15	20	25	30	35	(INT) 35	40	45
PH	6.76	6.85	6.81	6.88	6.89	6.98	6.93	6.87	7.27	6.94	6.83
Spec. Cond. (umho)	5500	6800	7000	5500	4000	4600	4800	4000	6400	4800	6100
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	23.0	24.0	24.0	24.4	21.0	20.9	20.8	20.9	-	-	-
	6.26.91								6.27.91		

COMMENTS:

- DEVELOPED TO VISUAL CLARITY
- NO ODR
- GOOD RECHARGE

A-2347



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35276

STAFF: B. KREUZER

DATE: 6.27.91

	DEVELOPMENT	
WELL NO.: <u>MW-3S</u>	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.58</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.35</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>1.50</u>	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (16.58 - 7.35) = 4.50$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	50	55	60	65	70	75	80	85	90	95	100	
PH	6.77	6.74	6.65	6.63	7.06	6.90	6.87	6.91	6.86	6.84	6.90	
Spec. Cond. (umho)	6.500	7.000	5.600	6.500	6.000	6.300	6.400	6.000	6.500	6.300	6.400	
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	
Temperature (°C)	-	-	-	-	19.1	19.6	19.3	19.1	18.3	17.6	18.2	

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: B. KREUZER
 DATE: 6.27.91 / 6.28.91

		DEVELOPMENT	
WELL NO.: MW-35		WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.58</u>		1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>		2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>2.35</u>		3"	0.38
		4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>1.50</u>		5"	1.04
		6"	1.50
		8"	2.60

$V = 0.0408 \text{ (2)}^2 \times \text{(1)} - \text{(3)} = \underline{4.50} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	105	110	115	120	125	130	135	140	145	150	155
PH	6.65	6.77	6.71	6.75	6.78	6.73	6.94	6.75	6.78	6.56	6.88
Spec. Cond. (umho)	6,000	5,100	4,800	5,500	4,900	3,000	5,500	5,000	5,000	5,000	4,100
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	-	-	-	-	-	-	-	-	-	-	-
	6.27	6.28.91									

COMMENTS:

A-2347

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: B. KREUZER

DATE: 6.28.07

WELL NO.: <u>MW-35</u>	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.50</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.35</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>1.50</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{4.50} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	160	165	170	175	180	185	190	195	200	205	210	
PH	6.71	6.65	6.65	6.52	6.59	6.44	6.97	6.47	6.45	6.49	6.51	
Spec. Cond. (umho)	3.900	4.000	4.100	5.200	5.000	6.100	6.000	5.900	5.900	5.900	5.900	
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	78	70	60	60	
Temperature (°C)	-	-	-	-	-	16.8	16.7	16.7	16.0	16.0	15.9	

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: B. KREUZER
 DATE: 6.28.91

DEVELOPMENT

WELL NO.: MW-35

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 6.58
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.): 7.35
- ④ VOLUME OF WATER IN CASING (GAL.): 1.50

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{4.50} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	215	220	225	230	235	240				
pH	6.50	6.46	6.41	6.47	6.41	6.31				
Spec. Cond. (µmho)	6.000	6.000	6.000	6.000	6.000	6.000				
Turbidity (NTU)	48	43	42	36	33	33				
Temperature (°C)	16.6	16.0	16.0	16.0	16.0	16.9				

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: D. SHEPPARD

DATE: 6.27.91

		DEVELOPMENT	
WELL NO.:	MW-105	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.):	<u>17.13</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.):	<u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.)	<u>2.08</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.)	<u>2.79</u>	4"	0.66
		5"	1.04
		6"	1.50
		8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{8.37} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	(INT)									
	0	5								
pH	6.75	6.19								
Spec. Cond. (umho)	550	450								
Turbidity (NTU)	27	100 ⁺								
Temperature (°C)	29.7	26.7								

COMMENTS:

- MW-105 IS BEING ABANDONED DUE TO THE FACT THAT THE SCREEN HAD BEEN DAMAGED, ALLOWING FOR THE SAND PACK TO ENTER THE WELL. THERE WAS APPROX 7' OF SAND WHEN FIRST OBSERVED

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: D. SHEPPARD / S. LAMB

DATE: 7-10-91

WELL NO.: MW105	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>17.00</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>1.63</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>2.61</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (17.00 - 1.63) = 7.83$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	5	10	15	20	25	30	35	40	45	50
pH	7.22	6.13	5.97	6.29	6.20	6.07	5.92	5.67	5.91	5.85	5.90
Spec. Cond. (µmho)	196	194	172	180	160	165	170	112	123	138	143
Turbidity (NTU)	34	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺
Temperature (°C)	28.2	18.7	16.8	16.9	16.2	17.5	17.3	17.7	18.5	16.9	17.3

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global R/ES
 PROJECT NO.: 35226
 STAFF: S. Lamb
 DATE: 7-10-91

DEVELOPMENT

WELL NO.: MW105

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 17.00
- ② CASING INTERNAL DIAMETER (in.): 2
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 1.62
- ④ VOLUME OF WATER IN CASING (GAL.) 2.61

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{7.83} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	55	60	65	70	75	80	85	90	95	100	105
pH	5.96	5.94	5.92	5.98	5.96	5.89	5.92	5.94	5.93	5.89	5.87
Spec. Cond. (umho)	140	142	130	130	130	140	140	120	120	135	133
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	17.5	17.5	16.8	16.2	16.1	16.1	16.8	16.7	17.1	15.9	16.8

COMMENTS:

PROJECT TITLE: Global RI/FS

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 7-10-91

DEVELOPMENT

WELL NO.: MW10S

① TOTAL CASING AND SCREEN LENGTH (FT.): 17.00

② CASING INTERNAL DIAMETER (in.): 2

③ WATER LEVEL BELOW TOP OF CASING (FT.) 1.62

④ VOLUME OF WATER IN CASING (GAL.) 2.61

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{7.83} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	110	115	120	125	130	135	140	145	150	155	160
pH	5.87	5.92	5.91	5.93	5.91	5.90	5.82	5.83	5.91	5.94	5.94
Spec. Cond. (umho)	147	127	140	110	115	105	120	113	110	130	135
Turbidity (NTU)	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺
Temperature (°C)	16.7	17.1	16.7	15.7	15.9	15.8	15.8	15.7	15.6	16.0	15.4

COMMENTS:

PROJECT TITLE: Global R/FS

PROJECT NO.: 35226

STAFF: S. Lamb

DATE: 7-10-91

DEVELOPMENT

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

WELL NO.: MW105

① TOTAL CASING AND SCREEN LENGTH (FT.): 17.00

② CASING INTERNAL DIAMETER (in.): 2

③ WATER LEVEL BELOW TOP OF CASING (FT.) 1.62

④ VOLUME OF WATER IN CASING (GAL.) 2.61

$V = 0.0408 (2)^2 \times (17 - 1.62) = \underline{7.83} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	165	170	175	180	185	190	195	200	205	210	215
pH	5.94	5.94	5.96	5.95	5.87	5.94	6.01	5.96	5.97	5.95	5.97
Spec. Cond. (µmho)	136	105	110	105	110	120	120	105	97	135	120
Turbidity (NTU)	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁺
Temperature (°C)	15.9	15.6	15.7	15.9	17.2	15.7	15.8	15.7	15.4	15.9	15.5

COMMENTS:

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
900	60	R	2.0	ND	ND	ND	3	7:05	5-10-91	Sandy moist soil
900	90	R	ND	ND	ND	ND	3	6:48	5-10-91	Sandy moist soil
925	0	BL	ND	ND	ND	ND	2	6:08	5-10-91	Water at 2.5' pumped up tube
925	30	L	0.3	ND	ND	ND	3	1:09	5-14-91	Dry sand
925	60	L	1.0	0.2	ND	ND	ambient	1:12	5-14-91	Saturated sand
925	90	L	0.4	ND	ND	ND	ambient	1:14	5-14-91	Saturated sand
925	120	L	ND	ND	ND	ND	ambient	1:16	5-14-91	Swamp (6" water)
925	150	L	ND	ND	ND	ND	ambient	1:17	5-14-91	Swamp (6" water)
925	180	L	ND	ND	ND	ND	ambient	1:18	5-14-91	Swamp (6" water)
925	210	L	3.6	ND	ND	ND	3	1:20	5-14-91	Wet sand
925	240	L	100	3.2	ND	ND	2	1:22	5-14-91	Refusal 3x - 2'
925	30	R	2.0/ND	ND	ND	ND	3	6:15	5-10-91	Sandy moist soil
925	60	R	9.0	ND	ND	ND	3	6:20	5-10-91	Sandy moist soil
925	90	R	10.0	ND	ND	ND	3	6:35	5-10-91	Sandy moist soil
925	125	R	ND	ND	ND	ND	3	6:41	5-10-91	Debris: wood, metal
950	0	BL	0.8	ND	ND	ND	3	6:04	5-10-91	Very Sandy moist soil
950	30	L	>1000	ND	ND	ND	3	1:44	5-14-91	Wet sand
950	60	L	60	ND	ND	ND	ambient	1:41	5-14-91	Saturated sand
950	90	L	12	ND	ND	ND	ambient	1:39	5-14-91	Saturated sand
950	120	L	ND	ND	ND	ND	ambient	1:38	5-14-91	Saturated sand
950	150	L	>1000	ND	ND	ND	3	1:34	5-14-91	Dry sand
950	180	L	22	ND	ND	ND	3	1:30	5-14-91	Dry sand
950	210	L	ND	ND	ND	ND	3	1:28	5-14-91	Dry soil/sand
950	30	R	1.3	ND	ND	ND	2	6:00	5-10-91	Water at 2.5' pumped up tube
950	60	R	0.4	ND	ND	ND	3	5:53	5-10-91	Sandy moist soil
950	90	R	0.8	ND	ND	ND	3	5:48	5-10-91	Sandy moist soil
950	120	R	1.0	ND	ND	ND	3	5:44	5-10-91	Sandy moist soil
975	0	BL	2.3	ND	ND	ND	3	5:00	5-10-91	Sandy moist soil
975	30	L	0.4	ND	ND	ND	3	2:14	5-14-91	Dry sand
975	60	L	0.3	ND	ND	ND	3	2:20	5-14-91	Wet sand
975	90	L	>1000	ND	ND	4	3	2:23	5-14-91	Wet sand
975	120	L	>1000	ND	ND	46	ambient	2:27	5-14-91	Saturated sand
975	150	L	>1000	ND	ND	100	ambient	2:32	5-14-91	Saturated sand
975	180	L	ND	ND	ND	ND	ambient	2:35	5-14-91	Moist fill
975	30	R	33.0	ND	ND	ND	3	5:10	5-10-91	Sandy moist soil
975	60	R	11.0	ND	ND	ND	3	5:14	5-10-91	Sandy moist soil
975	90	R	2.6	ND	ND	ND	3	5:18	5-10-91	Sandy moist soil

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
975	120	R	0.4	ND	ND	ND	3	5:25	5-10-91	Sandy moist soil
975	150	R	1.4	ND	ND	ND	3	5:36	5-10-91	Sandy moist soil
1000	0	BL	ND	ND	ND	ND	3	7:05	5-9-91	Sandy moist soil
1000	30	L	120	ND	ND	ND	3	2:44	5-14-91	Moist sand
1000	60	L	1.6	ND	ND	ND	3	2:48	5-14-91	Moist sand
1000	90	L	100	ND	ND	ND	3	2:53	5-14-91	Saturated sand
1000	120	L	ND	ND	ND	ND	3	2:56	5-14-91	Wet sand
1000	150	L	ND	ND	ND	ND	3	3:00	5-14-91	Fill pile
1000	30	R	ND	ND	ND	ND	3	6:56	5-9-91	Sandy moist soil
1000	60	R	4.3	ND	ND	ND	3	6:50	5-9-91	Sandy moist soil
1000	90	R	4.2	ND	ND	ND	3	6:44	5-9-91	Sandy moist soil
1000	120	R	3.6	ND	ND	ND	3	6:37	5-9-91	Sandy moist soil
1000	150	R	ND	ND	ND	ND	3	6:30	5-9-91	Sandy moist soil
1000	180	R	ND	ND	ND	ND	3	6:18	5-9-91	Sandy moist soil
1000	210	R	ND	ND	ND	ND	3	6:10	5-9-91	Sandy moist soil
1025	0	BL	42	ND	ND	ND	3	4:30	5-9-91	Sandy moist soil
1025	30	L	>1000	ND	ND	37	3	3:23	5-14-91	Dry sand
1025	60	L	>1000	ND	ND	37	0.5	3:17	5-14-91	Water saturated
1025	90	L	10	ND	ND	ND	ambient	3:12	5-14-91	Swamp leachate
1025	120	L	0.2	ND	ND	ND	ambient	3:09	5-14-91	Surface leachate
1025	180	L	0.2	ND	ND	ND	3	3:06	5-14-91	Fill pile
1025	30	R	5	ND	ND	ND	3	4:35	5-9-91	Sandy moist soil
1025	60	R	>1000	ND	2.0	>100	3	4:40	5-9-91	Sandy moist soil
1025	90	R	72	ND	ND	ND	3	5:20	5-9-91	Sandy moist soil
1025	120	R	0.6	ND	ND	ND	3	5:35	5-9-91	Sandy moist soil
1025	150	R	1.8	ND	ND	ND	3	5:45	5-9-91	Sandy moist soil
1025	180	R	1.6	ND	ND	ND	3	5:52	5-9-91	Sandy moist soil
1025	210	R	ND	ND	ND	ND	3	6:00	5-9-91	Sandy moist soil
1050	0	BL	4.9	ND	ND	ND	3	2:57	5-9-91	Sandy moist soil
1050	30	L	16	ND	ND	ND	3	3:29	5-14-91	Dry sand
1050	60	L	>1000	ND	ND	>100	ambient	3:35	5-14-91	Swamp (1" water)
1050	90	L	10	1.0	ND	ND	ambient	3:36	5-14-91	Swamp leachate
1050	120	L	>1000	0.2	ND	ND	ambient	3:37	5-14-91	Leachate breakout
1050	150	L	2.0	ND	ND	ND	3	3:44	5-14-91	Dry fill
1050	180	L	24	ND	ND	ND	3	3:48	5-14-91	Dry fill
1050	30	R	550	ND	ND	ND	3	2:50	5-9-91	Sandy moist soil
1050	60	R	>2000	ND	ND	ND	3	2:36	5-9-91	Sandy moist soil

**LANDFILL SOIL GAS SURVEY
LOWER GRID**

STATION	OFFSET	DIRECTION	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
1050	90	R	10.2	ND	ND	ND	3	2:25	5-9-91	Sandy moist soil
1050	120	R	0.8	ND	ND	ND	3	2:20	5-9-91	Sandy moist soil
1050	150	R	450	ND	ND	ND	3	2:14	5-9-91	Sandy moist soil
1050	180	R	0.8	ND	ND	ND	3	2:08	5-9-91	Sandy moist soil
1050	210	R	0.4	ND	ND	ND	3	1:58	5-9-91	Sandy moist soil
1075	0	BL	0.6	ND	ND	ND	3	12:35	5-9-91	Sandy moist soil
1075	30	L	>1000	ND	ND	ND	ambient	4:15	5-14-91	Swamp (2" water)
1075	60	L	64	ND	ND	ND	3	3:59	5-14-91	Moist sand
1075	90	L	0.4	ND	ND	ND	3	3:56	5-14-91	Moist sand
1075	120	L	0.2	ND	ND	ND	3	3:53	5-14-91	Moist sand
1075	30	R	2.1	0.1	ND	ND	3	12:45	5-9-91	Sandy moist soil
1075	60	R	2.6	ND	ND	ND	3	12:55	5-9-91	Sandy moist soil
1075	90	R	4.9	ND	ND	ND	3	1:08	5-9-91	Sandy moist soil
1075	120	R	>2000	ND	28	100	3	1:16	5-9-91	Sandy moist soil
1075	150	R	32	ND	ND	ND	3	1:37	5-9-91	Sandy moist soil
1075	180	R	180	ND	ND	ND	3	1:45	5-9-91	Sandy moist soil
1075	210	R	0.2	ND	ND	ND	3	1:49	5-9-91	Sandy moist soil
1100	0	BL	>1000	ND	ND	ND	0.66	12:28	5-9-91	Debris: wood concrete; water at 1 probe at 8"
1100	30	L	>1000	0.2	6.5	100	3	4:10	5-14-91	Saturated sand
1100	60	L	0.4	ND	ND	ND	3	4:04	5-14-91	Moist sand
1100	30	R	0.3	ND	ND	ND	3	12:21	5-9-91	Sandy moist soil
1100	60	R	72	ND	ND	ND	3	12:10	5-9-91	Sandy moist soil
1100	90	R	4.0	ND	ND	ND	3	11:55	5-9-91	Sandy moist soil
1100	120	R	ND	ND	ND	ND	3	11:35	5-9-91	Sandy moist soil
1100	150	R	ND	ND	ND	ND	3	11:20	5-9-91	Sandy moist soil
1100	180	R	0.8	0.1	ND	ND	3	11:10	5-9-91	Sandy moist soil
1100	210	R	3.9	ND	ND	ND	3	10:45	5-9-91	Sandy moist soil

**LANDFILL SOIL GAS SURVEY
UPPER GRID**

STATION	OFFSET	DIRECTION	AMBIENT OVA ppm	OVA ppm	HNu ppm	H2S ppm	LEL %	DEPTH (ft)	TIME	DATE	COMMENTS
5000	0	BL	8	8.0	ND	ND	ND	0.5	6:24	5-11-91	<p style="text-align: center;">Strong ambient odor 150' NW of 50+00 600 L</p> <p style="text-align: center;">Open smoke hole near 50+00 600'L</p>
5000	200	L	16	30	ND	ND	ND	0.5	7:25	5-11-91	
5000	400	L	14	>2000	ND	ND	ND	0.5	7:36	5-11-91	
5000	600	L	40	160	ND	ND	ND	0.5	8:20	5-11-91	
5000	800	L	42	>2000	ND	ND	ND	0.5	8:30	5-11-91	
5000	600	L	220	>2000	ND	ND	70	0.5	8:25	5-11-91	
5200	0	BL	16	30	ND	ND	ND	0.5	6:31	5-11-91	
5200	200	L	24	>2000	0.2	ND	5.0	0.5	7:20	5-11-91	
5200	400	L	16	16	ND	ND	ND	0.5	7:31	5-11-91	
5200	600	L	14	>2000	ND	ND	17	0.5	8:14	5-11-91	
5200	800	L	100	>1200	ND	ND	30	0.5	8:34	5-11-91	
5400	0	BL	30	>2000	0.2	ND	ND	0.5	6:40	5-11-91	
5400	200	L	30	>2000	ND	ND	100	0.5	7:14	5-11-91	
5400	400	L	60	60	ND	ND	ND	0.5	7:41	5-11-91	
5400	600	L	30	>2000	ND	ND	62	0.5	8:10	5-11-91	
5400	800	L	46	>2000	ND	ND	100	0.5	8:37	5-11-91	
5600	0	BL	ND	ND	ND	ND	ND	0.5	6:51	5-11-91	
5600	200	L	22	>2000	ND	0.5	100	0.5	7:09	5-11-91	
5600	400	L	10	>2000	ND	ND	100	0.5	7:47	5-11-91	
5600	600	L	8	8	ND	ND	ND	0.5	8:06	5-11-91	
5600	800	L	40	65	ND	ND	ND	0.5	8:42	5-11-91	
5800	0	BL	20	>2000	ND	0.5	100	0.5	7:01	5-11-91	
5800	200	L	22	80	ND	ND	ND	0.5	7:06	5-11-91	
5800	400	L	40	220	ND	ND	ND	0.5	7:52	5-11-91	
5800	600	L	50	40	ND	ND	ND	0.5	8:01	5-11-91	
5800	800	L	24	>2000	ND	16.0	100	0.5	8:46	5-11-91	

APPENDIX D

TERRAIN CONDUCTIVITY SURVEY REPORT

PROJECT TITLE: GLOBAL RITES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 7-10-91

		DEVELOPMENT	
WELL NO.:	MW105	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.):	<u>17.00</u>	1"	0.04
		2"	0.17
② CASING INTERNAL DIAMETER (in.):	<u>2</u>	3"	0.38
		4"	0.66
③ WATER LEVEL BELOW TOP OF CASING (FT.)	<u>1.62</u>	5"	1.04
		6"	1.50
④ VOLUME OF WATER IN CASING (GAL.)	<u>2.61</u>	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{7.83} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	220	225	230	235	240	245	250	255	260		
pH	5.95	5.94	5.98	5.93	5.92	5.70	5.63	5.69	5.61		
Spec. Cond. (µmho)	120	100	140	130	170	155	125	100	110		
Turbidity (NTU)	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100	79	20	7	29		
Temperature (°C)	15.6	15.4	16.6	16.5	16.1	16.3	15.0	15.7	16.1		

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.25.91

	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
WELL NO.: <u>MW-115</u>		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>17.00'</u>	1"	0.04
	2"	0.17
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	3"	0.38
	4"	0.66
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.64</u>	5"	1.04
	6"	1.50
④ VOLUME OF WATER IN CASING (GAL.) <u>1.53</u>	8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{4.58} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	5	10	15	(INT) 15	17	19	21	23	25	27
pH	6.91	6.71	6.67	6.45	6.95	5.70	6.05	6.01	6.04	6.05	6.04
Spec. Cond. (umho)	1,100	980	890	930	970	750	700	700	700	680	670
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	16.1	15.4	15.6	15.0	15.4	16.0	15.5	15.9	15.5	15.0	15.1

COMMENTS:

- WELL DEVELOPED TO VISUAL CLARITY, > 750 NTU
- SLIGHT ODOR
- EXCELLENT RECHARGE

A-2347



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: S. LAMB
 DATE: 6.25.91

		DEVELOPMENT	
WELL NO.: MW-115		WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>17.00'</u>		1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>		2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.64</u>		3"	0.38
		4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>1.53</u>		5"	1.04
		6"	1.50
		8"	2.60

$V = 0.0408 (2)^2 \times (17.00 - 7.64) = 4.58 \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	29	31	35-37	40	45	48	50	52	55	57	
PH	6.06	6.83	6.78	6.77	6.75	5.99	5.86	5.85	5.91	6.45	6.46
Spec. Cond. (umho)	530	800	740	690	700	720	710	690	680	670	700
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	15.2	15.3	15.7	15.7	15.8	15.9	16.7	15.4	16.1	16.6	16.2

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: S. LAMB
 DATE: 6.25.91

WELL NO.: MW-115

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 17.00'
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.): 7.64
- ④ VOLUME OF WATER IN CASING (GAL.): 1.53

DEVELOPMENT	
WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (2)^2 \times (17.00 - 7.64) = 4.58 \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	60	62	65	67	70	75	80	85	90	95	100
pH	6.00	6.04	5.98	6.00	6.47	5.67	5.80	5.83	5.99	6.02	6.02
Spec. Cond. (umho)	650	700	710	700	720	710	680	680	700	650	680
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	16.1	16.8	17.5	17.1	16.7	16.7	17.6	16.3	18.1	18.2	17.2
PID									0.4	0.8	0.6

COMMENTS:

PROJECT TITLE: GLOBAL RIFS

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.25.91

WELL NO.: MW-115		DEVELOPMENT	
		WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.):	<u>17.00'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.):	<u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.)	<u>7.64</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.)	<u>1.53</u>	4"	0.66
		5"	1.04
		6"	1.50
		8"	2.60

$V = 0.0408 (2)^2 \times (17.00 - 7.64) = 4.58 \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	105	110	115	120	125	130	135	145	150	155	160
pH	5.60	6.53	6.47	5.60	5.83	5.92	5.90	5.96	5.97	5.91	5.84
Spec. Cond. (µmho)	740	690	700	650	690	730	680	720	780	720	696
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	17.0	16.4	16.2	16.0	16.8	16.2	15.8	17.3	16.1	15.4	15.6
PID	1.2	0.4	0.2	0.0	0.4						

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RI/FS
 PROJECT NO.: 35226
 STAFF: S. LAMB
 DATE: 6.25.91

	DEVELOPMENT	
WELL NO.: MW-115	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>17.00'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.64</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>1.53</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (17.00 - 7.64) = 4.58 \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	165	170	175	180	185	190	193	195	196	197	198
pH	5.87	5.84	5.83	5.85	5.68	5.66	5.67	5.73	5.68	5.68	5.97
Spec. Cond. (umho)	600	640	680	650	630	670	650	730	700	700	740
Turbidity (NTU)	100+	100+	76	100+	81	100+	67	72	58	100+	100+
Temperature (°C)	16.2	15.3	16.4	15.4	16.0	15.6	15.6	15.6	15.4	15.4	17.5
PID				0.2					0.4		

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RI/ES

PROJECT NO.: 35226

STAFF: SLAMB

DATE: 6.25.01

WELL NO.: MW-11S	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>17.00</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
	3"	0.38
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.64</u>	4"	0.66
	5"	1.04
④ VOLUME OF WATER IN CASING (GAL.) <u>1.53</u>	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{4.58} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	198	199	200	201						
pH	5.97	6.02	6.00	6.04						
Spec. Cond. (µmho)	740	720	700	680						
Turbidity (NTU)	100+	90	41	22						
Temperature (°C)	17.5	17.0	16.8	16.8						

COMMENTS:

PROJECT TITLE: GLOBAL RIFS
 PROJECT NO.: 35226
 STAFF: S. LAMB; J. SHEPPARD
 DATE: 6-27-91

	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
WELL NO.: MW-125		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.89</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>6.52</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>1.69</u>	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{5.07} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	(INT) 0	5	10	15	20	25	30	35	40	45	50
PH	6.00	5.79	6.24	6.33	6.21	6.31	6.35	6.37	6.40	5.93	6.73
Spec. Cond. (umho)	19,500	18,700	18,600	18,700	18,600	19,000	18,300	18,800	18,800	18,300	18,400
Turbidity (NTU)	100+	100+	100+	100+	86	88	83	83	84	71	74
Temperature (°C)	25.7	20.6	22.8	22.7	20.1	20.7	20.5	20.8	20.6	20.3	22.0

COMMENTS:

PHYSICAL APPEARANCE - WELL WAS DEVELOPED TO SEDIMENT FREE APPEARANCE. WATER HAS A GREENISH/BLACK APPEAR. AN OILY FILM WAS NOTICED @ 250 gal UNTIL DEVELOPMENT HAD BEEN REACHED SLIGHT LEACHATE ODOOR. EXCELLENT RECHARGE

PROJECT TITLE: GLOBAL RIFS
 PROJECT NO.: 35226
 STAFF: S. LAMB / D SHEPPARD
 DATE: 6-27-91

WELL NO.: MW-125	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.89'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) _____	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) _____	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (16.89 - 1) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	55	60	65	70	75	80	85	90	95	100	105
pH	6.46	6.42	6.33	6.42	6.50	6.63	6.54	6.51	6.50	6.53	6.52
Spec. Cond. (umho)	18,500	18,500	18,200	18,200	18,200	17,800	18,000	18,200	18,000	18,000	17,800
Turbidity (NTU)	62	67	63	54	60	58	60	53	52	48	47
Temperature (°C)	21.7	20.4	20.6	20.2	22.3	20.1	20.4	20.6	19.7	20.0	19.5
PID					0.0						0.2

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COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: S. LAMB ; D. SHEPPARD
 DATE: 6.27.91 / 6.28.91

	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
WELL NO.: MW-125		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.89'</u>	1"	0.04
	2"	0.17
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	3"	0.38
	4"	0.66
③ WATER LEVEL BELOW TOP OF CASING (FT.) _____	5"	1.04
	6"	1.50
④ VOLUME OF WATER IN CASING (GAL.) _____	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	110	115	120	125	130	135	(LINT) 140	145	150	155	160
PH	6.56	6.58	6.61	6.62	6.67	6.67	6.97	6.96	6.95	6.98	7.01
Spec. Cond. (umho)	17,600	17,800	17,500	17,000	17,600	17,500	18,500	17,200	15,900	14,600	17,200
Turbidity (NTU)	50	45	46	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	19.5	19.6	19.2	19.2	20.3	20.2	19.9	19.7	19.2	19.4	18.9
PID				0.2							

6-28 →

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S LAMB, D. SHEPPARD

DATE: 6.28.91

WELL NO.: MW-125	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.89'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.): _____	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.): _____	5"	1.04
	6"	1.50
	8"	2.60

$$V = 0.0408 (2)^2 \times (16.89 - 0) = \text{_____ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	165	170	175	180	185	190	195	200	205	210	215
pH	6.96	6.96	7.07	7.13	7.13	7.09	7.09	7.01	6.97	6.99	7.13
Spec. Cond. (umho)	16,700	16,600	16,700	17,300	16,600	17,100	15,500	16,300	17,900	18,400	17,500
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	18.7	18.5	18.6	18.6	18.5	18.4	18.5	18.4	18.3	18.5	18.8
PID			0.2						0.2		

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S. LAMB, D. SHEPPARD

DATE: 6.28.91

	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
WELL NO.: MW-12S		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.88'</u>	1"	0.04
	2"	0.17
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	3"	0.38
	4"	0.66
③ WATER LEVEL BELOW TOP OF CASING (FT.) _____	5"	1.04
	6"	1.50
④ VOLUME OF WATER IN CASING (GAL.) _____	8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	220	225	230	235	240	245	250	255	260	265	270
PH	7.10	7.02	7.08	6.96	6.93	6.99	7.13	7.03	6.96	6.96	6.83
Spec. Cond. (µmho)	18,000	17,600	16,400	18,000	17,900	18,500	18,000	17,900	17,700	17,900	18,000
Turbidity (NTU)	100+	100+	96	93	86	100+	100+	95	92	92	92
Temperature (°C)	18.4	18.6	18.5	18.9	19.1	18.7	18.7	18.7	18.1	18.4	18.8

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 35226

STAFF: S. LAMB ; D. SHEPPARD

DATE: 6.28.91

DEVELOPMENT

WELL NO.: MW-125

① TOTAL CASING AND SCREEN LENGTH (FT.): 16.89'

② CASING INTERNAL DIAMETER (in.): 2"

③ WATER LEVEL BELOW TOP OF CASING (FT.) _____

④ VOLUME OF WATER IN CASING (GAL.) _____

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	275	280	285	290	295	300				
pH	6.99	6.47	6.42	6.40	6.44	6.55				
Spec. Cond. (umho)	18,500	18,500	18,600	18,700	18,700	18,500				
Turbidity (NTU)	86	43	39	35	34	31				
Temperature (°C)	18.7	21.3	20.1	20.6	20.7	20.8				

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: S LAMB ; D SHEPPARD
 DATE: 6.27.91

WELL NO.: MW-135

DEVELOPMENT	
WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 83.5'
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 77.08
- ④ VOLUME OF WATER IN CASING (GAL.) 1.06

$$V = 0.0408 \text{ (②)}^2 \times \text{(①)} - \text{(③)} = \underline{3.18} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	(INT) 0	5	10	15	20	25	30	35	40	45	50
pH	5.39	5.44	5.35	5.65	5.60	5.50	5.16	5.46	5.23	5.17	5.58
Spec. Cond. (umho)	115	103	107	103	124	115	103	107	102	102	105
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	17.3	22.9	15.4	15.2	16.0	15.8	15.1	17.3	17.9	16.8	15.6

COMMENTS:

- DEVELOPED TO VISUAL CLARITY
- NO ODDOR
- EXCELLENT RECHARGE



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 35226

STAFF: SIAM B ; D. SHEPPARD

DATE: 6.27.91 ; 6.28.91

		DEVELOPMENT	WELL I.D.	VOL. GAL./FT.
WELL NO.: MW-133				
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>83.5'</u>			1"	0.04
			2"	0.17
② CASING INTERNAL DIAMETER (in.): <u>2"</u>			3"	0.38
			4"	0.66
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>77.00</u>			5"	1.04
			6"	1.50
④ VOLUME OF WATER IN CASING (GAL.) <u>1.06</u>			8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{3.18} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	55	60	65	70	75	80	85	(INT) 85	90	95	100
pH	5.40	5.35	5.41	5.37	5.56	6.28	6.02	6.61	6.04	5.98	5.94
Spec. Cond. (umho)	105		102	105	104	130	120	182	142	157	119
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	15.8	16.0	14.1	14.6	15.6	15.4	15.4	15.8	14.7	14.4	14.8
	6.27.91							6.28.91			

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL R/FS

PROJECT NO.: 35226

STAFF: S. LAMB ; D. SHEPPARD

DATE: 6.28.91

WELL NO.: MW-135

DEVELOPMENT	
WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 83.5'
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 77.00
- ④ VOLUME OF WATER IN CASING (GAL.) 1106

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{3.18} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	105	110	120	125	130	135	140	145	150	155	160
PH	5.90	6.10	6.05	5.95	5.91	5.81	5.87	5.75	5.71	5.66	7.04
Spec. Cond. (umho)	110	110	120	114	106	97	102	103	98	100	105
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	96
Temperature (°C)	14.5	14.7	16.3	15.0	14.7	14.0	14.9	15.3	14.7	14.8	15.1

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S. LAMB, D. SHEPPARD

DATE: 6.28.91

WELL NO.: MW-135	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>83.5'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>77.00</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>1.06</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$$V = 0.0408 (2)^2 \times (83.5 - 77.00) = 3.18 \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	170	175	180	185	190	195	200	205	210	215	220	
pH	6.22	6.19	6.05	5.98	5.97	5.83	5.79	5.96	5.84	5.70	5.74	
Spec. Cond. (umho)	122	140	110	98	105	103	103	109	101	102	103	
Turbidity (NTU)	100+	79	86	69	59	55	43	38	34	31	30	
Temperature (°C)	-	16.7	16.9	14.8	15.6	15.3	15.9	17.8	16.2	15.5	16.2	

COMMENTS:

PROJECT TITLE: GLOBAL RIF/FS

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.26.07

WELL NO.: MW-145	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.59</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>3.68'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>2.10</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (16.59 - 3.68) = 6.30$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	(INT) 0	5	10	15	20	25	30	35	40	45	50
PH	6.82	6.68	6.74	6.72	6.70	6.70	6.70	6.73	6.89	6.74	6.69
Spec. Cond. (umho)	13900	8700	8200	7800	7900	7400	7500	7200	7300	7100	7400
Turbidity (NTU)	100*	100*	61	60	100*	100*	100*	100*	100*	100*	100*
Temperature (°C)	22.5	19.3	20.0	19.5	19.4	19.4	19.5	20.2	19.8	20.0	19.3
PID	2.0	0.4						0.2			

COMMENTS:

- DEVELOPED TO VISUAL CLARITY, WATER HAS A GREENISH/BLACK APPEARANCE TO IT
- STRONG LEAKATE ODOR
- EXCELLENT RECHARGE



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES
 PROJECT NO.: 35226
 STAFF: S. LAMB
 DATE: 6.26.91

DEVELOPMENT

WELL NO.: MW-145

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 16.59'
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 3.68'
- ④ VOLUME OF WATER IN CASING (GAL.) 2.10

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{6.30} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	55	60	65	70	75	80	85	90	95	100
PH	6.62	6.54	6.42	6.87	6.48	6.55	7.06	7.08	7.02	6.47
Spec. Cond. (umho)	7.000	7.200	6.900	6.700	6.900	6.700	7.100	7.200	7.200	7.300
Turbidity (NTU)	100*	100*	100*	100*	100*	100*	100*	92	76	19
Temperature (°C)	20.5	20.2	20.3	19.8	21.1	20.8	20.2	20.1	19.8	20.3

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFTS

PROJECT NO.: 35226

STAFF: S. LAMB ; B. KREUZER

DATE: 6.26.91 / 6.27.91

	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
WELL NO.: MW-14D		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>57.54</u>	1"	0.04
	2"	0.17
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	3"	0.38
	4"	0.66
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>2.14</u>	5"	1.04
	6"	1.50
④ VOLUME OF WATER IN CASING (GAL.) <u>9.03</u>	8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{27.09} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	(INT) 0	5	(INT) 7	10	15	20	25	30	35	40	45
pH	9.82	9.39	10.39	8.57	10.67	9.07	7.92	7.02	7.06	7.20	7.08
Spec. Cond. (µmho)	1820	1000	2,100	900	1,600	870	880	760	500	490	300
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	18.1	18.3						17.2			

COMMENTS:
 - SLOW RECHARGE; GOES TO DRYNESS



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: SLAMB, B. KREUZER

DATE: 6-27-91 / 7-8-91

WELL NO.: MW-14D	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>57.54'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) _____	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) _____	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (57.54 - 0) = \underline{\hspace{2cm}} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	50	55	60	65	70	75	80	85	90	95	100
PH	6.95	7.05	6.92	7.16	7.13	6.72	7.35	7.11	7.05	7.01	7.05
Spec. Cond. (µmho)	450	500	300	500	630	380	400	450	410	450	470
Turbidity (NTU)	100 ⁺	100 ⁺	100 ⁺	100 ⁺	100 ⁻	100 ⁺	100 ⁺	100 ⁺	100 ⁺	80	100 ⁻
Temperature (°C)	20.3				20.3	19.3	19.6	19.4	20.8	19.6	19.0

7-8

COMMENTS: RECHARGE BECAME INCREASINGLY BETTER AS DEVELOPMENT ADVANCED.

