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SOIL GAS AND SOIL SAMPLING
GULF STATE CREOSOTE-HATTIESBURG, MISSISSIPPI
PREPARED BY US EPA/ERT-MAY 1990

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SOIL GAS AND SOIL SAMPLING

GULF STATES CREOSOTE
HATTIESBURG, MISSISSIPPI

May, 1990

EPA Work Assignment No.: 1-335
Weston Work Order No.: 3347-11-01-2335
EPA Contract No.: 68-03-3482

FINAL REPORT

Prepared by:

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5/7/90
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rd:eh/ONEILL/FR-2335.R1

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Background

The former Gulf States Creosote Site is located in a commercial area of Hattiesburg, Mississippi (Figure 1). The site was an active wood preserving facility which operated from approximately 1920 to 1960. The property is currently owned by the city of Hattiesburg and subleased to several automobile dealerships, car-parts stores, a beverage distributer, a food store, and a furniture store. The process areas and wood drying/drip areas have been regraded, covered with asphalt, and are no longer evident. The former site encompasses approximately 20 acres, and is bordered on the east by railroad tracks, on the west by Gordons Creek, on the south by a drainage swale which feeds into Gordons creek, and on the north by Timothy Street.

The increase in surface runoff as a result of development and paving in the immediate area of the former site has significantly effected the flow into Gordons Creek. As a result, the U.S. Army Corps of Engineers (Corps) has been requested to rechannel Gordons Creek. In preparation for the rechannelization project, the Corps requested assistance from the US EPA in characterizing the nature and extent of contamination which may be present in the area as a result of former wood treating operations at the Gulf State Creosote site. Creosote and coal tar seeps are evident along the eastern bank of Gordons Creek.

1.2 Purpose of Investigation

The purpose of the ERT/REAC investigation was to identify the extent of contamination in the area of the former creosote plant. Specifically, areas adjacent to Gordons Creek were to be sampled in order to determine the nature and extent of contamination. If possible, an estimate of the volume of contaminated material/soils in the immediate area surrounding Gordons Creek was to be calculated.

During the soils investigation, ambient air monitoring/sampling was planned in order to identify any local air quality degradation which may have resulted from the presence of creosote residuals or during intrusive activities.

1.3 Summary of Activities

From January 20 to January 25, 1990, ERT/REAC completed a soil gas survey and preliminary soil sampling effort in the area surrounding the former plant site. The activities conducted during that investigation were summarized in a trip report dated February 16, 1990. Approximately 65 soil gas sampling stations were monitored and/or sampled. Analysis of soil gas samples was completed on-site using the ERT TAGA mobile tandem mass spectrometer (MS/MS). Fifteen soil borings were installed, from which ten (10) soil samples were collected and analyzed for Polynuclear Aromatic Hydrocarbons (PNA). Sampling activities had to be suspended due to an unusual amount of rain and subsequent rise in the water table.

15 SB 10 samples 15 SB 9 samples

On March 19 and 20, 1990, ERT/REAC returned to Hattiesburg to complete the soil borings and subsurface soil sampling investigation. The activities completed during this site visit are summarized in a trip report dated March 30, 1990. A total of fifteen soil borings were installed, from which nine (9) samples were collected and analyzed for PNA's.

Air sampling and monitoring was also conducted on January 23rd. A total of three air samples representing static conditions (i.e. prior to soil disturbance) were collected and analyzed for PNA compounds.

Appendix A includes copies of the two trip reports. Missing

1.4 Methods of Investigation

Soil gas sampling activities followed procedures outlined in ERT/REAC Standard Operating Procedure (SOP) #2149. The installation of soil borings was facilitated through the use of a "Little Beaver" power auger and procedures defined in ERT/REAC SOP #2122. Samples were collected using a stainless steel hand auger and followed procedures defined in ERT/REAC SOP #2012 and 2127.

Air sampling procedures were conducted according to ERT/REAC SOP# 2066, and air monitoring procedures followed ERT/REAC SOP# 2060, "RAM-1". Sample collection protocols and analytical techniques for PNA's adhered to NIOSH air sampling procedure #5515.

2.0 RESULTS

2.1 Soil Gas Survey

The soil gas survey produced mixed results. A summary of real-time monitoring data collected with the HNU Photoionization Detector and Foxboro Organic Vapor Analyzer is provided in Table 1. Preliminary soil gas sample results indicated naphthalene, the target compound of interest, in the 10 to 100 parts per billion (ppb) range in numerous samples. Benzene, toluene, and xylene (BTX) were also identified in some samples in the low ppb range. After additional quantification, the TAGA results were finalized and the contaminants were found to be below the detection limit in all soil gas samples. The detection limit for naphthalene was calculated to be 40 ppb. Appendix B contains a copy of the final TAGA data.

2.2 Soil Borings/Soil Sample Collection

A total of nineteen (19) soil samples were analyzed for PNA compounds by GC/MS. Those samples were collected from fourteen (14) different borings. Depth of sample collection varied between five (5) and fifteen (15) feet below surface. This range corresponds to the contaminated soil horizons. Of the 19 samples analyzed, twelve (12) can be considered contaminated with various PNA compounds. Table 2 presents a summary of soil results for those samples collected in January, 1990. Table 3 presents a summary of soil results for those samples collected in March, 1990.

2.3 Air Sampling/Monitoring

Air sampling consisted of collecting 900 liters of air through an XAD tube/filter using a personal air sampling pump. Three locations were sampled prior to initiating site activities. All samples indicated non-detectable levels of contaminants. Air monitoring consisted of using an MIE RAM-1 with data logger. Total particulate concentrations were integrated over a 2.5 hour period. Average concentration was .008 mg/m^3 with a maximum measurement of 1.09 mg/m^3.

3.0 DISCUSSION OF RESULTS

3.1 Soil Gas Results

There appears to be no relationship between real-time screening results and TAGA (MS/MS) soil gas analysis. Furthermore, there does not appear to be any spatial relationship between screening results and the former plant site location. Some inconsistency and variation in screening results could be due to a combination of equipment failure, weather conditions (high humidity), and soil moisture.

The soil gas concentrations, which proved to be lower than TAGA detection limits, could in part be due to the time span between site activity and sampling (30 years). Either the creosote compounds have naturally decayed to a point where volatilization is minimal or the material has migrated and collected to downgradient locations.

3.2 Soil Sampling Results

Of the soil samples identified as contaminated, those collected from the area bordered by West Pine Street and Gordons Creek, south of the drainage ditch which runs underneath West Pine Street, appear to contain the highest concentrations (Figure 2). Specifically, samples collected from this area include D-00, D01, E-24, E-25, and E-27. Sample E-20, located on the northeast side of the drainage swale also had significant contamination. The contamination identified in B-25 is significantly less than that identified in other samples and may have been influenced by surface conditions (i.e., adjacent asphalt parking lots). This sample was collected from the 0 to 12 inch depth. Likewise, the minor contamination found in sample D-03A may have also been influenced by surface conditions.

3.3 Air Sampling/Monitoring Results

Because of the extreme precipitation encountered, the air sampling and ambient monitoring effort was abandoned. Static air quality conditions do not appear to reflect any effect from coal tar residuals. The sampling results are not representative of ambient conditions which may result during intrusive soil disturbance activities in contaminated areas.

4.0 CONCLUSIONS AND VOLUME ESTIMATES

4.1 Conclusions

The findings of this investigation indicate that there is no spatial relationship between the former plant site lay-out and the residual contamination (Figure 3). This investigation did not characterize conditions east of Timothy Street where the former process area and storage vessels were located. Due to natural surface drainage conditions and topographical relief, one would expect to find the bulk of contamination west of Timothy Street. The focus of this investigation was west of Timothy, and specifically the area(s) just east of Gordons Creek.