A-2347



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIVES

PROJECT NO.: 35226

STAFF: S. LAMB ; B. KREUZER

DATE: 7-8-91 / 7-10-91

DEVELOPMENT

WELL NO.: MW14D

① TOTAL CASING AND SCREEN LENGTH (FT.): 57.54

② CASING INTERNAL DIAMETER (in.): 2

③ WATER LEVEL BELOW TOP OF CASING (FT.) _____

④ VOLUME OF WATER IN CASING (GAL.) _____

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	105	110	115	120	125	130	135	140	145	150	155
PH	7.08	7.15	7.10	7.05	7.00	6.93	6.99	6.81	6.66	6.43	6.43
Spec. Cond. (umho)	430	450	350	300	300	300	270	490	405	320	305
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	75	100+	100+	100+
Temperature (°C)	19.6	19.7	19.1	18.1	20.2	18.1	20.3	18.7	18.0	18.3	18.6
	7-8						7-10				

COMMENTS:

A-2347

PROJECT TITLE: GLOBAL RIFS

PROJECT NO.: 35226

STAFF: S. LOMB; B. KREUZER

DATE: 7-10-91

DEVELOPMENT

WELL NO.: MW14D

① TOTAL CASING AND SCREEN LENGTH (FT.): 57.54

② CASING INTERNAL DIAMETER (in.): 2

③ WATER LEVEL BELOW TOP OF CASING (FT.) _____

④ VOLUME OF WATER IN CASING (GAL.) _____

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	160	165	170	175	180	185	190	195	200		
pH	6.34	6.37	6.30	6.24	6.23	6.24	6.24	6.25	6.22		
Spec. Cond. (µmho)	300	290	300	270	295	299	300	286	290		
Turbidity (NTU)	100+	99	76	60	51	42	33	35	27		
Temperature (°C)	18.7	17.8	19.0	18.5	17.9	18.3	18.4	18.3	18.5		

COMMENTS:

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S. LAMB ; D. SHEPPARD

DATE: 6.26.01

WELL NO.: MW-155

① TOTAL CASING AND SCREEN LENGTH (FT.): 16.75

② CASING INTERNAL DIAMETER (in.): 2"

③ WATER LEVEL BELOW TOP OF CASING (FT.) 7.12

④ VOLUME OF WATER IN CASING (GAL.) 1.57

DEVELOPMENT

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (2")^2 \times (16.75 - 7.12) = 4.71$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	(INT) 0	5	10	15	20	25	30	35	40	45	50	
PH	6.70	6.41	6.49	6.48	6.48	6.45	6.45	6.43	6.46	6.19	6.21	
Spec. Cond. (umho)	10,900	11,200	11,600	12,100	12,100	11,700	12,400	12,100	12,100	10,700	12,100	
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	
Temperature (°C)	25.1	19.7	18.7	19.4	18.1	21.3	18.8	18.8	19.1	19.2	18.4	
PID		4.2							9.0	4.0		

COMMENTS:

- DEVELOPED TO VISUAL CLARITY
- AN OILY SHEEN WAS NOTICED @ 90 gal.
- SLIGHT ODOR
- GOOD RECHARGE

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S. LAMB, D. SHEPPARD

DATE: 6-26-91

WELL NO.: MW-155	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.75'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.12'</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) _____	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (16.75 - 7.12) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	55	60	65	70	75	80	85	90	95	100	105	
pH	6.18	6.24	6.33	6.30	6.28	6.24	6.19	6.46	6.41	6.54	6.43	
Spec. Cond. (umho)	12,000	12,000	12,200	12,100	11,800	12,200	12,300	12,000	12,400	12,200	12,100	
Turbidity (NTU)	100+	100+	50	48	46	43	35			42	49	
Temperature (°C)	18.3	18.4	21.0	18.0	19.0	18.2	19.4	20.1	19.2	18.9	20.0	
PID										5.0		

COMMENTS:

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S. LAMB ; D. SHEPPARD

DATE: 6-26-91

WELL NO.: MW-155	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.75'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
	3"	0.38
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.12'</u>	4"	0.66
	5"	1.04
④ VOLUME OF WATER IN CASING (GAL.) _____	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)						
	110	115	120	125	130	135	
PH	6.54	6.61	6.67	6.68	6.68	6.67	
Spec. Cond. (ymho)	11,900	11,000	10,000	11,800	12,000	12,200	
Turbidity (NTU)	42	38	35	26	26	23	
Temperature (°C)	19.8	19.9	18.3	18.8	17.9	17.8	

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 35226

STAFF: S LAMB

DATE: 6.26.91

WELL NO.: MW-15D	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>27.73</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>6.30</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>349</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$$V = 0.0408 (2)^2 \times (27.73 - 6.30) = 10.47 \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	(in ³) 0	5	10	15	20	25	30	35	40	45	50
PH	7.03	6.65	6.68	6.55	6.47	6.44	6.31	6.25	6.25	6.33	6.34
Spec. Cond. (umho)	1100	540	300	230	180	160	150	130	130	180	170
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	22.3	21.9	21.6	21.5	23.5	21.5	21.9	21.5	21.9	21.7	22.1

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 352210

STAFF: S. LAMB

DATE: 6.26.01

WELL NO.: MW-150	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>27.73</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>6.30</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) _____	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 \text{ (2)}^2 \times \text{(1)} - \text{(3)} = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	55	60	65	70	75	80	85	90	95	100	105	
PH	6.20	6.14	6.48	6.09	6.22	6.16	6.42	6.08	6.16	5.97	6.33	
Spec. Cond. (ymho)	168	150	162	170	168	170	140	150	165	145	168	
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	
Temperature (°C)	21.9	23.5	23.3	22.9	23.2	22.3	22.4	21.7	21.7	21.6	21.8	

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.26.91

WELL NO.: MW-15D

① TOTAL CASING AND SCREEN LENGTH (FT.): 27.73'

② CASING INTERNAL DIAMETER (in.): 2"

③ WATER LEVEL BELOW TOP OF CASING (FT.) 6.30

④ VOLUME OF WATER IN CASING (GAL.) _____

DEVELOPMENT	
WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	110	115	120	125	130	135	140	145	150	155	160
pH	6.06	6.06	5.88	5.89	5.74	5.80	5.77	5.54	6.29	6.02	6.42
Spec. Cond. (umho)	145	160	146	138	138	137	132	160	173	150	140
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	21.5	22.7	22.3	21.8	22.0	21.9	21.9	22.2	22.8	22.4	23.1

COMMENTS:

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.26.91

WELL NO.: MW-15D	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>27.73'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>6.30</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) _____	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	165	170	175	180	185	190	195	200	205	210	215
pH	6.25	5.97	5.93	6.03	5.83	5.79	5.92	6.04	5.89	5.92	6.11
Spec. Cond. (umho)	138	170	130	180	162	137	164	200	158	174	196
Turbidity (NTU)	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*
Temperature (°C)	21.7	22.2	21.7	21.3	22.1	21.4	22.1	21.7	-	22.3	21.8

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.26.91

DEVELOPMENT

WELL NO.: MW-15D

① TOTAL CASING AND SCREEN LENGTH (FT.): 27.73'

② CASING INTERNAL DIAMETER (in.): 2"

③ WATER LEVEL BELOW TOP OF CASING (FT.) 6.30'

④ VOLUME OF WATER IN CASING (GAL.) _____

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	220	225	230	235	240	245	250	255	260	265	270	
pH	5.94	6.11	5.84	6.16	5.92	6.47	5.91	5.87	5.88	5.86	5.73	
Spec. Cond. (umho)	125	172	145	150	133	162	136	118	136	119	115	
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	
Temperature (°C)	21.3	21.8	22.2	21.9	21.3	21.7	21.5	21.6	21.6	21.5	21.1	

COMMENTS:

PROJECT TITLE: GLOBAL RILES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.26.91

WELL NO.: MW-15D	DEVELOPMENT	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>27.73'</u>	1"	0.04
	2"	0.17
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	3"	0.38
	4"	0.66
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>6.30'</u>	5"	1.04
	6"	1.50
④ VOLUME OF WATER IN CASING (GAL.) _____	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	275	280	285	290	295	300	305	310	315	320	325
PH	5.77	6.38	6.24	6.19	5.98	6.34	6.20	6.09	6.00	6.21	6.24
Spec. Cond. (umho)	115	150	145	140	136	152	120	135	117	135	118
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	21.3	21.0	21.3	21.3	21.0	21.0	21.1	21.0	21.1	20.9	20.9

COMMENTS:

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: Co. 26.91 / Co. 27.91

WELL NO.: MW-15D

DEVELOPMENT	
WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 27.73'
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 6.30'
- ④ VOLUME OF WATER IN CASING (GAL.) _____

$V = 0.0408 (2)^2 \times (1 - 3) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	330	335	340	345	350	(INT) 350	355	360	365	370	375	
PH	5.97	6.04	6.07	6.15	6.00	6.30	6.44	6.32	6.22	6.22	6.20	
Spec. Cond. (umho)	115	118	120	136	115	143	160	176	162	155	160	
Turbidity (NTU)	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	100*	
Temperature (°C)	20.9	20.8	20.8	20.8	21.1	21.1	20.7	20.8	21.2	21.6	21.2	
	Co. 26.91						Co. 27.91					

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL PILES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.27.91

WELL NO.: MW-15D

DEVELOPMENT
WELL I.D. VOL. GAL./FT.

① TOTAL CASING AND SCREEN LENGTH (FT.): 27.73'

1" 0.04

② CASING INTERNAL DIAMETER (in.): 2"

2" 0.17

③ WATER LEVEL BELOW TOP OF CASING (FT.): _____

3" 0.38

4" 0.66

④ VOLUME OF WATER IN CASING (GAL.) _____

5" 1.04

6" 1.50

8" 2.60

$V = 0.0408 (2)^2 \times (1 - 3) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	380	385	390	395	400	405	410	415	420	425	430
pH	6.12	6.12	6.09	6.17	6.06	5.99	6.04	5.95	6.00	5.91	5.95
Spec. Cond. (umho)	150	137	134	135	128	126	127	122	126	122	123
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+
Temperature (°C)	21.8	21.6	22.1	21.6	21.8	22.0	22.0	22.0	20.8	22.4	22.1

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL RIFES

PROJECT NO.: 35226

STAFF: SLAMB

DATE: 6.27.91

DEVELOPMENT

WELL NO.: MW-15D

① TOTAL CASING AND SCREEN LENGTH (FT.): 27.73'

② CASING INTERNAL DIAMETER (in.): 2"

③ WATER LEVEL BELOW TOP OF CASING (FT.)

④ VOLUME OF WATER IN CASING (GAL.)

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{ } \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	435	440	445	450	455	460	465	470	475	480	485	
PH	5.93	5.90	5.80	5.88	5.89	5.75	5.82	6.07	5.85	5.90	5.96	
Spec. Cond. (umho)	124	118	120	115	118	125	122	117	118	120	122	
Turbidity (NTU)	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	100+	
Temperature (°C)	22.8	22.2	22.4	21.9	21.7	23.4	21.4	22.2	22.5	21.9	22.0	

COMMENTS:



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: GLOBAL R/ES

PROJECT NO.: 35226

STAFF: S. LAMB

DATE: 6.27.91

	DEVELOPMENT	
WELL NO.: MW-15D	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>27.73'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) _____	3"	0.38
	4"	0.66
	5"	1.04
	6"	1.50
④ VOLUME OF WATER IN CASING (GAL.) _____	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \text{_____ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	490	495	500	505	510	515	520	525	530	535	540
PH	5.82	5.76	5.82	5.95	5.88	5.84	5.80	5.76	5.81	5.83	5.84
Spec. Cond. (µmho)	118	120	122	121	120	115	119	120	121	119	118
Turbidity (NTU)	100+	100+	100+	92	84	80	72	64	52	48	40
Temperature (°C)	22.4	22.0	22.0	21.9	22.1	22.2	21.1	21.4	21.7	22.0	22.0

COMMENTS:

A-2347

WELL PURGING LOGS

PROJECT TITLE: Global Landfill RI/FS

PROJECT NO.: 35226

STAFF: D. Sheppard / B. Kreuzer / S Lamb

DATE: 7-16-91

	Purge Log	
WELL NO.: MW1A	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>36.74</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>4</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>30.64</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>4.03</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{12.09} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	4								
pH		6.42								
Spec. Cond. (µmho)		300								
Turbidity (NTU)		>100								
Temperature (°C)		22.3								
PID (ppm)		ND								

COMMENTS: The well was purged with a Waterra Hydrolift pump. The well was purged to dryness at 6 gallons. The water evacuated was clear to turbid (sand + silt) with a slight sulfur odor.

PROJECT TITLE: Global Landfill 31/FS

PROJECT NO.: 35226

STAFF: B. Kreuzer / S. Lamb

DATE: 7-18-91

Purge Log

WELL NO.: MW25

① TOTAL CASING AND SCREEN LENGTH (FT.): 16.41

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 4.28

④ VOLUME OF WATER IN CASING (GAL.) 7.98

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{23.94} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	8	16	30						
pH		5.97	6.36	6.45						
Spec. Cond. (umho)		17,000	17,500	15,200						
Turbidity (NTU)		9.0	2.5	2.0						
Temperature (°C)		15.2	19.9	17.4						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electrical centrifugal pump. The water evacuated was dark green to black with a strong sulfur odor.

PROJECT TITLE: Global Landfill RI/FS

PROJECT NO.: 35236

STAFF: B. Kreuzer / S. Lamb

DATE: 7-18-91

WELL NO.: MW2A	Purge Log	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>59.26</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>4</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>0.00</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>38.68</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (1) - (3) = \underline{116.64}$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	40	80	120						
pH		6.35	6.17	6.12						
Spec. Cond. (umho)		240	170	200						
Turbidity (NTU)		5.5	4.7	11						
Temperature (°C)		18.3	18.1	18.3						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was clear with some orange floc. No odor.

PROJECT TITLE: Global Landfill R/ES
 PROJECT NO.: 35226
 STAFF: B. Kreuzer / S. Lamo
 DATE: 7-18-91

Purge Log

WELL NO.: MW35

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 16.58
- ② CASING INTERNAL DIAMETER (in.): 2
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 7.78
- ④ VOLUME OF WATER IN CASING (GAL.) 1.44

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (2)^2 \times (16.58 - 7.78) = 4.32$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	1.5	3.0	6.0						
pH		6.27	6.26	6.23						
Spec. Cond. (µmho)		5.700	5.000	5.300						
Turbidity (NTU)		76	89	51						
Temperature (°C)		17.3	17.3	17.0						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with an ISCO peristaltic pump.
 The water evacuated was slightly turbid with a slight septic odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill RIFES

PROJECT NO.: 35226

STAFF: B. Kreuzer / S LGM

DATE: 7-18-91

WELL NO.: MW/3A

Purge Log

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 64.38
- ② CASING INTERNAL DIAMETER (in.): 4
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 2.96
- ④ VOLUME OF WATER IN CASING (GAL.) 40.25

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{120.75} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	40	80	120						
PH		6.28	6.31	6.40						
Spec. Cond. (umho)		175	196	175						
Turbidity (NTU)		25	10	6						
Temperature (°C)		18.1	15.9	17.2						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was slightly turbid to clear with no odor.

PROJECT TITLE: Global Landfill RIFES

PROJECT NO.: 35226

STAFF: D. Sheppard / S. Lemo

DATE: 7-23-91

Purge Log

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

WELL NO.: MW45

① TOTAL CASING AND SCREEN LENGTH (FT.): 18.70

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 6.76

④ VOLUME OF WATER IN CASING (GAL.) 7.79

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{23.37} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	8								
PH		5.47								
Spec. Cond. (umho)		>20,000								
Turbidity (NTU)		11								
Temperature (°C)		18.2								
PID (ppm)		ND								

COMMENTS: The well was purged to dryness with an Isco peristaltic pump. The water evacuated was clear with a slight odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Lead Fill RIFS

PROJECT NO.: 35226

STAFF: D. Sheppard / S. Lamb

DATE: 7-23-91

Purge Log

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

WELL NO.: MW4A

① TOTAL CASING AND SCREEN LENGTH (FT.): 60.80

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 0.92

④ VOLUME OF WATER IN CASING (GAL.) 39.07

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{117.21} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	40	80	120						
pH		5.95	5.92	5.65						
Spec. Cond. (umho)		140	180	135						
Turbidity (NTU)		15	20	21						
Temperature (°C)		21.2	20.8	21.6						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was clear with a slight sulfur odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill RIFES

PROJECT NO.: 35226

STAFF: B. Kreizer / S. Lamb

DATE: 7-19-91

Purge Log	
WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

WELL NO.: MW55

① TOTAL CASING AND SCREEN LENGTH (FT.): 19.35

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 5.38

④ VOLUME OF WATER IN CASING (GAL.) 9.12

$$V = 0.0408 (2)^2 \times (1) - (3) = \underline{27.36} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	10								
pH		5.22								
Spec. Cond. (umho)		>20,000								
Turbidity (NTU)		3.5								
Temperature (°C)		20.0								
PID (ppm)		ND								

COMMENTS: The well was purged to dryness with a Wayne electric centrifugal pump. The water evacuated was golden black with a strong sulfur odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill RI/FS

PROJECT NO.: 35226

STAFF: B. Kreuzer / S. Lamb

DATE: 7-19-91

WELL NO.: MWSA

① TOTAL CASING AND SCREEN LENGTH (FT.): 51.90

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 0.00

④ VOLUME OF WATER IN CASING (GAL.) 34.07

Purge Log

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{102.21} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	35	70	108						
pH		5.87	5.04	5.01						
Spec. Cond. (umho)		275	260	270						
Turbidity (NTU)		65	54	19						
Temperature (°C)		19.1	19.6	20.0						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was slightly turbid to clear with no odor.

PROJECT TITLE: Global Leadfill R/ES

PROJECT NO.: 35226

STAFF: B. Kreuzer / S. Lamb

DATE: 7-16-91

Purge Log

WELL NO.: MW65

① TOTAL CASING AND SCREEN LENGTH (FT.): 21.73

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 6.72

④ VOLUME OF WATER IN CASING (GAL.) 8.75

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{26.25} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	10	20	30						
PH		6.43	5.95	5.86						
Spec. Cond. (umho)		1500	1850	1450						
Turbidity (NTU)		17	11	11						
Temperature (°C)		15.1	15.5	15.2						
PID (ppm)		0.6	ND	0.2						

COMMENTS: The well was purged with a Wayne electric centrifugal pump.
The water evacuated was clear with no odor.

PROJECT TITLE: Global LeadF.11 RIFs

PROJECT NO.: 35226

STAFF: B. Kreuzer / S. Lamb

DATE: 7-16-91

WELL NO.: MW6D	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>41.73</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>4</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>1.02</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>27.24</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{81.72} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	30	60	95						
pH		6.09	5.73	5.78						
Spec. Cond. (umho)		115	87	100						
Turbidity (NTU)		>100	42	>100						
Temperature (°C)		13.2	13.1	13.2						
PID (ppm)		0.2	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was turbid to 30 gallons, slightly turbid to clear to 60 gallons, then back to turbid at 95 gallons.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill RI/FS

PROJECT NO.: 35276

STAFF: D. Sheppard / B. Kreuzer / S. Lamb

DATE: 7-16-91

WELL NO.: MW7S

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 18.87
- ② CASING INTERNAL DIAMETER (in.): 4
- ③ WATER LEVEL BELOW TOP OF CASING (FT.): 2.08
- ④ VOLUME OF WATER IN CASING (GAL.): 11.08

Purge Log

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{33.24} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	11	22	33						
pH		5.82	5.67	5.45						
Spec. Cond. (µmho)		83	73	74						
Turbidity (NTU)		7.6	6.0	3.4						
Temperature (°C)		15.1	15.4	14.5						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with an ISCO peristaltic pump. The water evacuated was clear with no odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill RIFES

PROJECT NO.: 35226

STAFF: D. Sheppard / B. Kreuzer / S. Lamb

DATE: 7-16-91

Purge Log

WELL NO.: MW7D

① TOTAL CASING AND SCREEN LENGTH (FT.): 50.50

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 2.34

④ VOLUME OF WATER IN CASING (GAL.) 31.24

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{93.72} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	31	62	93						
PH		5.93	5.80	5.86						
Spec. Cond. (umho)		85	79	81						
Turbidity (NTU)		5.0	2.5	3.5						
Temperature (°C)		14.0	14.1	14.1						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged using a Wayne electric centrifugal pump. The water evacuated was clear with no odor.

PROJECT TITLE: Global Landfill R/LFS
 PROJECT NO.: 35226
 STAFF: B. Kreuzer / S. Lamo
 DATE: 7-18-91

Purge Log

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

WELL NO.: MW 85

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 29.71
- ② CASING INTERNAL DIAMETER (in.): 4
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 13.08
- ④ VOLUME OF WATER IN CASING (GAL.) 10.86

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{32.84} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	12	24	36						
PH		6.06	6.08	6.13						
Spec. Cond. (umho)		>20,000	19,100	19,200						
Turbidity (NTU)		15	9.8	10						
Temperature (°C)		20.5	20.3	20.7						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with an 1500 peristaltic pump.
 The water evacuated was yellow to black with a strong septic odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill RI/FS

PROJECT NO.: 35226

STAFF: B. Kreuzer / S. Lamb

DATE: 7-18-91

Purge Log	
WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

WELL NO.: MWB D

① TOTAL CASING AND SCREEN LENGTH (FT.): 52.31

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 9.90

④ VOLUME OF WATER IN CASING (GAL.) 27.68

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{83.64} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	30	60	90						
pH		6.25	6.07	6.22						
Spec. Cond. (umho)		410	500	550						
Turbidity (NTU)		5.5	20	25						
Temperature (°C)		18.3	18.1	18.3						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was clear to very slightly turbid with no odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global landfill RUFFS

PROJECT NO.: 35226

STAFF: B. Kreuzer / S. Lamb

DATE: 7-16-91

WELL NO.: MW45

① TOTAL CASING AND SCREEN LENGTH (FT.): 20.09

② CASING INTERNAL DIAMETER (in.): 4

③ WATER LEVEL BELOW TOP OF CASING (FT.) 3.14

④ VOLUME OF WATER IN CASING (GAL.) 11.06

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{33.18} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	11	22	33						
pH		6.06	5.95	5.93						
Spec. Cond. (umho)		95	86	80						
Turbidity (NTU)		56	24	14						
Temperature (°C)		13.4	13.5	12.7						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was slightly turbid to clear with no odor.

PROJECT TITLE: Global landfill RI/FS

PROJECT NO.: 35226

STAFF: D. Sheppard / S. Lamb

DATE: 7-25-91

WELL NO.: MW105

① TOTAL CASING AND SCREEN LENGTH (FT.): 14.0

② CASING INTERNAL DIAMETER (in.): 2

③ WATER LEVEL BELOW TOP OF CASING (FT.) 1.72

④ VOLUME OF WATER IN CASING (GAL.) 2.00

Purge Log

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (\text{②})^2 \times (\text{①} - \text{③}) = \underline{45} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	15	30	45							
pH		6.67	6.60	6.52							
Spec. Cond. (umho)		130	82	75							
Turbidity (NTU)		16	18	8.6							
Temperature (°C)		16.5	16.2	16.0							
PID (ppm)		ND	ND	ND							

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water was clear with no odor. Excessive volume was removed to obtain acceptable turbidity values

PROJECT TITLE: Sichel Landfill R/ES

PROJECT NO.: 35226

STAFF: D. Sheppard / B. Kreuzer / S. Lamb

DATE: 7-15-91

WELL NO.: MW115	Purge Log	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.99</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>7.58</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>1.16</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{3.48} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	1.2	2.4		4.8	5.8				
PH		5.82	5.82	5.84	5.84	5.89				
Spec. Cond. (umho)		850	860	880	860	870				
Turbidity (NTU)		74	40	100	80	72				
Temperature (°C)		16.2	15.2	15.1	15.1	15.2				
PID (ppm)		ND	ND	ND	ND	ND				

COMMENTS: The well was purged with an ISCO peristaltic pump.

Initially the water was clear to very slightly turbid with a slight odor. At approximately each 1 gallon interval, the water would get slightly turbid (s.l.t) then clear again. No odor upon purge completion.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill R/FS
 PROJECT NO.: 35226
 STAFF: D. Sheppard / B. Kreuzer / S. Lamb
 DATE: 7-15-91

	Purge Log WELL I.D.	VOL. GAL./FT.
WELL NO.: <u>MW12S</u>		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>16.89</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>6.30</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>1.80</u>	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{5.40} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	2	4	6	8	10	12	14	16	18
pH		6.44	6.55	6.77						
Spec. Cond. (µmho)		>20,000	>20,000	>20,000						
Turbidity (NTU)		60	40	40						
Temperature (°F)		20.1	19.8	19.7						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with an ISCO peristaltic pump. The water evacuated was clear with a slight yellow tint throughout. No odor.

PROJECT TITLE: Global Landfill R/ES

PROJECT NO.: 35226

STAFF: D. Sheppard, R. Kreuzer / S. Lamb

DATE: 7-15-91

WELL NO.: MW135	Purge Log	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>86.49</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>78.55</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>1.35</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{4.05} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	1.35	2.7	6.0						
PH		5.52	5.45	5.49						
Spec. Cond. (umho)		122	115	105						
Turbidity (NTU)		89	88	88						
Temperature (°C)		20.3	20.3	17.6						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Waterra Hydrolift Pump.
The water evacuated remained consistently slightly turbid
with no odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill RIFES

PROJECT NO.: 35226

STAFF: D. Sheppard / S. Lamb

DATE: 7-25-91

Purge Log

WELL NO.: MW145

① TOTAL CASING AND SCREEN LENGTH (FT.): 14.00

② CASING INTERNAL DIAMETER (in.): 2

③ WATER LEVEL BELOW TOP OF CASING (FT.): 3.70

④ VOLUME OF WATER IN CASING (GAL.): 1.68

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{5.04} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	2	4	6						
pH		6.40	6.38	6.37						
Spec. Cond. (umho)		5500	5700	5800						
Turbidity (NTU)			11	14						
Temperature (C)		20.9	20.1	20.1						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was clear with a black tint. Slight odor

PROJECT TITLE: Global Landfill R/ES
 PROJECT NO.: 35226
 STAFF: D. Sheppard / S. Lamb
 DATE: 7-25-91

WELL NO.: <u>MW14D</u>	Purge Log	
	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>55.0</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>2.09</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>9.02</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (1) - (3) = \underline{30}$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	10	20	30						
PH		6.29	6.46	6.27						
Spec. Cond. (umho)		270	290	295						
Turbidity (NTU)		10	82	72						
Temperature (°C)		17.7	17.7	17.7						
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with a Wayne electric centrifugal pump. The water evacuated was clear to slightly turbid with no odor.



WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: Global Landfill #1/FS

PROJECT NO.: 35226

STAFF: B. Kreuzer/S. Lamb

DATE: 7-19-91

WELL NO.: MW155

Purge Log

① TOTAL CASING AND SCREEN LENGTH (FT.): 17.78

1"

0.04

② CASING INTERNAL DIAMETER (in.): 2

2"

0.17

③ WATER LEVEL BELOW TOP OF CASING (FT.) 7.20

3"

0.38

④ VOLUME OF WATER IN CASING (GAL.) 1.83

4"

0.66

5"

1.04

6"

1.50

8"

2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1}) - (\textcircled{3}) = \underline{5.94} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	2	4	6						
pH		6.01	5.96	5.89						
Spec. Cond. (umho)		12,500	12,900	13,000						
Turbidity (NTU)		17	11							
Temperature (°C)		18.5	18.3							
PID (ppm)		ND	ND	ND						

COMMENTS: The well was purged with an ISCO peristaltic pump. The water evacuated was clear with a yellow tint. Septic odor.

PROJECT TITLE: Global Landfill RI/FS

PROJECT NO.: 35226

STAFF: D. Sheppard/S Lamb

DATE: 7-25-91

Purge Log

WELL NO.: MW15D

① TOTAL CASING AND SCREEN LENGTH (FT.): 43.0

② CASING INTERNAL DIAMETER (in.): 2

③ WATER LEVEL BELOW TOP OF CASING (FT.) 5.39

④ VOLUME OF WATER IN CASING (GAL.) 6.12

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{30} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)							
	0	10	20	30				
PH		5.94	5.92	5.87				
Spec. Cond. (umho)		120	125	120				
Turbidity (NTU)		10	9	12				
Temperature (°C)		21.8	21.8	22.3				
PID (ppm)		ND	ND	ND				

COMMENTS: The well was purged with a Wayne electric centrifugal pump.
The water evacuated was clear with no odor.

APPENDIX H

HYDRAULIC CONDUCTIVITY CALCULATIONS

• PROJECT NAME : GLOBAL LANDFILL RI/FS
 • PROJECT NO : 35229.30
 • WELL NO : WELL MW-3S (slug out)
 • ANALYST : Przybyl
 • DATE COLLECTED : 7-10-91
 • CHECKED BY :
 • RISER PIPE (ID): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN DIA AMETER:(2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN LEN NGTH: (L) = 9.00 Ft.
 • MAX DRAWDOWN (IN SUB BSET): (Ymax) = 0.33 Ft.
 • STATIC WATER LEVEL: (SWL) = 2.77 Ft.
 • DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 9.00 Ft.
 • EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 9.00 Ft.
 • INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 • SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:

RATIO OF L/(r sub w) = 108.00
 ---LOG OF L/(r sub w) = 2.0334
 FOR PARTIALLY PENETRATING WELLS--
 A = 4.50
 B = 0.79
 FOR FULLY PENETRATING WELLS--
 C = 4.83
 ---EVALUATION OF LN(Ra/(r sub w)):
 CONST.1 = 0.2349
 CONST.2 = ERR -(MAX. OF 8.0) = ERR
 LN(Ra/(r sub w)) = 3.80

EFFECTIVE r sub c (for sandpack dewatering) = 0.0833
 (1/T)(LN(Yo/Y1)) (SLOPE) = -2.42E-02 sec⁻¹

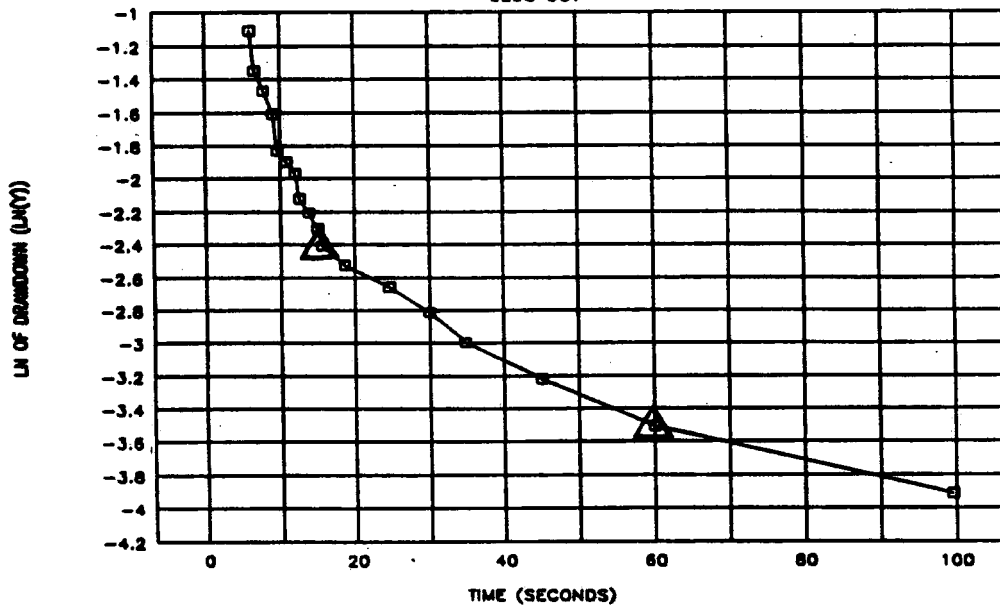
HYDRAULIC CONDUCTIVITY (K) = 3.36E-05 ft/sec
 1.02E-03 cm/sec

Regression Output:

Constant -2.08E+00
 Std Err of Y Est 0.0438
 R Squared 0.9885
 No. of Observations 6
 Degree of Freedom 4
 X Coefficient(s) -2.42E-02
 Std Err of Coef. 0.0013

△ REGRESSED INTERVAL

**RATE OF RECOVERY TEST: WELL MW-3S
SLUG OUT**



• PROJECT NAME : GLOBAL LANDFILL RI/FS
 • PROJECT NO : 35226.30
 • WELL NO : WELL MW-10SR (slug out)
 • ANALYST : Przybyl
 • DATE COLLECTED : 7-12-91
 • RISER PIPE (ID): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN DIA AMETER:(2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN LEN NGTH: (L) = 10.00 Ft.
 • MAX DRAWDOWN (IN SUB BSET): (Ymax) = 0.45 Ft.
 • STATIC WATER LEVEL: (SWL) = 1.74 Ft.
 • DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 14.00 Ft.
 • EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 14.00 Ft.
 • INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 • SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOWLER AND RICE CURVE COEFFICIENTS:

RATIO OF L/(r sub w) = 120.00
 ---LOG OF L/(r sub w) = 2.0792

FOR PARTIALLY PENETRATING WELLS--

A = 4.73
 B = 0.85

FOR FULLY PENETRATING WELLS--

C = 4.88

---EVALUATION OF LN(Re/(r sub w)):

CONST.1 = 0.2147
 CONST.2 = ERR
 LN(Re/(r sub w)) = ERR
 ERR --(MAX. OF 6.0)-- ERR
 3.90

EFFECTIVE r sub w (for sandpack dewatering) = 0.0833
 (1/T)(LN(Ya/Yt)) (SLOPE) = -5.11E-02 sec⁻¹

HYDRAULIC CONDUCTIVITY (K) = 6.93E-05 ft/sec
 2.11E-03 cm/sec

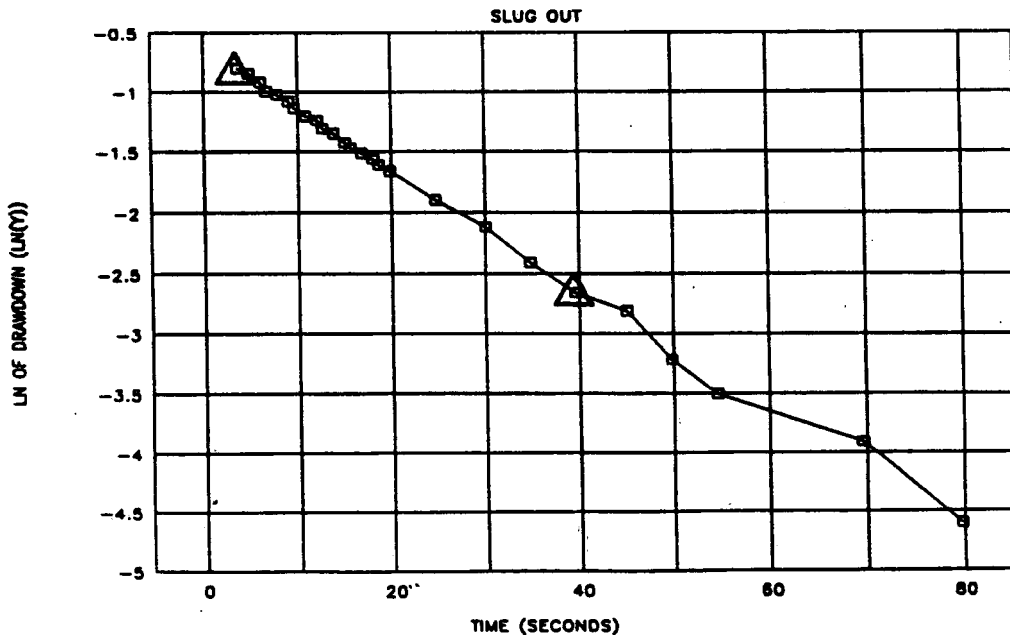
Regression Output:

Constant -6.37E-01
 Std Err of Y Est 0.0233
 R Squared 0.9978
 No. of Observations 21
 Degrees of Freedom 19

X Coefficient(s) -5.11E-02
 Std Err of Coef. 0.0005

△ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-10SR



• PROJECT NAME : GLOBAL LANDFILL R/W/S
 • PROJECT NO : 35228.30
 • WELL NO : WELL MW-11S (slug out)
 • ANALYST : Przybyl
 • DATE COLLECTED : 7-10-91
 • RISER PIPE (ID): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN DIA AMETER:(2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN LEN NGTH: (L) = 9.44 Ft.
 • MAX DRAWDOWN (IN SUB SSET): (Ymax) = 0.28 Ft.
 • STATIC WATER LEVEL: (SWL) = 2.15 Ft.
 • DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 0.44 Ft.
 • EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 50.00 Ft.
 • INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 • SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

CHECKED BY:

BOUWER AND RICE CURVE COEFFICIENTS:

RATIO OF L/(r sub w) = 113.28
 ---LOG OF L/(r sub w) = 2.0542

FOR PARTIALLY PENETRATING WELLS---

A = 4.61
 B = 0.82

FOR FULLY PENETRATING WELLS---

C = 4.78

---EVALUATION OF LN(Ra/(r sub w)):

CONST. 1 = 0.2328
 CONST. 2 = 6.1677 --(MAX. OF 6.0)= 6.0000
 LN(Ra/(r sub w)) = 3.18

EFFECTIVE r sub c (for sandpack dewatering) = 0.0833
 (1/T)(LN(Yo/Yt)) (SLOPE) = -5.35E-02 sec⁻¹

HYDRAULIC CONDUCTIVITY (K) = 6.21E-05 N/sec
 1.89E-03 cm/sec

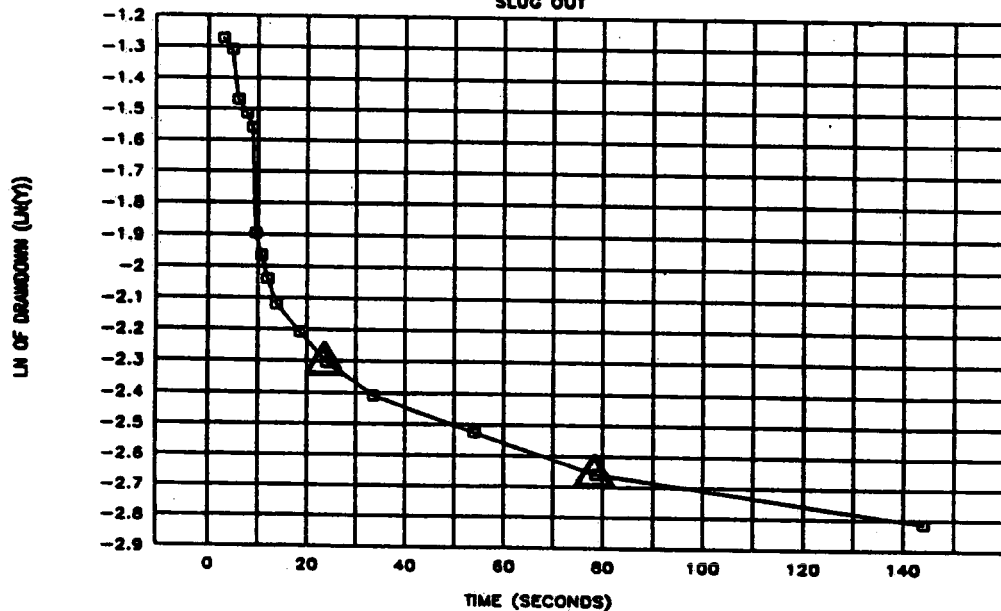
Regression Output:

Constant -1.39E+00
 Std Err of Y Est 0.0088
 R Squared 0.9842
 No. of Observations 4
 Degrees of Freedom 2

X Coefficient(s) -5.35E-02
 Std Err of Coef. 0.0029

△ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-11S
SLUG OUT



* PROJECT NAME : GLOBAL LANDFILL RI/FS
 * PROJECT NO : 35226.30
 * WELL NO : WELL MW-12S (slug out)
 * ANALYST : Przybyl
 * DATE COLLECTED : 7-10-91
 * RISER PIPE (ID): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 * EFFECTIVE SCREEN DIA AMETER: (2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 * EFFECTIVE SCREEN LENGTH: (L) = 10.00 Ft.
 * MAX DRAWDOWN (IN SUB BSET): (Ymax) = 0.19 Ft.
 * STATIC WATER LEVEL: (SWL) = 3.69 Ft.
 * DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 11.00 Ft.
 * EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 50.00 Ft.
 * INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 * SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:

RATIO OF L/(r sub w) = 120.00
 --LOG OF L/(r sub w) = 2.0792
 FOR PARTIALLY PENETRATING WELLS--
 A = 4.73
 B = 0.85
 FOR FULLY PENETRATING WELLS--
 C = 4.86
 --EVALUATION OF LN(Re/(r sub w)):
 CONST.1 = 0.2253
 CONST.2 = 6.1465 --(MAX. OF 6.0)-- 6.0000
 LN(Re/(r sub w)) = 3.26

EFFECTIVE r sub c (for sandpack dewatering) = 0.0833
 (1/T)LN(Yo/Yt) (SLOPE) = -9.94E-02 sec⁻¹

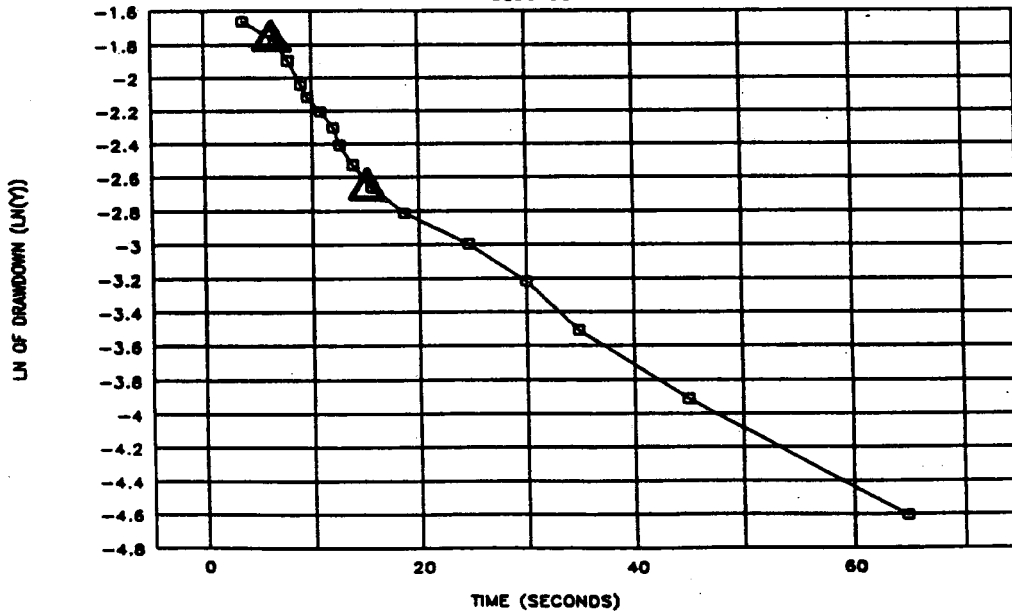
HYDRAULIC CONDUCTIVITY (K) = 1.12E-04 ft/sec
 3.42E-03 cm/sec

Regression Output:

Constant -1.13E+00
 Std Err of Y Est 0.0231
 R Squared 0.9945
 No. of Observations 9
 Degrees of Freedom 7
 X Coefficient(s) -9.94E-02
 Std Err of Coef. 0.0028

△ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-12S
SLUG OUT



• PROJECT NAME : GLOBAL LANDFILL R1/F3
 • PROJECT NO : 36226.30
 • WELL NO : WELL MW-13S (slug out)
 • ANALYST : Przybyl
 • DATE COLLECTED : 7-10-91
 • RISER PIPE (ID): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN DIA AMETER:(2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN LEN NGTH: (L) = 9.00 FL
 • MAX DRAWDOWN (IN SUB SSET): (Ymax) = 0.19 FL
 • STATIC WATER LEVEL: (SWL) = 2.53 FL
 • DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 9.00 FL
 • EST. AQUIFER DEPTH (BWL TO AQUIFER BOTTOM): (D) = 60.00 FL
 • INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 • SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:
 RATIO OF L/(r sub w) = 108.00
 ---LOG OF L/(r sub w) = 2.0334
FOR PARTIALLY PENETRATING WELLS---
 A = 4.50
 B = 0.79
FOR FULLY PENETRATING WELLS---
 C = 4.63
 ---EVALUATION OF LN(Ro/(r sub w)):
 CONST.1 = 0.2349
 CONST.2 = 6.1966 --(MAX. OF 6.0)--
 LN(Ro/(r sub w)) = 3.12 6.0000

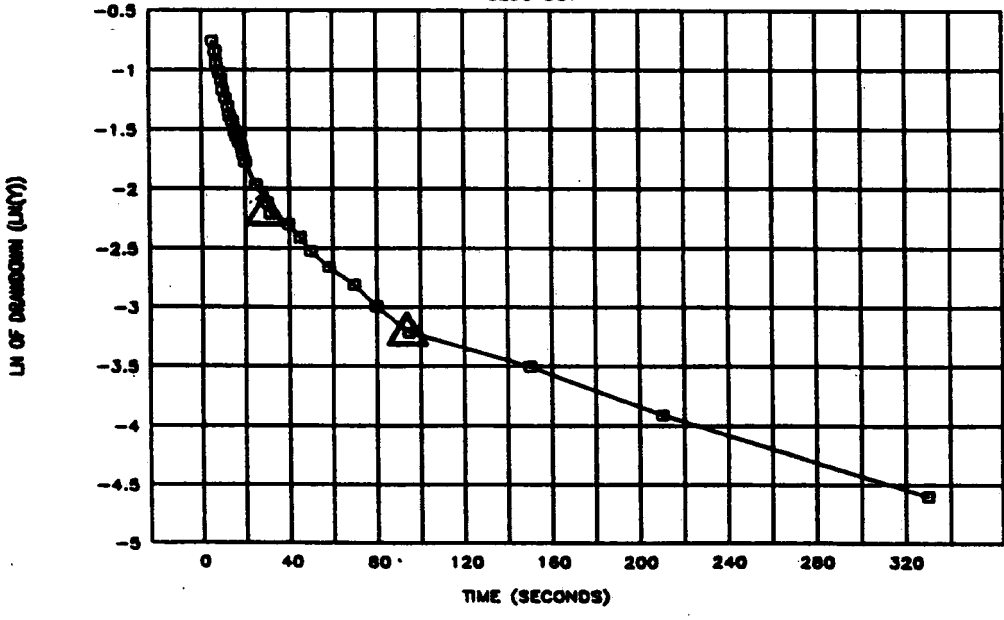
EFFECTIVE r sub c (for sandpack dewatering) = 0.0633
 (1/T)(LN(Yo/Y1)) (SLOPE) = -1.02E-02 sec⁻¹(-1)

HYDRAULIC CONDUCTIVITY (K) = 1.95E-06 N/sec <-----
 5.98E-04 cm/sec <-----

Regression Output:
 Constant -1.69E+00
 Std Err of Y Est 0.0214
 R Squared 0.9968
 No. of Observations 8
 Degrees of Freedom 6
 X Coefficient(s) -1.02E-02
 Std Err of Coef. 0.0004

△ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-13S
 SLUG OUT



* PROJECT NAME : GLOBAL LANDFILL RI/FS
 * PROJECT NO : 35226.30
 * WELL NO : WELL MW-14D (slug out)
 * ANALYST : Przybyl
 * DATE COLLECTED : 7-10-91
 * RISER PIPE (ID): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 * EFFECTIVE SCREEN DIA AMETER:(2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 * EFFECTIVE SCREEN LEN NGTH: (L) = 15.00 Ft.
 * MAX DRAWDOWN (IN SUB BSET): (Ymax) = 0.39 Ft.
 * STATIC WATER LEVEL: (SWL) = 4.67 Ft.
 * DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 55.00 Ft.
 * EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 100.00 Ft.
 * INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 * SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

CHECKED BY:

BOUMER AND RICE CURVE COEFFICIENTS:

RATIO OF L/(r sub w) = 180.00
 --- LOG OF L/(r sub w) = 2.2563
 FOR PARTIALLY PENETRATING WELLS---
 A = 6.67
 B = 1.14
 FOR FULLY PENETRATING WELLS---
 C = 6.44
 --- EVALUATION OF LN(Re/(r sub w)):
 CONST.1 = 0.1694
 CONST.2 = 5.2918 --(MAX. OF 6.0)-- 6.0000
 LN(Re/(r sub w)) = 4.19

EFFECTIVE r sub w (for sandpack dewatering) = 0.0833
 (1/T)(LN(Yo/Yt)) (SLOPE) = -8.32E-02 sec⁻¹

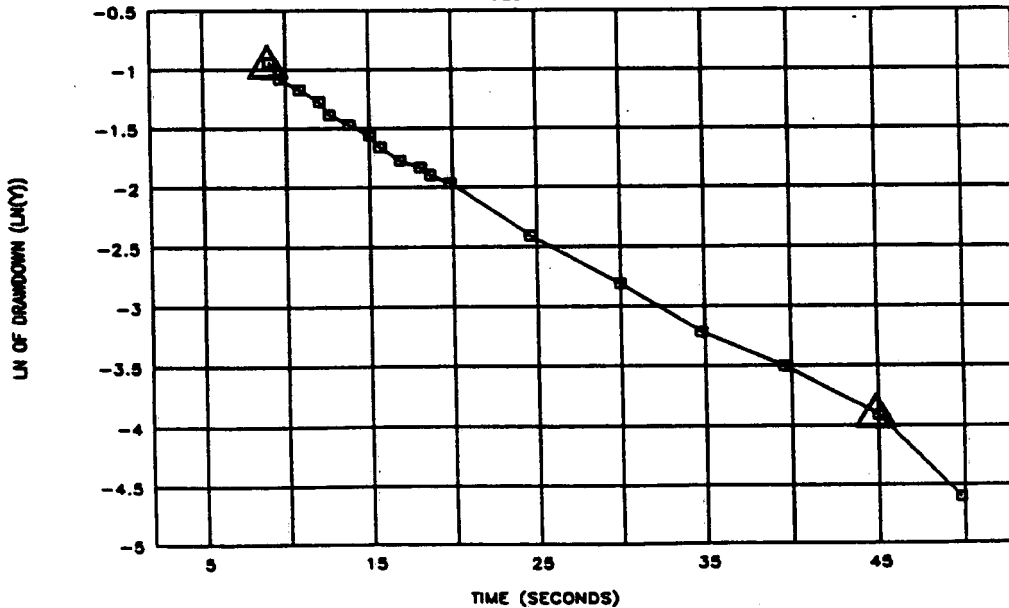
HYDRAULIC CONDUCTIVITY (K) = 8.06E-05 ft/sec
 2.46E-03 cm/sec

Regression Output:

Constant -3.10E-01
 Std Err of Y Est 0.0834
 R Squared 0.9863
 No. of Observations 16
 Degrees of Freedom 14
 X Coefficient(s) -8.32E-02
 Std Err of Coef. 0.0016

△ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-14D
SLUG OUT



* PROJECT NAME : GLOBAL LANDFILL R/F/S
 * PROJECT NO : 35226.30
 * WELL NO : WELL MW-14S (slug out)
 * ANALYST : Przybyl
 * DATE COLLECTED : 7-8-81
 * RISER PIPE (ID): (d) (2 r sub o) = 2.0 in. = 0.0833 (radius in ft.)
 * EFFECTIVE SCREEN DIA AMETER:(2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 * EFFECTIVE SCREEN LEN NGTH: (L) = 10.00 FL
 * MAX DRAWDOWN (IN SUB BSET): (Ymax) = 0.38 FL
 * STATIC WATER LEVEL: (SWL) = 2.44 FL
 * DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 11.00 FL
 * EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 11.00 FL
 * INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 * SANDPACK'S SPECIFIC YIELD (Sy) = 0.18

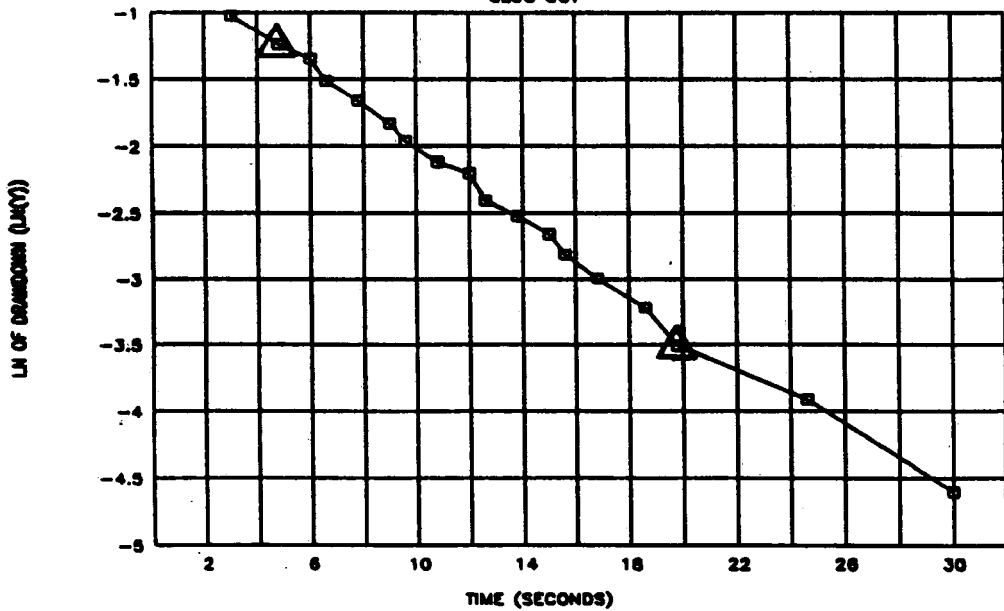
BOWER AND RICE CURVE COEFFICIENTS:
 RATIO OF L/(r sub w) = 120.00
 ---LOG OF L/(r sub w) = 2.0792
 FOR PARTIALLY PENETRATING WELLS---
 A = 4.73
 B = 0.65
 FOR FULLY PENETRATING WELLS---
 C = 4.98
 ---EVALUATION OF LN(Ra/(r sub w)):
 CONST.1 = 0.2263
 CONST.2 = ERR (MAX. OF 6.0) = 3.75
 LN(Ra/(r sub w)) = ERR

EFFECTIVE r sub o (for sandpack dewatering) = 0.0833
 (1/T)(LN(Yo/Y1)) (SLOPE) = -1.48E-01 sec⁻¹
 HYDRAULIC CONDUCTIVITY (K) = 1.92E-04 ft/sec
 5.96E-03 cm/sec

Regression Output:
 Constant -5.06E-01
 Std Err of Y Est 0.0428
 R Squared 0.9984
 No. of Observations 18
 Degree of Freedom 13
 X Coefficient(s) -1.48E-01
 Std Err of Coef. 0.0025

▲ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-14S
 SLUG OUT



• PROJECT NAME : GLOBAL LANDFILL R1/F9
 • PROJECT NO : 35226.30
 • WELL NO : WELL MW-15D (slug out)
 • ANALYST : Przybyl
 • DATE COLLECTED : 7-10-91
 • RISER PIPE (D): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN DIA AMETER: (2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN LENGTH: (L) = 10.00 Ft.
 • MAX DRAWDOWN (IN SUB BSET): (Ymax) = 0.37 Ft.
 • STATIC WATER LEVEL: (SWL) = 3.37 Ft.
 • DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 41.50 Ft.
 • EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 100.00 Ft.
 • INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 • SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:

RATIO OF L/(r sub w) = 120.00
 —LOG OF L/(r sub w) = 2.0792

FOR PARTIALLY PENETRATING WELLS—

A = 4.73
 B = 0.85

FOR FULLY PENETRATING WELLS—

C = 4.96

—EVALUATION OF LN(Re/(r sub w)):

CONST.1 = 0.1771
 CONST.2 = 6.5539 —(MAX. OF 6.0)— 6.0000
 LN(Re/(r sub w)) = 3.88

EFFECTIVE r sub c (for sandpack dewatering) = 0.0833
 (1/T)(LN(Yo/Y)) (SLOPE) = -1.41E-01 sec⁻¹(-1)

HYDRAULIC CONDUCTIVITY (K) = 1.89E-04 ft/sec <-----
 5.77E-03 cm/sec <-----

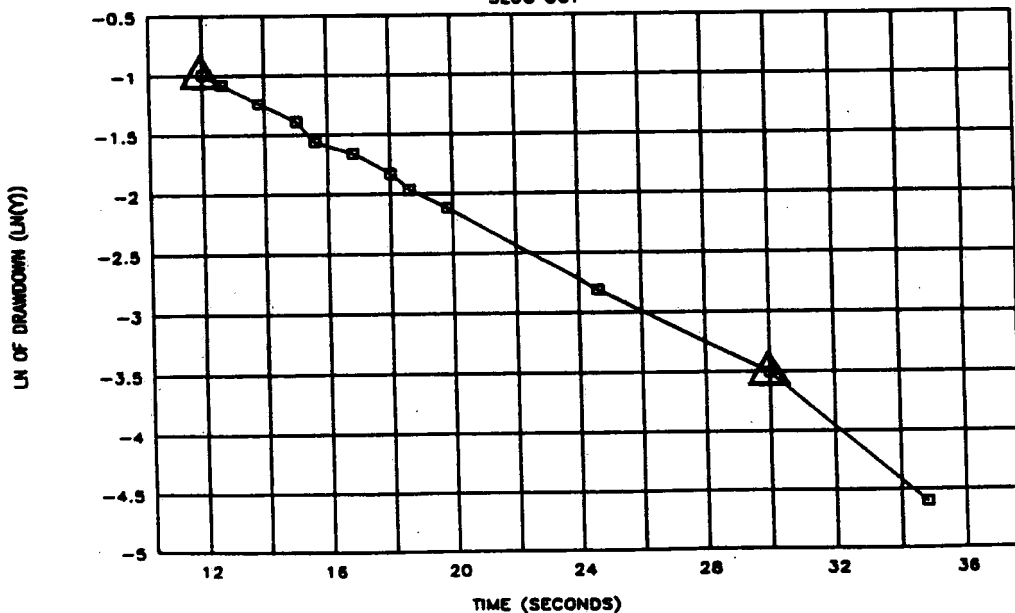
Regression Output:

Constant 6.84E-01
 Std Err of Y Est 0.0314
 R Squared 0.9865
 No. of Observations 11
 Degrees of Freedom 9

X Coefficient(s) -1.41E-01
 Std Err of Coef. 0.0018

△ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-15D
SLUG OUT



• PROJECT NAME : GLOBAL LANDFILL RI/FS
 • PROJECT NO : 35229.30
 • WELL NO : WELL MW-15S (slug out)
 • ANALYST : Przybyl
 • DATE COLLECTED : 7-10-91
 • CHECKED BY :
 • RISER PIPE (ID): (d) (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN DIA AMETER:(2 r sub w) = 2.0 in. = 0.0833 (radius in ft.)
 • EFFECTIVE SCREEN LEN NGTH: (L) = 10.00 Ft.
 • MAX DRAWDOWN (IN SUB BSET): (Ymax) = 0.03 Ft.
 • STATIC WATER LEVEL: (SWL) = 1.65 Ft.
 • DEPTH FROM SWL TO EFF. SCREEN BOTTOM: (H) = 10.50 Ft.
 • EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 10.50 Ft.
 • INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 0
 • SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOWLER AND RICE CURVE COEFFICIENTS:
 RATIO OF L/(r sub w) = 120.00
 ---LOG OF L/(r sub w) = 2.0792
FOR PARTIALLY PENETRATING WELLS---
 A = 4.73
 B = 0.86
FOR FULLY PENETRATING WELLS---
 C = 4.06
 ---EVALUATION OF LN(Re/(r sub w)):
 CONST.1 = 0.2274
 CONST.2 = ERR
 LN(Re/(r sub w)) = ERR
 ERR -(MAX. OF 8.0)= 3.72

EFFECTIVE r sub c (for sandpack dewatering) = 0.0833
 (1/T)(LN(Yo/Y1)) (SLOPE) = -2.19E-01 sec⁻¹

HYDRAULIC CONDUCTIVITY (K) = 2.83E-04 ft/sec
 8.63E-03 cm/sec

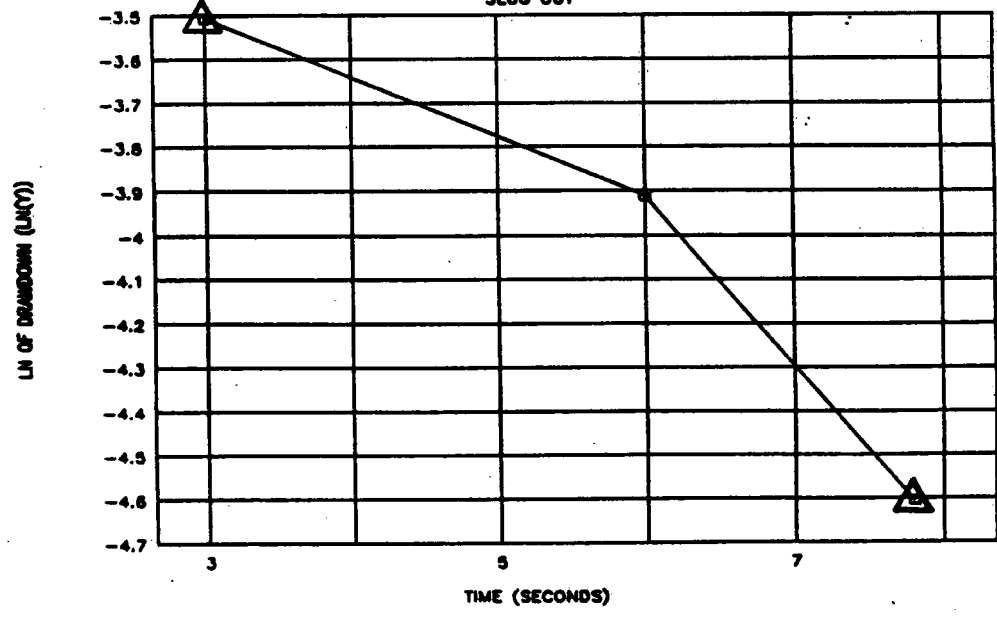
Regression Output:

Constant -2.78E+00
 Std Err of Y Est 0.2272
 R Squared 0.9164
 No. of Observations 3
 Degrees of Freedom 1

X Coefficient(s) -2.19E-01
 Std Err of Coef. 0.0663

△ REGRESSED INTERVAL

RATE OF RECOVERY TEST: WELL MW-15S
SLUG OUT



APPENDIX I

GEOTECHNICAL TESTING REPORT



AUG 8 1991

GEOTECHNICAL TESTING REPORT
GLOBAL LANDFILL SITE
OLD BRIDGE, NEW JERSEY

For:

URS Consultants, Inc.
Buffalo, New York

JOB NO. G008.007
July, 1991



AUG 8 1991

August 5, 1991

Mr. Bruce Przybyl, PE
URS Consultants, Inc.
282 Delaware Avenue
Buffalo, New York 14202-1805

Reference: Geotechnical Testing, Contaminated Soil Samples
Global Landfill Site
Old Bridge, New Jersey

Dear Mr. Przybyl:

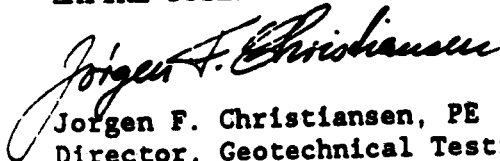
Transmitted herewith are two (2) copies of the Geotechnical Testing Report for testing performed on contaminated soil samples from the Global Landfill Site in Old Bridge, New Jersey. The study was performed as part of the Subcontract Agreement with Empire Soils Investigations, Inc., 35 National Road, Edison, New Jersey.

A total of fifteen (15) soil samples were received at our laboratory in Middleport, New York on July 17, 1991. The samples were catalogued with Lab Nos. 850.001 through 850.015, inclusive. In accordance with instructions received with the sample shipment all samples were tested for grain size distribution in accord with ASTM Designation D 422. Individual grain size distribution test reports are attached.

Should you have any questions, or in case we may be of further service, do not hesitate to contact the undersigned at 716-735-3400.

Respectfully submitted,

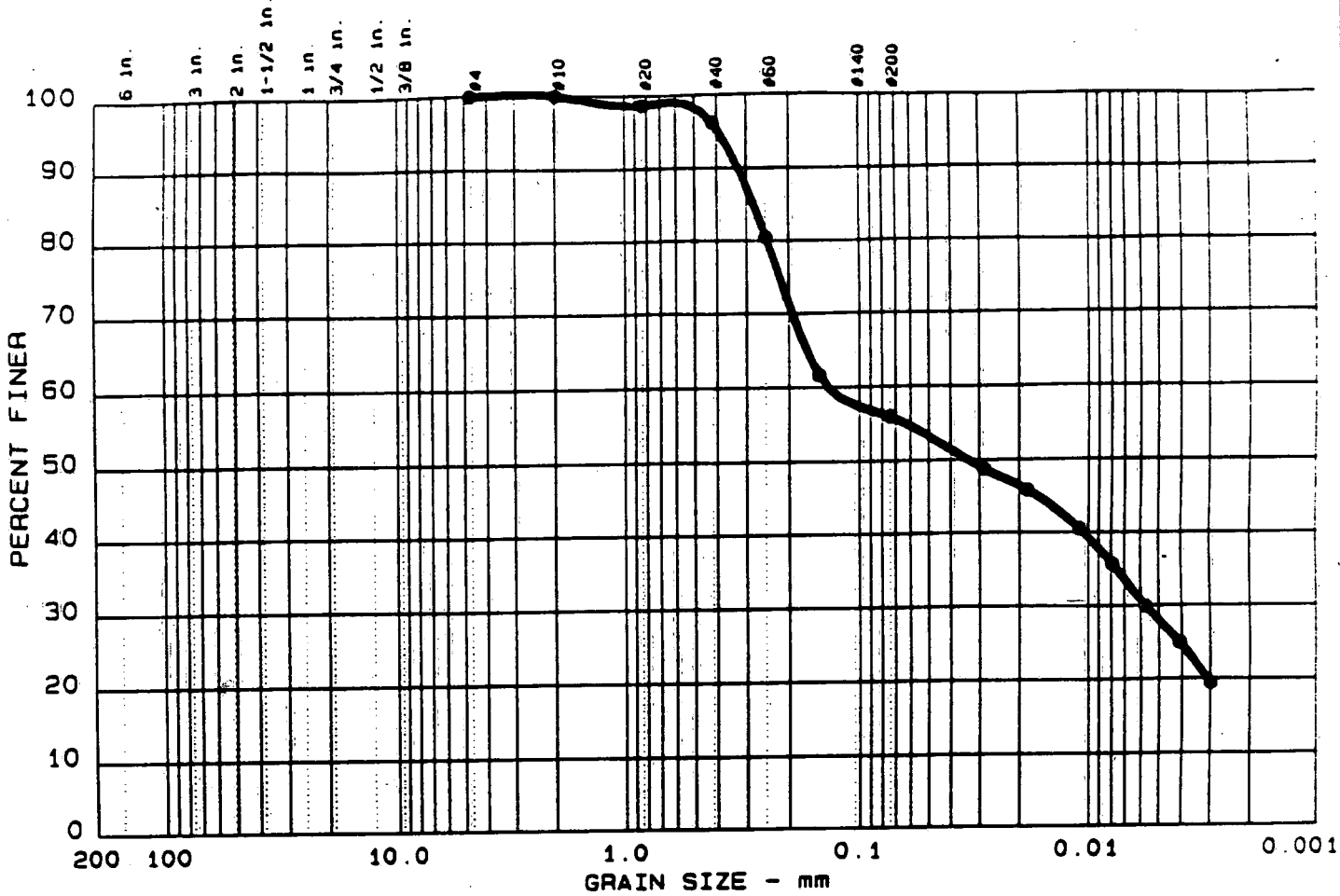
EMPIRE SOILS INVESTIGATIONS, INC.


Jorgen F. Christiansen, PE
Director, Geotechnical Testing

JFC/lkn

Enclosures

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 1	0.0	0.0	44.1	28.0	27.9

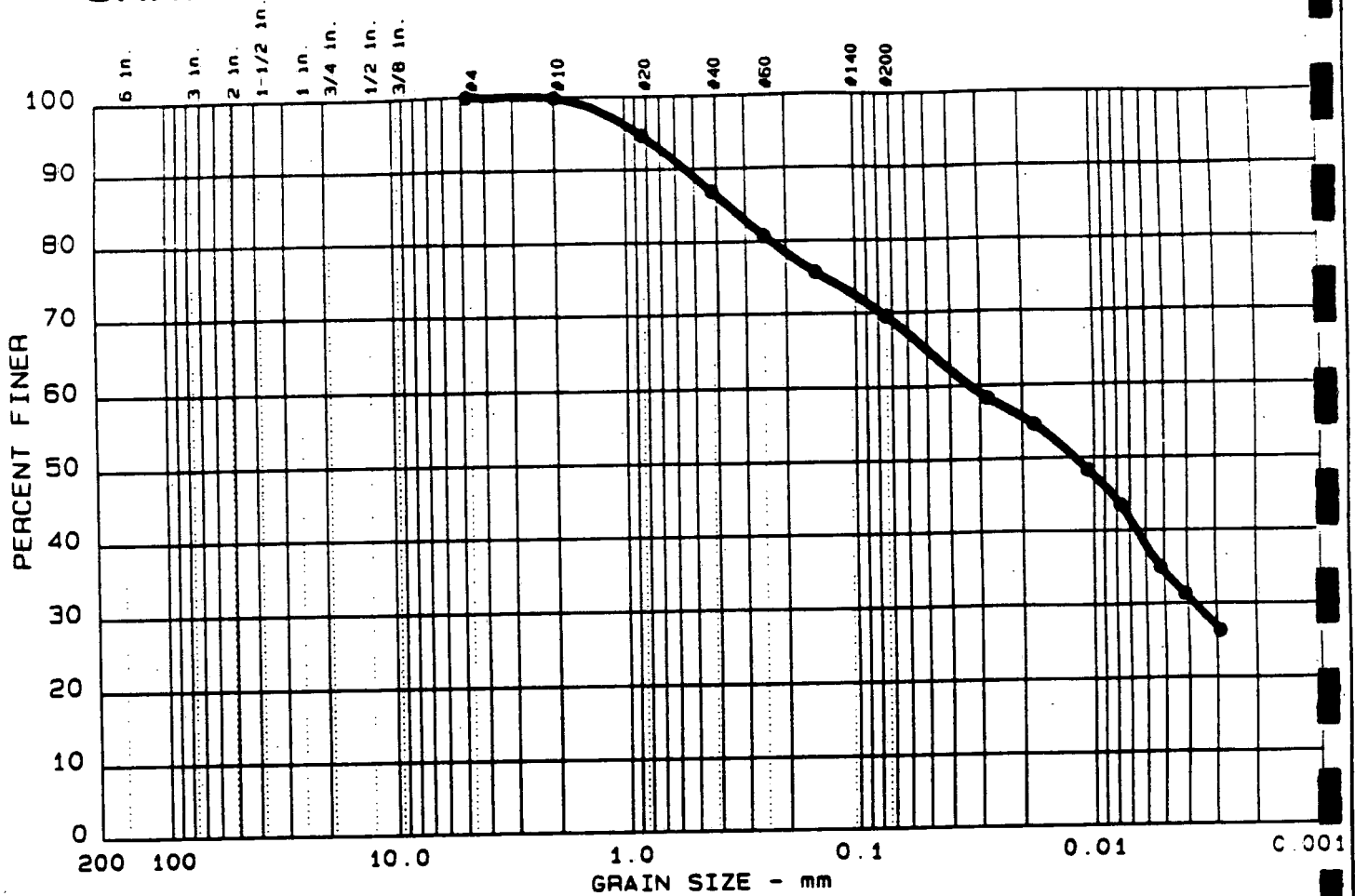
LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
●		0.28	0.14	0.03	0.006				

MATERIAL DESCRIPTION	USCS	AASHTO
● BLACK SAND, Sm Silt & clay, ORGANICS		

Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SD-1
 Date: JULY 31, 1991

Remarks:
 CLIENT: URS CONSULTANTS
 +10 SIEVES CONTAINED
 ORGANIC MATERIAL
 LAB NO. 850.001

GRAIN SIZE DISTRIBUTION TEST REPORT



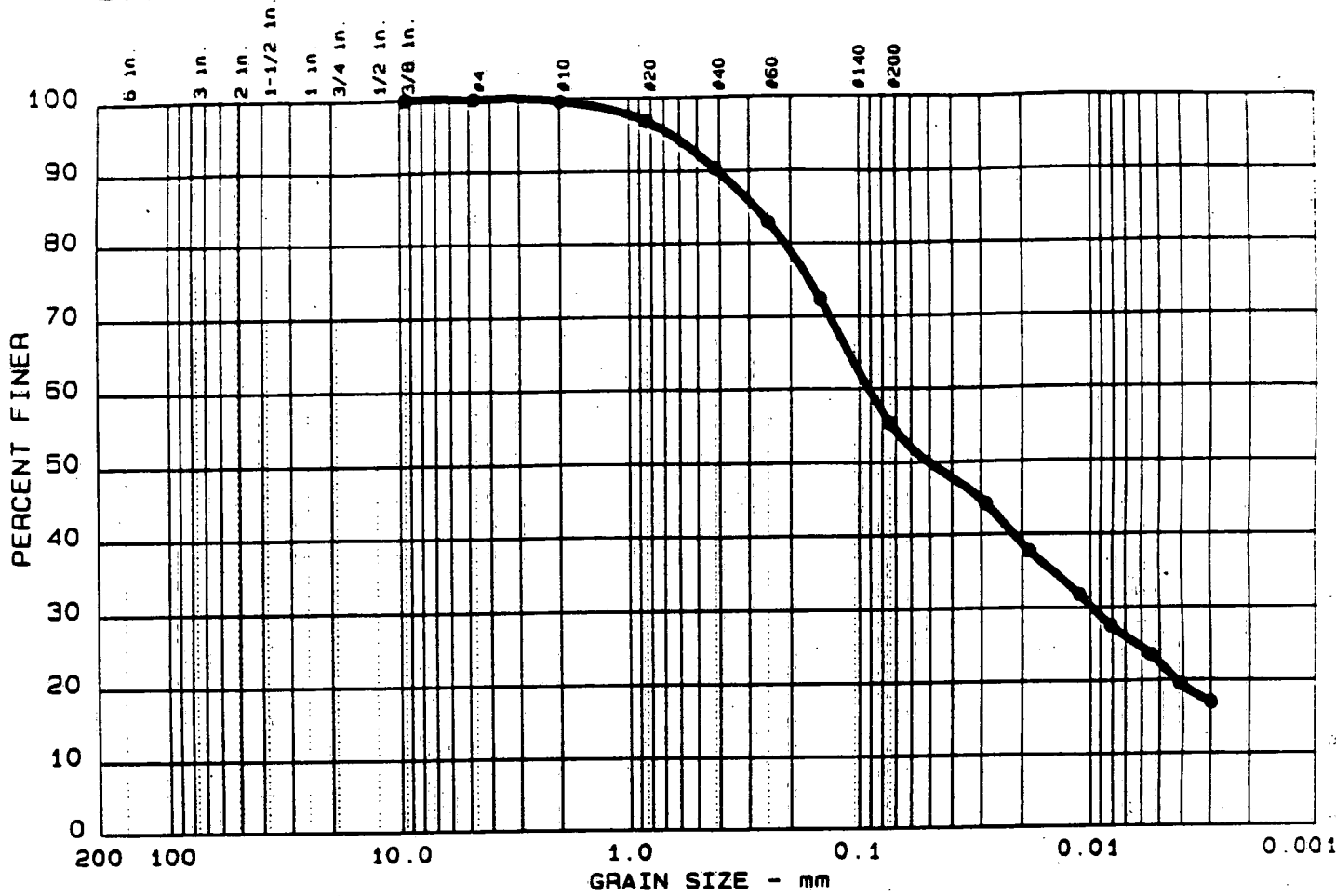
Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 2	0.0	0.0	30.5	35.2	34.3

LL	PI	D ₉₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.36		0.01	0.004				

MATERIAL DESCRIPTION	USCS	AASHTO
● BLACK SILT And Clay, some sand, ORGANICS		

Project No.: G008.007 Project: GLOBAL LANDFILL ● Location: SD-2 Date: JULY 31, 1991	Remarks: CLIENT: URS CONSULTANTS +10 SIEVES CONTAINED ORGANIC MATERIAL LAB NO. 850.002
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GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 3	0.0	0.2	44.6	33.0	22.2

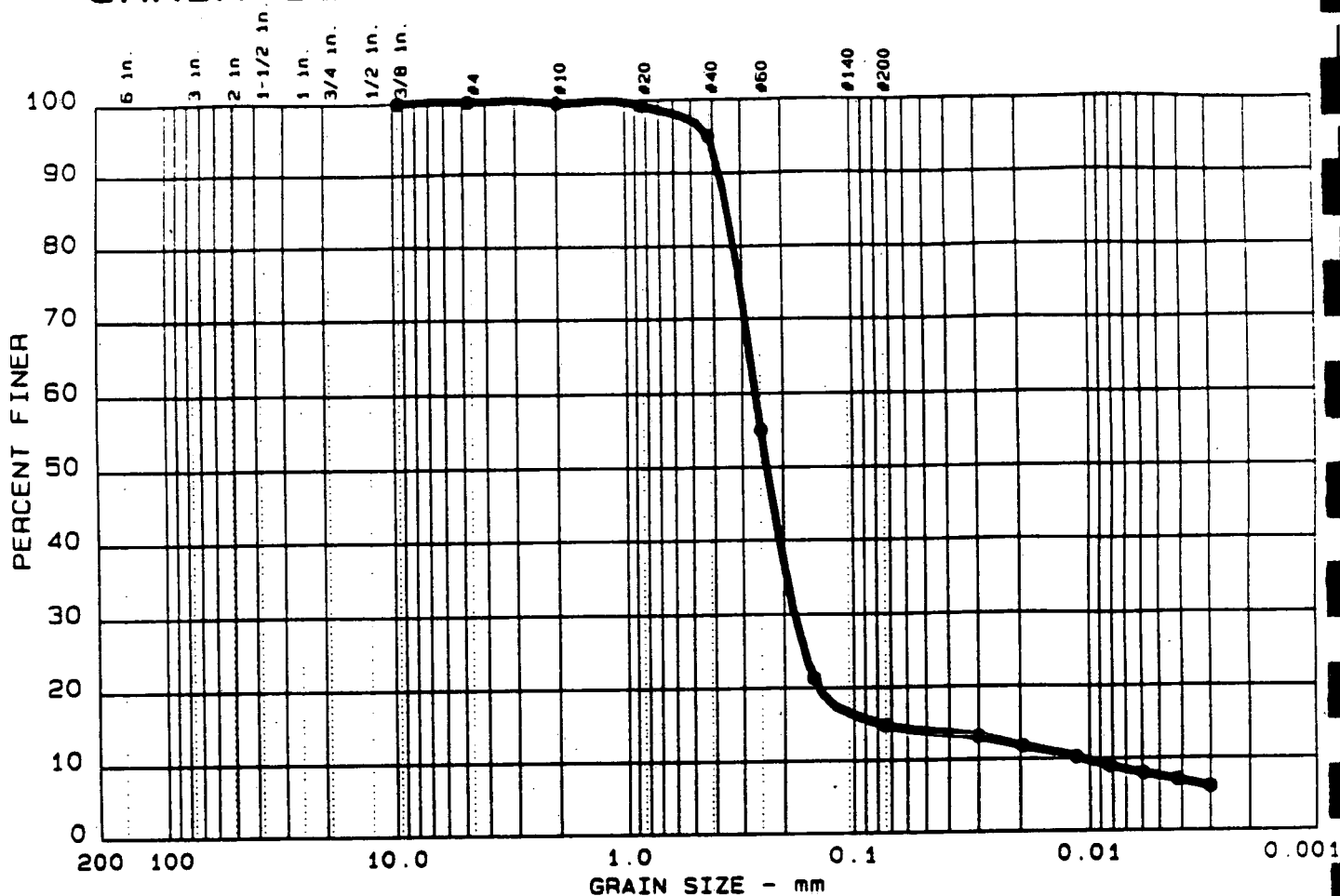
LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.29	0.09	0.05	0.010				

MATERIAL DESCRIPTION	USCS	AASHTO
● BLACK SAND, Sm Silt, lt clay, tr gravel, ORGANICS		

Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SD-3
 Date: JULY 31, 1991

Remarks:
 CLIENT: URS CONSULTANTS
 +10, +4 SIEVES CONTAINED ORGANIC MATERIAL
 LAB NO. 850.003

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 4	0.0	0.2	85.1	7.3	7.4

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
●		0.35	0.26	0.24	0.180	0.0760	0.0109	11.36	24.2

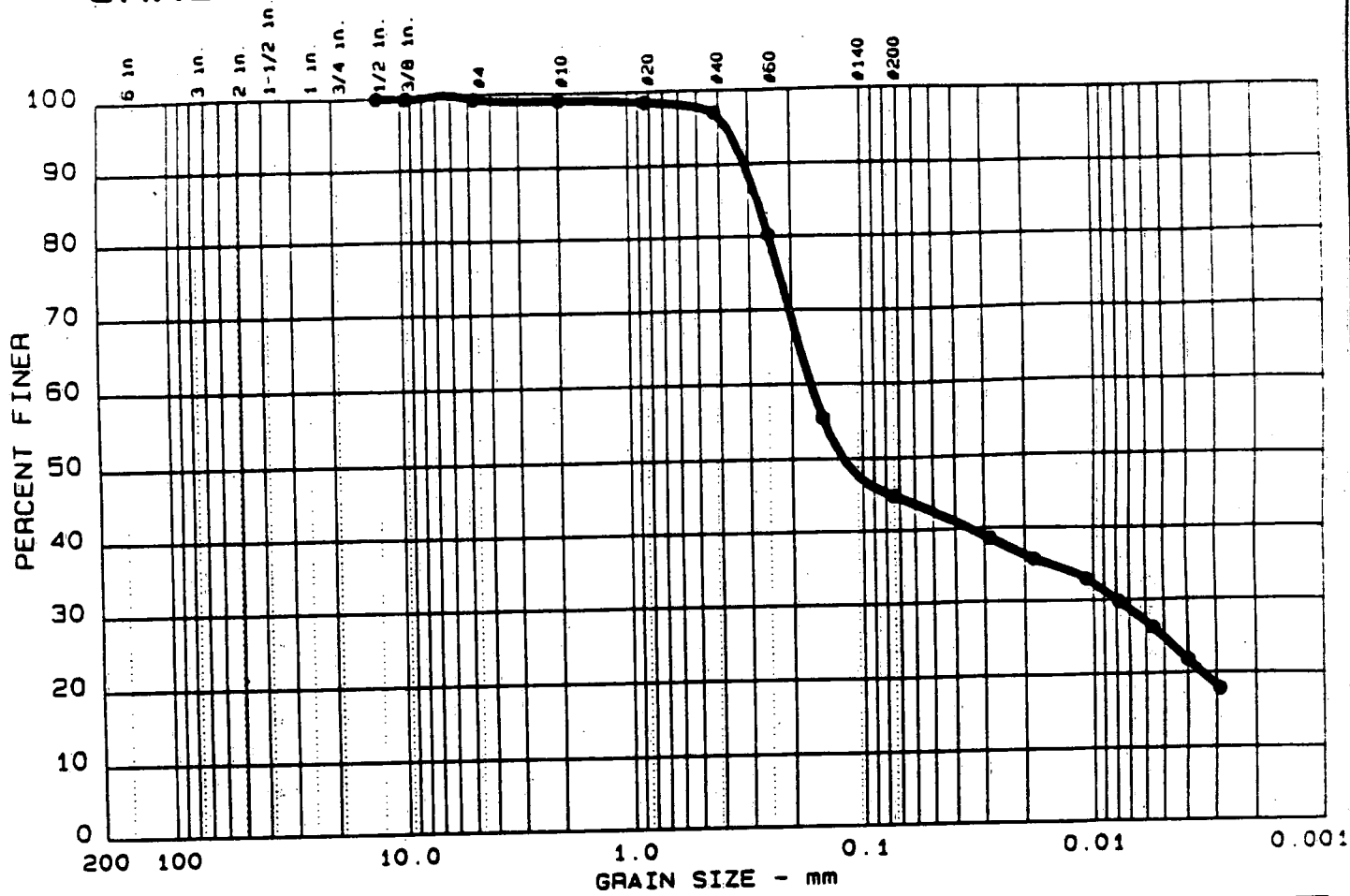
MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, Trace Clay, silt, gravel, ORGANICS		

Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SD-4

 Date: JULY 31, 1991

Remarks:
 CLIENT: URS CONSULTANTS
 +10, +4 SIEVES CONTAINED
 ORGANIC MATERIAL
 LAB NO. 850.004

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 5	0.0	0.6	54.6	20.0	24.8

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
●		0.28	0.17	0.12	0.008				

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, Some Clay & silt, tr gravel, ORGANICS		

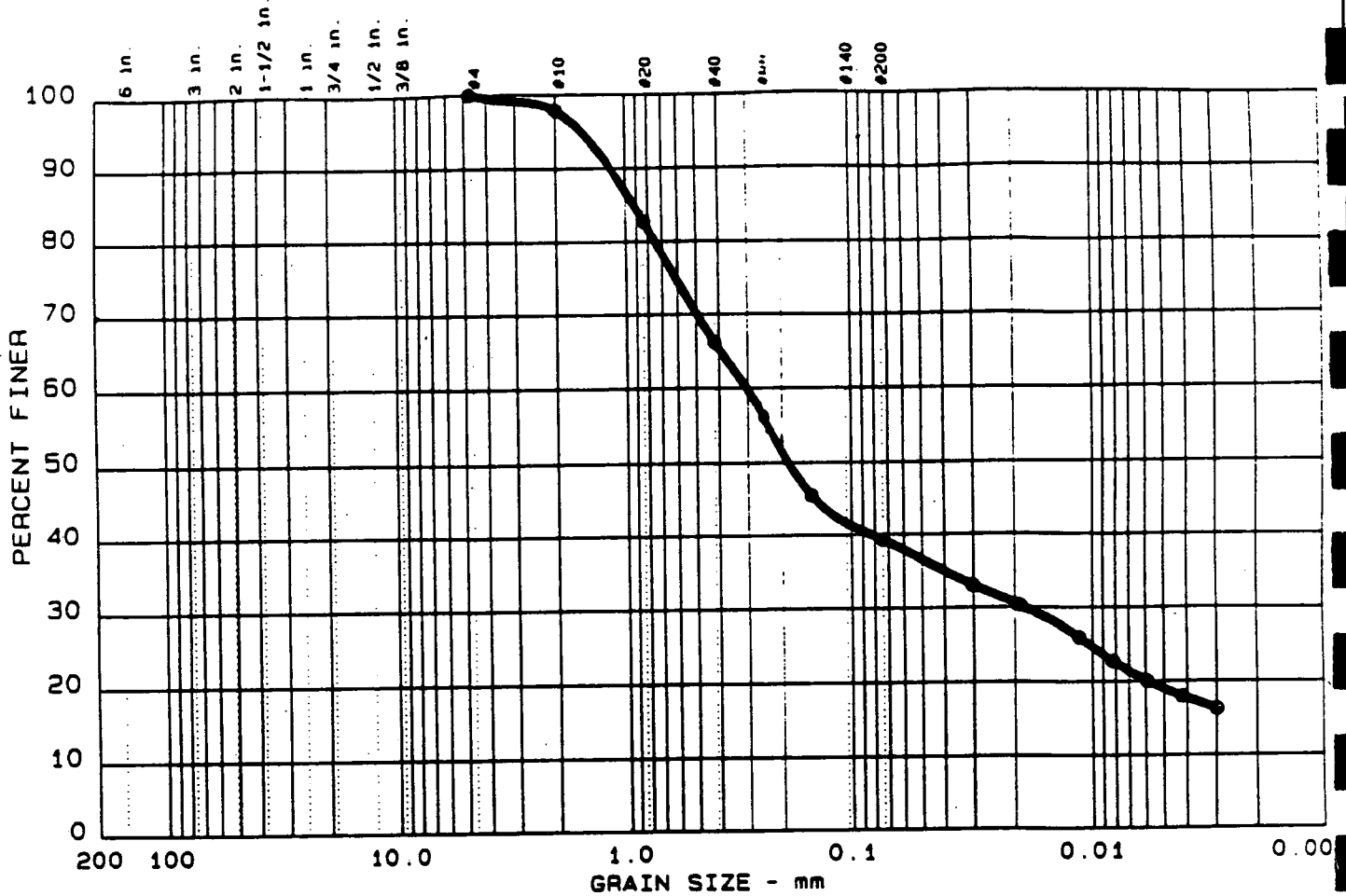
Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SD-5
 Date: JULY 31, 1991

GRAIN SIZE DISTRIBUTION TEST REPORT
EMPIRE SOILS INVESTIGATIONS, INC

Remarks:
 CLIENT: URS CONSULTANTS
 +3/8 - +20 SIEVES CONT.
 ORGANIC MATERIAL
 LAB NO. 850.005

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 6	0.0	0.0	60.7	20.4	18.9

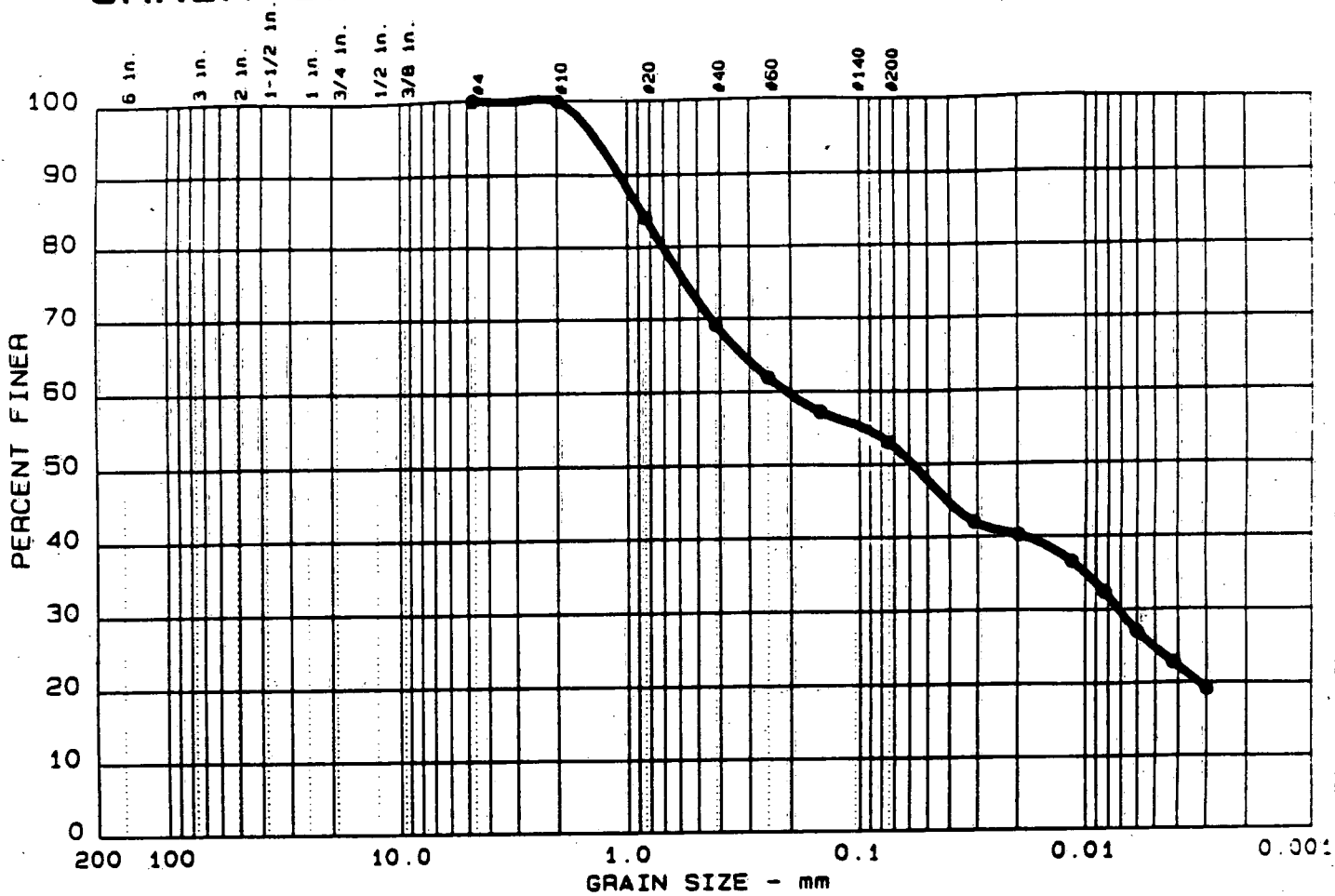
LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.92	0.30	0.19	0.073				

MATERIAL DESCRIPTION	USCS	AASHTO
● BLACK SAND, Some Silt, little clay, ORGANICS		

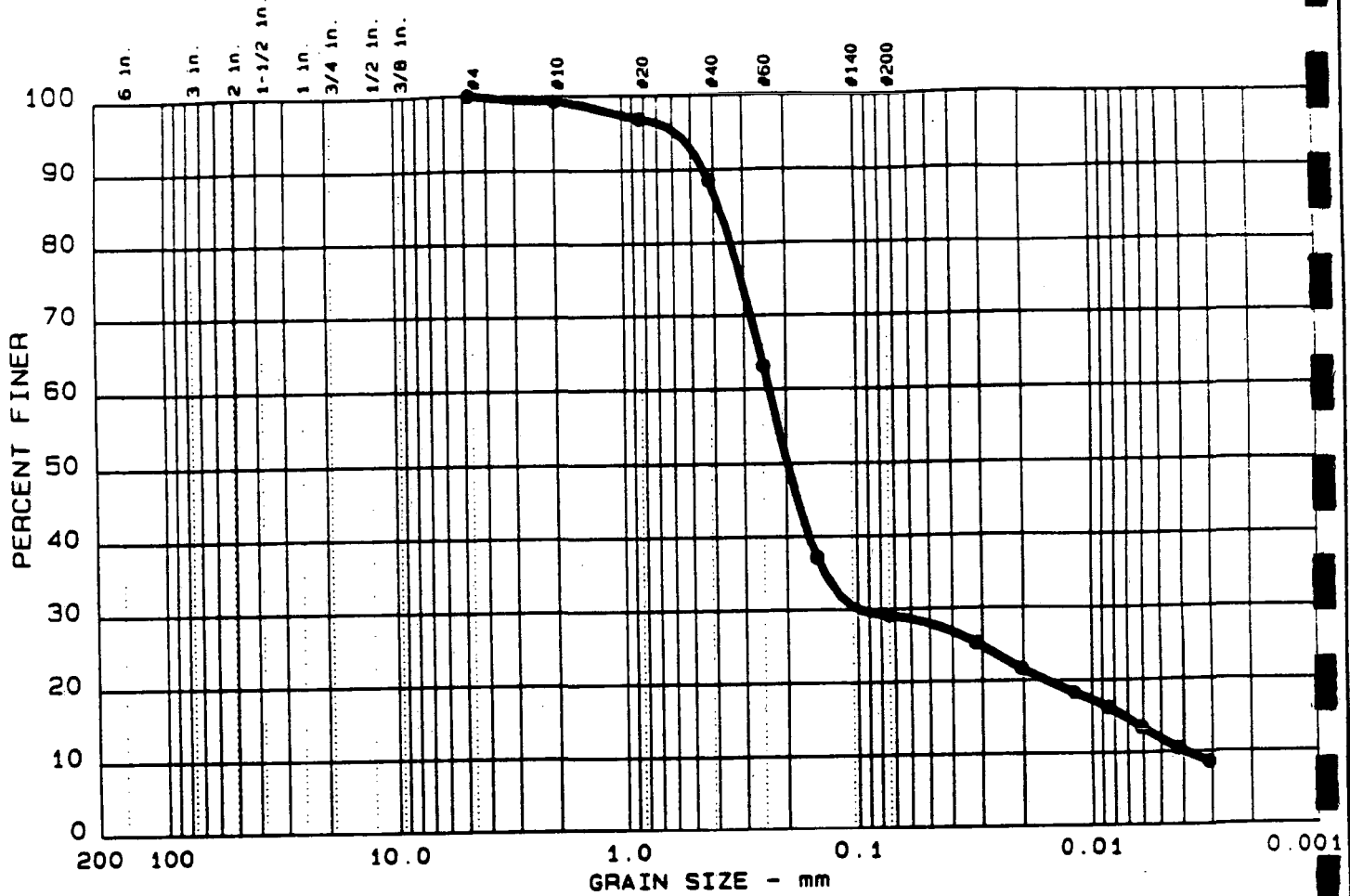
Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SD-6
 Date: JULY 31, 1991

Remarks:
 CLIENT: URS CONSULTANTS
 +10 SIEVE CONTAINED
 ORGANIC MATERIAL
 LAB NO. 850.006

GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 8	0.0	0.0	70.9	17.4	11.7

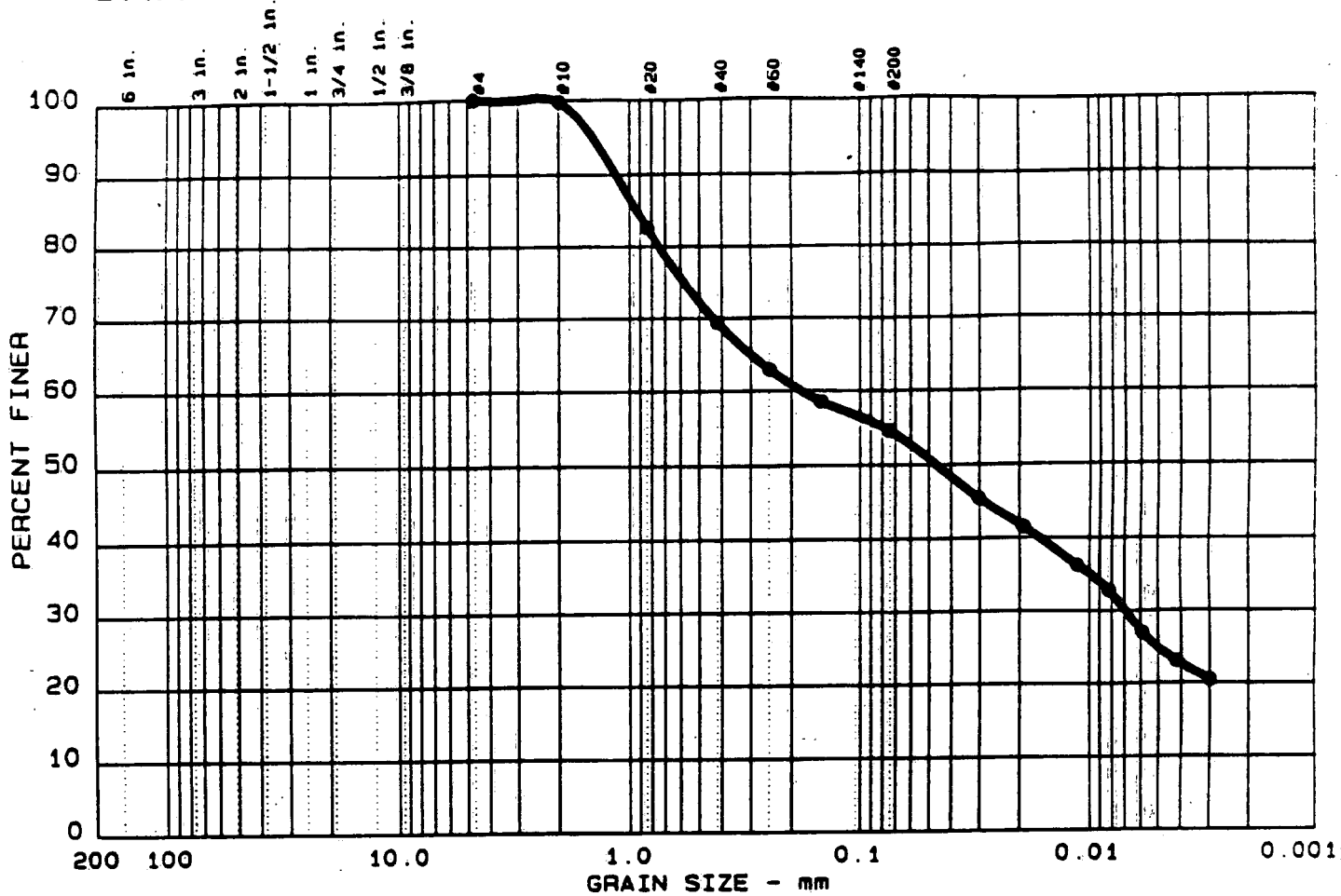
LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.38	0.24	0.20	0.099	0.0073	0.0039	10.53	59.9

MATERIAL DESCRIPTION	USCS	AASHTO
● BLACK SAND, Little Silt & clay, ORGANICS		

Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SD-8
 Date: JULY 31, 1991

Remarks:
 CLIENT: URS CONSULTANTS
 +10 SIEVE CONTAINED ORGANIC MATERIAL
 LAB NO. 850.008

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 9	0.0	0.0	45.5	29.7	24.8

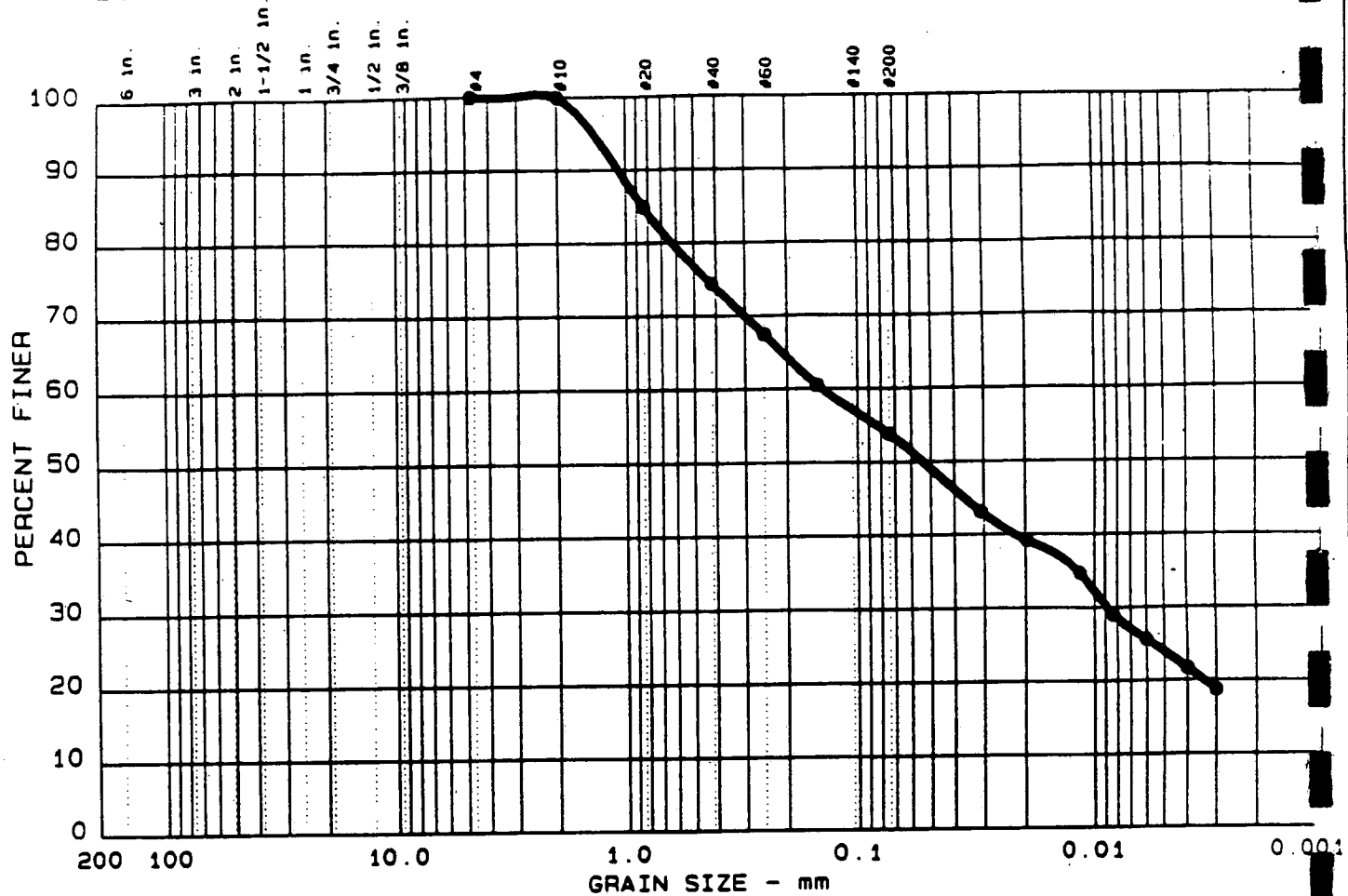
LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
●		0.92	0.18	0.05	0.007				

MATERIAL DESCRIPTION	USCS	AASHTO
● BLACK SAND, Some Silt & clay. ORGANICS		

Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SD-9
 Date: JULY 31, 1991

Remarks:
 CLIENT: URS CONSULTANTS
 +10 SIEVE CONTAINED
 ORGANIC MATERIAL
 LAB NO. 850.009

GRAIN SIZE DISTRIBUTION TEST REPORT



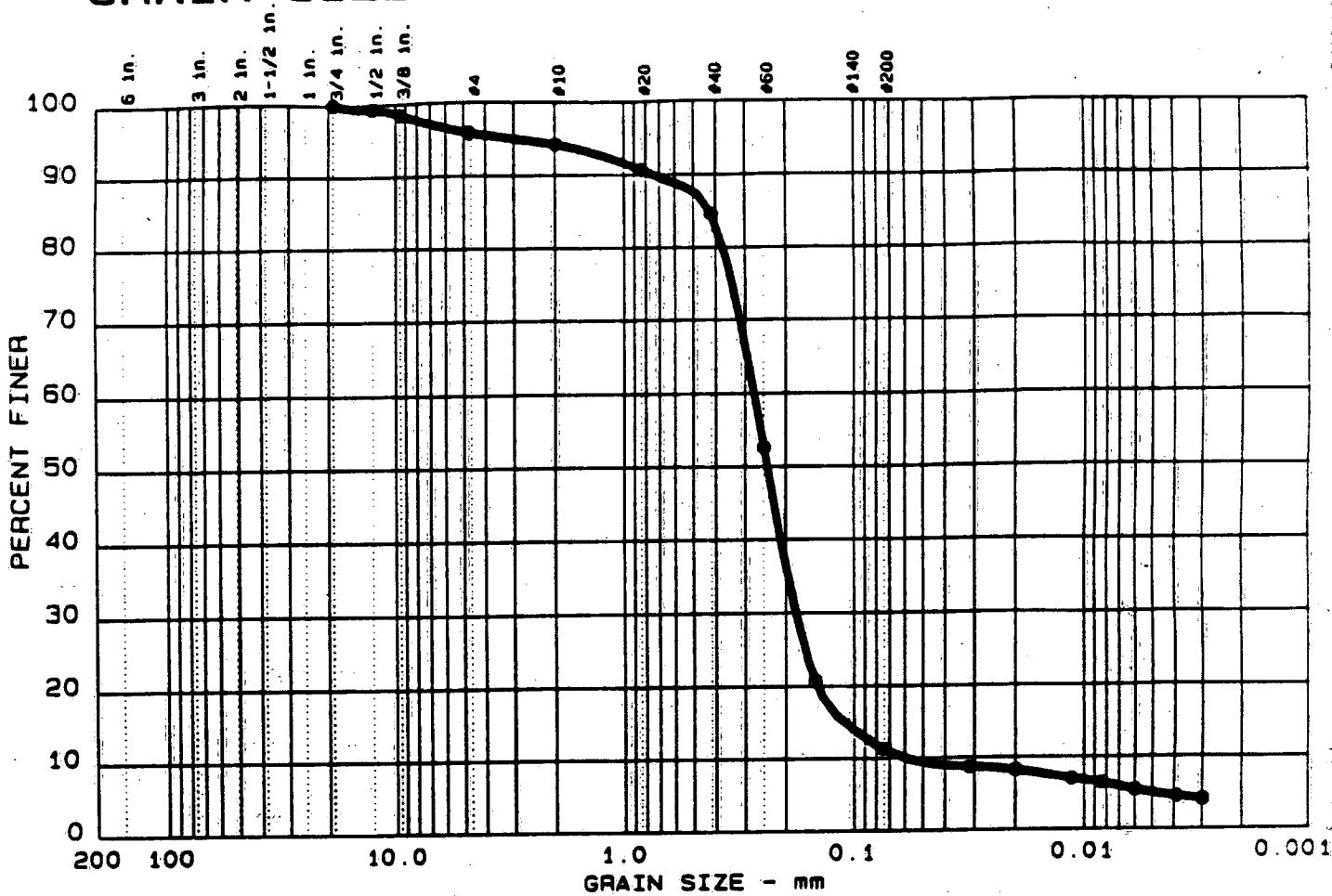
Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 10	0.0	0.0	46.2	29.9	23.9

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
●		0.84	0.14	0.05	0.009				

MATERIAL DESCRIPTION	USCS	AASHTO
● BLACK SAND, Some Silt & clay. ORGANICS		

Project No.: G008.007 Project: GLOBAL LANDFILL ● Location: SD-10 Date: JULY 31, 1991	Remarks: CLIENT: URS CONSULTANTS +10 SIEVE CONTAINED ORGANIC MATERIAL LAB NO. 850.010
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GRAIN SIZE DISTRIBUTION TEST REPORT



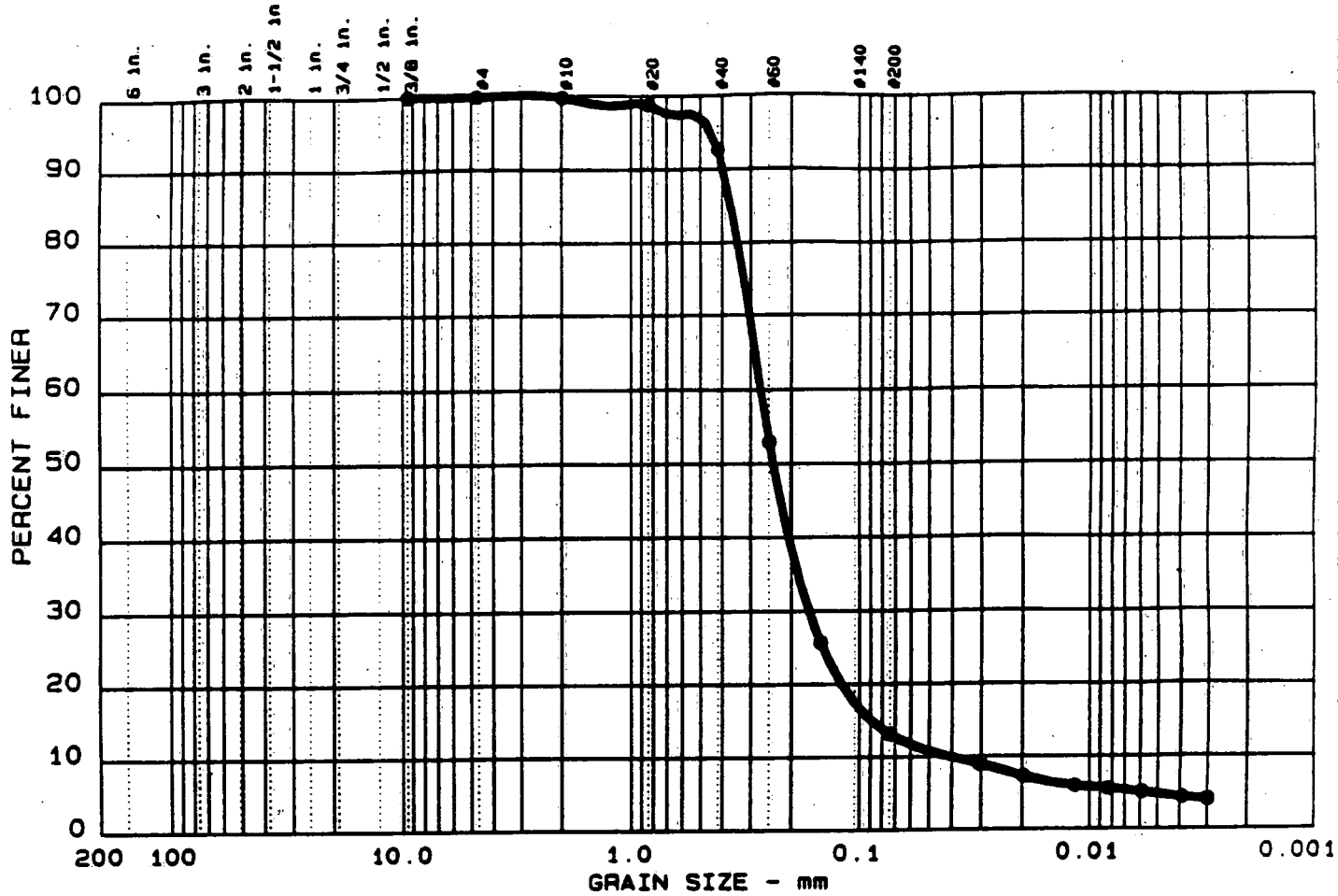
Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 11	0.0	4.1	84.7	6.2	5.0

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
●		0.43	0.28	0.24	0.181	0.1103	0.0585	2.03	4.7

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, Trace Silt, clay, & gravel. ORGANICS		

Project No.: G008.007 Project: GLOBAL LANDFILL ● Location: SS-1 Date: JULY 31, 1991	Remarks: CLIENT: URS CONSULTANTS +3/8 - #10 SIEVES CONT. ORGANIC MATERIAL LAB NO. 850.011
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GRAIN SIZE DISTRIBUTION TEST REPORT



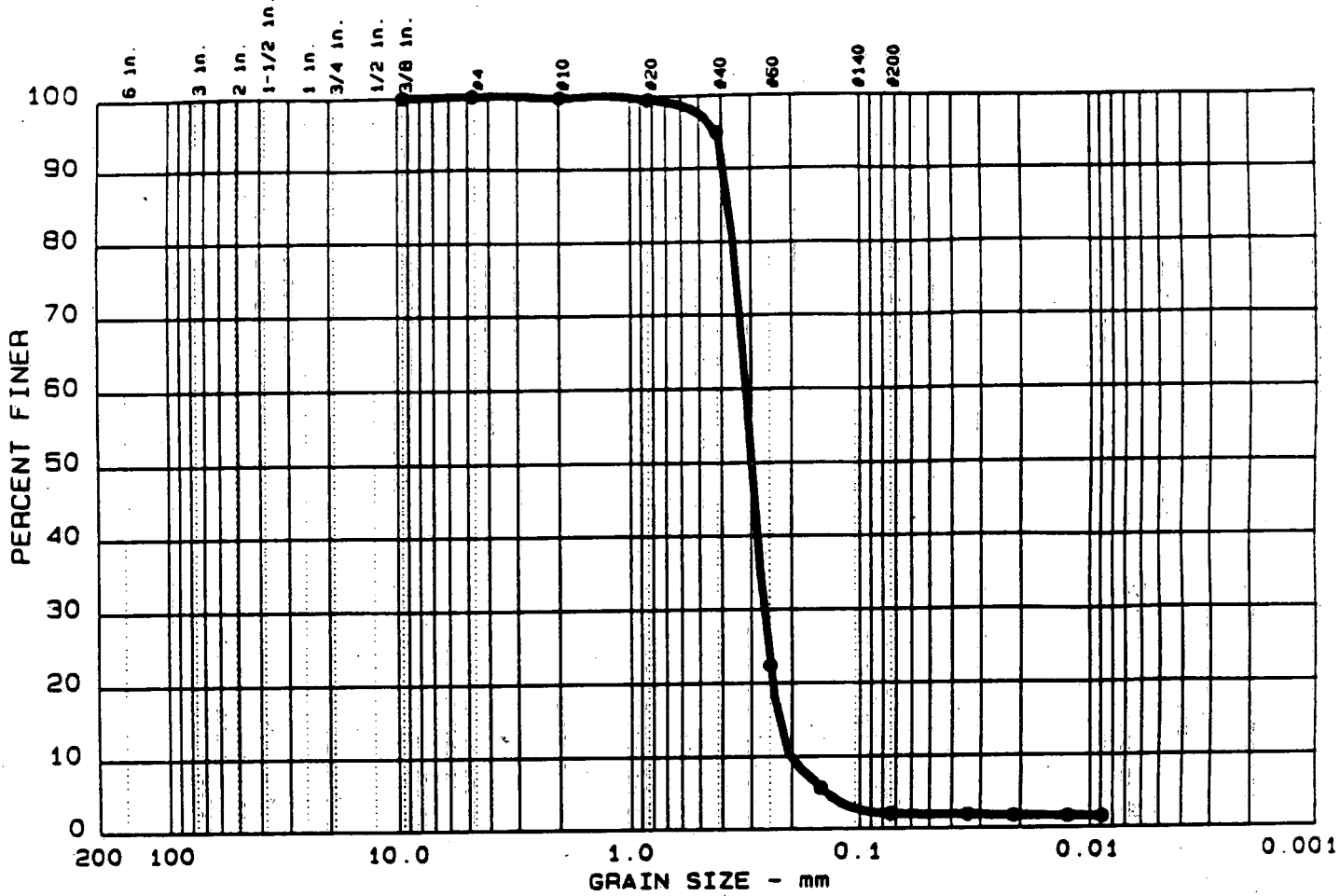
Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 13	0.0	0.2	86.7	8.4	4.7

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
●		0.37	0.27	0.24	0.167	0.0889	0.0416	2.48	6.5

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, Trace Silt, clay & gravel, ORGANICS		

Project No.: G008.007 Project: GLOBAL LANDFILL ● Location: SS-3 Date: JULY 31, 1991	Remarks: CLIENT: URS CONSULTANTS +10 SIEVE CONTAINED ORGANIC MATERIAL LAB NO. 850.013
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GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 15	0.0	0.0	97.9	2.1	

LL	PI	D ₉₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.37	0.32	0.30	0.265	0.2294	0.2044	1.08	1.6

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, Trace Fines, ORGANICS		

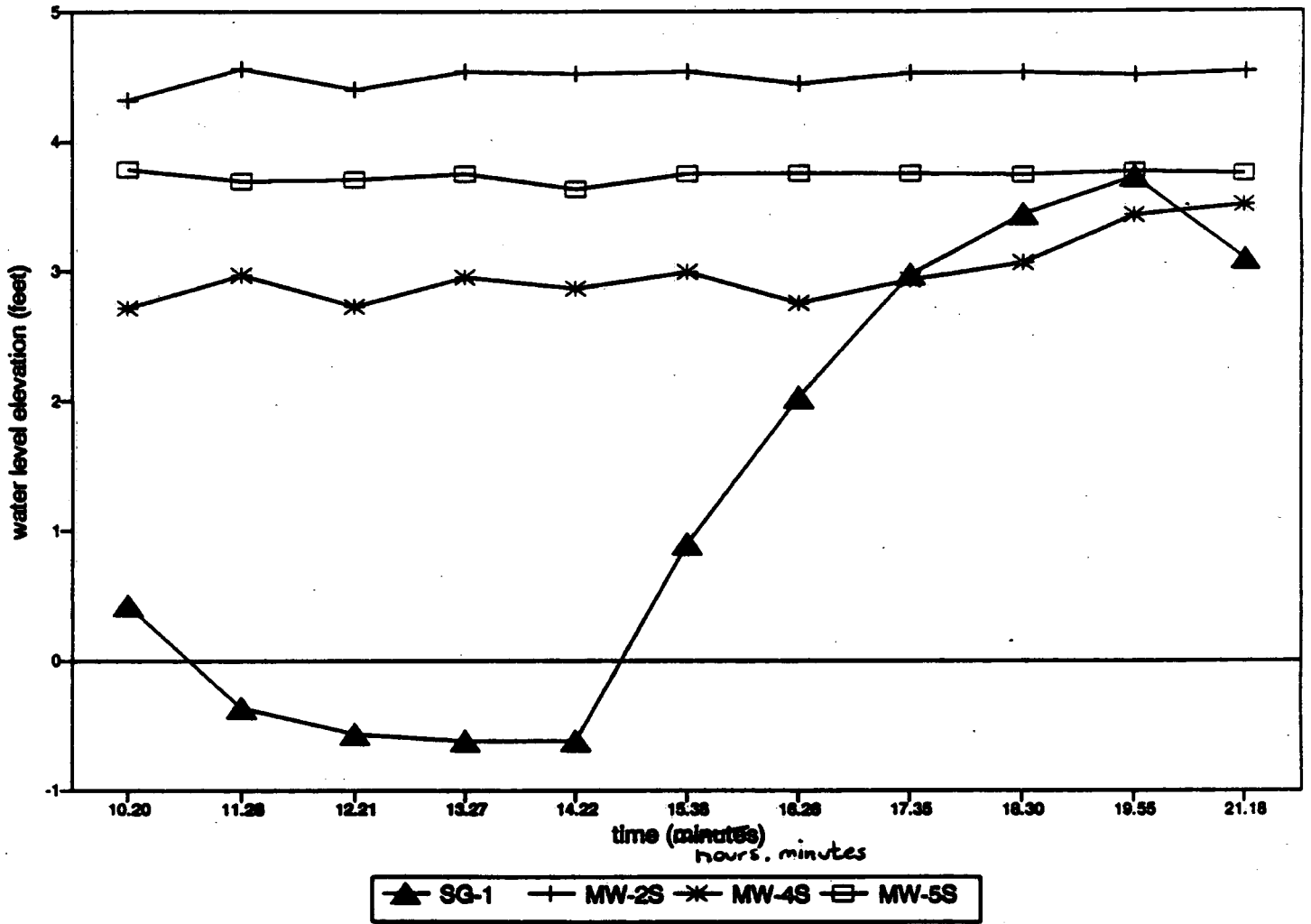
Project No.: G008.007
 Project: GLOBAL LANDFILL
 ● Location: SS-5
 Date: JULY 31, 1991

Remarks:
 CLIENT: URS CONSULTANTS
 +4 & +10 SIEVES CONTAIN ORGANIC MATERIAL
 LAB NO. 850.015

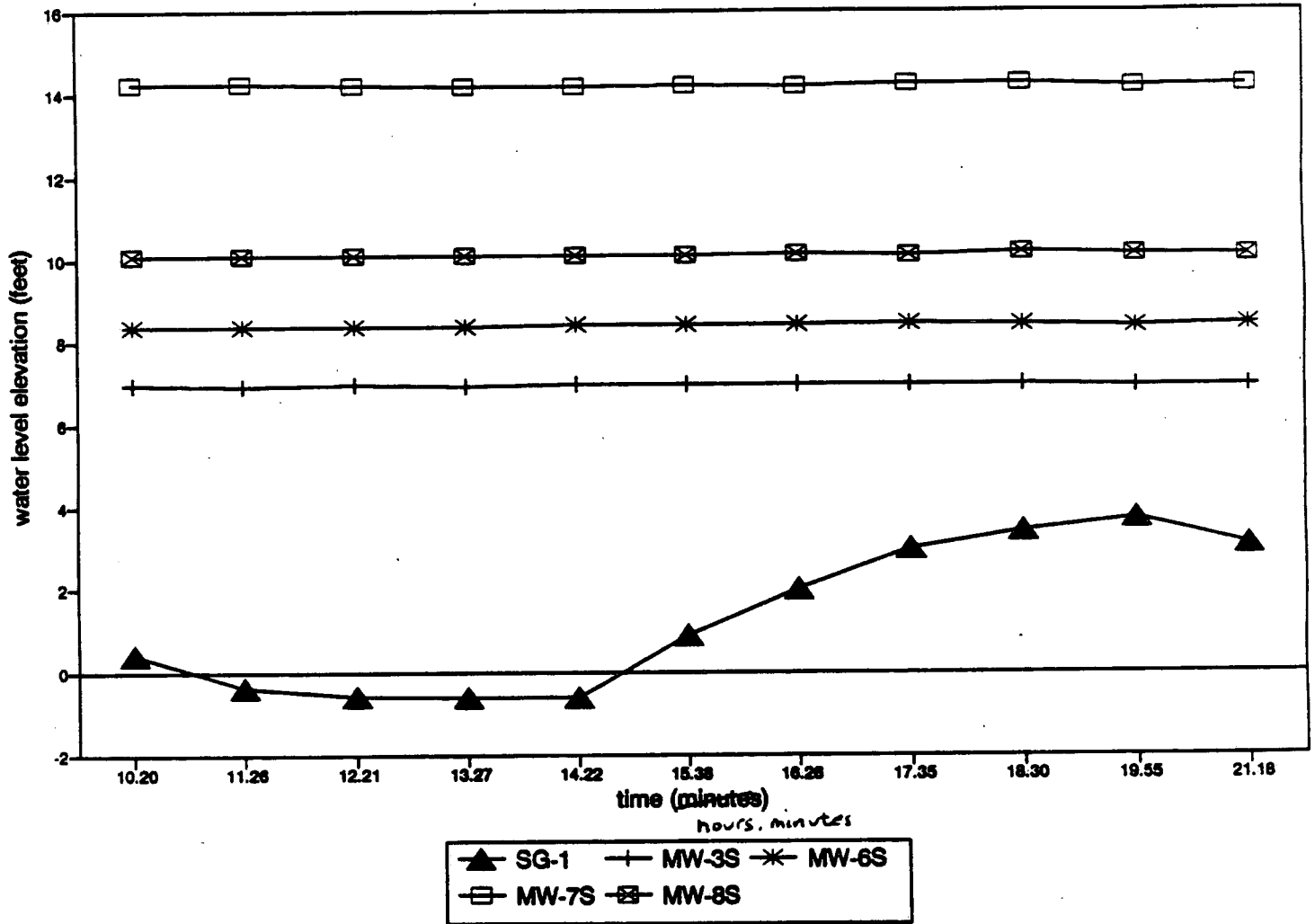
APPENDIX J

SURFACE WATER/GROUNDWATER FLUCTUATION DATA

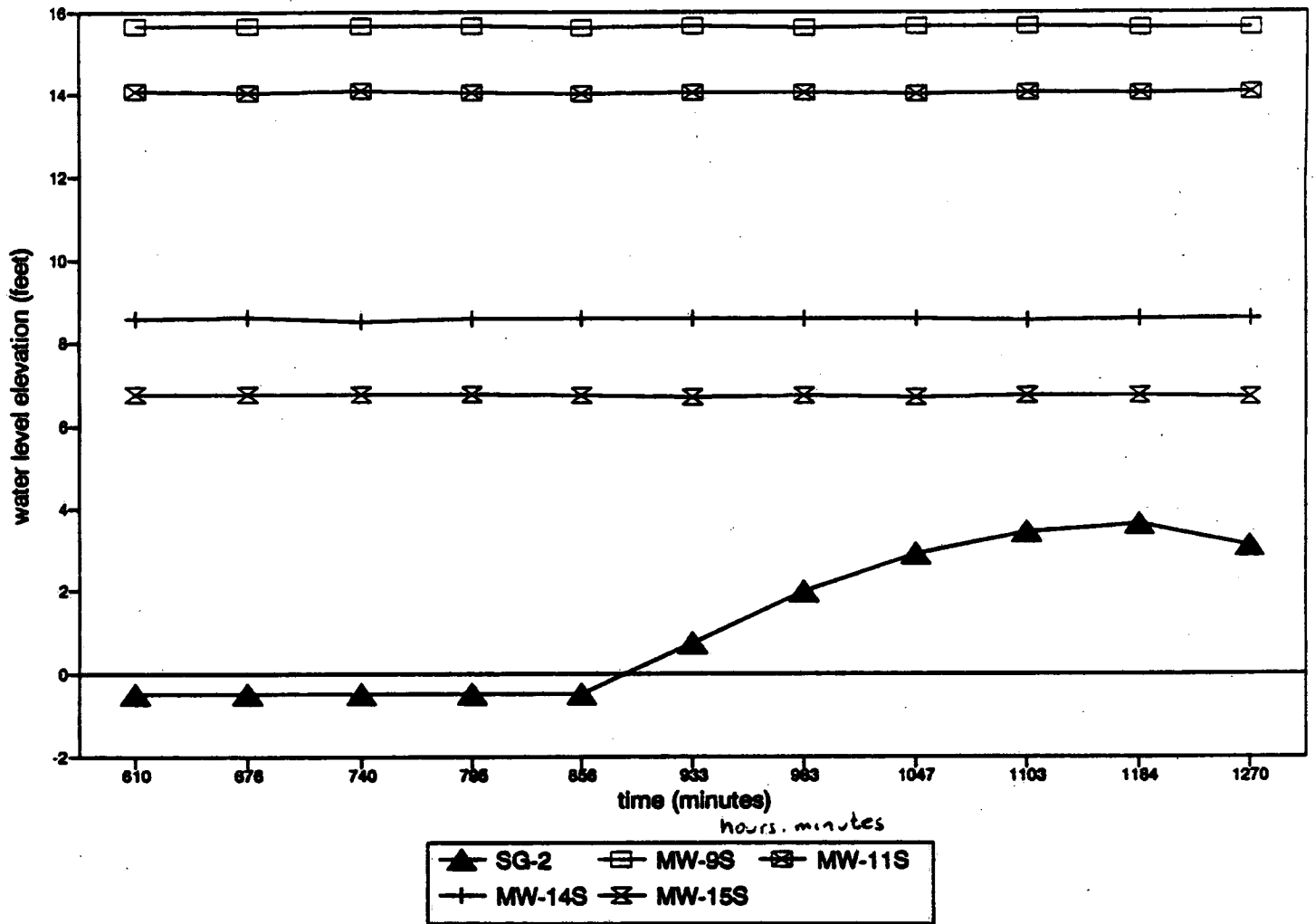
WATER LEVEL ELEVATION vs. TIME
 SG-1; MW-2S; MW-4S; MW-5S



WATER LEVEL ELEVATION vs. TIME
SG-1; MW-3S; MW-6S; MW-7S; MW-8S



WWTER LEVEL ELEVATION vs. TIME
 SG-2; MW-9S; MW-11S; MW-14S; MW-15S



APPENDIX K
ECOLOGICAL SURVEY DATA

Appendix K Comprehensive Plant Species List
Global Landfill Area

<u>Scientific Name</u>	<u>Common Name</u>	<u>Habitat</u>
LYCOPODIACEAE		
<u>Lycopodium flabelliforme</u>	ground pine	4
<u>Lycopodium obscurum</u>	tree clubmoss	4
EQUISETACEAE		
<u>Equisetum arvense</u>	field horsetail	5
<u>Equisetum hyemale</u>	common scouring rush	5
ASPLENIACEAE		
<u>Onoclea sensibilis</u>	sensitive fern	2,3
<u>Polystichum acrotichoides</u>	christmas fern	4
BLECHNACEAE		
<u>Lorinseria areolata</u>	netted chain fern	2,3
<u>Woodwardia virginica</u>	virginia chain fern	2,3
DENNSTAEDTIACEAE		
<u>Pteridium aquilinum</u>	bracken fern	5
OSMUNDACEAE		
<u>Osmunda cinnamomea</u>	cinnamon fern	3
<u>Osmunda claytoniana</u>	interrupted fern	3
<u>Osmunda regalis</u>	royal fern	3
THELYPTERIDACEAE		
<u>Thelypteris palustris</u>	marsh fern	2,3
CUPRESSACEAE		
<u>Juniperus virginiana</u>	red cedar	5
PINACEAE		
<u>Pinus rigida</u>	pitch pine	4
ACERACEAE		
<u>Acer rubrum</u>	red maple	3,4,5

AIZOACEAE* Mollugo verticillata

carpet-weed 5

AMARANTHACEAEAmaranthus cannabinus

water-hemp 1

ANACARDIACEAERhus copallina

winged sumac 4,5

Rhus glabra

smooth sumac 5

Rhus radicans

poison ivy 2,3,4,5

Rhus typhina

staghorn sumac 5

Rhus vernix

poison sumac 3

APOCYNACEAEApocynum androsaemifolium

spreading dogbane 5

Apocynum cannabinum

indian hemp 5

* Vinca minor

periwinkle 5

AQUIFOLIACEAENemopanthus mucronata

mountain holly 3

ASCLEPIADACEAEAsclepias syriaca

common milkweed 5

Asclepias tuberosa

butterfly-weed 5

BALSAMINACEAEImpatiens capensis

spotted touch-me-not 2,3

Impatiens pallida

pale touch-me-not 2,3

BETULACEAEAlnus rugosa

speckled alder 2,3

Betula nigra

river birch 3

Betula populifolia

gray birch 3,4,5

CAPRIFOLIACEAE* Lonicera japonica

japanese honeysuckle 5

Sambucus canadensis

common elderberry 2,3

Viburnum acerifolium

maple-leaf viburnum 4

Viburnum dentatum

arrow-wood 3

Viburnum prunifolium

black-haw 3,4

CARYOPHYLLACEAE

* <u>Cerastium fontanum</u>	mouse-eared chickweed	5
* <u>Dianthus armeria</u>	deptford pink	5
* <u>Saponaria officinalis</u>	bouncing bet	5

CERATOPHYLLACEAE

<u>Ceratophyllum demersum</u>	coontail	2
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CHENOPODIACEAE

<u>Atriplex patula</u>	sparscale	1,5
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* <u>Chenopodium album</u>	lamb's quarters	5
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<u>Salicornia europaea</u>	slender glasswort	1
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CLETHRACEAE

<u>Clethra alnifolia</u>	sweet pepperbush	3,4,5
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COMPOSITAE

* <u>Achillea millefolium</u>	common yarrow	5
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<u>Ambrosia artemisiifolia</u>	common ragweed	5
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<u>Arctium minus</u>	common burdock	5
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<u>Aster subulatus</u>	salt marsh aster	1
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<u>Baccharis halimifolia</u>	groundsel-tree	1
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<u>Bidens frondosa</u>	beggar ticks	2,3
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<u>Bidens vulgata</u>	beggar-ticks	2,3
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* <u>Centaurea jacea</u>	brown knapweed	5
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* <u>Chrysanthemum leucanthemum</u>	ox-eye daisy	5
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* <u>Cichorium intybus</u>	chicory	5
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<u>Conyza canadensis</u>	horseweed	5
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<u>Erechtites hieracifolia</u>	pilewort	5
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<u>Eupatorium album</u>	white thoroughwort	4
<u>Eupatorium perfoliatum</u>	boneset	3,5
<u>Euthamia graminifolia</u>	flat-topped goldenrod	2,3,5
* <u>Galinsoga parviflora</u>		5
<u>Gnaphalium uliginosum</u>	low cudweed	5
* <u>Hypochoeris radicata</u>	cat's ear	5
<u>Iva frutescens</u>	marsh elder	1
<u>Lactuca biennis</u>	tall blue lettuce	5
<u>Lactuca canadensis</u>	wild lettuce	5
* <u>Lactuca serriola</u>	prickly lettuce	5
<u>Rudbeckia hirta</u>	black-eyed susan	5
<u>Solidago canadensis</u>	field goldenrod	5
<u>Solidago juncea</u>		5
<u>Solidago nemoralis</u>	early goldenrod	5
<u>Solidago odora</u>	sweet goldenrod	4
<u>Solidago rugosa</u>	wrinkled goldenrod	5
* <u>Taraxacum officinale</u>	common dandelion	5
* <u>Tragopogon pratensis</u>	goat's beard	5
* <u>Tussilago farfara</u>	coltsfoot	5
<u>Vernonia noveboracensis</u>	New York ironweed	5
CONVOLVULACEAE		
<u>Calystegia sepium</u>	hedge bindweed	5
* <u>Convolvulus arvensis</u>	field bindweed	5
<u>Cuscuta gronovii</u>	common dodder	2,5
CORNACEAE		
<u>Cornus amomum</u>	silky dogwood	2,3,5
<u>Cornus florida</u>	flowering dogwood	4
<u>Cornus racemosa</u>	gray dogwood	3,5

CRUCIFERAE

* <u>Armoracia rusticiana</u>	horseradish	5
* <u>Barbarea vulgaris</u>	yellow rocket	5
* <u>Brassica nigra</u>		5
* <u>Capsella bursa-pastoris</u>	shepherd's-purse	5
* <u>Hesperis matronalis</u>	dame's-rocket	5
* <u>Lepidium campestre</u>	cow-cress	5
* <u>Raphanus raphanistrum</u>	wild radish	5

DROSERACEAE

<u>Drosera rotundifolia</u>	sundew	2
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ERICACEAE

<u>Chamaedaphne calyculata</u>	leatherleaf	2,3
<u>Gaylussacia baccata</u>	huckleberry	4
<u>Gaylussacia frondosa</u>	dangleberry	4
<u>Kalmia angustifolia</u>	sheep laurel	2,3
<u>Kalmia latifolia</u>	mountain laurel	4
<u>Leucothoe racemosa</u>	fetterbush	3
<u>Lyonia ligustrina</u>	maleberry	3
<u>Monotropa uniflora</u>	indian-pipe	4
<u>Rhododendron nudiflorum</u>	pink azalea	3,4
<u>Rhododendron viscosum</u>	swamp azalea	3
<u>Vaccinium corymbosum</u>	highbush blueberry	4
<u>Vaccinium macrocarpon</u>	large cranberry	2
<u>Vaccinium stamineum</u>	deerberry	4
<u>Vaccinium vacillans</u>	lowbush blueberry	4

FAGACEAE

<u>Castanea dentata</u>	chestnut	4
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<u>Fagus grandifolia</u>	american beech	4
<u>Quercus alba</u>	white oak	4
<u>Quercus coccinea</u>	scarlet oak	4
<u>Quercus ilicifolia</u>	scrub oak	4,5
<u>Quercus marilandica</u>	blackjack oak	4
<u>Quercus palustris</u>	pin oak	3
<u>Quercus prinus</u>	chestnut oak	4
<u>Quercus rubra</u>	red oak	4
<u>Quercus stellata</u>	post oak	4
<u>Quercus velutina</u>	black oak	4
GENTIANACEAE		
<u>Bartonia virginica</u>	yellow bartonia	2
GERANIACEAE		
<u>Geranium maculatum</u>	wild geranium	4
GUTTIFERAE		
<u>Hypericum mutilum</u>		5
<u>Hypericum perforatum</u>	common St. John's-wort	5
<u>Hypericum virginicum</u>	marsh St. John's-wort	2
HALORAGACEAE		
* <u>Myriophyllum spicatum</u>	water-milfoil	2
HAMAMELIDACEAE		
<u>Hamamelis virginiana</u>	witch-hazel	3,4
JUGLANDACEAE		
<u>Carya glabra</u>	pignut	4
<u>Carya tomentosa</u>	mockernut hickory	4
<u>Juglans nigra</u>	black walnut	3,4
LABIATAE		
* <u>Ajuga reptans</u>	bugleweed	5
<u>Collinsonia canadensis</u>	richweed	3,4
* <u>Glechoma hederacea</u>	gill-over-the-ground	5
* <u>Lamium purpureum</u>	purple henbit	5

<u>Lycopus virginicus</u>	water-horehound	2,3
<u>Prunella vulgaris</u>	self-heal	5
<u>Scutellaria integrifolia</u>	narrow-leaved skullcap	4
<u>Teucrium canadense</u>	American germander	2,3
LAURACEAE		
<u>Lindera benzoin</u>	spicebush	3,4
<u>Sassafras albidum</u>	sassafras	4,5
LEGUMINOSAE		
<u>Apios americana</u>	ground-nut	5
<u>Lathyrus latifolius</u>	perennial pea	5
<u>Lespedeza capitata</u>	bush-clover	5
* <u>Lotus corniculata</u>	birdsfoot trefoil	5
* <u>Medicago lupulina</u>	black medic	5
* <u>Melilotus alba</u>	white sweet clover	5
* <u>Melilotus officinalis</u>	yellow sweet clover	5
<u>Robinia pseudoacacia</u>	black locust	4,5
* <u>Trifolium aureum</u>	yellow clover	5
* <u>Trifolium dubium</u>	little hop clover	5
* <u>Trifolium hybridum</u>	alsike clover	5
* <u>Trifolium pratense</u>	red clover	5
* <u>Trifolium repens</u>	white clover	5
<u>Strophostyles helvola</u>	trailing wild bean	5
LYTHRACEAE		
* <u>Lythrum salicaria</u>	purple loosestrife	2
MAGNOLIACEAE		
<u>Liriodendron tulipifera</u>	tulip tree	4
<u>Magnolia virginiana</u>	swamp magnolia	3

MALVACEAE		
* <u>Abutilon theophrasti</u>	velvet-leaf	5
MORACEAE		
* <u>Morus alba</u>	white mulberry	5
<u>Morus rubra</u>	red mulberry	4,5
MYRICACEAE		
<u>Comptonia peregrina</u>	sweet-fern	5
<u>Myrica gale</u>	sweet-gale	2,3
<u>Myrica pensylvanica</u>	bayberry	2,3
NYMPHAEACEAE		
<u>Nymphaea odorata</u>	water-lily	2
NYSSACEAE		
<u>Nyssa sylvatica</u>	black gum	3,4,5
OLEACEAE		
<u>Fraxinus americana</u>	white ash	3,4
ONAGRACEAE		
<u>Circaea lutetiana</u>	enchanter's nightshade	3,4
<u>Ludwigia alternifolia</u>	seedbox	2
<u>Ludwigia palustris</u>	water-purslane	2
<u>Oenothera biennis</u>	evening primrose	5
<u>Oenothera perennis</u>		5
OROBANCHACEAE		
<u>Epifagus virginiana</u>	beech-drops	4
OXALIDACEAE		
<u>Oxalis europaea</u>	yellow wood-sorrel	5
PHYTOLACCACEAE		
<u>Phytolacca americana</u>	pokeweed	5
PLANTAGINACEAE		
* <u>Plantago aristata</u>	bracted plantain	5
* <u>Plantago lanceolata</u>	english plantain	5
* <u>Plantago major</u>	common plantain	5

POLYGONACEAE

	<u>Polygonum arifolium</u>	halberd-leaf tearthumb	2,3
*	<u>Polygonum aviculare</u>	knotweed	5
	<u>Polygonum cilinode</u>	fringed bindweed	5
*	<u>Polygonum cuspidatum</u>	Japanese knotweed	5
	<u>Polygonum punctatum</u>	water smartweed	2
	<u>Polygonum ramosissimum</u>	bushy knotweed	1
	<u>Polygonum sagittatum</u>	arrow-leaf tearthumb	2,3
*	<u>Rumex acetosella</u>	sheep sorrel	5
*	<u>Rumex crispus</u>	yellow dock	5

PRIMULACEAE

	<u>Lysimachia ciliata</u>	fringed loosestrife	5
	<u>Lysimachia quadrifolia</u>	whorled loosestrife	4,5
	<u>Lysimachia terrestris</u>	swamp-candles	2
	<u>Trientalis borealis</u>	starflower	4

RANUNCULACEAE

*	<u>Ranunculus acris</u>	tall buttercup	5
	<u>Thalictrum dasycarpum</u>	purple meadow-rue	5

RHAMNACEAE

*	<u>Rhamnus frangula</u>	glossy buckthorn	2,3,5
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ROSACEAE

	<u>Agrimonia gryposepala</u>	tall hairy agrimony	5
	<u>Aronia prunifolia</u>	black chokeberry	4,5
	<u>Crataegus crus-galli</u>	cockspur thorn	4,5
	<u>Crataegus punctata</u>	dotted hawthorn	4,5
	<u>Fragaria virginiana</u>	wild strawberry	4,5
	<u>Geum laciniatum</u>	avens	4,5
*	<u>Malus pumila</u>	apple	5
*	<u>Potentilla recta</u>	upright cinquefoil	5

*	<u>Prunus avium</u>	sweet cherry	4,5
	<u>Prunus serotina</u>	wild cherry	4,5
	<u>Rosa carolina</u>		4,5
*	<u>Rosa multiflora</u>	multiflora rose	5
	<u>Rubus allegheniensis</u>	blackberry	5
	<u>Rubus flagellaris</u>	dewberry	5
	<u>Rubus occidentalis</u>	black raspberry	5
	<u>Rubus strigosus</u>	wild red raspberry	5
	<u>Sanguisorba canadensis</u>	Canada burnet	2,3
RUBIACEAE			
	<u>Cephalanthus occidentalis</u>	buttonbush	2,3
	<u>Galium circaezans</u>	wild licorice	4,5
	<u>Galium pilosum</u>	hairy bedstraw	4,5
	<u>Galium triflorum</u>	sweet bedstraw	2
	<u>Mitchella repens</u>	partridge-berry	4
SALICACEAE			
	<u>Populus deltoides</u>	cottonwood	3,5
	<u>Populus grandidentata</u>	big-tooth aspen	5
	<u>Populus tremuloides</u>	quaking aspen	5
*	<u>Salix alba</u>	white willow	5
*	<u>Salix babylonica</u>	weeping willow	5
	<u>Salix discolor</u>	pussy willow	2,3
*	<u>Salix fragilis</u>	crack willow	3,5
	<u>Salix nigra</u>	black willow	3
	<u>Salix sericea</u>	silky willow	2,3
SCROPHULARIACEAE			
	<u>Aureolaria flava</u>	yellow false foxglove	4
	<u>Mimulus ringens</u>	monkey-flower	2
	<u>Penstemon digitalis</u>	beard-tongue	5
*	<u>Verbascum blattaria</u>	moth mullein	5
*	<u>Verbascum thapsus</u>	common mullein	5

SIMAROUBACEAE		
* <u>Ailanthus altissima</u>	tree-of-heaven	5
SOLANACEAE		
* <u>Datura stramonium</u>	jimson-weed	5
* <u>Solanum dulcamara</u>	deadly nightshade	5
<u>Solanum nigrum</u>		5
ULMACEAE		
<u>Celtis occidentalis</u>	hackberry	4
<u>Ulmus americana</u>	American elm	3
UMBELLIFERAE		
<u>Cicuta maculata</u>	spotted water-hemlock	2,5
* <u>Daucus carota</u>	wild carrot	5
<u>Hydrocotyle americana</u>	American-pennywort	2
* <u>Pastinaca sativa</u>	parsnip	5
<u>Sanicula canadensis</u>	black snakeroot	3,4
<u>Sanicula marilandica</u>		3,4
URTICACEAE		
<u>Boehmeria cylindrica</u>	false nettle	3
<u>Urtica dioica</u>	stinging nettle	5
VERBENACEAE		
<u>Verbena hastata</u>	blue vervain	2,5
VITACEAE		
<u>Parthenocissus quinquefolia</u>	virginia creeper	4,5
<u>Vitis aestivalis</u>	summer grape	4,5
<u>Vitis labrusca</u>	fox grape	4,5
ALISMATACEAE		
<u>Alisma plantago-aquatica</u>	mud plantain	2
<u>Sagittaria latifolia</u>	duck potato	2

ARACEAE

<u>Peltandra virginica</u>	arrow-arum	2
<u>Symplocarpus foetidus</u>	skunkcabbage	3

CYPERACEAE

<u>Carex crinita</u>	fringed sedge	3
<u>Carex folliculata</u>	long sedge	3
<u>Carex intumescens</u>		3
<u>Carex lurida</u>		2,3
<u>Carex scoparia</u>	pointed broom sedge	2
<u>Carex stricta</u>		2
<u>Carex swanii</u>		4
<u>Carex vulpinoidea</u>		2
<u>Cyperus strigosus</u>	common umbrella-sedge	2,5
<u>Dulichium arundinaceum</u>	three-way sedge	2
<u>Eleocharis acicularis</u>		2
<u>Rhynchospora alba</u>		2
<u>Scirpus americanus</u>		2
<u>Scirpus cyperinus</u>	wool-grass	2
<u>Scirpus validus</u>	soft-stemmed bulrush	2

GRAMINEAE

* <u>Agropyron repens</u>	quack grass	5
* <u>Agrostis gigantea</u>	red top	2,5
<u>Agrostis perennans</u>	autumn bent-grass	5
<u>Andropogon virginicus</u>	broom-sedge	5
<u>Aristida dichotoma</u>	poverty grass	5
* <u>Bromus inermis</u>	hungarian brome grass	5
* <u>Bromus japonicus</u>	japanese brome	5
<u>Cinna arundinacea</u>	wood reedgrass	3
* <u>Dactylis glomerata</u>	orchard grass	5

<u>Danthonia spicata</u>	poverty grass	5
* <u>Digitaria sanguinalis</u>	crab-grass	5
<u>Distichlis spicata</u>	spike grass	1
* <u>Festuca arundinacea</u>	Kentucky fescue	5
<u>Glyceria canadensis</u>	rattlesnake grass	2,3
<u>Glyceria striata</u>	fowl manna grass	2,3
* <u>Holcus lanatus</u>	velvet grass	5
* <u>Hordeum jubatum</u>	squirrel-tail barley	5
<u>Leersia oryzoides</u>	rice cutgrass	2,3
<u>Leersia virginica</u>	white grass	2,3
* <u>Lolium perenne</u>	perennial rye-grass	5
<u>Muhlenbergia schreberi</u>	nimblewill	5
<u>Panicum clandestinum</u>	deertongue grass	5
<u>Panicum dichotomiflorum</u>	fall panic grass	5
<u>Panicum dichotomum</u>		5
<u>Panicum virgatum</u>	switchgrass	1,2,5
<u>Phalaris arundinacea</u>	reed canary grass	2,3,5
* <u>Phleum pratense</u>	timothy	5
* <u>Phragmites australis</u>	common reed	1,2,5
* <u>Poa compressa</u>	Canada bluegrass	5
* <u>Poa pratensis</u>	Kentucky bluegrass	5
<u>Spartina alterniflora</u>	salt marsh grass	1
<u>Spartina cynosuroides</u>	salt reedgrass	1
<u>Spartina patens</u>	salt marsh hay	1
<u>Tridens flavus</u>	tall redtop	5
JUNCACEAE		
<u>Juncus bufonius</u>	toad rush	5

<u>Juncus effusus</u>	common rush	2
<u>Juncus gerardii</u>	blackgrass	1
<u>Juncus tenuis</u>	path rush	2,5
LEMNACEAE		
<u>Lemna minor</u>	lesser duckweed	2
<u>Spirodela polyrhiza</u>	greater duckweed	2
LILIACEAE		
* <u>Allium vineale</u>	field garlic	5
<u>Maianthemum canadense</u>	Canada mayflower	3,4
<u>Polygonatum commutatum</u>	large solomon's-seal	4
<u>Smilacina racemosa</u>	false solomon's seal	4
<u>Smilax herbacea</u>	carriion-flower	3,4,5
<u>Smilax rotundifolia</u>	common greenbrier	3,4,5
ORCHIDACEAE		
<u>Cypripedium acaule</u>	pink moccasin-flower	4
PONTEDERIACEAE		
<u>Pontederia cordata</u>	pickerelweed	2
SPARGANIACEAE		
<u>Sparganium americanum</u>	bur-reed	2
TYPHACEAE		
<u>Typha angustifolia</u>	narrow-leaved cat-tail	1,2
<u>Typha latifolia</u>	common cat-tail	2

* = Non-native

¹Habitat key:

1. salt/brackish marsh
2. fresh marsh
3. swamp woods
4. upland woods
5. disturbed areas

URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-24-91

Time 12:30

Initials of Field Personnel W/P

Site Number S-1

Photo Number(s) 6, 4

Site Location/Description (use back of form for sketch of site)

Upstream of wooden bridge over McElvin's Creek

Bird location B-S-3

Weather Conditions SUNNY Air Temp. 75°F

Soil Type MUCK

Surface Water Conditions:

pH 7.8 Salinity yes Conductivity 11000 DO 1.5

Tidal Influence? (yes/no) YES

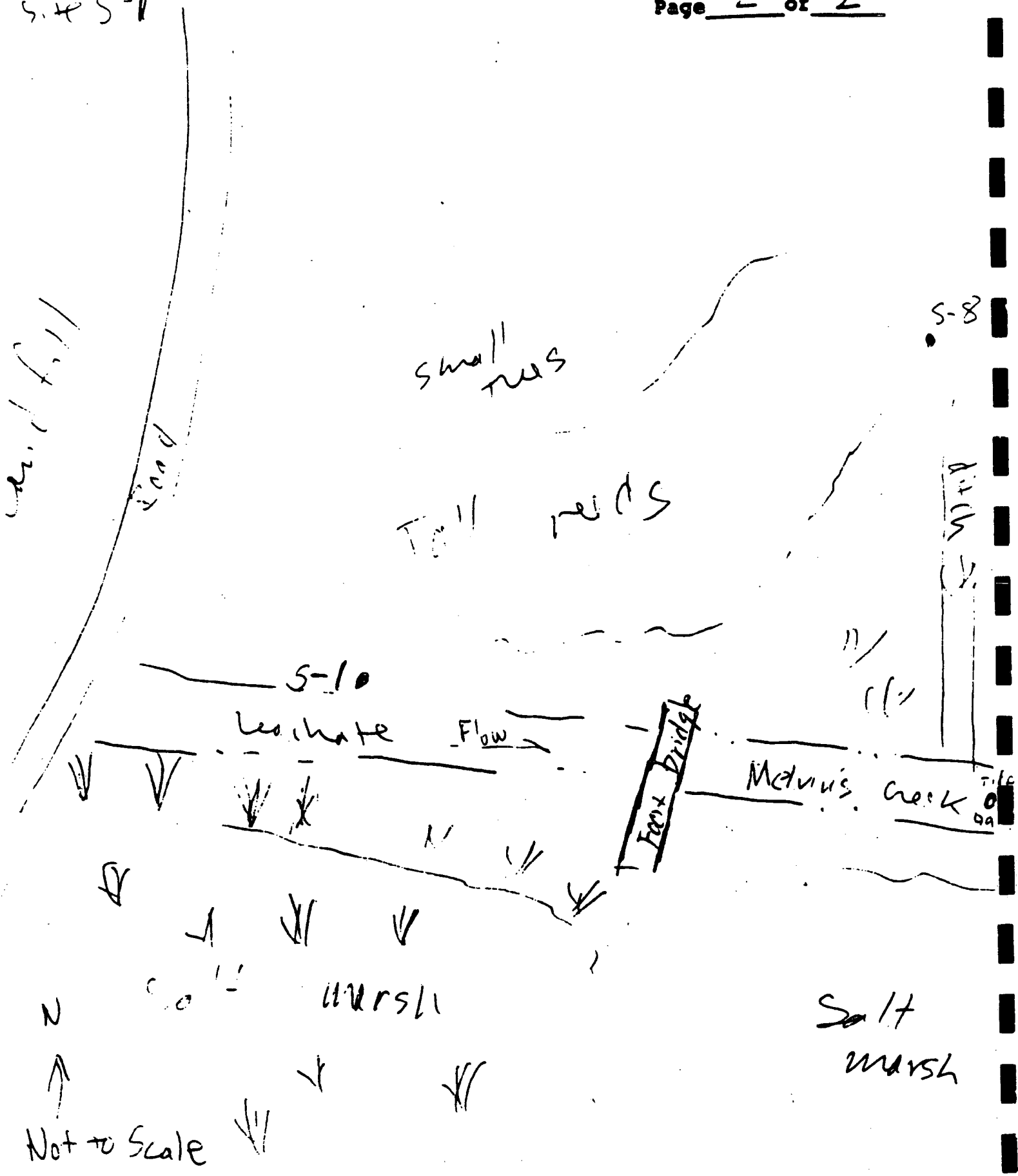
General Habitat Type Salt marsh and tidal creek

Possible Sources of Pollution leachate - stained
water and odor prevalent

Additional Comments Duck tracks and seal seen
sewer mussels and crabs in creek - maybe due
to leachate toxicity. very low tide stream
was all leachate

NOTE: Identified plants and animals for this site are checked on attached list.

S-4 S-7



URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-23-91

Time 12:00

Initials of Field Personnel MM

Site Number S-2

Photo Number(s) 23/24

Site Location/Description (use back of form for sketch of site)

Melvin's Creek 100m downstream of landfill

Weather Conditions Sunny Air Temp. 75°F

Soil Type Marsh

Surface Water Conditions:

pH 6.8 Salinity YES Conductivity 15000 DO 2.8/24°C

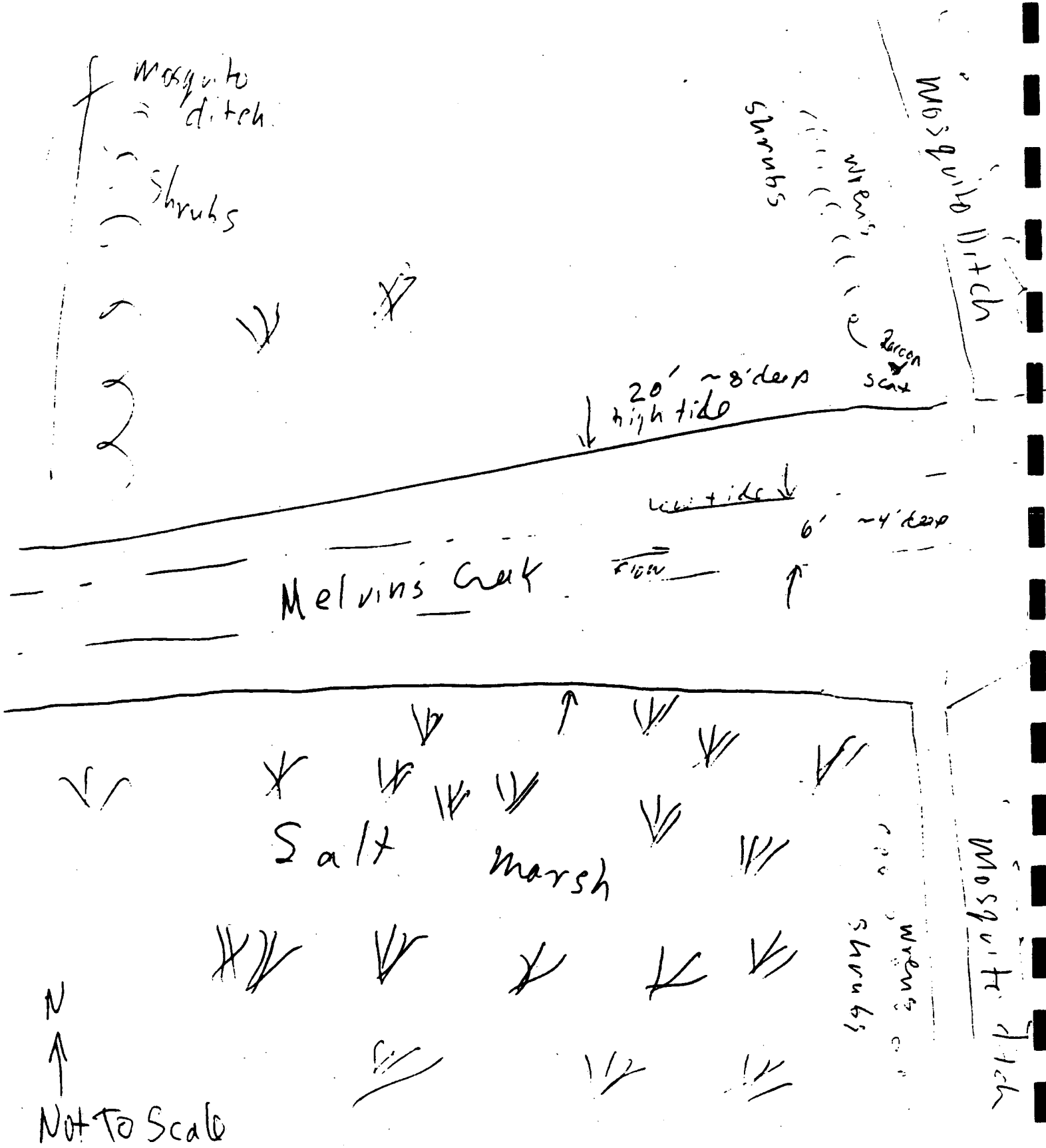
Tidal Influence? (yes/no) yes

General Habitat Type Tidal Stream through Salt
MARSH

Possible Sources of Pollution Sediment transport from
upstream - contaminated surface water

Additional Comments This is a major tributary of
Cheesquake Creek. Sedge spoil between ditches
forms high bank where straws have rot. Wrens in shrubs
high density of crabs and mussels. Fish larvae and blue crabs in water

NOTE: Identified plants and animals for this site are checked on attached list.



URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-25-91

Time 5:00

Initials of Field Personnel WKP

Site Number BS-1

Photo Number(s) _____

Site Location/Description (use back of form for sketch of site)

Top of landfill along East Road.
Use for bird locations!

Weather Conditions Sunny Air Temp. 85

Soil Type Sand

Surface Water Conditions:

pH 7.1 Salinity NO Conductivity 400 DO 5.0

Tidal Influence? (yes/no) YES

General Habitat Type Fresh marsh/upland boundary
Small trees (willow)

Possible Sources of Pollution leachate seep h-55

Additional Comments Box turtle, woodchuck, toads,
frog in pool on road

NOTE: Identified plants and animals for this site are checked on attached list.

Tall reeds
dirt bike Path

Woods

upland margin

Fresh water
ditch

landfill

LS-5

Tall reeds

Willow

Willow

Tall reeds

Salt/Fresh margin

Salt grass

Not to Scale

URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-25-11

Time 5:00 PM

Initials of Field Personnel MA

Site Number 4

Photo Number(s) 5

Site Location/Description (use back of form for sketch of site)

Bird count area 4, Leachate Seep (SQ4)

Weather Conditions Sunny - Warm Air Temp. 80°E

Soil Type Sand

Surface Water Conditions:

pH 2 Salinity Yes Conductivity 16,000 DO 1

Tidal Influence? (yes/no) Yes

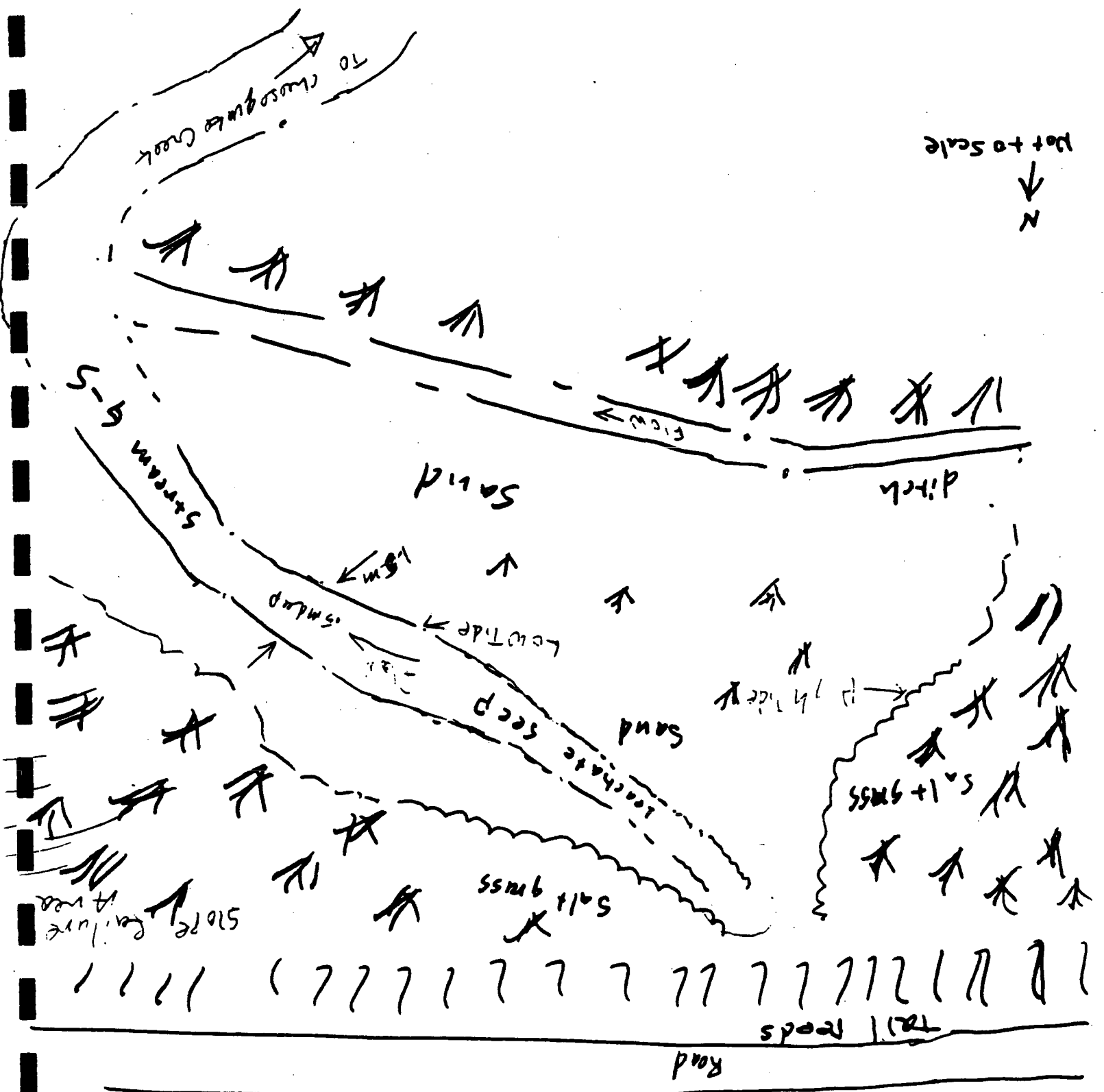
General Habitat Type Sand has suffocated vegetation at seep - erosion, leachate odor prevalent, many flies

Possible Sources of Pollution leachate

Additional Comments 1 Killdeer seen feeding on flies in leachate. Cottontail seen. mouse tracks

NOTE: Identified plants and animals for this site are checked on attached list.