The fact that significant contamination was not found in areas removed from Gordons Creek could indicate that contaminants have migrated to that downgradient location over the years following plant closure. Another explanation may be that during shut down of the plant or construction of West Pine Street, the bulk of surface materials was dumped or bull-dozed into that area. Another explanation may be that contamination is randomly dispersed and so low in concentration that the soil gas sampling was not able to detect the contamination.

4.2 Volume Estimates

An estimated volume of soil that is contaminated with PNA compounds from the presence of creosote was computed based on ERT/REAC field observations. The soil borings and the visual assessment made along Gordons Creek provided enough information to approximate an area of contamination, which is designated on Figures 2 and 3. Based on an estimated thickness of the contamination (three feet), the volume calculation yielded approximately 7,200 yd^3 of contaminated soil.

A second calculation was performed using a thickness of five feet as a worst case scenario. Creosote outcroppings approximately five feet in thickness were visible along the banks of Gordons Creek, and due to the thick underlying clay layer, the water table fluctuates quite a bit between the surface and twenty feet. These two observations support using five feet in the calculation which yielded a volume of 12,000 yd^3.

These estimates will be used in planning remedial measures based on treatability studies presently being performed by ERT/REAC.

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TABLE 1. SOIL GAS FIELD SCREENING DATA

GULF STATES CREOSOTE SITE
HATTIESBURG, MISSISSIPPI
JANUARY 22-26, 1990

Sample Location	Sample Number	Instrument Reading OVA	HNU
A01	01521	0.5	0.0
A02	01522	3.5	0.0
A03	01523	1.8	0.0
A04	01524	2.0	0.0
A05	01525	5.0	0.0
A06	01526	1.0	0.0
A07	01527	18.5	NR
A08	01528	0.5	NR
A09	01529	3.5	NR
A10	01530	400.0	NR
A11	00611	0.0	NR
A12	00612	18.0	NR
B01	01538	0.6	0.0
B02	01539	0.4	0.0
B03	01540	0.4	0.0
B04	NS	NR	NR
B05	NS	NR	NR
B06	00621	1000.0	0.0
B07	00622	2.0	NR
B08	00625	1.5	NR
B09	00624	0.6	NR
B10	NS	NR	NR
B11	NS	NR	NR
B12	00623	1.0	NR
C01	01491	NR	0.0
C02	NS	NR	0.0
C03	01492	NR	0.0
C04	NS	NR	0.0
C05	01493	NR	0.0
C06	01494	NR	0.5
C07	NS	NR	0.0
C08	NS	NR	0.0
C09	01497	NR	0.5
C10	NS	NR	NR
C11	01498	NR	2.0
C12	NS	NR	0.0
C13	01500	NR	0.0
C14	NS	NR	0.0
C15	01501	NR	0.0
C16	NS	NR	0.0

NS - No sample collected.
NR - Reading not taken.

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TABLE 1 (CONT'D). SOIL GAS FIELD SCREENING DATA

GULF STATES CREOSOTE SITE
HATTIESBURG, MISSISSIPPI
JANUARY 22-26, 1990

Sample Location	Sample Number	Instrument Reading OVA	HNU
C17	NS	NR	NR
E01	01531	80.0	NR
E02	01522	880.0	NR
E03	01533	2.0	NR
E04	01534	3.2	NR
E05	01535	2.4	NR
E06	01536	2.0	NR
E07	01537	NR	NR
E07	01502	0.8	0.0
E08	NS	0.2	NR
E09	01503	0.6	NR
E10	01505	1.0	NR
E11	01506	0.2	NR
E12	NS	NR	NR
E21	NS	NR	NR
E22	01509	NEG	NR
E23	01508	30.0	NR
E24	01507	NR	NR

E-13
E-20
(NO DATA)

NS - No sample collected.
NR - Reading not taken.
NEG - Negative reading.

58 GAS VAPOR SAMPLES

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TABLE 2. SUMMARY OF SOILS ANALYSIS

GULF STATES CREOSOTE SITE
HATTIESBURG, MISSISSIPPI
JANUARY, 1990

Parts per million (ppm)

Compound Name	Sample Location / Sample Depth	B0 2.5 0-12 in.	D00 5 ft.	D00 8 ft.	D01 5 ft.	D01 8 ft.	E20 4 ft.
Naphthalene		*	178	354	280	148	4.1J
2-Methylnaphthalene		*	99	197	460	82	3.6J
1-Methylnaphthalene		*	72	104	340	45	*
Biphenyl		*	22J	55	9J	24	*
2,6-Dimethylnaphthalene		*	72	66	53	28	*
Acenaphthylene		*	4.4J	4.2J	2.3J	*	*
Acenaphthene		*	259	156	225	81	14J
Dibenzofuran		*	158	125	114	78	4.7J
Fluorene		*	245	140	219	90	9.4J
Phenanthrene		6.5J	718	325	715	229	26
Anthracene		*	465	210	521	114	69
Carbazole		*	173	96	157	38	15J
Fluoranthene		3J	844	215	763	188	138
[illegible]ene		1.1J	181	64	266	65	98
[illegible]nzo(a)anthracene		1.6J	181	54	259	62	104
Chrysene		2.9J	230	61	318	73	160
Benzo(b)fluoranthene		3.8J	*	78	143	127	248
Benzo(k)fluoranthene		*	231	74	135	121	236
Benzo(e)pyrene		2.5J	83	25	97	52	83
Benzo(a)pyrene		2.5J	125	35	133	55	116
Indeno(1,2,3-cd)pyrene		1.8J	51	15J	54	26	53
Dibenzo(a,h)anthracene		.5J	23	5J	19J	12J	17J
Benzo(g,h,i)perylene		1.5J	41	11J	42	22	42
Total			4,455		5,322		

* - Non-detectable levels.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the lowest linear detection limit of 10.0 ug/ml, but greater than zero and the concentration is given as an approximate value.

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TABLE 3. SUMMARY OF SOILS ANALYSIS

GULF STATES CREOSOTE SITE
HATTIESBURG, MISSISSIPPI
MARCH, 1990

Parts per million (ppm)

Compound Name	Sample Location / Sample Depth	D03A 10 ft. Top of Auger	D03A Bottom of Auger	E19 11 ft.	E24 8 ft.	E25 8 ft.	E27 8 ft.
Naphthalene		0.5J	7.3	2.5	544	48	753
2-Methylnaphthalene		•	.1J	.9	224	26	293
1-Methylnaphthalene		•	.06J	.6	107	26	193
Biphenyl		•	.02J	.3J	55	3.5J	140
2,6-Dimethylnaphthalene		•	•	.4J	71	13	160
Acenaphthylene		•	•	.04J	7.3J	2.4J	20
Acenaphthene		•	.1J	1.5	264	86	213
Dibenzofuran		•	.05J	.7	159	37	125
Fluorene		•	.05J	.9	194	66	129
Phenanthrene		•	.04J	2.7	420	136	425
Anthracene		•	•	1.7	87	41	126
Carbazole		•	.07	.3	48	5.5J	59
Fluoranthene		.1J	.03J	2.9	224	144	288
Pyrene		.2J	.04J	3.4	180	126	296
Benzo(a)anthracene		.07J	•	1.1	52	34	100
Chrysene		.08J	•	1.2	42	37	86
Benzo(b)fluoranthene		•	•	1.0	•	•	86
Benzo(k)fluoranthene		•	•	.4	27J	30	•
Benzo(e)pyrene		•	•	.5	•	9.7J	31
Benzo(a)pyrene		•	•	.6	•	11	42
Indeno(1,2,3-cd)pyrene		•	•	•	•	•	•
Dibenzo(a,h)anthracene		•	•	•	•	•	•
Benzo(g,h,i)perylene		•	•	•	•	•	•

• - Non-detectable levels.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the lowest lin detection limit of 10.0 ug/ml, but greater than zero and the concentration is given as an approximate value.