Not to Scale
N
↓



Site 4

LANDFILL

URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-24-91

Time 2:30

Initials of Field Personnel MP

Site Number S-3

Photo Number(s) 8

Site Location/Description (use back of form for sketch of site)

Cheesegvaka Creek Near Parkway

Weather Conditions sunny Air Temp. 75°C

Soil Type Sand

Surface Water Conditions:
pH 6.5 Salinity YES Conductivity 20,000 DO 2.6

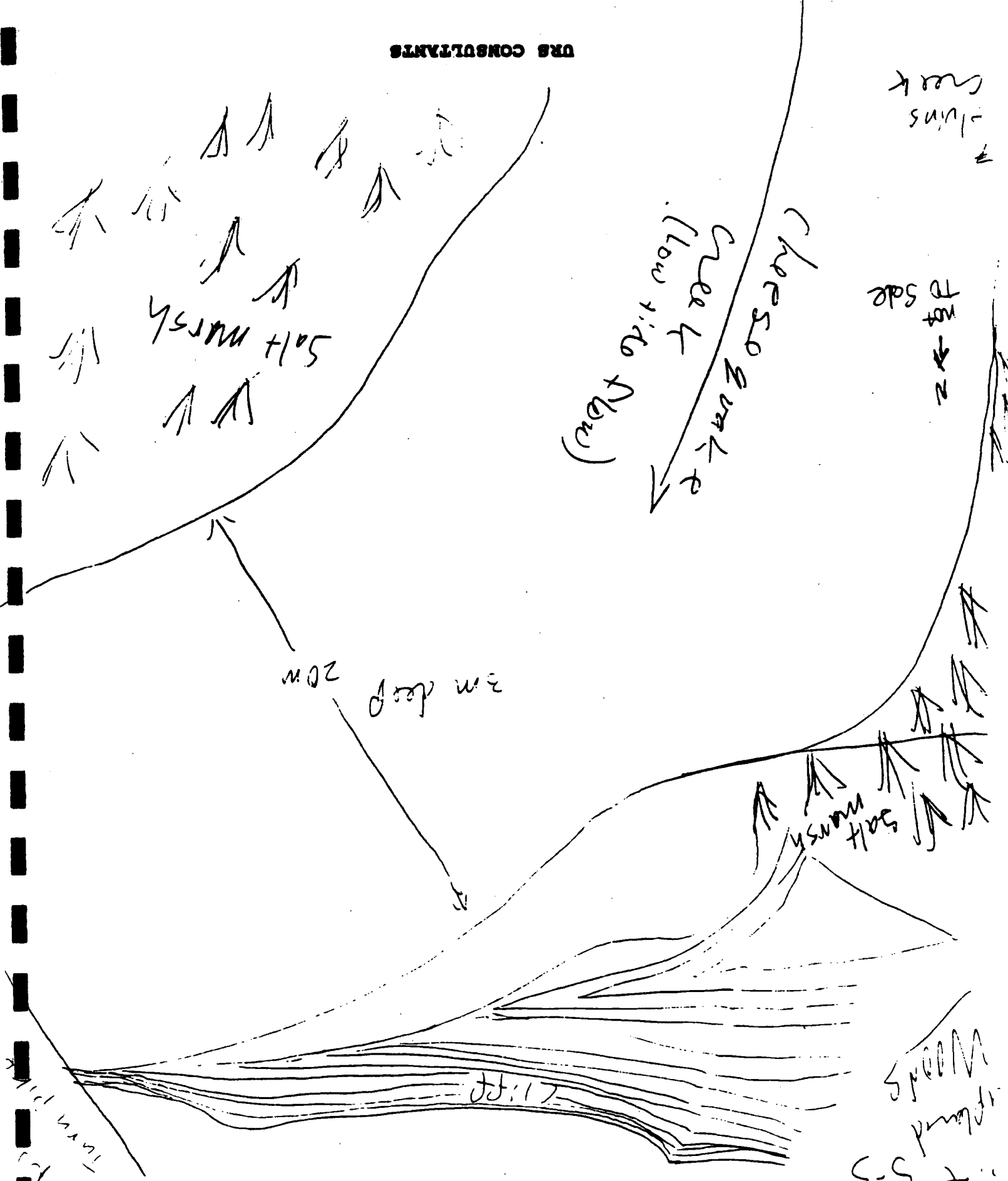
Tidal Influence? (yes/no) YES

General Habitat Type upland cliff to north and
salt marsh to south

Possible Sources of Pollution Highway, boats, trash

Additional Comments This portion of Cheesegvaka
creek appears to have been created and
is maintained as part of Turnpike

NOTE: Identified plants and animals for this site are checked on attached list.



URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-25-91
Time 6:20
Initials of Field Personnel WKP

Site Number S-5a

Photo Number(s) _____

Site Location/Description (use back of form for sketch of site)

Northwest of landfill - fresh - non tidal stream
flowing into pond at W. edge of landfill

Weather Conditions Sunny Air Temp. 75° F

Soil Type Sand / silt / clay

Surface Water Conditions:

pH 7.1 Salinity NO Conductivity 840 DO 4.9 28°C

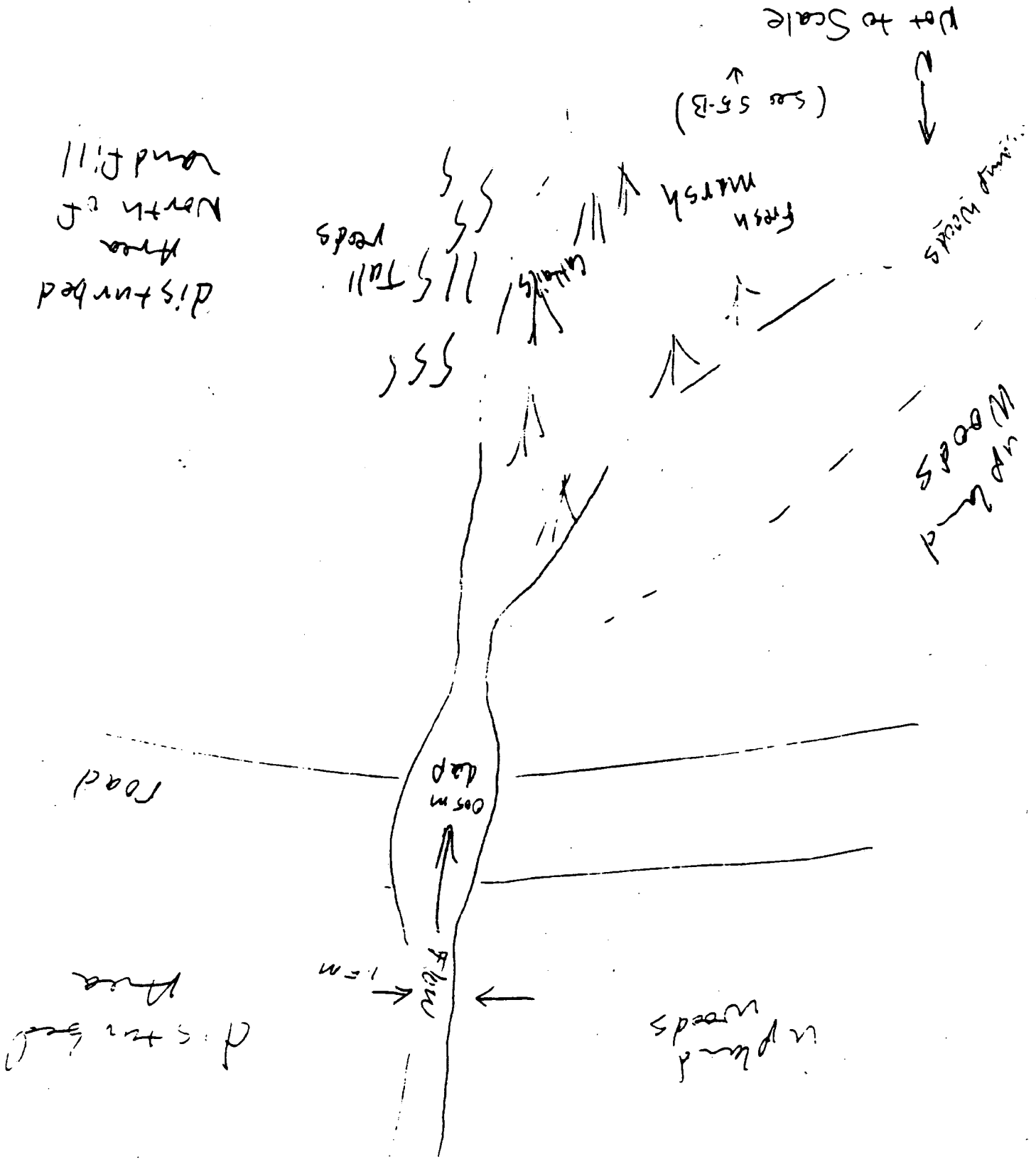
Tidal Influence? (yes/no) NO

General Habitat Type Upland Woods transitional to
riparian and marsh wetlands

Possible Sources of Pollution Upstream from
apartments, downstream from landfill

Additional Comments There does not appear to be
any fish in the stream, probably because of
intermittent flow

NOTE: Identified plants and animals for this site are checked on attached list.



URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-25-91

Time 6:40

Initials of Field Personnel WKP

Site Number S-5b

Photo Number(s) _____

Site Location/Description (use back of form for sketch of site)

Fresh Marsh to west of landfill

Weather Conditions Sunny Air Temp. 25°C

Soil Type Muck

Surface Water Conditions:

pH 6.7 Salinity NO Conductivity 840 DO 3.8 28°C

Tidal Influence? (yes/no) NO

General Habitat Type Fresh Marsh bordered by
Swamp Woods - some open water with duck.

Possible Sources of Pollution Landfill Seepage

Additional Comments This area seems to be man-made
caused by damming of stream at
south west edge of landfill. May have been salt
marsh at one time.

NOTE: Identified plants and animals for this site are checked on attached list.

Not to Scale
→ N

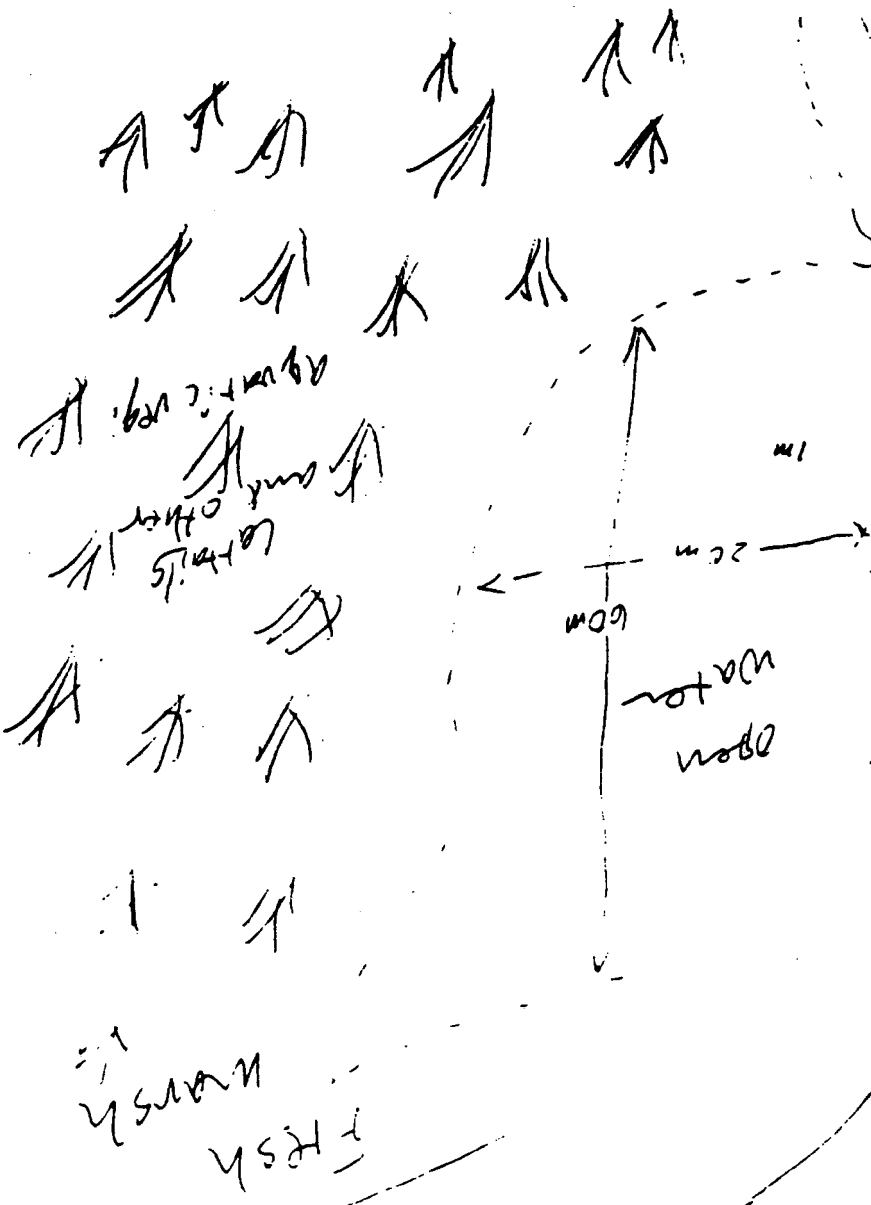
URS CONSULTANTS

Salt marsh
↓

Jebri's Dam
Tail Ponds
Disturbed Soil
Jebri's Pk

Flow ↑

Road



Savanna Woods

Upland Boundary ↓

(see STA)

URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-24-91

Time 1:30

Initials of Field Personnel MP

Site Number S-6

Photo Number(s) 14-13

Site Location/Description (use back of form for sketch of site)

South west edge of landfill

Weather Conditions Sunny Air Temp. 75°F

Soil Type Sand / muck

Surface Water Conditions:
pH 7.8 Salinity yes Conductivity 17,000 DO 2.8

Tidal Influence? (yes/no) yes

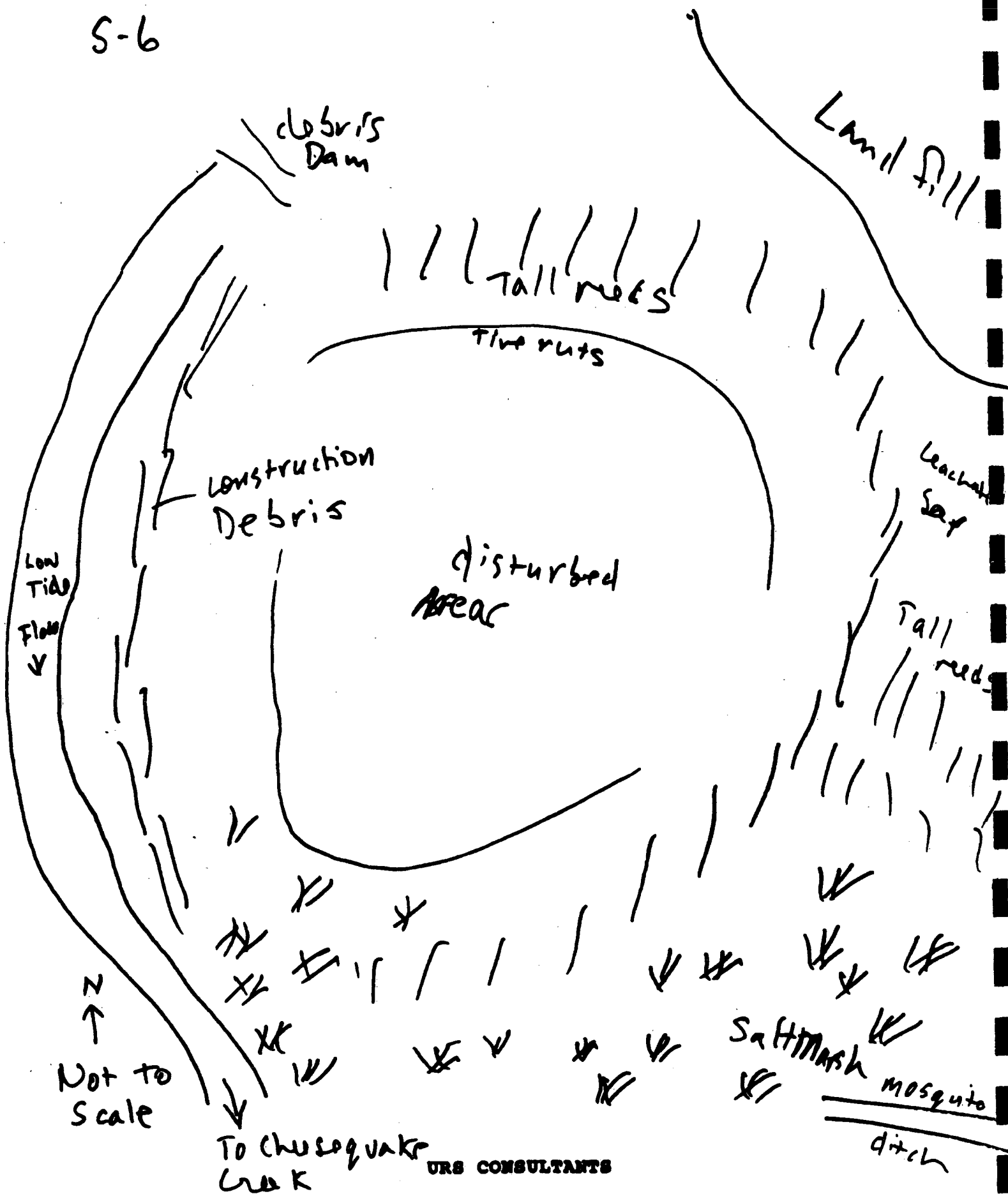
General Habitat Type Salt marsh reeds

Possible Sources of Pollution Landfill

Additional Comments This is a disturbed area with truck ruts and debris piles evident

NOTE: Identified plants and animals for this site are checked on attached list.

S-6



URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-24-91

Time 12:15

Initials of Field Personnel WJ

Site Number S-8

Photo Number(s) 22-21

Site Location/Description (use back of form for sketch of site)

East of landfill just north of mulking

Weather Conditions Sunny Air Temp. 75° F

Soil Type Sand/muck

Surface Water Conditions:

pH 7.7 Salinity yes Conductivity 11,000 DO 1.5

Tidal Influence? (yes/no) _____

General Habitat Type Salt marsh

Possible Sources of Pollution leachate - odor and
discolored stream water

Additional Comments This stream is a mosquito
ditch. The density of weeds and grass
is better than other sites. No larval fish seen

NOTE: Identified plants and animals for this site are checked on attached list.

Site S-8



URS CONSULTANTS
GLOBAL LANDFILL
PROJECT FIELD SHEETS

Date 6-25-91

Time 2:00

Initials of Field Personnel WJD

Site Number Background

Photo Number(s) Panorama

Site Location/Description (use back of form for sketch of site)

N. End of Steamboat Rd

Weather Conditions Sunny Air Temp. 80°F

Soil Type Sand / muck

Surface Water Conditions:

pH 6.8 Salinity Yes Conductivity 11,500 DO 6.4 25°C

Tidal Influence? (yes/no) Yes

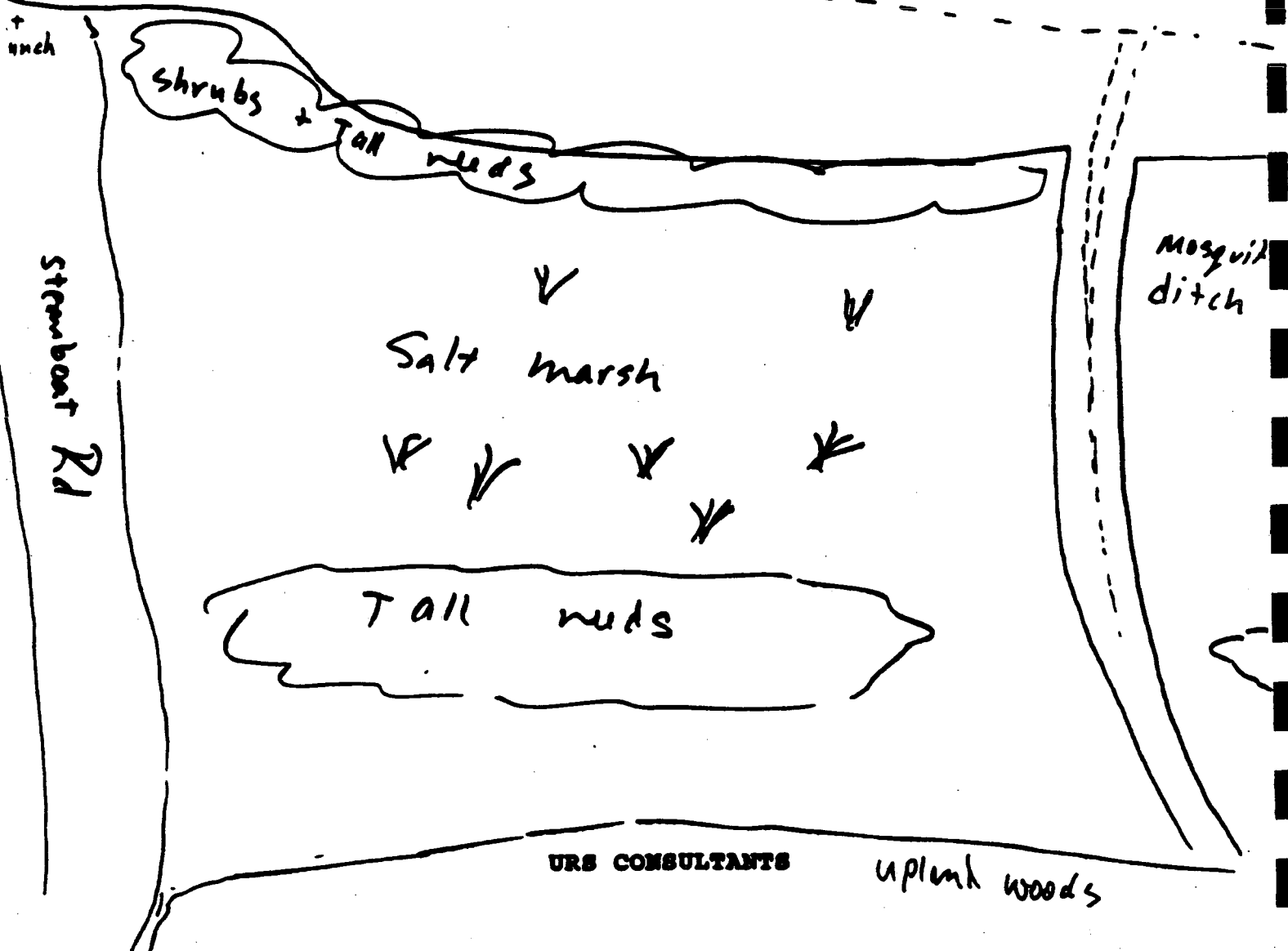
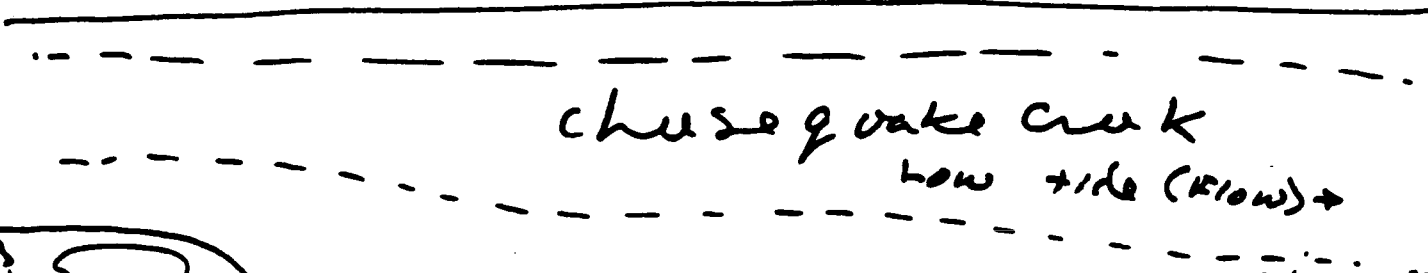
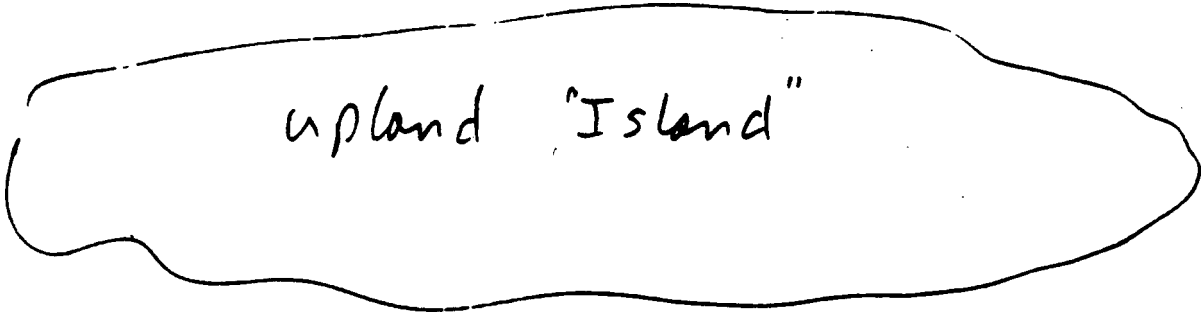
General Habitat Type Salt marsh bordered by upland woods

Possible Sources of Pollution Boaters, fishermen upstream

Additional Comments This location is at the Northeast corner of Chesapeake and State Park

NOTE: Identified plants and animals for this site are checked on attached list.

Background



APPENDIX L

ENVIRONMENTAL SAMPLE DESCRIPTIONS

TABLE L-1
ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SB-B1	6-12-91	Subsurface Soil	Fill to 3'. Black wood and paper w/brick and concrete from 0-3'. Grey tan silty sand intermixed from 3-4'. No odor.	Soil gas survey. PID readings of 11.2 ppm.
U-SB-B2	6-13-91	Subsurface Soil	Grey silty sand from 0-5'. Black sandy fill w/red blebs and brown clayey silt from 5-6'. No odor.	Soil gas survey. PID reading of 1.2 ppm and FID readings >2,000 ppm.
U-SB-B3R	6-21-91	Subsurface Soil	Black dense granular fill w/wood and concrete. No odor.	Soil gas survey. FID reading >2,000 ppm and H ₂ S reading of 28 ppm. Poned water on historic aerial photo.
U-SB-B4R	6-21-91	Subsurface Soil	Black fill w/brick, concrete and wood in a sandy matrix. No odor.	Soil gas survey. FID reading of >2,000 ppm. Poned water on aerial photo.
U-SB-B5	6-13-91	Subsurface Soil	Orange peat layer 2-3". Brown/tan medium silty sand. H ₂ S odor.	Soil gas survey. PID reading of 3.2 ppm.
U-SB-B6	6-13-91	Subsurface Soil	Orange-brown medium sand w/some fill. No odor.	Background boring location. No hits during soil gas survey.
U-SB-B7	6-13-91	Subsurface Soil	Wet organic peat layer from 2-3". Tan/grey medium sand. H ₂ S odor.	Soil gas survey. FID reading >2,000 ppm and H ₂ S reading of 7.0 ppm.

TABLE L-1 (Continued) (Pg. 2 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SB-B8	6-13-91	Subsurface Soil	Wet tan/grey medium silty sand. H ₂ S odor.	Soil gas survey. FID reading >1,000 ppm and H ₂ S reading of 2 ppm.
U-SB-B9	6-13-91	Subsurface Soil	Black moist fill as wood and roofing shingles. Tar odor.	Soil gas survey. FID reading >2,000 ppm. Suspected sludge pit area.
U-SB-B10	6-13-91	Subsurface Soil	Moist tan/grey medium sand w/some silt at 2-3'. Black granular fill w/tar paper and roofing shingles at 3-4'. Tar odor.	Soil gas survey. PID reading of 3.2 ppm. Suspected sludge pit area.
U-SB-B11	6-14-91	Subsurface Soil	Fill material as moist wood and cloth in a sandy matrix. No odor.	Exploratory boring used to define the limits of the silty clay semi-confining layer.
U-MW3-SB	5-30-91	Subsurface Soil	Dry, fine brown sand with small rock fragments. No odor.	Sample taken from spoon directly above the water table.
U-MWSB-10	6-10-91	Subsurface Soil	Black organic decay layer from 2-2.5'. Brown medium moist sand w/silt. No odor.	Sample taken from spoon directly above the water table.
U-MWSB-11	6-11-91	Subsurface Soil	Orange/brown moist medium silty sand w/wood fill from 2-4'. Wet grey medium sand w/fill and wood plastic in a sandy matrix. No odor.	Sample taken from spoon directly above the water table.

TABLE L-1 (Continued) (Pg. 3 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-MWSB-12	6-11-91	Subsurface Soil	Tan medium silty sand w/fill as wood, plastic & paper. No odor.	Sample taken from spoon directly above the water table.
U-MWSB-13	6-7-91	Subsurface Soil	Orange/brown to black medium moist sand w/some silt. No odor.	Sample taken from spoon directly above the water table.
U-MW14-SB	5-30-91	Subsurface Soil	Black fill as wood and paper in a sandy matrix. No odor.	Sample taken from spoon directly above the water table.
U-MW15-SB	6-3-91	Subsurface Soil	Black fill as roofing shingles, wood, brick and concrete. No odor.	Sample taken from spoon directly above the water table. PID at 0.4 ppm.
U-LS-1	6-5-91	Leachate	Dark brown "coffee-like" liquid w/floating vegetation on the surface. Slight organic odor.	Leachate outbreak on west side of landfill.
U-LS-2	5-31-91	Leachate	Aqueous black liquid w/brown foam on the surface. Organic vegetation floating on surface. Pungant odor.	Leachate outbreak on southwest side of landfill.
U-LS-3	5-30-91	Leachate	Dark brown "coffee-like" aqueous. Liquid was effervescent with an oily sheen. Pungant odor.	Major leachate outbreak on southeast side of landfill.

TABLE L-1 (Continued) (Pg. 4 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-LS-4	5-30-91	Leachate	Dark brown "coffee-like" aqueous. Liquid was effervescent w/an oily sheen. Pungant odor.	Major leachate outbreak on east side of landfill.
U-LS-5	5-31-91	Leachate	Aqueous black w/grey/brown foam on surface. Pungant odor.	Leachate outbreak on northeast side of landfill.
U-SW-1L	6-20-91	Surface Water	Clear w/red tint. No odor.	Headwaters of Melvins Creek near landfill.
U-SW-1H	6-20-91	Surface Water	Clear to very slightly turbid w/some floating particulate. No odor.	Headwaters of Melvins Creek near landfill.
U-SW-2(H)	6-18-91	Surface Water	Clear, no odor.	Midstream on Melvins Creek.
U-SW-2L	6-18-91	Surface Water	Clear to very slightly turbid. No odor.	Midstream on Melvins Creek.
U-SW-3L	6-19-91	Surface Water	Clear to very slightly turbid. Some floating particulate. No odor.	Downstream of landfill on the Cheesequake Creek at the confluence of Melvins Creek.
U-SW-3H	6-19-91	Surface Water	Clear, no odor.	Downstream of landfill on the Cheesequake Creek at the confluence of Melvins Creek.
U-SW-4L	6-20-91	Surface Water	Clear to slightly turbid w/floating particulate and some orange floc. Slight odor.	Small channel on west side of landfill. Drains northwest extension area.

TABLE L-1 (Continued) (Pg. 5 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SW-4H	6-20-91	Surface Water	Clear to very slightly turbid w/floating particulate. No odor.	Small channel on west side of landfill. Drains northwest extension area.
U-SW-5L	6-20-91	Surface Water	Clear to slightly turbid w/suspended particulate. No odor.	Ponded water on southwest side of landfill.
U-SW-5H	6-20-91	Surface Water	Clear to slightly turbid w/floating particulate. No odor.	Ponded water on southwest side of landfill.
U-SW-6L	6-18-91	Surface Water	Clear w/some floating particulate. No odor.	Small channel that drains area near unused leachate collection pond.
U-SW-6H	6-18-91	Surface Water	Clear w/some floating particulate. No odor.	Small channel that drains area near unused leachate collection pond.
U-SW-7L	6-20-91	Surface Water	Clear w/some floating particulate. No odor.	Channel downstream of major leachate outbreak (LS-3).
U-SW-7H	6-20-91	Surface Water	Clear w/some floating particulate. No odor.	Channel downstream of major leachate outbreak (LS-3).
U-SW-8L	6-5-91	Surface Water	Aqueous yellow w/organic vegetation. Very effervescent. Slight odor.	Channel on east side of landfill with noticeable leachate entering from the landfill.
U-SW-8H	6-5-91	Surface Water	Aqueous yellow w/some sediment and organic vegetation. No odor.	Channel on east side of landfill with noticeable leachate entering from the landfill.

TABLE L-1 (Continued) (Pg. 6 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SW-9L	6-18-91	Surface Water	Clear to very slightly turbid. No odor.	Further downstream of major leachate outbreak (LS-3).
U-SW-9(H)	6-18-91	Surface Water	Clear to very slightly turbid. No odor.	Further downstream of major leachate outbreak (LS-3).
U-SW-10L	6-19-91	Surface Water	Clear to very slightly turbid. No odor.	Background on Cheesequake Creek.
U-SW-10H	6-19-91	Surface Water	Clear to very slightly turbid. No odor.	Background on Cheesequake Creek.
U-SD-1	6-20-91	Stream Sediment	Brown/black silty saturated sand w/organic sludge. Slight odor.	Headwaters of Melvins Creek near Landfill.
U-SD-2	6-18-91	Stream Sediment	Brown/black saturated sand w/silty sludge. Some organic decay vegetation. Slight odor.	Midstream on Melvins Creek.
U-SD-3	6-19-91	Stream Sediment	Black saturated silty sludge w/some organic vegetation. Slight odor.	Downstream of landfill on Cheesequake Creek at the confluence of Melvins Creek.
U-SD-4	6-20-91	Stream Sediment	Black saturated organic vegetation (decayed) w/some brown black sandy silt. Slight odor.	Small channel on west side of landfill. Drains northwest extension area.
U-SD-5	6-20-91	Stream Sediment	Brown medium saturated sand w/some black organic vegetation. No odor.	Ponded water on southwest side of landfill.

TABLE L-1 (Continued) (Pg. 7 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SD-6	6-18-91	Stream Sediment	Saturated black organic debris w/trace fine sand. Strong decay odor.	Small channel that drains area near unused leachate collection pond.
U-SD-7	6-20-91	Stream Sediment	Black saturated silt and organic debris w/some fine brown sand. Moderate odor.	Channel downstream of major leachate outbreak (LS-3).
U-SD-8	6-5-91	Stream Sediment	Black/brown saturated sandy silt w/some organic vegetation as reed roots. Slight oil sheen on top of sediment. Petroleum odor.	Channel on east side on landfill with noticeable leachate entering from the landfill (LS-3).
U-SD-9	6-18-91	Stream Sediment	Saturated black organic vegetation w/some brown/black sandy silt. Moderate decay odor.	Further downstream of major leachate outbreak (LS-3).
U-SD-10	6-19-91	Stream Sediment	Brown/black sandy silt w/some organic debris and rock pebbles. Slight odor.	Background on Cheesequake Creek.
U-SS-1	7-10-91	Surface Soil	18-24" - Moist dark brown/black sand w/wood fill. Moderate decay odor. 0-6" (VOA) - Dry brown medium sand w/some rock fragments. No odor.	Juncture of highly traveled motorcycle paths - human exposure senerio.

TABLE L-1 (Continued) (Pg. 8 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SS-2	7-10-91	Surface Soil	6-12" - Black tar + roofing shingle fragments. Slight petroleum odor. 0-6" (VOA) - Dry brown medium sand w/some roofing shingles. Slight odor.	Area of less frequent motorcycle activity. Close to landfill. Human exposure scenario.
U-SS-3	7-10-91	Surface Soil	0-6" (VOA) - Dry brown medium sand w/some roots. No odor. 18-24" - Wet brown/orange medium sand w/black tar blebs. Slight odor.	Area of heaviest motorcycle activity. Human exposure scenario.
U-SS-4 (VOA)	7-10-91	Surface Soil	18-24" - Moist Brown fine sand and silt. Black layers of silt 20-24". No odor. 0-6" (VOA) Dry brown fine-medium sand. No odor.	Area of motorcycle activity on 1st level at borrow area. Human exposure scenario.
U-SS-5	7-10-91	Surface Soil	18-24" - Dry brown/orange fine-medium sand. No odor. 0-6" (VOA) - Dry brown fine-medium sand. No odor.	Background
U-MW1A-GW	7-16-91	Groundwater	Clear, no odor.	Resample of existing well.
U-MW2S-GW	7-18-91	Groundwater	Clear to a dark-green tint. Strong H ₂ S odor.	Resample of existing well.
U-MW2A-GW	7-18-91	Groundwater	Clear w/some suspended flocculant from inside of protective casing. No odor.	Resample of existing well.

TABLE L-1 (Continued) (Pg. 9 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-MW3S-GW	7-18-91	Groundwater	Clear to yellow tint. Slight septic odor.	<ul style="list-style-type: none"> •Compliment to existing MW-3A. •Yields downgradient shallow groundwater quality information for assessment of groundwater treatment alternatives. •Yields additional vertical gradient control.
U-MW3A-GW	7-18-91	Groundwater	Clear, no odor.	Resample of existing well.
U-MW4S-GW	7-23-91	Groundwater	Clear, slight sulfur odor.	Resample of existing well.
U-MW4A-GW	7-23-91	Groundwater	Clear, slight sulfur odor.	Resample of existing well.
U-MW5S-GW	7-19-91	Groundwater	Clear with a dark golden tint. Strong sulfur odor.	Resample of existing well.
U-MW5A-GW	7-19-91	Groundwater	Clear, no odor.	Resample of existing well.
U-MW6S-GW	7-16-91	Groundwater	Clear, no odor.	Resample of existing well.
U-MW6D-GW	7-16-91	Groundwater	Clear, no odor.	Resample of existing well.
U-MW7S-GW	7-16-91	Groundwater	Clear, no odor.	Resample of existing well.
U-MW7D-GW	7-16-91	Groundwater	Clear, no odor.	Resample of existing well.
U-MW8S-GW	7-18-81	Groundwater	Clear with a slight yellow tint. Moderate septic odor.	Resample of existing well.
U-MW8D-GW	7-18-91	Groundwater	Very slightly turbid, no odor.	Resample of existing well.
U-MW9S-GW	7-16-91	Groundwater	Clear, no odor.	Resample of existing well.

TABLE L-1 (Continued) (Pg. 10 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-MW10SR-GW	7-25-91	Groundwater	Clear, no odor.	<ul style="list-style-type: none"> •Yields shallow groundwater quality control in an area of suspected southwestward flows from the drum disposal area into the wetlands.
U-MW-11S-GW	7-15-91	Groundwater	Clear to very slightly turbid. No odor.	<ul style="list-style-type: none"> •Shallow flow direction control in area of potential radial shallow flow (northwestward flow). •Provides groundwater quality information.
U-MW12S-GW	7-15-91	Groundwater	Clear with a yellow tint. Sample effervescent. No odor.	<ul style="list-style-type: none"> •Shallow flow direction control in area of potential radial shallow flow (northwestward flow). •Provides groundwater quality information.
U-MW13S-GW	7-15-91	Groundwater	Clear to very slightly turbid. No odor.	<ul style="list-style-type: none"> •Background well upgradient from suspected drum disposal area. •Additional shallow flow direction and gradient control.