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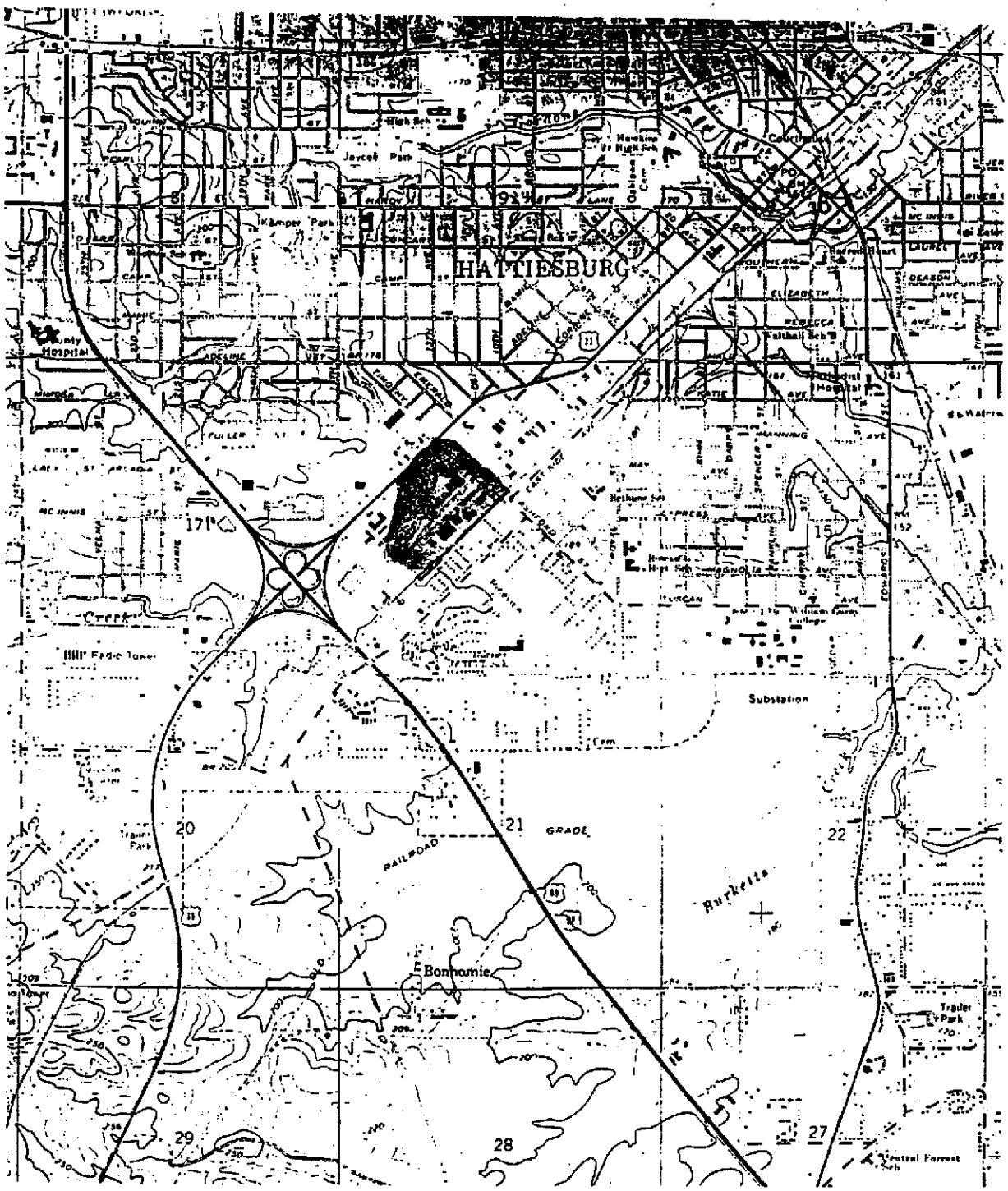
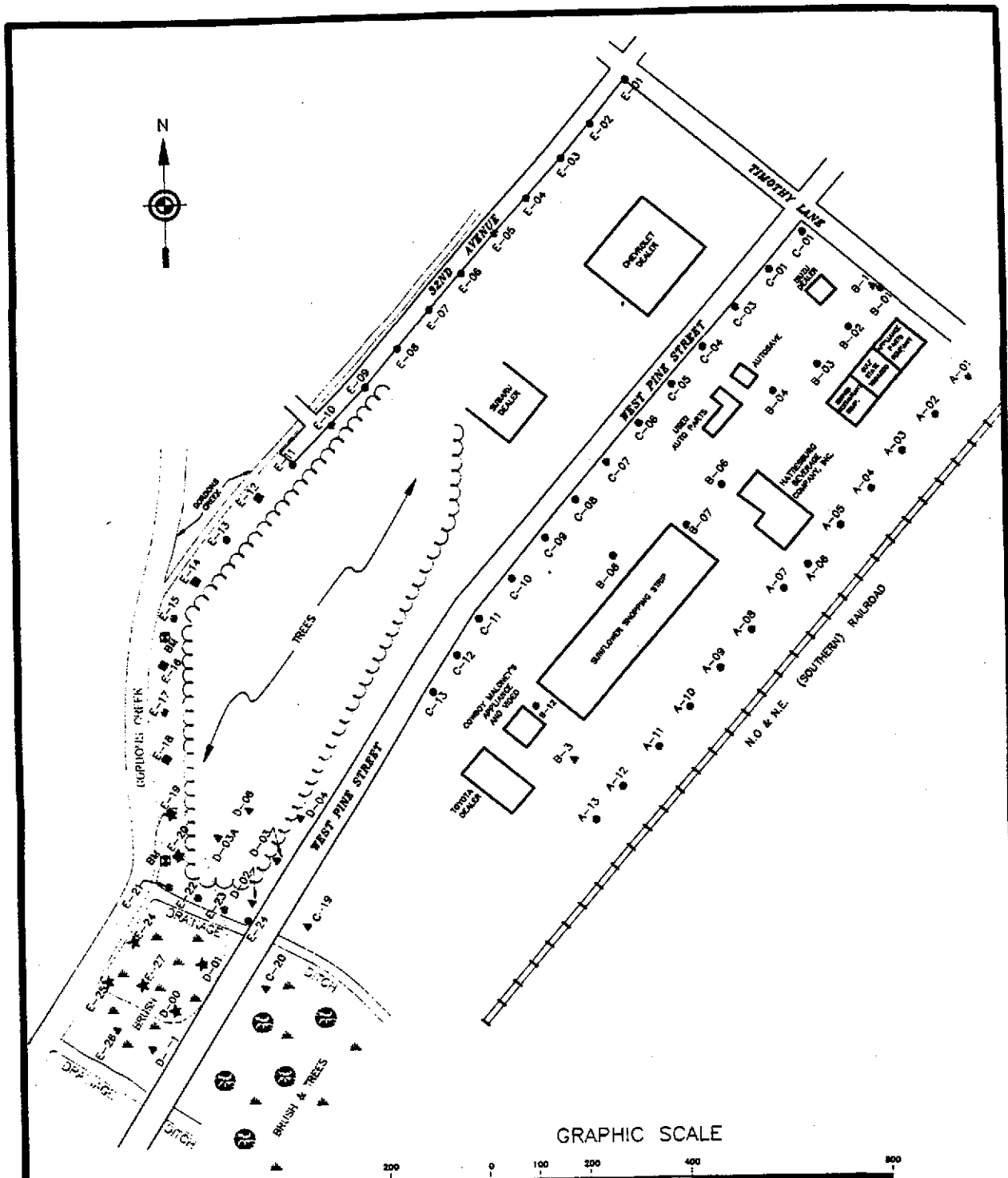