TABLE L-1 (Continued) (Pg. 11 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-MW-14S-GW	7-23-91	Groundwater	Clear to very slightly turbid with black tint. No odor.	<ul style="list-style-type: none"> •Yields downgradient shallow groundwater quality information for assessment of groundwater treatment alternatives •Yields additional vertical gradient control.
U-MW14D-GW	7-25-91	Groundwater	Clear to slightly turbid. No odor.	<ul style="list-style-type: none"> •Yields downgradient lower aquifer quality information. •Yields additional vertical gradient control.
U-MW15S-GW	7-19-91	Groundwater	Clear with a yellow tint. Septic odor.	<ul style="list-style-type: none"> •Yields downgradient shallow groundwater quality information for assessment of groundwater treatment alternatives. •Yields additional vertical gradient control.
U-MW15D-GW	7-25-91	Groundwater	Clear, no odor.	<ul style="list-style-type: none"> •Yield downgradient lower aquifer quality information. •Yields additional vertical gradient control.
U-SG-1HP (Impinger)	7-9-91	Air	Impinger reagent turned light yellow w/precipitation.	Ambient FID at 220 ppm 6" OVA at >2,000 ppm 6" LEL at 60%, Large area of visible venting.

TABLE L-1 (Continued) (Pg. 12 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SG-1HP (Summa Cannister)	7-9-91	Air	Noticeable odor during sample collection.	Ambient FID at 220 ppm 6" OVA at >2,000 ppm 6" LEL at 60%, Large area of visible venting.
U-SG-2HP (Impinger)	7-9-91	Air	Impinger reagent turned light yellow w/precipitate.	6" FID at >2,000 ppm 6" PID at 3.8 ppm
U-SG-2HP (Summa Cannister)	7-9-91	Air	Noticeable odor during sample collection.	6" FID at >2,000 ppm 6" PID at 3.8 ppm
U-SG-3HP (Impinger)	7-9-91	Air	Impinger reagent turned light yellow w/precipitate.	6" FID at >2,000 ppm 6" HNu at 6.0 ppm
U-SG-3HP (Summa Cannister)	7-9-91	Air	Noticeable odor during sample collection.	6" FID at >2,000 ppm 6" HNu at 6.0 ppm
U-SG-4HP (Impinger)	7-9-91	Air	Reagent remained clear.	6" FID at >2,000 ppm 6" PID at 200 ppm
U-SG-4HP (Summa Cannister)	7-9-91	Air	Noticeable odor during sample collection.	6" FID at >2,000 ppm. 6" PID at 200 ppm
U-SG-5HP (Impinger)	7-9-91	Air	Reagent remained clear.	6" FID at >2,000 ppm 6" LEL at 100%
U-SG-5HP (Summa Cannister)	7-9-91	Air	Noticeable odor during sample.	6" FID at >2,000 ppm 6" LEL at 100%

TABLE L-1 (Continued) (Pg. 13 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SG-6HP (Impinger)	7-9-91	Air	Reagent remained clear.	Ambient FID at 24 ppm 6" FID at >2,000 ppm 6" PID at 0.2 ppm 6" LEL at 5.0%
U-SG-6HP (Summa Cannister)	7-9-91	Air	No noticeable odor during sample.	Ambient FID at 24 ppm 6" FID at >2,000 ppm 6" PID at 0.2 ppm 6" LEL at 5.0%
U-SG-7HP (Impinger)	7-9-91	Air	Reagent remained clear.	Ambient FID at 22 ppm 6" FID at >2,000 ppm 6" H ₂ S at 0.5 ppm 6" LEL at 100%
U-SG-7HP (Summa Cannister)	7-9-91	Air	Noticeable odor during sample.	Ambient FID at 22 ppm 6" FID at >2,000 ppm 6" H ₂ S at 0.5 ppm 6" LEL at 100%
U-SG-8HP (Impinger)	7-9-91	Air	Reagent remained clear.	Ambient FID at 24 ppm 6" FID at >2,000 ppm 6" H ₂ S at 16 ppm 6" LEL at 100%
U-SG-8HP (Summa Cannister)	7-9-91	Air	Noticeable odor during sample.	Ambient FID at 24 ppm 6" FID at >2,000 ppm 6" H ₂ S at 16 ppm 6" LEL at 100%
U-SG1-LP (Impinger)	7-24-91	Air	Impinger reagent turned yellow during sample w/precipitate.	See U-SG-1HP

TABLE L-1 (Continued) (Pg. 14 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SG1-LP (Summa Cannister)	7-24-91	Air	Noticeable odor during sample.	See U-SG-1HP
U-SG2-LP (Impinger)	7-24-91	Air	Impinger reagent turned yellow during sample w/precipitate.	See U-SG-2HP
U-SG2-LP (Summa Cannister)	7-24-91	Air	Noticeable odor during sample.	See U-SG-2HP
U-SG3-LP (Impinger)	7-24-91	Air	Impinger reagent turned yellow during sample w/precipitate.	See U-SG-3HP
U-SG3-LP (Summa Cannister)	7-24-91	Air	Noticeable odor during sample.	See U-SG-3HP
U-SG4-LP (Impinger)	7-24-91	Air	Reagent remained clear.	See U-SG-4HP
U-SG4-LP (Summa Cannister)	7-24-91	Air	Noticeable odor during sample.	See U-SG-4HP
U-SG5-LP (Impinger)	7-24-91	Air	Reagent remained clear.	See U-SG-5HP
U-SG5-LP (Summa Cannister)	7-24-91	Air	Noticeable odor during sample.	See U-SG-5HP

TABLE L-1 (Continued) (Pg. 15 of 15)

ANALYTICAL SAMPLE DESCRIPTIONS

Sample ID	Date Sampled	Matrix	Description	Reason for Location
U-SG6-LP (Impinger)	7-24-91	Air	Reagent remained clear.	See U-SG-6HP
U-SG6-LP (Summa Canister)	7-24-91	Air	No noticeable odor during sample.	See U-SG-6HP
U-SG7-LP (Impinger)	7-24-91	Air	Reagent remained clear.	See U-SG-7HP
U-SG7-LP (Summa Canister)	7-24-91	Air	Noticeable odor during sample.	See U-SG-7HP
U-SG8-LP (Impinger)	7-24-91	Air	Reagent remained clear.	See U-SG-8HP
U-SG8-LP (Summa Canister)	7-24-91	Air	Noticeable odor during sample.	See U-SG-8HP

APPENDIX M

SUMMARY OF METEOROLOGICAL CONDITIONS

FIGURE M-1

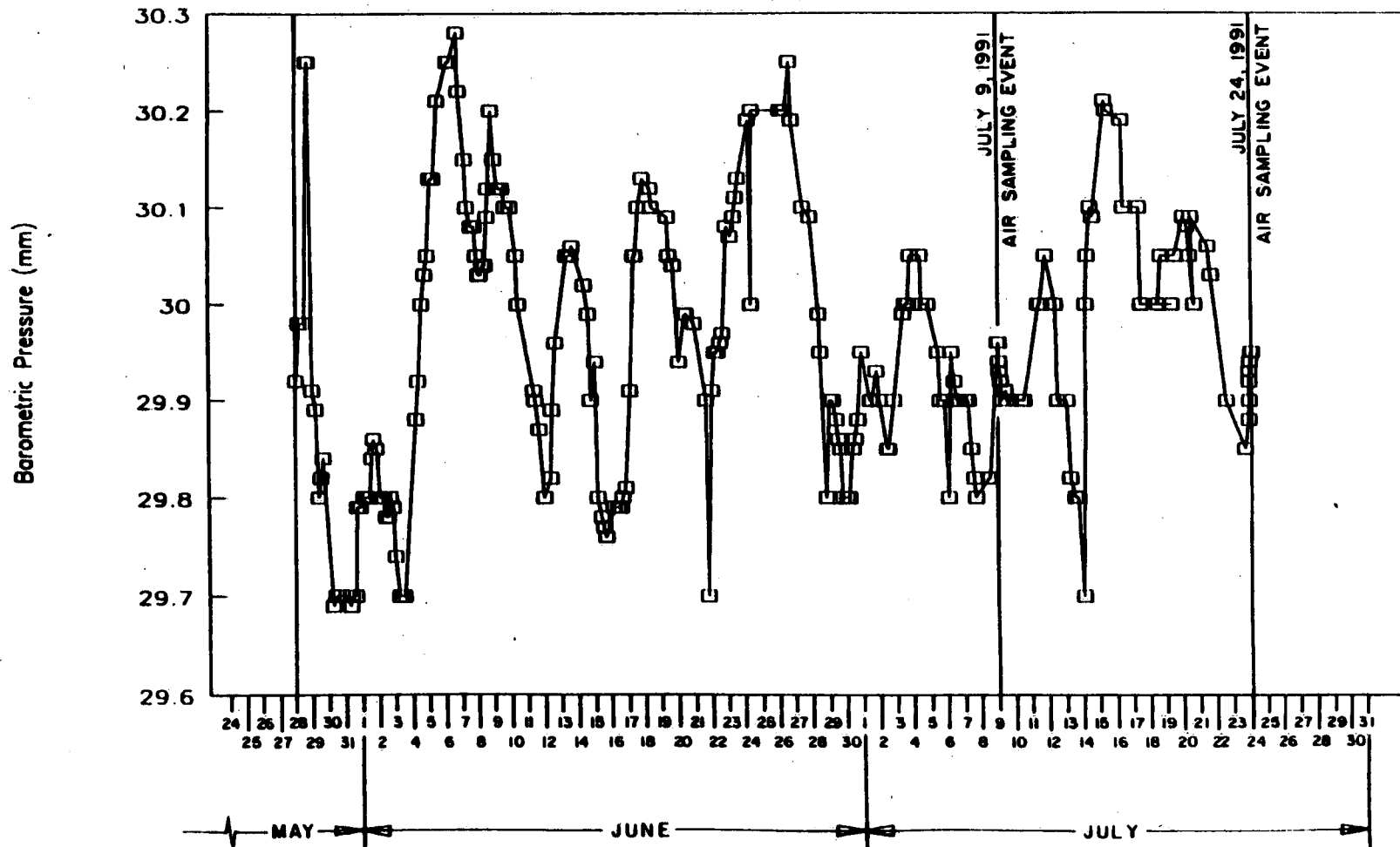
BAROMETRIC PRESSURE FROM MAY 28—JULY 24
GLOBAL LANDFILL

TABLE M - 1
 GLOBAL LANDFILL - SITE METEOROLOGICAL STATION
 SUMMARY OF WEATHER DATA

DATE 1991	TIME	TEMP Deg.F	WIND SPEED	WIND DIR	BAROM PRESS	DESCRIPTION
MAY 28	18.50	92	0	N	29.92	SUNNY
MAY 28	23.00	80	0	W	29.98	
MAY 29	6.00	84	0	E	29.98	
MAY 29	7.40	74	0	E	29.98	SUNNY
MAY 29	11.00	91	0	W	30.25	SUNNY
MAY 29	12.30	98	0	E	30.25	SUNNY
MAY 29	18.00	91	0	NW	29.91	PTLY SUNNY
MAY 29	23.00	78	0	W	29.89	
MAY 30	3.00	70	0	NW	29.80	
MAY 30	6.00	80	0	W	29.82	PTLY SUNNY
MAY 30	9.30	88	0	SE	29.84	
MAY 30	23.00	74	0	N	29.69	
MAY 31	3.00	74	0	NW	29.70	
MAY 31	6.00	76	0	NW	29.70	
MAY 31	17.15	80	2	W	29.70	
MAY 31	23.30	72	0	W	29.69	
JUN 1	2.00	72	0	W	29.70	
JUN 1	7.00	78	0	W	29.70	
JUN 1	9.00	80	0	W	29.79	
JUN 1	14.00	88	0	W	29.79	
JUN 1	19.00	82	0	SW	29.80	
JUN 1	23.00	70	0	SW	29.80	
JUN 2	3.00	63	0	SW	29.80	
JUN 2	7.00	67	0	SW	29.84	
JUN 2	9.00	89	0	E	29.86	
JUN 2	14.00	84	0	E	29.85	
JUN 2	18.30	78	3	SE	29.80	
JUN 2	23.00	66	0	E	29.80	
JUN 3	3.00	62	0	E	29.78	
JUN 3	7.00	64	0	SE	29.78	
JUN 3	9.58	82	<5	E	29.80	
JUN 3	13.50	92	<5	E	29.79	
JUN 3	17.00	84	5	SE	29.74	
JUN 3	23.00	72	0	E	29.70	
JUN 4	2.00	66	0	SE	29.70	
JUN 4	6.00	62	0	S	29.70	
JUN 4	23.30	58	1	E	29.88	
JUN 5	3.00	56	1	NE	29.92	
JUN 5	8.20	61	2	N	30.00	PTLY CLOUDY
JUN 5	13.00	78	2	NE	30.03	PTLY CLOUDY
JUN 5	16.40	70	3-5	SSW	30.05	OVERCAST/RAIN
JUN 5	21.50	57	0	N	30.13	OVERCAST

TABLE M - 1
 GLOBAL LANDFILL - SITE METEOROLOGICAL STATION
 SUMMARY OF WEATHER DATA

DATE 1991	TIME	TEMP Deg.F	WIND SPEED	WIND DIR	BAROM PRESS	DESCRIPTION
JUN 6	2.00	56	1	NE	30.13	CLOUDY
JUN 6	9.10	66	2-5	S	30.21	CLOUDY
JUN 6	23.30	58	1	E	30.25	
JUN 7	2.25	56	0	S	30.25	
JUN 7	13.35	82	2	NNE	30.28	CLOUDY
JUN 7	16.00	88	0	S	30.22	CLOUDY
JUN 7	24.00	64	1	S	30.15	CLOUDY
JUN 8	2.25	60	1	S	30.10	
JUN 8	8.30	90	0	E	30.08	
JUN 8	13.30	96	0	E	30.08	
JUN 8	16.00	96	4	E	30.05	
JUN 8	19.00	88	0	SSW	30.03	
JUN 8	21.00	74	0	SSW	30.03	
JUN 9	1.00	62	0	S	30.04	
JUN 9	4.00	60	0	S	30.04	
JUN 9	7.00	66	0	S	30.09	
JUN 9	9.00	80	0	S	30.12	
JUN 9	14.00	84	0	E	30.20	
JUN 9	18.00	81	3	NE	30.15	
JUN 9	23.00	70	0	NE	30.12	
JUN 10	3.00	60	0	SW	30.12	
JUN 10	5.30	62	0	SW	30.12	
JUN 10	10.10	80	2	SW	30.10	CLOUDY
JUN 10	16.00	94	5-7	SSW	30.10	CLOUDY
JUN 10	24.00	74	1	E	30.05	
JUN 11	2.40	72	1	E	30.00	
JUN 11	24.00	68	1	S	29.91	RAINY
JUN 12	2.00	68	1	S	29.90	
JUN 12	7.35	71	2-5	SW	29.87	OVERCAST
JUN 12	14.52	84	10	SE	29.80	OVERCAST
JUN 12	24.00	62	1	S	29.82	
JUN 13	2.00	54	1	E	29.89	
JUN 13	7.20	56	>2	N	29.96	
JUN 13	24.00	60	1	E	30.05	
JUN 14	1.50	54	1	NE	30.05	
JUN 14	6.00	50	1	S	30.05	
JUN 14	7.30	59	>2	ESE	30.06	
JUN 14	24.00	60	1	S	30.02	
JUN 15	6.00	78	1	S	29.99	
JUN 15	9.00	84	1	E	29.90	
JUN 15	15.00	90	1	E	29.94	
JUN 15	19.00	88	0	E	29.80	
JUN 15	23.45	70	0	E	29.78	

TABLE M - 1
 GLOBAL LANDFILL - SITE METEOROLOGICAL STATION
 SUMMARY OF WEATHER DATA

DATE 1991	TIME	TEMP Deg.F	WIND SPEED	WIND DIR	BAROM PRESS	DESCRIPTION
JUN 16	3.15	62	0	E	29.77	
JUN 16	6.35	68	0	E	29.76	
JUN 16	17.15	84	10-12	NE	29.79	
JUN 16	23.30	72	0	E	29.79	
JUN 17	3.25	66	0	E	29.79	
JUN 17	6.00	70	0	E	29.80	
JUN 17	11.08	98	>2	NE	29.81	
JUN 17	17.25	79	>2	SW	29.91	
JUN 17	23.30	62	1	W	30.05	
JUN 18	1.50	60	0	W	30.05	
JUN 18	6.00	62	0	W	30.10	
JUN 18	12.50	60	>2	W	30.13	LT RAIN
JUN 18	24.00	57	2	S	30.12	
JUN 19	2.00	58	0	W	30.10	
JUN 19	23.50	60	1	S	30.09	
JUN 20	2.00	60	0	N	30.05	
JUN 20	7.45	65	>2	NNE	30.04	
JUN 20	15.30	89	>2	NE	29.94	
JUN 20	24.00	65	1	N	29.99	
JUN 21	2.00	62	1	NE	29.99	
JUN 21	13.00	98	>2	NW	29.98	
JUN 22	6.00	66	0	NE	29.90	
JUN 22	9.00	74	0	E	29.70	
JUN 22	15.00	68	0	NE	29.91	
JUN 22	19.00	64	0	NW	29.95	
JUN 22	23.00	62	1	NW	29.95	
JUN 23	3.00	58	1	NW	29.96	
JUN 23	6.00	60	3	W	29.97	LT RAIN
JUN 23	13.00	66	0	NE	30.08	
JUN 23	18.00	65	0	W	30.07	
JUN 23	23.00	62	0	NE	30.09	
JUN 24	2.15	48	0	NE	30.11	
JUN 24	5.30	50	0	NE	30.13	
JUN 24	21.15	61	2	WNW	30.19	
JUN 24	23.50	59	1	S	30.00	
JUN 25	2.00	54	0	N	30.20	
JUN 26	19.30	72	>2	NW	30.20	
JUN 26	23.50	62	1	S	30.20	

TABLE M - 1
 GLOBAL LANDFILL - SITE METEOROLOGICAL STATION
 SUMMARY OF WEATHER DATA

DATE 1991	TIME	TEMP Deg.F	WIND SPEED	WIND DIR	BAROM PRESS	DESCRIPTION
JUN 27	2.00	58	0	N	30.20	
JUN 27	8.45	80	2-5	N	30.25	
JUN 27	11.30	70	1	S	30.19	
JUN 28	2.00	65	0	S	30.10	
JUN 28	12.05	100	5-10	S	30.09	
JUN 28	23.55	76	1	E	29.99	
JUN 29	2.00	74	0	E	29.95	
JUN 29	10.00	90	0	E	29.80	
JUN 29	15.00	94	0	E	29.90	
JUN 29	18.30	88	0	S	29.90	
JUN 29	23.30	76	0	S	29.88	
JUN 30	3.00	63	0	E	29.86	
JUN 30	6.00	65	0	E	29.85	
JUN 30	9.00	74	0	E	29.80	
JUN 30	15.00	83	0	E	29.80	
JUN 30	18.00	74	2	N	29.80	
JUN 30	23.00	58	0	NE	29.85	
JUL 1	2.00	56	0	NE	29.86	
JUL 1	6.00	60	0	NE	29.88	
JUL 1	12.00	94	0	S	29.95	
JUL 1	24.00	64	1	S	29.90	
JUL 2	2.00	60	0	E	29.90	
JUL 2	9.00	80	0	N	29.93	
JUL 2	13.00	70	0	N	29.90	
JUL 2	24.00	64	1	S	29.85	
JUL 3	2.00	64	0	N	29.85	
JUL 3	9.00	64	0	N	29.90	
JUL 3	23.00	64	1	N	29.99	
JUL 4	2.30	56	0	N	30.00	
JUL 4	6.30	59	0	N	30.00	
JUL 4	9.45	84	0	N	30.05	
JUL 4	24.00	62	1	N	30.05	
JUL 5	2.00	60	0	NW	30.00	
JUL 5	10.00	70	0	N	30.00	
JUL 5	24.00	64	1	S	29.95	
JUL 6	2.50	62	0	NW	29.90	
JUL 6	9.00	57	0	N	29.90	
JUL 6	15.00	75	0	N	29.80	
JUL 6	18.45	78	0	N	29.95	
JUL 6	23.15	56	0	N	29.92	

TABLE M - 1
 GLOBAL LANDFILL - SITE METEOROLOGICAL STATION
 SUMMARY OF WEATHER DATA

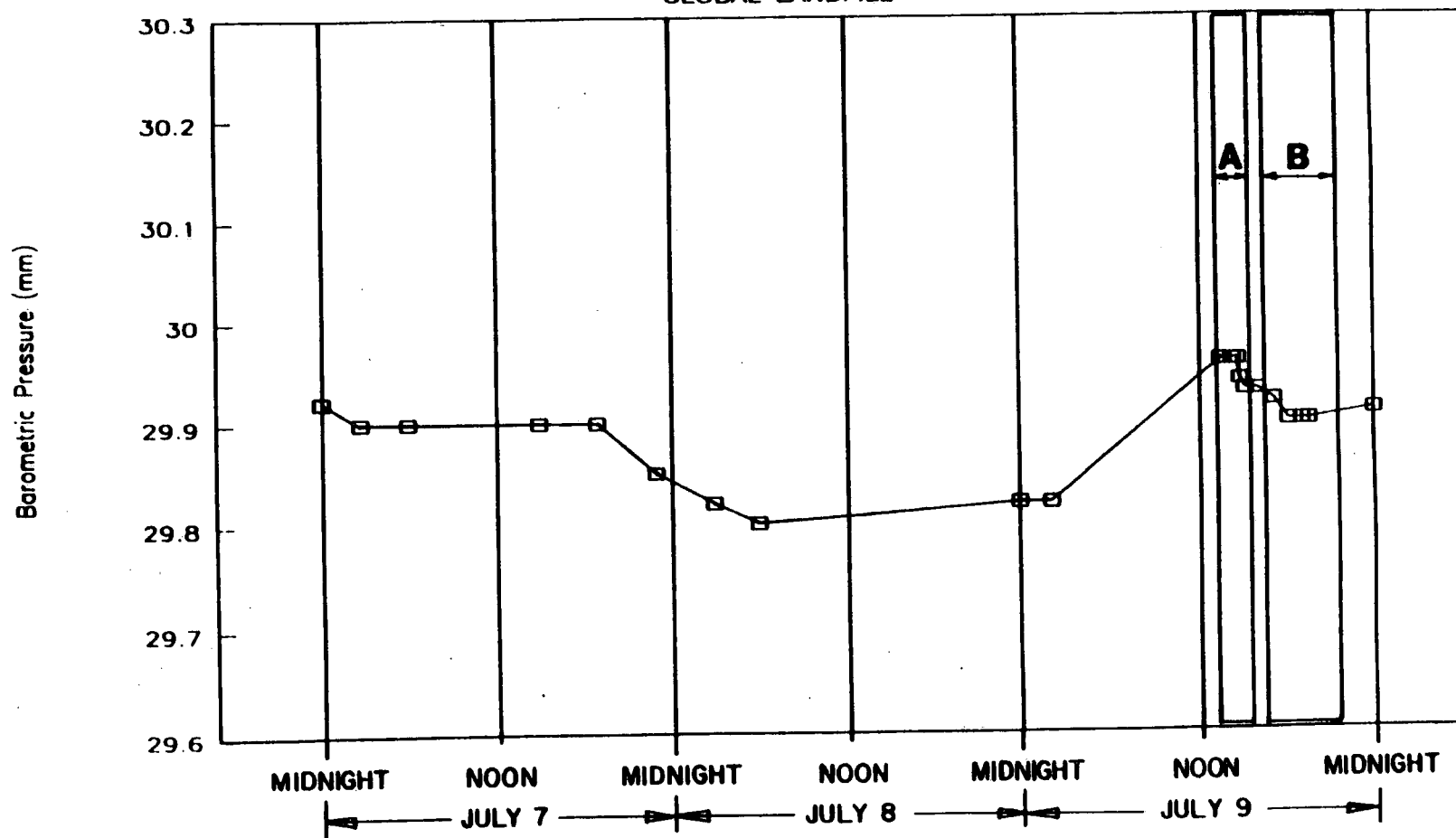
DATE 1991	TIME	TEMP Deg.F	WIND SPEED	WIND DIR	BAROM PRESS	DESCRIPTION
JUL 7	2.45	55	0	NE	29.90	
JUL 7	6.00	63	0	NE	29.90	
JUL 7	15.00	74	0	E	29.90	
JUL 7	19.00	72	1	E	29.90	
JUL 7	23.00	62	0	E	29.85	
JUL 8	3.00	60	0	E	29.82	
JUL 8	6.00	64	0	E	29.80	
JUL 8	23.50	72	1	E	29.82	
JUL 9	2.00	60	0	E	29.82	
JUL 9	13.30	85	5-10	S	29.96	
JUL 9	14.19	84	>2	E	29.96	
JUL 9	14.40	85	>2	E	29.96	
JUL 9	14.50	84	5	S	29.94	
JUL 9	15.10	84	>2	S	29.93	MOSTLY SUNNY
JUL 9	16.00	85	2-5	E	29.93	MOSTLY SUNNY
JUL 9	17.05	82	>2	ENE	29.92	MOSTLY SUNNY
JUL 9	18.05	78	>2	S	29.90	CLOUD/SUN
JUL 9	19.00	76	>2	S	29.90	MOSTLY CLOUD
JUL 9	19.30	74	>2	ENE	29.90	MOSTLY CLOUD
JUL 9	24.00	68	>1	S	29.91	MOSTLY CLOUD
JUL 10	2.00	62	1	S	29.90	MOSTLY CLOUD
JUL 10	24.00	70	1	ENE	29.90	MOSTLY CLOUD
JUL 11	2.50	64	1	S	29.90	MOSTLY CLOUD
JUL 11	24.00	68	1	S	30.00	MOSTLY CLOUD
JUL 12	2.00	60	1	E	30.00	
JUL 12	10.00	88	1	S	30.05	SUNNY
JUL 12	24.00	70	1	N	30.00	MOSTLY CLOUD
JUL 13	2.00	68	1	NW	29.90	
JUL 13	15.00	72	1	N	29.90	
JUL 13	20.00	66	0	S	29.82	RAINY
JUL 14	3.00	62	0	S	29.80	CLEAR/COOL
JUL 14	8.00	68	0	S	29.80	CLOUDY
JUL 14	15.00	84	0	E	29.70	SUNNY
JUL 14	19.00	64	0	S	30.00	SUNNY(EVE)
JUL 14	22.00	58	0	S	30.05	CLEAR
JUL 15	2.25	54	0	S	30.10	CLEAR
JUL 15	5.30	56	0	S	30.09	SUNNY
JUL 15	24.00	66	0	S	30.21	CLOUDY
JUL 16	2.00	64	0	S	30.20	
JUL 16	24.00	70	0	S	30.19	CLOUDY
JUL 17	2.00	64	0	S	30.10	
JUL 17	24.00	74	0	S	30.10	CLEAR
JUL 18	2.00	68	0	S	30.00	

TABLE M - 1
 GLOBAL LANDFILL - SITE METEOROLOGICAL STATION
 SUMMARY OF WEATHER DATA

DATE 1991	TIME	TEMP Deg.F	WIND SPEED	WIND DIR	BAROM PRESS	DESCRIPTION
JUL 19	21.30	78	0	S	30.00	CLEAR
JUL 19	2.00	74	0	S	30.00	
JUL 19	7.00	89	0	S	30.05	
JUL 20	2.00	90	0	S	30.05	
JUL 20	15.00	98	0	S	30.09	
JUL 20	20.15	82	0	SE	30.08	CLOUDY/HOT
JUL 20	23.45	76	0	SE	30.05	CLOUDY
JUL 21	6.00	72	0	SE	30.00	CLOUDY
JUL 21	2.00	82	0	S	30.09	CLOUDY
JUL 22	2.00	70	0	S	30.06	CLOUDY
JUL 22	6.00	68	0	S	30.03	MOSTLY CLOUD
JUL 23	2.00	70	0	NE	29.90	
JUL 24	5.00	65	0	E	29.85	
JUL 24	10.00	82	5	SW	29.88	SOME CLOUDS
JUL 24	10.30	86	6	S	29.90	PARTLY SUNNY
JUL 24	11.00	88	3-5	SW	29.92	MOSTLY SUNNY
JUL 24	11.30	88	7-10	E	29.93	MOSTLY SUNNY
JUL 24	12.00	86	5	S	29.94	MOSTLY SUNNY
JUL 24	12.30	86	3-5	E	29.94	MOSTLY SUNNY
JUL 24	13.00	85	5-7	S	29.94	MOSTLY SUNNY
JUL 24	13.30	85	5	SE	29.95	MOSTLY SUNNY
JUL 24	14.00	85	3-5	E	29.95	MOSTLY SUNNY
JUL 24	14.15	84	5-10	E	29.95	MOSTLY SUNNY
JUL 24	14.30	85	5	E	29.95	MOSTLY SUNNY
JUL 24	16.00	84	5-7	E	29.95	CLEAR
JUL 24	16.15	84	5	SE	29.95	CLEAR
JUL 24	16.25	84	3-5	SE	29.95	CLEAR

BAROMETRIC PRESSURE FROM JULY 7-9, 1991

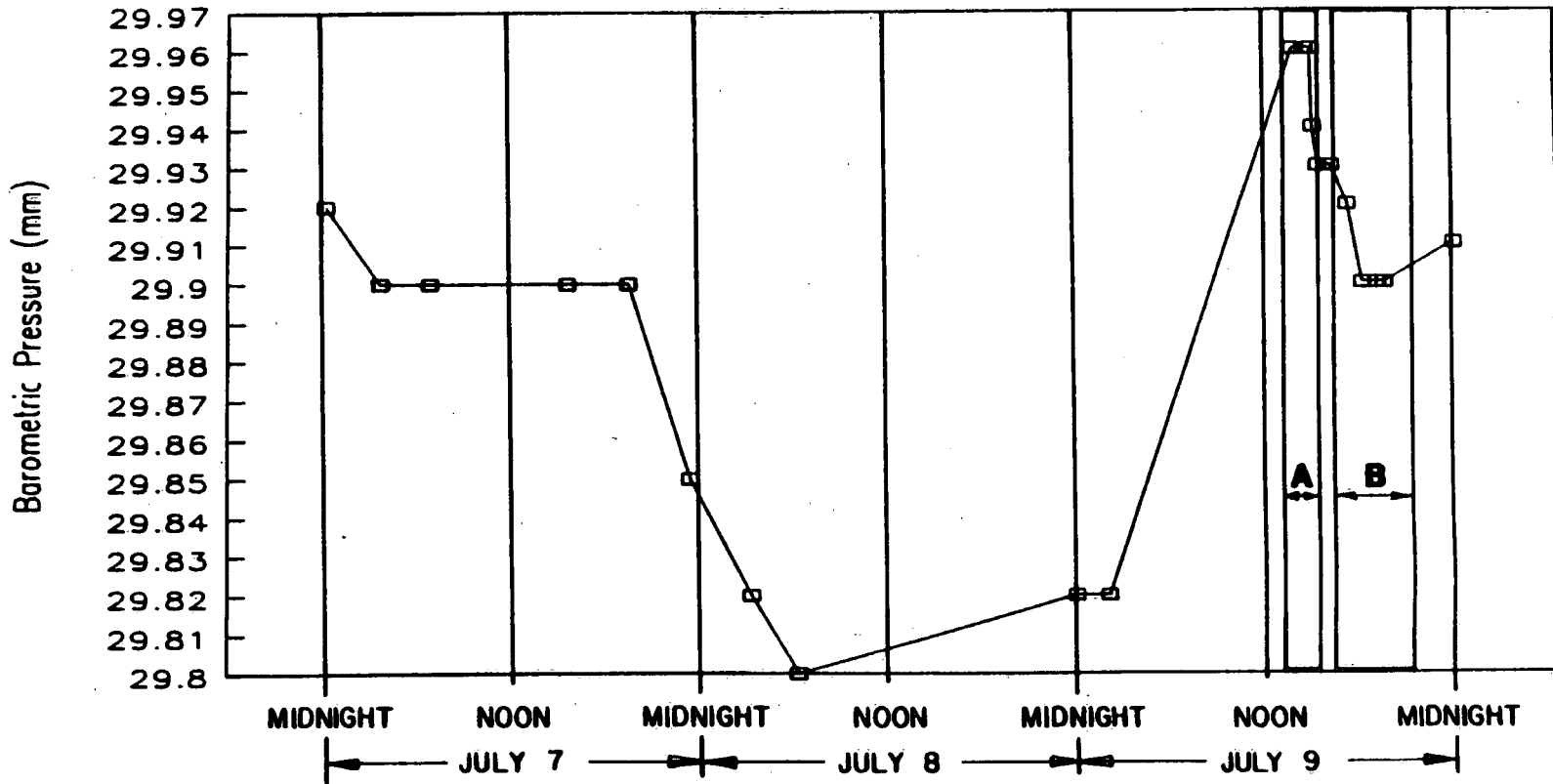
GLOBAL LANDFILL

AIR SAMPLING INTERVALS

A - SUMMA CANISTER METHOD

B - IMPINGER TRAIN METHOD

BAROMETRIC PRESSURE FROM JULY 7-9, 1991 GLOBAL LANDFILL

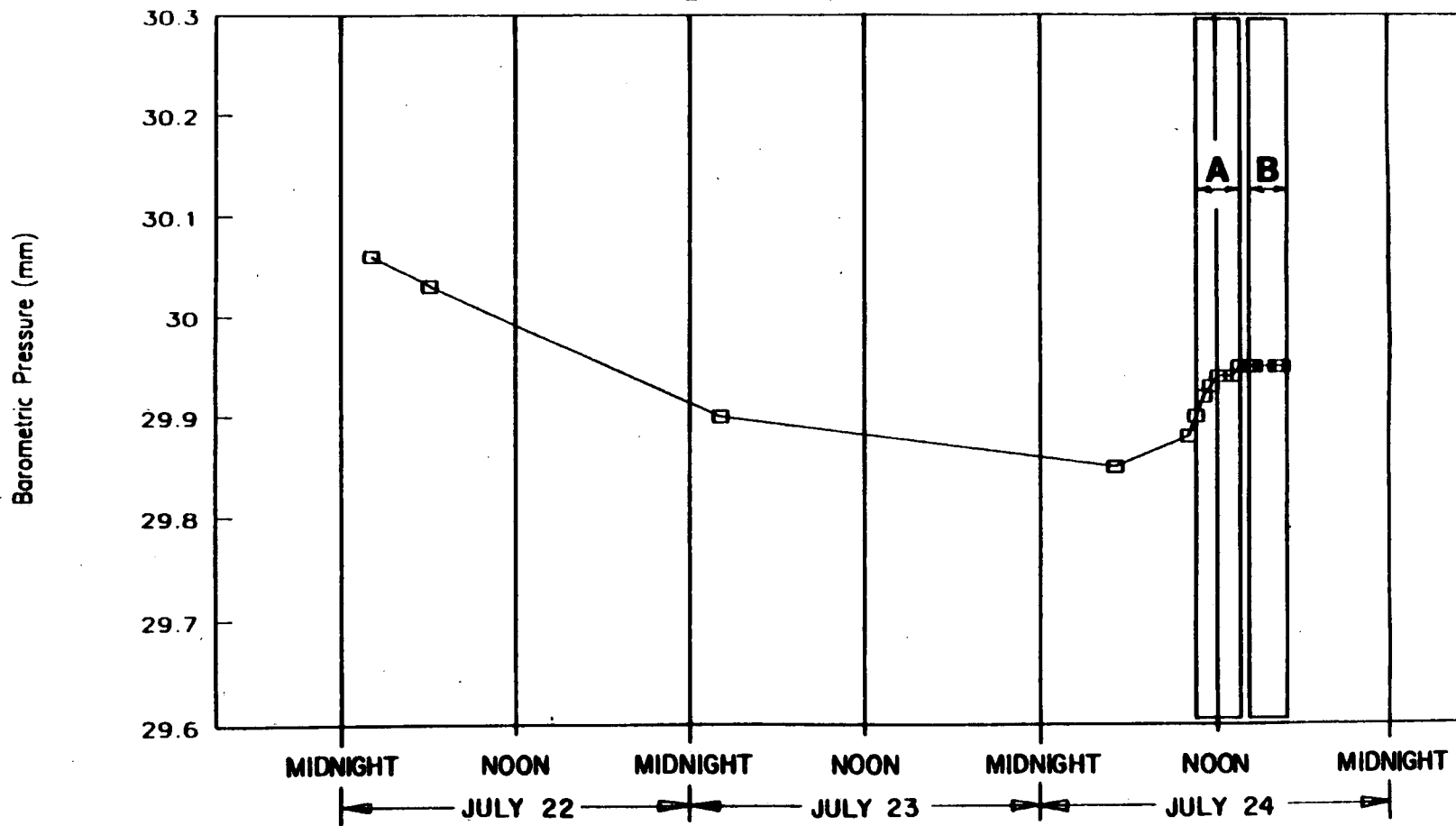


AIR SAMPLING INTERVALS

- A** - SUMMA CANISTER METHOD
- B** - IMPINGER TRAIN METHOD

BAROMETRIC PRESSURE FROM JULY 22-24

GLOBAL LANDFILL

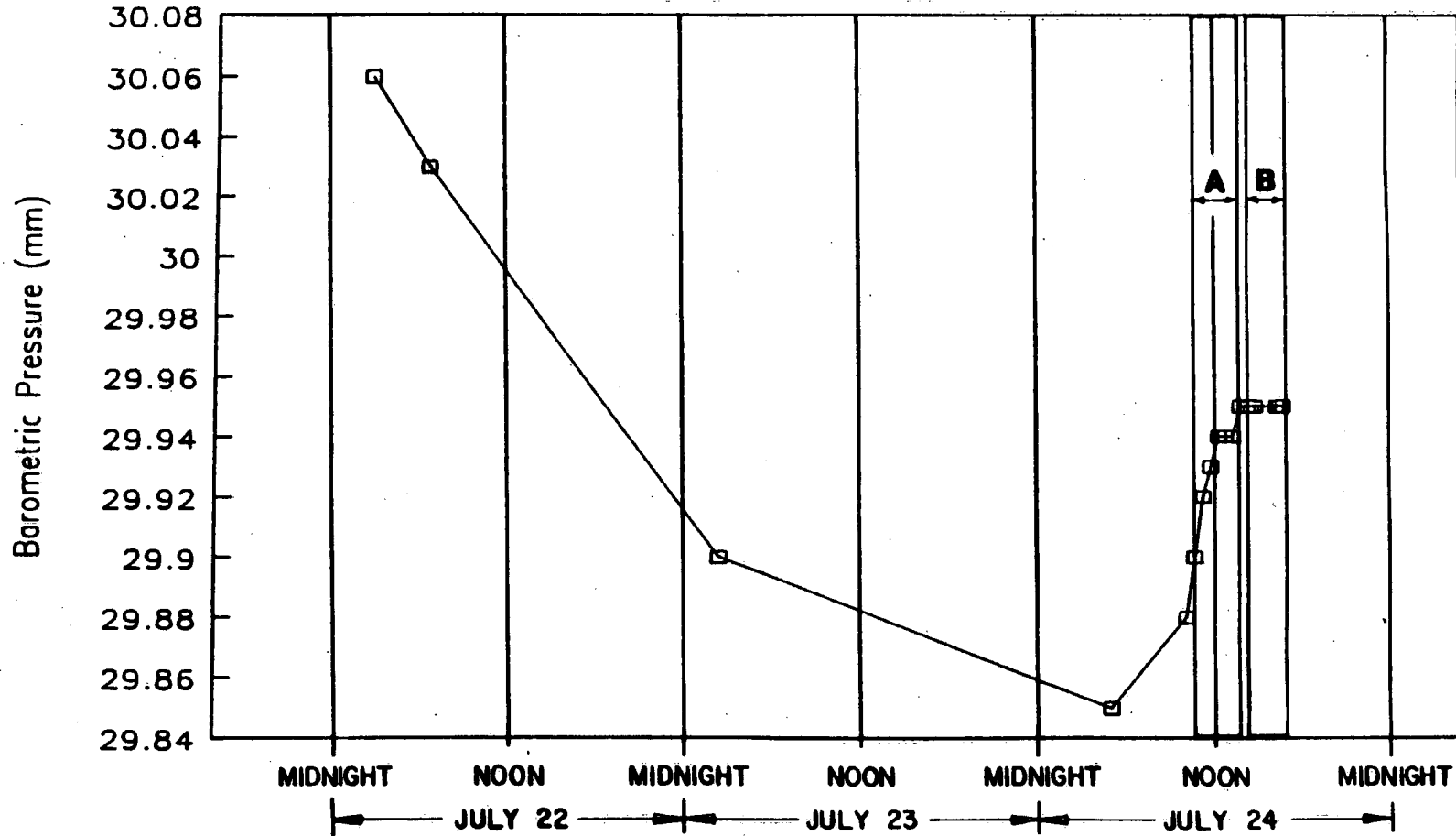


AIR SAMPLING INTERVALS

A - SUMMA CANISTER METHOD

B - IMPINGER TRAIN METHOD

BAROMETRIC PRESSURE FROM JULY 22-24, 1991 GLOBAL LANDFILL



AIR SAMPLING INTERVALS

- A** - SUMMA CANISTER METHOD
- B** - IMPINGER TRAIN METHOD

Station **NEW BRUNSWICK** County **MIDDLESEX** State **NJ** Date (Month & yr.) **05/97** (Time of Complete Observation) (Local time) **0700 DST** Standard Time in Use **DST**

DATE	AIR TEMPERATURE °F					PRECIPITATION					WIND			EVAPORATION (Inches & hundredths)			WATER TEMP.		ADDITIONAL DATA/REMARKS STATE OF GROUND MAX/MIN			
	24 Hours Ending at Observation		At Observation			Supplemental Readings at		SKY	SKY	WEATHER	24 Hour Amounts		At Obs. Snow, Ice Pellets, Hail, Ice on ground (in.)	Ass. Anemometer Dial Reading (Miles)	24 Hour Movement	Gage Reading or Amount Added	Reading When Tank Filled or Amount Removed	Amount of Evaporation		24 Hours Ending at Observation		
	Max.	Min.	Wet-bulb	Dew Point	MAX	MIN	Observed	Forecast	Remarks	Rain, Melting snow, etc. (in. & hundredths)	Snow, Ice Pellets, Hail (in. & tenths)			YDA	TOA		Max.	Min.				
1	70	51	53		100	ND	100	3/8	OBS	Fog	0	0	0			2.248	2.470	0.058			57/54/55	
2	78	47	53		100	59	100	0/8	CIR		T	0	0			2.470	2.215	0.255			63/55/57	
3	67	44	48		100	54	100	7/8	BKN		T	0	0			2.735	2.169	0.266			61/56/56	
4	64	44	46		100	64	100	3/8	SC		0	0	0			2.469	2.259	0.215			59/54/54	
5	71	44	50		100	44	100	3/8	SCT		0	0	0			2.234	2.031	0.223			62/54/55	
6	67	50	57		100	59	100	5/8	OVC		0.27	0	0			2.282	2.384	0.148			61/55/59	
7	66	50	52		100	102	100	2/8	SCT		1.25	0	0			0.351	3.594	0.055			60/51/57	
8	65	41	51		100	67	100	1/8	SCT		0	0	0			1.749	1.537	0.214			61/50/50	
9	71	47	50		100	60	100	m	m		0	0	0			m	m	0.110				
10	64	52	53		100	89	100	m	m		T	0	0			m	m	m				
11	71	43	48		100	70	100	0/8	CIR		0	0	0			-	1.199	m			61/56/56	
12	72	48	57		100	70	100	9/8	CIR		0	0	0			1.199	.935	.264			76/53/56	
13	87	57	62		100	78	100	9/8	CLR		0	0	0			1.558	1.338	.220			67/59/62	
14	89	62	65		100	88	100	2/8	SCT		0.31	0	0			1.338	1.778	.270			70/62/64	
15	86	62	64		100	96	100	2/8	OBS	Fog	0.02	0	0			1.778	1.632	.162			69/64/66	
16	83	55	58		100	66	100	3/8	SCT		0	0	0			1.632	1.432	.204			72/66/66	
17	85	58	60		100	71	100	5/8	SCT		0	0	0			1.432	1.121	.311			71/66/66	
18	83	56	56		100	100	100	4/8	OVC		T	0	0			1.121	.958	.161			72/64/68	
19	64	45	47		100	96	100	4/8	OVC		0	0	0			.958	m	m			69/63/63	
20	64	38	45		100	68	100	0/8	CLR		0	0	0			m	2.114	m			69/61/61	
21	73	42	49		100	35	94	9/8	CLR		0	0	0			2.114	1.780	.234			70/61/61	
22	79	49	64		100	43	100	6/8	BKN		0	0	0			1.980	1.660	.220			70/61/65	
23	80	61	67		100	30	94	9/8	CIR	haze	0	0	0			1.660	1.426	.234			73/65/67	
24	80	58	59		100	50	100	8/8	OVC	Fog	0	0	0			1.426	1.176	.250			73/67/67	
25	85	59	69		100	50	100	6/8	OVC		0	0	0			1.176	.955	.221			73/67/69	
26	91	68	72		100	44	92	4/8	OVC	haze	0	0	0			2.506	2.248	.258			76/69/71	
27	78	62	63		100	69	100	3/8	OVC	Fog	0	0	0			2.248	2.014	.234			71/70/70	
28	90	63	73		100	50	100	6/8	BKN		0.81	0	0			2.014	2.590	.468			75/70/73	
29	89	61	69		100	42	83	0/8	CLR		0	0	0			2.590	2.300	.290			76/71/71	
30	87	67	70		100	38	100	4/8	SCT		0	0	0			2.300	2.054	.246			78/71/73	
31	89	66	74		100	56	100	4/8	SCT	haze	.43	0	0			2.054	2.232	.252			78/72/73	
Sum											3.49	0	0									
Avg.																						