US EPA ENVIRONMENTAL RESPONSE TEAM	GULF STATES CREOSOTE
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT 68-03-3482	Figure 1. Site Location Map

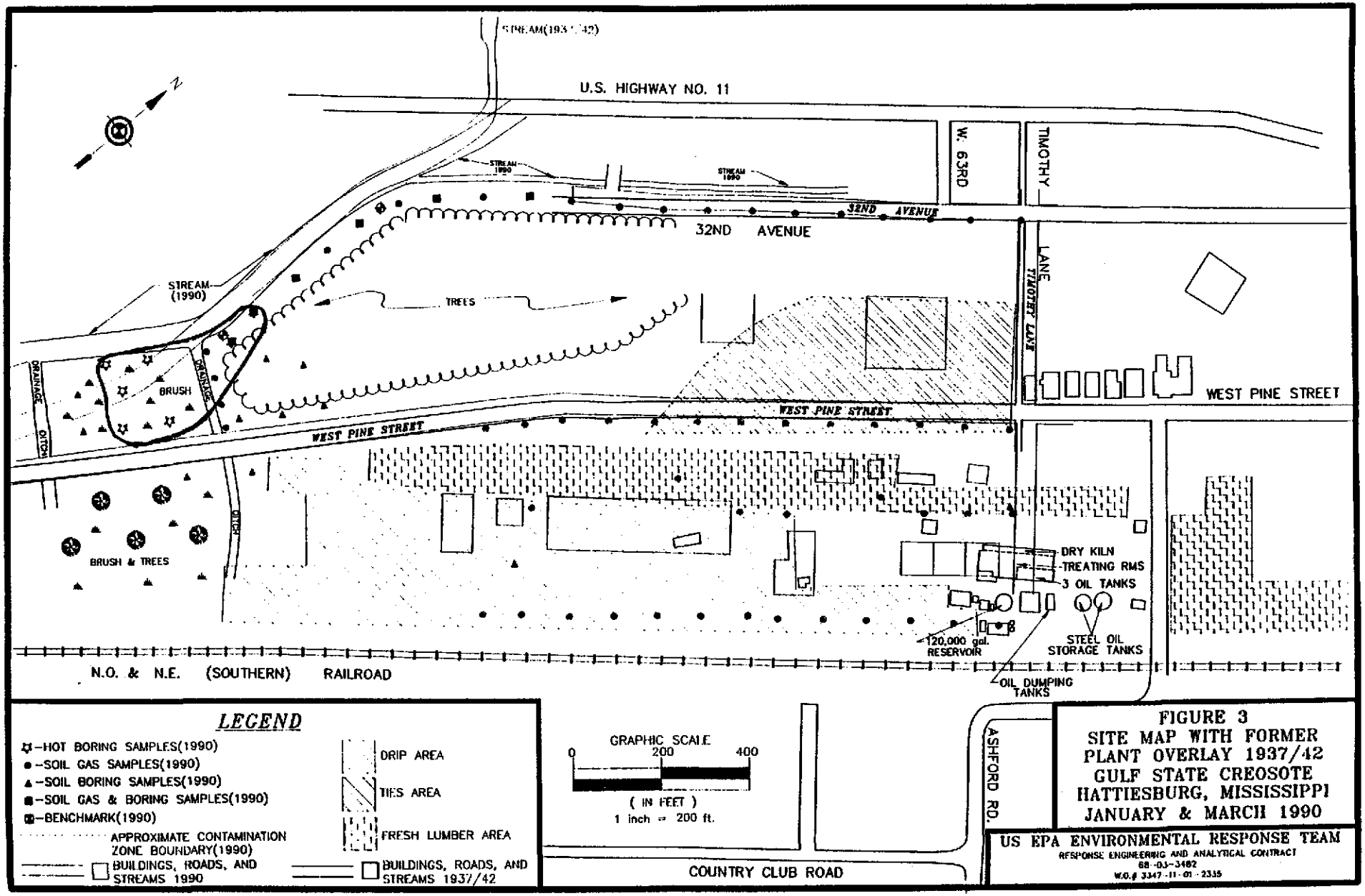


LEGEND

- ☆ – HOT BORING SAMPLES
- ● – SOIL GAS SAMPLES
- ▲ – SOIL BORING SAMPLES
- ■ – SOIL GAS AND BORING SAMPLES
- ⊠ – BENCHMARK
- ---------- – APPROXIMATE CONTAMINATION ZONE BOUNDARY

FIGURE 2
SAMPLE LOCATION MAP
GULF STATE CREOSOTE
HATTIESBURG, MISSISSIPPI
JANUARY & MARCH 1990

US EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
W.O.# 3347-11-01-2335


STREAM(1937/42)
U.S. HIGHWAY NO. 11
W. 63RD
TIMOTHY
STREAM 1990
STREAM 1990
32ND AVENUE
32ND AVENUE
LANE
TIMOTHY LANE
STREAM (1990)
TREES
DRAINAGE DITCH
BRUSH
DRAINAGE DITCH
WEST PINE STREET
WEST PINE STREET
WEST PINE STREET
DITCH
BRUSH & TREES
DRY KILN
TREATING RMS
3 OIL TANKS
120,000 gal. RESERVOIR
STEEL OIL STORAGE TANKS
OIL DUMPING TANKS
N.O. & N.E. (SOUTHERN) RAILROAD
ASHFORD RD.
COUNTRY CLUB ROAD
LEGEND
-HOT BORING SAMPLES(1990)
-SOIL GAS SAMPLES(1990)
-SOIL BORING SAMPLES(1990)
-SOIL GAS & BORING SAMPLES(1990)
-BENCHMARK(1990)
APPROXIMATE CONTAMINATION ZONE BOUNDARY(1990)
BUILDINGS, ROADS, AND STREAMS 1990
DRIP AREA
TIES AREA
FRESH LUMBER AREA
BUILDINGS, ROADS, AND STREAMS 1937/42
GRAPHIC SCALE
0 200 400
(IN FEET)
1 inch = 200 ft.
FIGURE 3
SITE MAP WITH FORMER PLANT OVERLAY 1937/42
GULF STATE CREOSOTE
HATTIESBURG, MISSISSIPPI
JANUARY & MARCH 1990
US EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
W.O.# 3347-11-01-2335

APPENDIX A

GULF STATES CREOSOTE TRIP REPORTS

APRIL, 1990

REAC SUPPORT ORGANIZATION
GSA RARITAN DEPOT
WOODBRIDGE AVENUE
BUILDING 209, BAY F
EDISON, NJ 08837
PHONE: 201-632-9200

DATE: February 16, 1990

TO: Harry Compton, US EPA-ERT Work Assignment Manager

FROM: Martin O'Neill, REAC Task Leader

THRU: Craig Moylan, REAC O&A Section Chief

SUBJECT: GULF STATES CREOSOTE SOIL GAS AND SOIL SAMPLING SURVEY: WA 3347-11-01-2335 - TRIP REPORT

BACKGROUND

The former Gulf States Creosote Site is located in a commercial area of Hattiesburg, Mississippi. The site was an active wood preserving facility from approximately 1920 to 1960. It is currently owned by the city of Hattiesburg and subleased to several automobile dealerships, car-parts stores, a beverage distributer, a food store, and a furniture store. The process areas and wood drying/drip areas have been regraded, covered with asphalt, and are no longer evident. The former site encompasses approximately 20 acres, and is bordered on the east by railroad tracks, on the west by Gordens Creek, on the south by a drainage swale which feeds into Gordens Creek, and on the north by Timothy Street.

The increase in surface runoff as a result of development and paving in the immediate area of the former site has significantly effected the flow into Gordens Creek. As a result, the U.S. Army Corps. of Engineers (Corps) has been requested to re-channel Gordens Creek. In preparation for the re-channelization project, the Corps requested assistance from the U.S. EPA in characterizing the nature and extent of contamination which may be present in the area as a result of the former Gulf States wood treating operation.

The purpose of the ERT/REAC sampling effort was to identify the extent of contamination by completing a soil gas survey in the area, and to determine the nature of soil and/or groundwater contamination through the installation of well points. In addition, air sampling was planned in an attempt to determine if contaminants associated with the wood treating process, namely polynuclear aromatic hydrocarbons (PAHs) were present in ambient air as a result of soil disturbance activities (i.e., soil borings).

OBSERVATIONS

The ERT/REAC TAGA arrived in Hattiesburg on Saturday, January 20, 1990, at which time TAGA operators Dave Mickunas, Mark Bernick, Joe Gorski, and Gmae Loy commenced with instrument calibration and preparation. Additional ERT/REAC personnel including Harry Compton, Mark Sprenger, Greg Powell, Martin O'Neill, Akos Fekete, and Mark Ellis arrived

in Hattiesburg on Sunday. ERT/REAC performed a site walk-through, and area familiarization survey on Sunday.

On Monday, January 22, ERT/REAC personnel met with the U.S. EPA On-Scene Coordinator (OSC), Don Rigor, to discuss planned activities and the general sampling/survey approach. Following the meeting, REAC personnel commenced with equipment pick-up and logistical set-up at the site. The TAGA was mobilized to the site and began preparing for analysis of tedlar bags in conjunction with the soil gas sampling effort.

On Monday afternoon, ERT/REAC commenced with the soil gas sampling program. A total of four (4) transects were established running north to south, parallel to Pine Street. Transect A was established adjacent to the railroad tracks along the eastern border of the site. Transect C was placed along the eastern curb of Pine Street. Transect B was located approximately equi-distant, and between, transect A and C, and transect E was placed along the eastern curb of 32nd Street. Where possible, sampling points were placed at 100 foot intervals along each of the transects. Because of building locations, paved areas and lack of access, the location of sampling stations along transect B varied from the expected straight line. Figure 1 provides the location of soil gas sample stations and soil borings.

Note Coolest Time of Year.

The soil gas sampling continued into and was completed on Tuesday, January 23. A total of 49 stations were sampled. Sampling stations were surveyed using the HnU PI 101 photoionization detector, and Foxboro Organic Vapor Analyzer (OVA). In general, the HnU's were not responsive to the contaminants of concern whereas the OVA's were. Readings averaged 2 to 5 units and ranged from 1 to 400 units (at location A-07). A Tedlar bag was collected at only those stations where positive readings were obtained on the OVA. Bag samples were analyzed using the TAGA tandem mass spectrometer (MS/MS). Holding times for soil gas samples were less than 2 hours. The TAGA field report is presented in the Appendix of this trip report.

Note

On Tuesday afternoon, a hand auger team commenced with the soil boring program in the area adjacent to the railroad tracks and along the tree-line west of Pine Street. The purpose of the hand auger points was to gather preliminary information regarding local surficial geology, and provide for a "quick and dirty" screening for the presence of creosote compounds. Another team began gathering and preparing equipment as required for the well point installations planned for Wednesday and Thursday.

A series of background samples were also collected on Tuesday. Two sampling stations were established in up-wind locations, and one station was located down-wind from the site. The background sample results were to be used in evaluating the possible effects of soil disturbance activities on ambient air quality.

Following review of the TAGA soil gas data on Wednesday, ERT in conjunction with the OSC decided that the investigation would focus on the areas adjacent to Gordens Creek. Additionally, it was decided that samples would be collected from each of the soil borings and sent to the ERT/REAC laboratory in Edison, NJ. The TAGA was no longer needed and could be de-mobilized. TAGA personnel spent Wednesday completing analyses and readying the instrument for the trip back to Edison. TAGA personnel departed Hattiesburg on Wednesday and the TAGA departed early on Thursday, January 25.

Preparation of equipment and establishment of a temporary decontamination facility was completed by Wednesday at noon. Two soil boring teams, both equipped with hydraulic power augers (Mini-Beaver), started sampling shortly after noon. Fourteen soil borings were drilled

in Hattiesburg on Sunday. ERT/REAC performed a site walk-through, and area familiarization survey on Sunday.

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On Tuesday afternoon, a hand auger team commenced with the soil boring program in the area adjacent to the railroad tracks and along the tree-line west of Pine Street. The purpose of the hand auger points was to gather preliminary information regarding local surficial geology, and provide for a "quick and dirty" screening for the presence of creosote compounds. Another team began gathering and preparing equipment as required for the well point installations planned for Wednesday and Thursday.

A series of background samples were also collected on Tuesday. Two sampling stations were established in up-wind locations, and one station was located down-wind from the site. The background sample results were to be used in evaluating the possible effects of soil disturbance activities on ambient air quality.

Following review of the TAGA soil gas data on Wednesday, ERT in conjunction with the OSC decided that the investigation would focus on the areas adjacent to Gordens Creek. Additionally, it was decided that samples would be collected from each of the soil borings and sent to the ERT/REAC laboratory in Edison, NJ. The TAGA was no longer needed and could be de-mobilized. TAGA personnel spent Wednesday completing analyses and readying the instrument for the trip back to Edison. TAGA personnel departed Hattiesburg on Wednesday and the TAGA departed early on Thursday, January 25.

Preparation of equipment and establishment of a temporary decontamination facility was completed by Wednesday at noon. Two soil boring teams, both equipped with hydraulic power augers (Mini-Beaver), started sampling shortly after noon. Fourteen soil borings were drilled

prior to a torrential rain-storm that arrived at approximately 1500. This severe downpour, together with the 2+ inches of rain that the Hattiesburg area received during Tuesday night, made working conditions challenging and sampling of distinct depths difficult. Shortly after the rain commenced on Wednesday, the entire soil column at 1 to 2 feet below ground surface became saturated. ERT/REAC sampling efforts were abandoned at 1530, and on-site operations ceased. Equipment was decontaminated and some of the unnecessary pieces were shipped back to REAC in Edison, NJ. A total of ten (10) soil samples were also shipped to the ERT/REAC laboratory.

The rain continued throughout the night on Wednesday and into Thursday. Since characterization of distinct subsurface soil horizons would be compromised by the extremely elevated water table, ERT, in conjunction with the OSC, decided to postpone additional boring samples until dryer conditions prevailed. In addition, because of the rain and extreme wet conditions, the air sampling/monitoring program had to be suspended.

On Thursday, a team consisting of M. Ellis, G. Prince, G. Powell, and D. Rigor (OSC), commenced with the topographic survey of soil gas sampling locations, soil borings and significant features. The rest of the team began packaging the equipment for shipment back to Edison, and returning the rental equipment in preparation of site demobilization. A. Fekete, M. O'Neill, W. Batz, H. Compton, and M. Sprenger returned to NJ on Thursday night. The topographic survey was completed on Thursday which allowed the remaining crew to return to NJ on Friday.

FUTURE ACTIVITIES

The ten (10) soil samples and three (3) ambient air samples are currently being analyzed for PAH compounds by the S&A section of REAC. Draft analytical data are expected to be available in late February. Final analytical data are to be delivered to ERT on March 1, 1990.