City **New Brunswick** County **Middlesex** State **NJ** Date (Month & yr.) **06/91** Time of Complete Observation (Local time) **0700 DST** Standard Time in Use **DST**

AIR TEMPERATURE °F				PRECIPITATION				WIND			EVAPORATION (Inches & hundredths)			WATER TEMP. °F		ADDITIONAL DATA/REMARKS								
24 Hours Ending at Observation		At Observation		24 Hour Amounts		At Obs.	24 Hour	24 Hour	24 Hours Ending at Observation	Max.	Min.	Stage	Remarks											
Max.	Min.	Barob.	Wet-bulb	Dew Point	Rel. Hum.	Rel. Hum.	Direction	Speed	Max.					Min.	Max.		Min.							
70	68	72			100	52	88	3/8	SLT			.79	0	0	2.22	2.22	.239	1	78/73/75					
64	58	63			100	40	100	0	0			0	0	0	2.78	2.50	.208	1	76/72/72					
64	58	64			100	42	100	0	CLR			0	0	0	2.50	2.249	.257	1	76/71/71					
61	59	60			100	36	100	0	OVC			0.01	0	0	2.249	1.998	.261	1	76/71/71					
57	54	54			100	40	86	0	CLR			0.04	0	0	1.998	1.856	.181	1	71/67/67					
69	47	53			100	42	100	3/8	SLT			0.28	0	0	1.856	1.820	.316	1	68/65/65					
72	49	54			100	36	100	0	CLR			0	0	0	1.820	1.808	.012	1	69/65/65					
65	57	60			100	28	78	1/8	SLT			0	0	0	1.808	1.604	.204	1	70/64/66					
64	59	64			100	32	96	0	CLR	None		0	0	0	1.604	1.38	.224	1	72/65/67					
63	56	63			100	33	100	0	CLR			0	0	0	1.38	1.051	.267	1	73/67/68					
63	63	70			100	30	85	3/8	SLT			0	0	0	1.051	0M	0M	0	72/68/70					
65	65	67			100	38	100	1/8	BKN	None		0.56	0	0	0M	2.194	.19	0	73/69/70					
63	56	56			100	53	62	0	CLR	BEAUTIFUL!		0.11	0	0	2.194	2.114	.198	0	73/68/68					
49	57	57			100	32	80	3/8	SLT			0	0	0	2.114	1.910	.304	0	72/67/67					
57	62	62			100	32	100	0	0			0	0	0	1.910	1.81	.244	1	73/64/68					
62	74	74			100	34	96	5/8	SLT			0	0	0	1.81	1.276	.285	1	75/68/72					
73	76	76			100	44	87	0	OVC	Muggy		0	0	0	1.650	1.844	.280	0	76/71/74					
64	65	65			100	47	86	0	OVC			0	0	0	1.844	1.158	.200	0	75/72/72					
60	62	62			100	86	100	0	OVC	Light Rain		0.56	0	0	1.158	1.674	.044	2	72/68/69					
62	65	65			100	100	100	7/8	BKN			.45	0	0	2.478	2.874	0	1	68/68/68					
62	68	68			100	40	96	0	CLR	HTV Dew		0	0	0	2.874	2.626	.248	1	75/68/71					
64	72	72			100	38	78	0	SLT			0	0	0	2.626	2.317	.309	1	74/71/72					
62	62	62			100	M	100	0	OVC			.02	0	0	2.317	2.176	.141	1	73/70/70					
65	61	61			100	58	100	0	CLR	HTV Dew		0.10	0	0	2.176	2.194	.082	1	69/67/67					
65	61	61			100	29	100	3/8	SLT			0	0	0	2.194	1.934	.260	1	72/67/68					
66	62	62			100	35	100	0	CLR	Clear & bill		0	0	0	1.934	1.666	.268	1	72/67/68					
60	64	64			100	36	100	0	BKN			0	0	0	1.666	1.490	.176	1	73/67/69					
64	68	68			100	40	100	0	OVC	High Clouds		0	0	0	1.490	1.127	.368	1	75/69/11					
68	78	78			100	42	84	0	0			0	0	0	1.127	1.58	.311	0	76/71/74					
71	73	73			100	45	100	0	0			0	0	0	1.58	1.276	.212	1	78/72/75					
												2.93	0											
												Adjusted Total												

COUNTY			STATE			STATION NO.			DATE OF OBSERVATION			STANDARD TIME IN USE			EVAPORATION (Inches & hundredths)			WIND		TEMP.		ADDITIONAL DATA/REMARKS	
AIR TEMPERATURE °F			PRECIPITATION			WIND			EVAPORATION (Inches & hundredths)			WIND		TEMP.		ADDITIONAL DATA/REMARKS							
At Observation			Supplemental Readings			SKY			WEATHER			24 Hour Amount			As Observed			24 Hour		24 Hours Ending at Observation		ADDITIONAL DATA/REMARKS	
Hour	Temp	Dew Point	Max	Min	Wet Bulb	Clouds	Wind	Direction	Force	Rate	Moisture	Temp	Wind	Direction	Force	Temp	Wind	Direction	Force	Max	Min	State	Remarks
61	66		100	52	96	3/8	SE			T	0	0				1.276	1.031	.245					77/71/71
62	65		100	57	78	4/8	SE			0	0	0				1.031	0.731	.30					77/72/73
63	63		100	57	100	5/8	SE			0.36	0	0				1.936	2.123	0.17					72/72/73
64	62		100	54	100	5/8	SE			T	0	0				2.023	2.134	.111					74/70/70
65	61		100	42	100	5/8	SE			.42	0	0				2.134	1.910	.251					76/70/72
66	60		100	42	100	5/8	SE			.29	0	0				1.910	2.168	.162					71/71/71
67	60		100	65	100	7/8	SE			.01	0	0				2.168	2.068	.110					74/70/72
68	60		100	60	100	7/8	SE			.40	0	0				2.068	2.300	.148					73/71/72
69	60		100	56	100	7/8	SE			T	0	0				2.300	2.066	.234					76/72/72
70	60		100	38	92	0/8	SE			0	0	0				2.066	1.746	.320					76/71/71
71	60		100	36	68	0/8	SE			0	0	0				1.746	1.452	.294					76/71/72
72	60		100	35	100	5/8	SE			0	0	0				1.452	1.190	.262					77/71/72
73	60		100	40	100	5/8	SE			0.27	0	0				2.066	2.720	.338					76/70/74
74	60		100	76	100	7/8	SE			1.21	0	0				2.720	3.771	.251					74/72/73
75	60		100	42	100	5/8	CLD			0	0	0				3.771	3.525	.246					76/73/73
76	60		100	32	100	0/8	CLD			0	0	0				3.525	3.178	.347					76/72/72
77	60		100	32	100	1/8	CLD			0	0	0				3.178	2.864	.314					76/72/73
78	60		100	36	100	4/8	CLD			0	0	0				2.864	2.562	.302					78/74/75
79	60		100	36	100	4/8	CLD			0	0	0				2.562	2.220	.342					78/74/75
80	60		100	46	100	5/8	CLD			0	0	0				2.220	1.904	.316					80/75/77
81	60		100	42	100	4/8	CLD			0	0	0				1.904	1.712	.232					80/77/77
82	60		100	38	100	7/8	CLD			.51	0	0				1.712	1.922	.31					80/77/77
83	60		100	61	100	5/8	SE			.16	0	0				1.922	2.064	.142					71/71/77
84	61		100	46	100	5/8	Bkn			.64	0	0				2.064	2.351	.287					71/71/77
85	61		100	33	100	5/8	CLD			.10	0	0				2.351	2.222	.129					76/76/76
86	61		100	96	100	5/8	CLD			.08	0	0				2.222	2.163	.059					81/73/74
87	61		100	94	100	7/8	CLD			1.03	0	0				2.163	3.097	.934					74/74/74
88	62		100	46	100	5/8	CIR			0	0	0				3.097	3.174	.077					74/74/74
89	62		100	40	100	5/8	CLD			0	0	0				3.174	2.864	.310					74/74/74
90	61		100	67	99	4/8	Bkn			.13	0	0				2.864	2.351	.513					74/74/74
91	64		100	56	100	5/8	CLD			T	0	0				2.351	2.735	.384					74/74/74
										5.22	0	0	Adjusted Total										

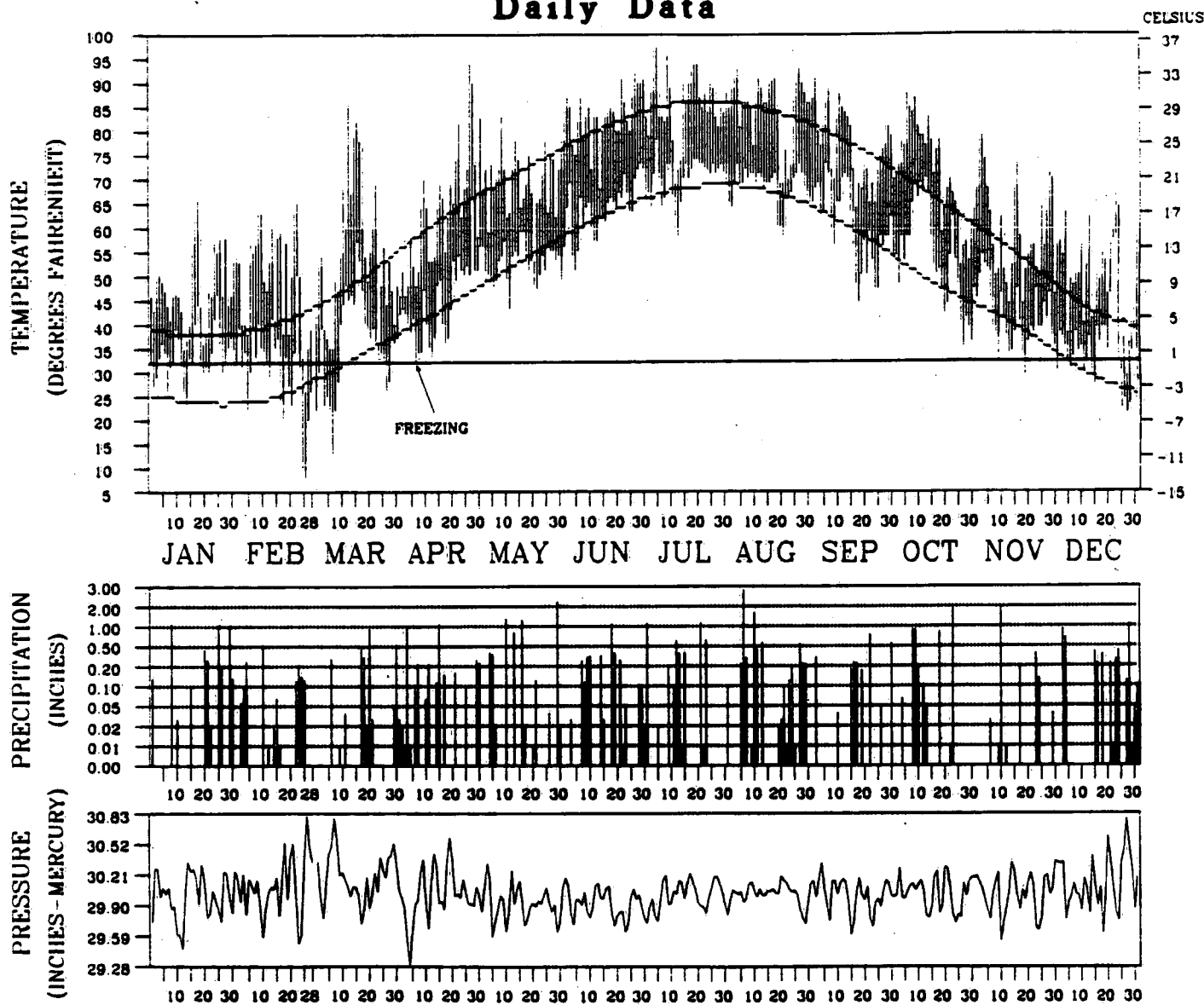
1990 LOCAL CLIMATOLOGICAL DATA

ANNUAL SUMMARY WITH COMPARATIVE DATA



NEWARK, NEW JERSEY

Daily Data



TEMPERATURE DEPICTS NORMAL MAXIMUM, NORMAL MINIMUM AND ACTUAL DAILY HIGH AND LOW VALUES (FAHRENHEIT)
 PRECIPITATION IS MEASURED IN INCHES. SCALE IS NON-LINEAR
 STATION PRESSURE IS MEASURED IN INCHES OF MERCURY

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC DATA CENTER, ASHEVILLE, NORTH CAROLINA, 28801

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE

NATIONAL CLIMATIC DATA CENTER ASHEVILLE NORTH CAROLINA

Kenneth D. Halpern
 DIRECTOR
 NATIONAL CLIMATIC DATA CENTER

NORMALS, MEANS, AND EXTREMES

NEWARK, NEW JERSEY

LATITUDE: 40°42'N LONGITUDE: 74°10'W ELEVATION: 87 FT BRNO TIME ZONE: EASTERN ZONE: 14734
 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC YEAR

TEMPERATURE °F:	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	YEAR
Normals													
Daily Maximum	41.0	43.0	47.0	52.0	58.0	64.0	69.0	72.0	73.0	71.0	66.0	60.0	54.0
Daily Minimum	28.0	29.0	32.0	36.0	41.0	46.0	50.0	52.0	51.0	48.0	42.0	35.0	29.0
Monthly	34.5	36.0	39.5	44.0	49.5	55.0	60.0	62.0	62.0	60.0	54.0	47.5	41.5
Extremes													
Record Highest	49	51	57	64	71	77	82	85	86	84	78	71	65
Record Lowest	14	15	19	23	28	33	37	38	37	34	28	21	15
NORMAL DEGREE DAYS:													
Heating base 65°F	1045	902	738	587	440	300	170	60	20	36	254	555	915
Cooling base 65°F	0	0	0	0	56	199	366	326	132	12	0	0	109
% OF POSSIBLE SUNSHINE													
MEAN SKY COVER (tenths)	44	55	64	63	64	65	62	62	61	57	55	54	51
Sunrise - Sunset	44	55	64	63	64	65	62	62	61	57	55	54	51
MEAN NUMBER OF DAYS:													
Sunrise to Sunset													
Clear	48	41	34	28	23	19	16	14	13	12	11	10	9
Partly Cloudy	48	41	34	28	23	19	16	14	13	12	11	10	9
Cloudy	48	41	34	28	23	19	16	14	13	12	11	10	9
Precipitation													
0.1 inches or more	49	41	35	31	27	23	20	18	17	16	15	14	13
Snow, ice pellets													
1.0 inches or more	49	22	13	12	10	10	10	10	10	10	10	10	10
Thunderstorms	49	22	13	12	10	10	10	10	10	10	10	10	10
Heavy Fog Visibility	49	22	13	12	10	10	10	10	10	10	10	10	10
Temperature													
Maximum													
30° and above	25	0.0	0.0	0.0	0.2	1.1	4.5	8.7	6.9	1.4	0.0	0.0	0.0
32° and below	25	0.0	5.5	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum													
32° and below	25	24.1	21.1	12.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30° and below	25	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVG. STATION PRESS. (mb)	17.1	16.7	16.3	16.3	16.4	16.4	16.4	16.6	16.9	17.4	18.1	18.5	18.6
RELATIVE HUMIDITY (%)													
Hour 01	25	70	69	66	65	72	72	73	75	77	76	73	72
Hour 07	25	74	72	69	66	70	71	72	75	78	78	74	73
Hour 13 (Local Time)	25	58	54	50	47	51	52	51	53	55	53	50	50
Hour 19	25	64	60	57	54	58	58	59	62	64	64	64	63
PRECIPITATION (inches):													
Water Equivalent													
Normal		3.13	3.05	4.15	3.57	3.59	2.94	3.85	4.30	3.66	3.09	3.59	3.42
Maximum Monthly	49	10.10	4.94	11.14	11.14	10.22	6.40	9.98	11.94	10.28	8.20	11.53	9.47
Year		1979	1979	1983	1983	1984	1975	1988	1955	1944	1943	1977	1983
Minimum Monthly	49	0.45	1.22	1.10	0.90	0.52	0.07	0.89	0.50	0.95	0.21	0.51	0.27
Year		1981	1968	1981	1963	1964	1949	1966	1964	1951	1963	1976	1955
Maximum in 24 hrs	37	3.59	2.45	2.66	3.73	4.22	2.31	3.63	7.84	5.27	3.04	7.22	2.77
Year		1979	1961	1978	1984	1979	1973	1988	1971	1971	1973	1977	1983
Snow, ice pellets													
Maximum Monthly	49	27.4	26.1	26.0	13.8	7	0.0	0.0	0.0	0.0	0.3	5.7	29.1
Year		1978	1979	1956	1982	1977					1952	1989	1947
Maximum in 24 hrs	49	17.8	20.0	17.5	12.8	7	0.0	0.0	0.0	0.0	0.3	5.7	26.0
Year		1978	1961	1956	1982	1977					1952	1989	1947
WIND:													
Mean Speed (mph)	46	11.2	11.5	12.0	11.3	10.1	9.5	8.9	8.7	9.0	9.4	10.2	10.9
Prevailing Direction through 1963		NE	NW	NW	WNW	SW	SW	SW	SW	SW	SW	SW	SW
Fastest Obs. 1 Min.													
Direction (dir)	42	30	23	27	27	32	26	35	09	05	11	09	22
Speed (MPH)	42	52	46	43	50	50	58	52	46	51	48	82	82
Year		1964	1965	1950	1951	1963	1984	1988	1955	1960	1954	1950	1950
Peak Gust													
Direction (dir)		W	NW	W	WNW	NW	W	NW	W	W	SW	NW	NW
Speed (mph)		53	58	56	58	58	63	63	64	64	53	60	60
Date		1987	1984	1986	1987	1988	1984	1988	1988	1985	1980	1988	1988

See Reference Notes on Page 58
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METEOROLOGICAL DATA FOR 1990

NEWARK, NEW JERSEY

LATITUDE: 40°42'N LONGITUDE: 74°07'W ELEVATION: FT. GRND 7 BARO 39 TIME ZONE: EASTERN WBAN: 14734

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE OF:													
Averages													
-Daily Max	41	46	56	63	71	80	83	85	81	74	64	54	48
-Daily Min	33	37	44	50	56	63	67	69	64	57	47	37	31
-Monthly	37	41	50	56	63	71	74	76	70	61	50	40	39
-Monthly Dewpt	48	50	55	60	65	71	74	76	70	61	50	40	39
Extremes													
-Highest	80	83	86	92	93	93	93	95	91	84	74	64	58
-Date	7-30	8-26	9-10	10-7	10-31	11-1	11-1	11-1	10-12	9-17	8-26	7-30	7-30
-Lowest	13	16	23	27	33	38	40	42	41	34	24	14	8
-Date	1-10	2-6	3-10	4-12	5-12	6-1	6-23	7-1	8-1	9-1	10-1	11-1	12-31
DEGREE DAYS BASE 65 °F:													
Heating	756	699	622	369	122	2	1	1	50	153	445	597	2928
Cooling	0	0	7	23	11	262	403	365	155	39	2	0	127
% OF POSSIBLE SUNSHINE													
AVG. SKY COVER (tenths)													
Sunrise - Sunset	7.2	6.4	6.5	6.1	7.2	6.1	7.2	6.3	5.7	4.3	3.4	7.0	6.4
Midnight - Midnight	6.0	5.0	6.2	5.3	7.0	6.1	6.3	6.1	5.3	4.9	3.4	6.0	6.4
NUMBER OF DAYS:													
Sunrise to Sunset													
-Clear	3	4	8	10	3	3	3	3	6	12	12	6	36
-Partly Cloudy	5	4	9	6	10	17	12	14	14	9	9	20	104
-Cloudy	20	15	15	14	18	10	16	15	10	12	10	20	115
Precipitation													
0.1 inches or more	11	12	11	15	12	15	12	17	9	9	9	14	145
Snow, ice pellets													
1.0 inches or more	1	2	1	0	0	0	0	0	0	0	0	2	6
Thunderstorms	0	0	1	0	5	7	3	7	3	5	2		39
Heavy Fog, visibility													
1/4 mile or less	1	1	0	1	0	1	1	0	1	1	0	2	9
Temperature of													
-Maximum													
30° and above	0	0	0	2	0	5	9	9	1	0	0	0	26
32° and below	0	1	0	0	0	0	0	0	0	0	0	2	3
-Minimum													
32° and below	17	16	11	1	0	0	0	0	0	0	2	13	60
0° and below	0	0	0	0	0	0	0	0	0	0	0	0	0
AVG. STATION PRESS. (mb)													
	1015.6	1019.0	1022.0	1015.9	1012.9	1012.9	1015.5	1016.3	1015.9	1016.6	1016.3	1020.0	1016.5
RELATIVE HUMIDITY (%)													
Hour 01	72	70	67	69	73	74	76	79	75	75	67	77	73
Hour 07	73		72	70	71	71	75	77	77	78	70	79	
Hour 13 (Local Time)	58	52	47	49	51	47	53	54	53	51	46	63	52
Hour 19	64	60	57	57	58	59	65	65	64	62	54	67	61
PRECIPITATION (inches):													
Water Equivalent													
-Total	4.72	1.71	2.81	3.98	6.87	3.68	4.98	7.71	2.72	5.11	2.82	5.19	52.30
-Greatest (24 hrs)	1.21	0.52	0.97	1.26	2.25	1.42	1.22	2.82	0.80	1.90	1.99	1.67	2.82
-Date	29-30	10	20-21	14-15	29-30	18-19	21-22	6	22	23	9-10	3-4	AUG 6
Snow, ice pellets													
-Total	2.4	2.8	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	T	7.6	15.9
-Greatest (24 hrs)	1.4	2.7	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	T	7.6	7.6
-Date	8	24-25	6	7							13	27-29	DEC 27-29
WIND:													
Resultant													
-Direction (111)	258	288	279	240	288	233	257	339	249	253	287	284	269
-Speed (mph)	5.1	4.4	2.6	2.7	1.6	4.4	0.9	1.5	2.5	3.5	6.3	9.2	3.1
Average Speed (mph)	9.6	11.1	9.9	9.9	9.8	9.1	9.8	8.3	7.8	9.6	11.4	10.5	9.7
Fastest Obs. (111)													
-Direction (111)	26	29	30	32	24	25	35	34	30	36	29	31	29
-Speed (mph)	29	35	29	23	28	28	31	32	22	30	35	28	35
-Date	12	25	21	18	11	19	1	28	17	26	12	31	NOV 12
Peak Gust													
-Direction (111)	W	NW	NW	SW	SW	N	N	NW	NW	SW	NW	N	NW
-Speed (mph)	49	49	45	41	45	41	46	41	30	30	33	52	53
-Date		25	23	11	11	30	1	1				31	NOV 11

PRECIPITATION (inches)

NEWARK, NEW JERSEY

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1961	3.34	3.97	4.36	5.28	3.35	2.46	7.95	4.22	3.49	2.76	2.54	3.65	45.37
1962	2.56	4.25	3.33	3.44	1.46	3.89	2.34	3.73	3.33	3.72	4.39	3.39	40.85
1963	2.19	2.16	3.92	3.80	2.37	2.01	2.44	3.33	3.94	2.11	3.88	4.97	29.52
1964	2.22	2.39	2.22	2.56	3.32	3.09	4.44	2.81	2.30	3.31	3.99	4.40	33.42
1965	2.85	2.31	2.81	2.50	2.23	2.23	7.73	2.81	2.20	2.31	4.48	3.96	45.00
1966	2.23	4.11	1.12	3.01	4.86	0.49	0.89	3.08	3.86	3.33	3.08	3.01	37.86
1967	1.55	3.00	3.86	2.84	3.37	3.31	7.33	4.33	3.35	2.97	3.38	4.44	44.00
1968	1.11	2.22	3.33	2.44	6.28	3.37	1.77	1.11	4.88	2.97	4.44	3.22	33.89
1969	1.17	2.33	3.33	3.33	2.33	2.33	2.33	2.24	3.33	3.33	4.30	4.44	46.99
1970	0.87	3.33	3.33	3.33	2.64	2.44	3.88	3.33	3.33	3.33	4.44	0.55	34.39
1971	2.74	4.44	1.11	3.35	3.55	1.48	6.88	0.53	3.88	3.36	3.36	3.11	50.11
1972	2.26	4.01	3.33	3.33	6.66	0.22	4.44	3.00	3.03	3.33	4.42	4.44	44.96
1973	3.83	3.39	3.33	3.33	3.33	4.44	3.33	3.33	3.33	3.33	3.33	3.33	40.00
1974	3.84	4.44	4.44	2.37	3.33	3.60	3.31	3.31	3.60	3.33	3.33	3.33	38.88
1975	3.99	2.56	2.94	2.29	3.27	6.40	8.02	4.36	9.00	3.24	3.74	2.91	50.99
1976	5.04	2.52	2.33	2.50	4.12	1.54	3.91	4.98	2.50	3.07	3.31	4.17	43.19
1977	1.55	2.77	3.33	3.16	1.31	3.89	1.31	2.29	3.99	3.33	3.33	4.17	41.19
1978	1.66	2.26	4.44	2.60	7.97	2.05	4.99	7.30	4.23	3.33	3.33	3.33	44.19
1979	0.77	1.11	3.33	2.88	7.77	3.33	3.33	3.33	3.33	3.33	3.33	3.33	38.88
1980	0.86	2.29	3.33	2.88	2.61	3.27	2.88	0.44	3.87	3.33	3.33	3.33	38.88
1981	0.45	4.81	1.10	3.15	3.88	2.61	4.51	0.57	3.42	3.47	1.15	5.32	35.54
1982	4.77	2.36	2.82	5.20	2.26	5.28	2.22	3.86	3.33	3.33	3.33	3.33	40.00
1983	4.37	3.03	1.14	2.14	2.81	2.81	3.33	3.46	2.93	3.33	3.33	3.33	38.88
1984	2.78	4.57	6.96	6.36	10.22	4.77	8.55	1.14	2.46	3.33	3.33	3.33	53.33
1985	1.22	2.58	1.59	1.17	4.23	4.29	4.52	2.58	4.19	2.29	8.32	3.31	37.29
1986	4.44	3.88	1.95	5.88	1.41	1.71	6.62	4.16	1.96	1.93	6.78	5.23	45.95
1987	6.21	1.30	3.81	5.06	2.55	4.13	4.66	5.26	3.87	3.37	2.94	2.37	43.33
1988	3.74	4.13	2.13	1.97	5.86	1.06	9.98	1.82	4.56	4.45	7.11	1.11	43.33
1989	1.98	2.76	3.25	8.80	5.41	5.41	5.23	7.03	6.43	4.00	2.57	1.35	53.99
1990	4.72	1.71	2.81	3.98	6.87	3.68	4.98	7.71	2.72	1.11	2.82	1.11	52.30
Record Mean	3.37	2.92	3.98	3.68	3.89	3.33	4.09	4.17	3.71	3.08	3.64	3.33	43.18

See Reference Notes on Page 68.

1991 - 3.49 2.92 5.22 7.34

AVERAGE TEMPERATURE (deg. F)

NEWARK, NEW JERSEY

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1961	26.6	35.9	41.2	48.6	59.7	71.9	77.3	75.8	74.5	59.5	47.4	33.8	54.4
1962	30.8	30.3	42.0	52.5	64.3	72.5	73.9	72.9	64.7	57.3	43.5	31.1	53.0
1963	29.6	27.6	42.5	52.6	61.1	72.0	77.0	74.0	64.0	61.2	49.7	29.3	53.4
1964	34.3	31.9	42.6	49.1	65.4	71.2	76.0	73.9	68.9	55.9	49.4	35.9	54.6
1965	28.3	32.4	39.0	50.0	67.3	71.6	75.7	74.5	68.4	54.0	44.4	38.8	53.7
1966	30.4	33.2	41.7	48.2	59.3	73.8	79.6	76.5	66.6	55.3	48.9	36.5	54.2
1967	36.9	29.4	37.6	50.9	54.3	72.0	74.2	73.5	66.6	56.4	42.2	38.3	53.7
1968	27.8	29.9	43.1	54.0	59.6	69.7	78.2	76.9	70.7	59.7	45.7	32.5	52.0
1969	31.3	31.3	38.8	54.6	64.1	72.8	74.2	77.3	67.5	56.2	45.5	33.1	53.9
1970	24.2	33.0	39.0	51.9	64.6	70.9	77.2	77.3	70.6	59.5	49.1	35.3	54.4
1971	27.3	35.2	41.2	51.4	60.6	74.8	77.8	76.0	71.8	63.2	46.2	41.4	55.6
1972	35.4	31.3	40.9	50.0	63.0	68.8	77.9	75.9	69.8	53.3	44.8	39.7	54.2
1973	35.3	33.3	48.6	54.2	60.4	74.6	78.7	79.6	71.0	60.3	48.8	39.4	57.0
1974	35.4	31.9	43.4	56.5	62.7	70.1	77.1	76.5	66.6	53.9	47.5	38.9	53.9
1975	36.9	35.1	39.7	47.3	65.8	71.6	76.9	75.1	64.3	59.1	51.7	35.4	54.9
1976	26.8	39.3	44.0	55.2	61.1	73.6	74.9	74.4	66.5	52.6	39.9	29.1	53.1
1977	20.9	32.8	46.8	53.7	65.4	70.3	78.2	75.1	68.0	54.5	47.1	33.3	53.9
1978	27.2	25.5	38.5	51.0	60.5	71.6	75.1	76.7	66.1	57.5	48.8	38.1	53.1
1979	32.5	23.5	46.2	52.0	64.5	69.4	77.0	76.6	69.1	56.5	51.8	40.2	54.9
1980	34.0	30.8	38.9	52.6	65.9	70.2	78.9	78.6	70.8	55.0	42.9	30.4	54.1
1981	24.1	37.6	40.2	55.3	64.0	74.6	79.3	75.1	67.2	53.1	46.0	34.6	54.3
1982	24.2	36.2	41.8	50.6	63.2	67.9	78.4	72.5	66.7	56.9	48.8	42.8	54.2
1983	35.0	35.9	44.7	52.2	60.8	73.5	79.6	77.6	70.6	57.8	47.8	34.2	55.8
1984	27.8	40.8	36.5	52.7	62.2	75.0	76.6	77.3	65.4	62.3	45.3	40.8	55.2
1985	24.9	33.9	44.9	57.0	67.1	69.4	76.3	75.6	70.2	58.5	49.5	33.3	55.0
1986	33.0	31.1	44.2	53.4	66.7	72.7	76.9	74.2	68.6	58.0	45.0	38.1	55.2
1987	31.5	33.0	45.0	53.9	63.9	74.5	79.4	75.3	68.7	53.7	47.6	38.4	55.4
1988	28.7	34.4	43.9	51.1	63.4	73.0	80.5	79.8	68.0	52.6	48.9	35.5	55.0
1989	37.0	34.2	42.4	52.9	63.2	74.3	77.2	76.3	69.9	59.1	45.0	25.6	54.7
1990	40.4	39.8	44.9	53.3	61.1	73.4	77.8	76.6	68.6	62.4	50.0	42.3	57.6
Record Mean	31.4	32.8	41.1	51.6	62.3	71.4	76.6	75.0	67.7	56.9	46.2	35.2	54.0
Max	38.5	40.4	49.4	60.9	71.9	80.8	85.7	83.8	76.7	66.1	54.1	42.3	62.3
Min	24.3	25.1	32.8	42.3	52.7	62.0	67.5	66.2	58.7	47.7	38.3	28.1	49.5

See Reference Notes on Page 48.

NEWARK, NEW JERSEY

Terrain in vicinity of the station is flat and rather marshy. To the northwest are ridges oriented roughly in a south-southwest to north-northeast direction. They rise to an elevation of about 200 feet at 4.5 to 5 miles and to 500 to 600 feet at 7 to 8 miles. All winds between west-northwest and north-northwest are downslope and therefore are subject to some adiabatic temperature increase. This effect is evident in the rapid improvement which normally occurs with shift of wind to westerly, following a coastal storm or frontal passage. The drying effect of the downslope winds accounts for the relatively few local thunderstorms occurring at the station, compared to areas to the west. Easterly winds, particularly southeasterly, moderate the temperature because of the influence of the Atlantic Ocean.

Temperature falls of 5 to 15 degrees, depending on the season, are not uncommon when the wind backs from southwesterly to southeasterly. Periods of very hot weather, lasting as long as a week, are associated with a west-southwest air flow which has a long trajectory over land. Extremes of cold are related to rapidly moving outbreaks of cold air traveling southeastward from the

Hudson Bay region. Temperatures of zero or below occur in one winter out of four, but are much more common several miles to the west of the station. Average dates of the last occurrence in spring and the first occurrence in autumn of temperatures as low as 32 degrees are in mid-April and the end of October or early November. Areas to the west of the station experience a growing season at least a month shorter than that at the airport.

A considerable amount of precipitation is realized from the Northeasters of the Atlantic coast. These storms, more typical of the fall and winter, generally last for a period of two days and commonly produce between 1 and 2 inches of precipitation. Storms producing 4 inches or more of snow occur from two to five times a winter. Snowstorms producing 8 inches or more have occurred in about one-half the winters. As many as three such storms have been experienced in one winter. The frequency and intensity of snow storms and the duration of snow cover increase dramatically within a few miles to the west of the station.

STATION LOCATION

NEWARK, NEW JERSEY

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE										REMARKS		
						GROUND												
						SEA LEVEL	WIND INSTRUMENTS	EXTREMITY INSTRUMENTS	PSYCHROMETER	SUNSHINE SWITCH	TIPPING BUCKLE	RAIN GAGE	WEIGHING RAIN GAGE	8 INCH RAIN GAGE	HYGRO-THERMOMETER			
COOPERATIVE																		
In city of Newark Street address unknown	5/1843	7/1897		40° 44'	74° 10'													Observations credited to Messrs. Whitehead and Ricord.
In city of Newark Street address unknown	3/1892	12/1905		40° 44'	74° 10'													Observations credited to Mr. George C. Conn.
High school, 6th Avenue and Ridge Street	1/1906	3/1912		40° 45'	74° 11'	140		11			100		8					8" gage in use prior to December 1910; tipping bucket gage in use thereafter.
High school, High and New Streets	4/1912	6/30/24	0.9 mi. SSE	40° 44'	74° 11'	70		89			89							
AIRPORT																		
Municipal Hangar Newark Airport	3/14/29	4/14/31	2.5 mi. SSE	40° 42'	74° 10'	11	62											
Airport Post Office Building, Newark AP	4/14/31	12/10/41	1800 ft. ESE	40° 42'	74° 10'	11	47	35	34				32					Daily max. and min. temperature record began 8/16/30. Daily precipitation record began 7/26/31.
Airmail & Express Bldg. (Administration Bldg. prior to July 1953) Newark Airport	12/10/41	Present	1800 ft. WNW	40° 42'	74° 10'	e7	20 120	6 e	9 130 130	NA	NA	NA	NA	NA	NA	NA	NA	Weighting gage installed 12/1/43. Rain gages moved to roof exposure 6/25/53. Telepsychrometer installed 3/4/54. Hygrothermometer commissioned 7/9/61 at thermometer site. a - 50 ft. to 6/30/65. b - Relocated 5000 ft. south on field site 6/1/65. c - 11 ft. to 6/1/65. d - Telepsychrometer replaced by hygrothermometer 7/9/61. e - Removed in 1966. f - Standby equipment. g - Minor adjustment 11/1968. h - Moved to roof 7/1984. i - Minor adjustment & type change 6/1985. j - Moved to field 12/1985. k - Moved to roof 4/1987.
Newark International Airport eff. 1972.																		

SUBSCRIPTION: Price and ordering information available through: National Climatic Data Center, Federal Building, Asheville, North Carolina 28801. USCOMM-NOAA-ASHEVILLE, N.C. - 1115

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