REAC is currently preparing ACAD presentations of the land survey, soil gas contours and the extent of the former site operations. Preparation and delivery of a final summary report is planned for April 1, 1990.

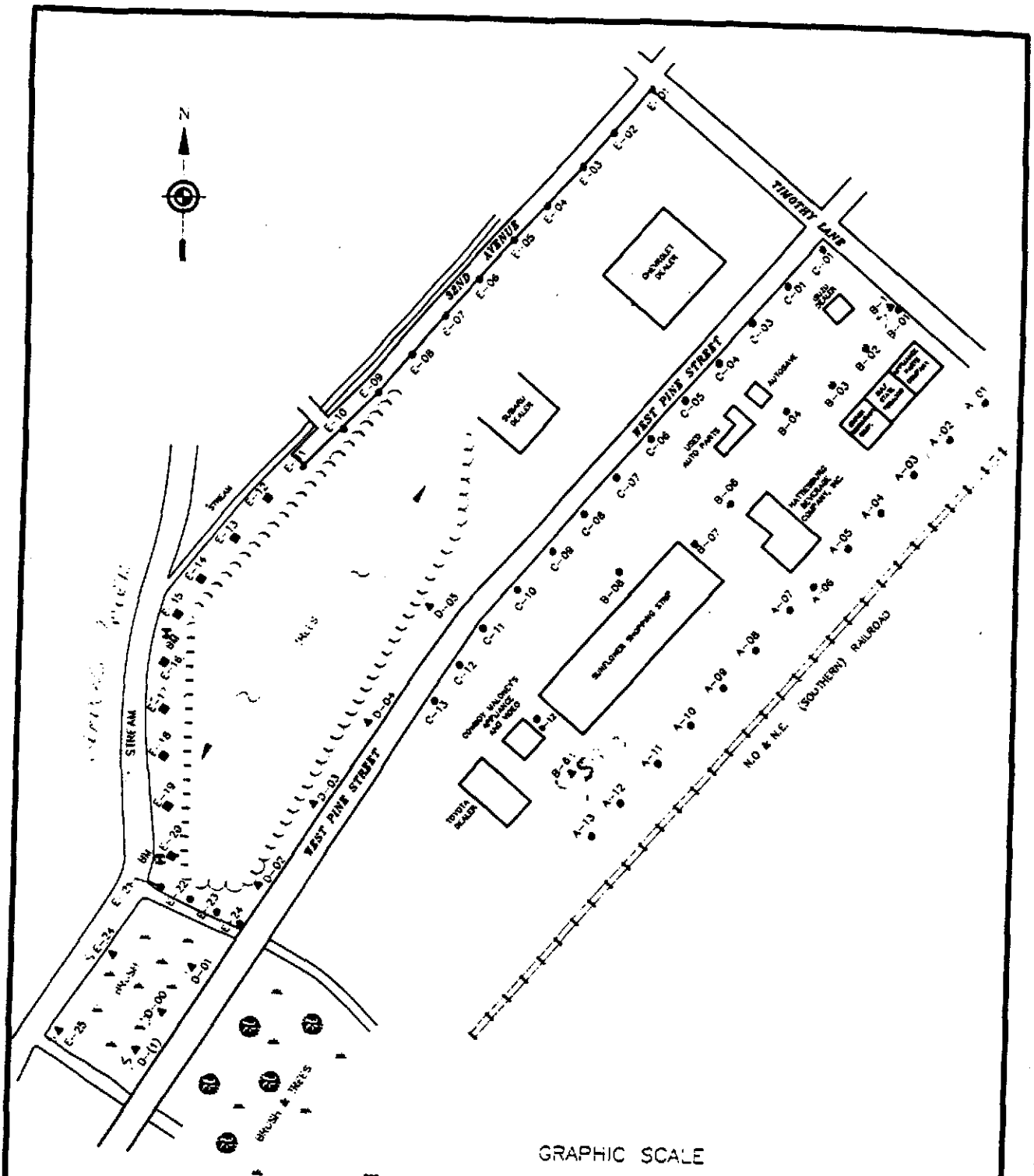
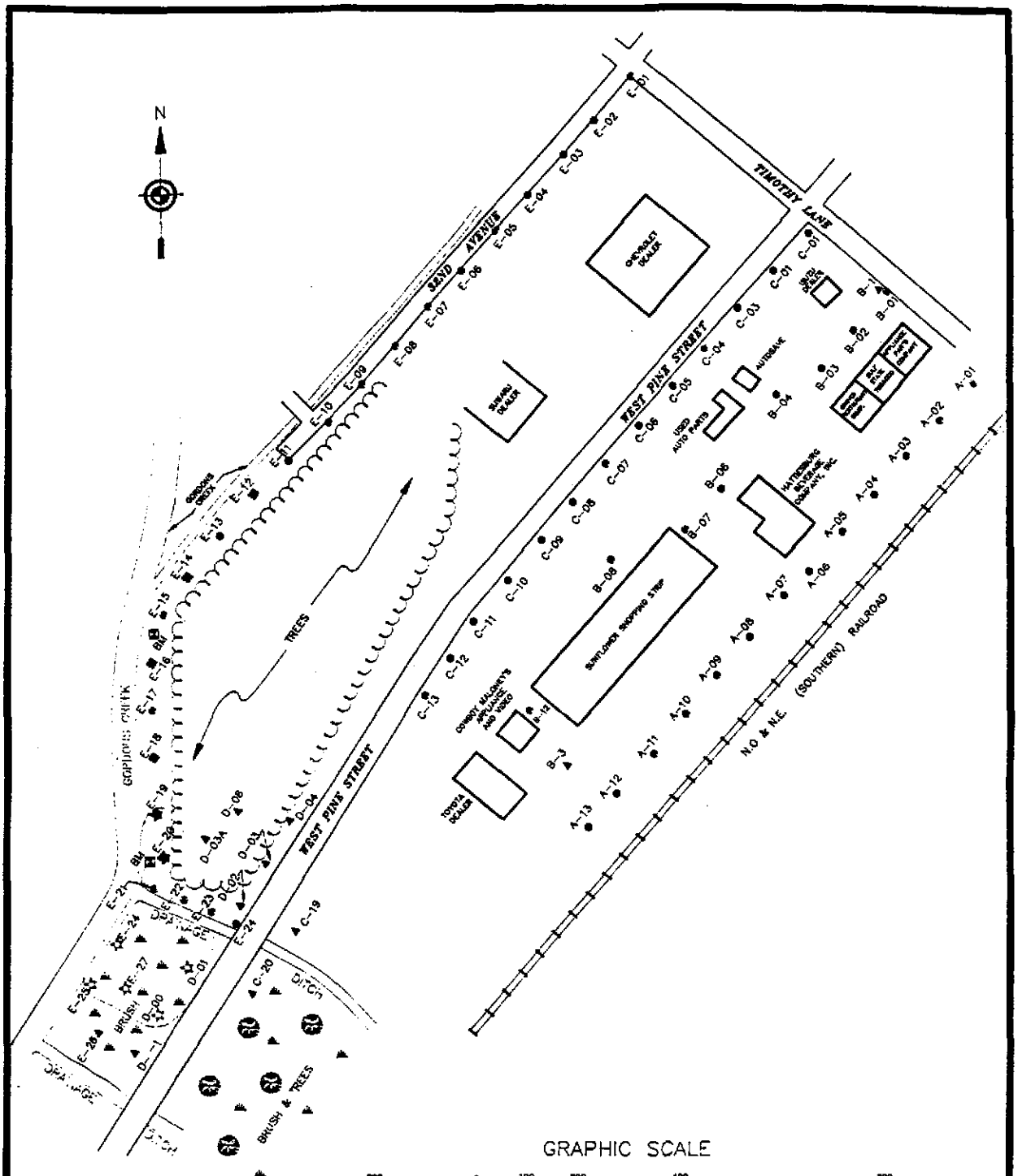


FIGURE 1
SAMPLE LOCATION MAP
GULF STATE CREOSOTE
HATTIESBURG MISSISSIPPI
JANUARY 22 - 26, 1990

LEGEND

- ● – SOIL GAS SAMPLES
- ▲ – SOIL BORING SAMPLES
- ■ – SOIL GAS AND BORING SAMPLES
- ⊠ – BENCHMARK

US EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
W.O.# 3347-11-01-2335



LEGEND

- ☆ – HOT BORING SAMPLES
- ● – SOIL GAS SAMPLES
- ▲ – SOIL BORING SAMPLES
- ■ – SOIL GAS AND BORING SAMPLES
- ⊠ – BENCHMARK
- ---------- – APPROXIMATE CONTAMINATION ZONE BOUNDARY

FIGURE 2
SAMPLE LOCATION MAP
GULF STATE CREOSOTE
HATTIESBURG, MISSISSIPPI
JANUARY & MARCH 1990

US EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
W.O.# 3347-11-01-2333

REAC SUPPORT ORGANIZATION
GSA RARITAN DEPOT
WOODBRIDGE AVENUE
BUILDING 209, BAY F
EDISON, NJ 08837
PHONE. 201-632-9200

DATE: March 30, 1990

TO: Harry Compton, Work Assignment Manager

FROM: Mark Ellis, REAC Geologist
Martin O'Neill, REAC Task Leader

THRU: Craig Moylan, O&A Section Chief

SUBJECT: GULF STATE CREOSOTE SOIL SAMPLING SURVEY:
W.A. # 3347-11-01-2335 - TRIP REPORT

BACKGROUND

The former Gulf States Creosote Site is located in a commercial area of Hattiesburg, Mississippi. The site was an active wood preserving facility which operated from approximately 1920 to 1960. It is currently owned by the city of Hattiesburg and subleased to several automobile dealerships, car-parts stores, a beverage distributer, a food store, and a furniture store. The process areas and wood drying/drip areas have been regraded, covered with asphalt, and are no longer evident. The former site encompasses approximately 20 acres, and is bordered on the east by railroad tracks, on the west by Gordons Creek, on the south by a drainage swale which feeds into Gordons creek, and on the north by Timothy Street.

The increase in surface runoff as a result of development and paving in the immediate area of the former site has significantly effected the flow into Gordons Creek. As a result, the U.S. Army Corps of Engineers (Corps) has been requested to rechannel Gordons Creek. In preparation for the rechannelization project, the Corps requested assistance from the US EPA in characterizing the nature and extent of contamination, which may be present in the area as a result of former wood treating operations at the Gulf State Creosote site.

ERT/REAC completed a soil gas survey and a series of preliminary soil borings in January, 1990. Because of an unexpected amount of rainfall, completion of the soil sampling effort had to be postponed.

The purpose of this ERT/REAC sampling event was to complete the subsurface soil investigations in the area of the former Gulf States Creosote Plant. Samples were to be collected at borings which appeared to be contaminated and analyzed for Poly Aromatic Hydrocarbon (PAH) compounds by the S&A Section of REAC.

OBSERVATIONS

The ERT/REAC team consisting of George Prince and Mark Ellis arrived in Hattiesburg, MS at approximately 1430 on Monday, March 19, 1990. A meeting was held with the On-Scene Coordinator (OSC), Don Rigger, Richard Ball from the state of Mississippi, Department of Environmental Quality,

Greg Powell of ERT Cincinnati, and JoAnna Cole from Region IV TAT to discuss the planned scope of work.

Following the meeting, the sampling teams met on site. One team began soil borings using the "Little Beaver" two-man power auger, while the other team surveyed new sampling locations from existing transects. Three borings were completed at locations D-1, E-26 and E-27, as depicted on Figure 1, Sample Location Map. Field data sheets are included in Appendix A. They include a rough geologic log and final depths for each boring. Boring locations E-26 and E-27 were measured 100 feet perpendicular from transect D. Boring E-27 had a distinct creosote odor, and a sample was collected using a stainless steel bucket auger. Site activities were completed at approximately 1745.

On Tuesday morning, the sampling teams met on site at 0730 and commenced boring at location E-25. The equipment was decontaminated after the completion of this boring using a high-pressure steam cleaner. A boring was then advanced at location E-24. Samples were collected at each of these locations from the bottom of the boreholes, or approximately nine feet.

A series of borings were drilled along transect D (D-02, D-03, D-03A, D-04, D-06). The first two locations, D-02 and D-03, were abandoned after the auger flights met refusal between three and six feet, due to an unknown thickness of fill material. Two samples were collected at location D-03A. One was representative of the wet sands just above a thick white clay layer and the other was a sample of the clay material. The clay layer was sampled to determine if the downward movement of the creosote is being retarded by the clay layer. Borings D-04 and D-06 were drilled to 10 feet and 14 feet, respectively. Both of these holes appeared to be clean (no odor), so no samples were collected.

Borings were completed at locations E-19, C-19 and C-20. Two samples were collected from boring E-19, again, one representing the sands above the clay layer and one of the clay itself. Samples were also collected at C-19 and C-20. These samples were collected in order to verify the presence/absence of any creosote compounds in the area east of West Pine Street.

After visual observation, it was decided that it was not necessary to drill or sample areas west of Gordons Creek. The crew mobilized to the decontamination area, cleaned all of the equipment, and began packaging it for shipment back to Edison. Site activities were completed at 1645 and the equipment was shipped back to Edison, NJ via Federal Express.

FUTURE ACTIVITIES

REAC is currently preparing to perform some preliminary treatability studies. Shaker tests will be performed to determine the likelihood of using microbial treatment as a means of remediation at the site.

The ACAD section at REAC is presently updating the sample location map which will be included in a final summary report.

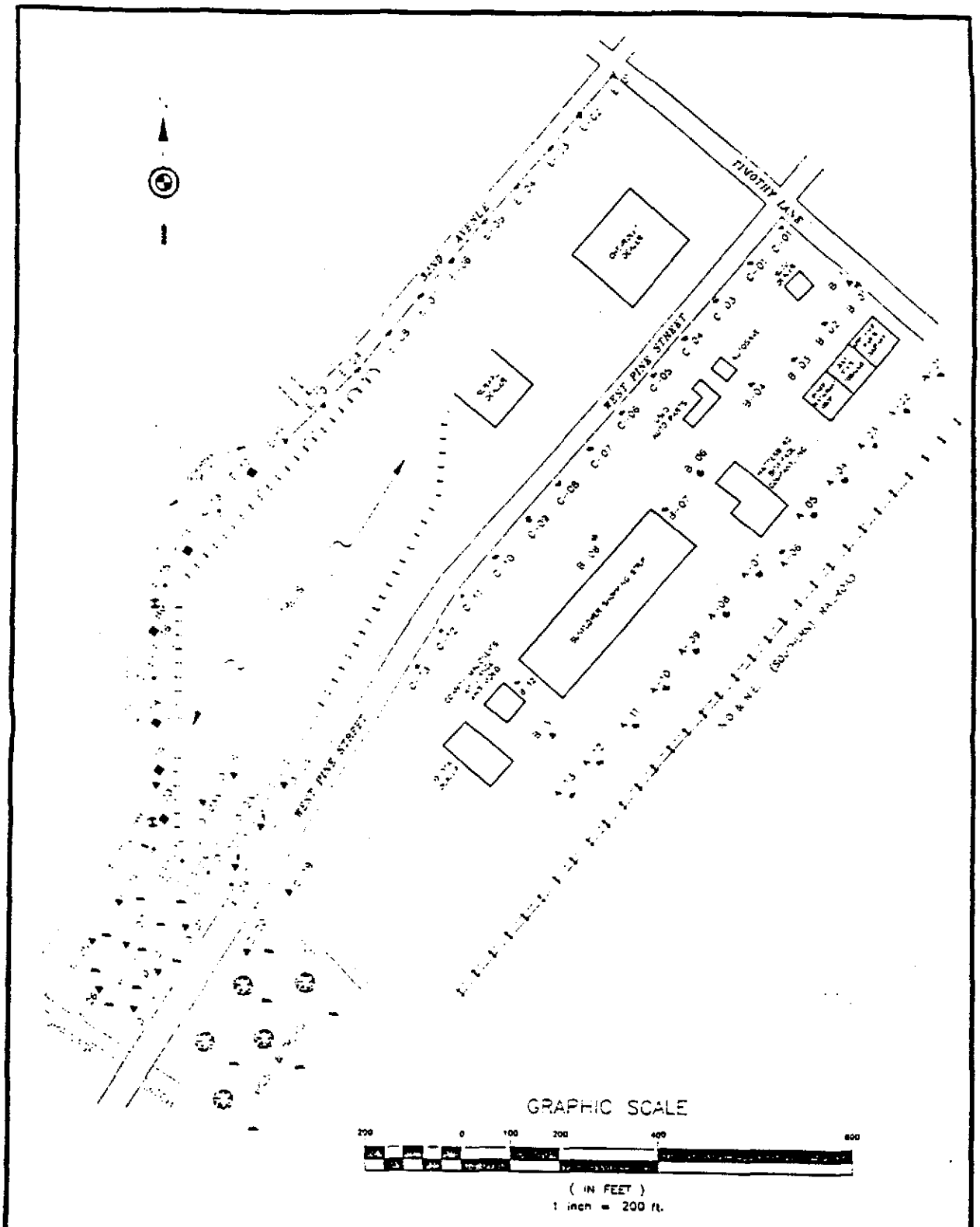


FIGURE 1
SAMPLE LOCATION MAP
GULF STATE CREOSOTE
HATTIESBURG MISSISSIPPI
JANUARY & MARCH 1990

LEGEND

- ● – SOIL GAS SAMPLES
- ▲ – SOIL BORING SAMPLES
- ■ – SOIL GAS AND BORING SAMPLES
- ⊠ – BENCHMARK

US EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482

APPENDIX B

TAGA SOIL GAS ANALYSIS
GULF STATES CREOSOTE
APRIL, 1990

TAGA FIELD REPORT

Prepared by
Roy F. Weston, Inc.

Gulf States Creosote Site
Hattiesburg, Mississippi

February 13, 1990

EPA Work Assignment No. 1-335
Project No. 3347-11-01-2335
EPA Contract No. 68-03-3482

Analysis by:
Mark Bernick
Gmae Loy
Dave Mickunas

Prepared by:
Mark Bernick
Gmae Loy

Reviewed by:
Dave Mickunas

TABLE OF CONTENTS

LIST OF DATA TABLES

LIST OF QA/QC TABLES

APPENDICES

APPENDIX

INTRODUCTION

This report presents the results of EPA Work Assignment No. 0-335, Weston Order No. 3347-11-01-2335, EPA Contract No. 68-03-3482.

The Response Engineering and Analytical Contract (REAC) was tasked by the USEPA/ERT to mobilize the U.S. EPA Trace Atmospheric Gas Analyzer (TAGA) to Hattiesburg, Mississippi to analyze soil gas samples from the Gulf States Creosote Plant Site. The analysis commenced on January 22, 1990, and concluded one day earlier than anticipated on January 23, 1990, due to the meteorological forecast calling for rain that would impair soil gas sampling.

The goal of the investigation was to analyze soil gas and soil head space samples for target compounds to identify creosote, gas and oil contaminated soils. Naphthalene was used as the target compound for identification of creosote contaminated soil; benzene, toluene, and xylene were monitored as indicators of gasoline and/or oil contaminated soil.

TABLE 1

TARGET COMPOUND LIST

benzene
naphthalene
toluene
xylene

TAGA PROCEDURE

The following operating procedures were performed during each analysis day using the TAGA 6000E:

(1) The first and third quandrupoles were scanned for 15 minutes each; this readied the instrument electronically.
(2) A gas mixture containing trichloroethene and tetrachloroethene was introduced by a mass flow controller into the sample air stream to optimize the first and third quadrupoles for sensitivity and mass assignment.
(3) The instrument was calibrated before and after each sampling period to generate target compound response factors - ion counts per second/parts per billion by volume (ICPS/ppbv).

Gas Calibration System

The gas calibration system consisted of a regulated gas cylinder with a mass flow controller. This calibration system was used to generate analytes' response factors (ICPS/ppbv), which were then used to quantify trace components in soil gas samples. The following is a list of target compounds, for which the instrument was calibrated, using the gas cylinder method:

benzene
toluene
xylene

A gas cylinder, containing a known mixture of target compounds as certified by Scott Specialty Gases (see Appendix A), was regulated at preset flow rates and diluted with ambient air. This dilution of the gas cylinder gave known analyte concentrations. Software, as described in the Plessey Interface Manual, utilized the analyte's cylinder concentration, the gas flow rate, the air sampling flow rate, and the atmospheric pressure to calculate the analyte's response factors (RFs). These response factors were obtained for the ion pairs of each compound of interest in the cylinder:

Cylinder ALM-001166

benzene
toluene
xylene

Tedlar Bag Calibration System

The Tedlar bag calibration system consisted of Tedlar bags, a 500 milliliter (ml) gas tight syringe, 5 and 60 ml sterile Becton-Dickinson B-D type syringes, and a temperature probe. The 5 and 60 ml syringes were filled with approximately 5 grams (gm) of the analyte and allowed to equilibrate for 15 minutes at room temperature. The temperature of the syringes was measured, and the concentration of the analyte in the gas phase of the syringe was calculated using the vapor pressure of the analyte, atmospheric pressure and the temperature of the syringe. The analyte was then diluted in the Tedlar bag to the target calibration concentration using ambient air and a volume of the syringe gas phase. The Tedlar bag was then attached directly to the TAGA sampling line and analyzed undiluted for the analyte's ion pairs.

A linear regression was run using the analyte's known Tedlar bag concentration and the respective ion pair's ion counts. The slope of the regression was equal to the ion pair's response factor. The target compound calibrated using the Tedlar bag calibration method was naphthalene.

Tedlar Bag Analysis

The Tedlar bags were received and stored inside an opaque plastic bag to prevent analyte degradation from by light. The bag sample number, location, sampling date and time were logged into the Taga computer prior to analysis. The Tedlar bag was attached directly to the TAGA sampling line and analyzed undiluted for the target compounds. Once the sample's target ion response equilibrated, a two minute file was collected and saved for each bag analyzed.

After the intensity data was downloaded off the hard disk; it was processed as described in the PC-Plessey Interface Manual. The PC-Plessey calculates an average concentration for each target compound. This concentration is arrived at by taking the signal intensity of selected parent/daughter ion pairs of a compound, dividing them by the appropriate response factor, and averaging the resultant concentrations of the ion pairs.

Soil Head Space Analysis

Soil samples were received and stored at room temperature in 40 ml glass Volatile Organic Analysis (VOA) bottles. These bottles contained about 35 ml of soil with about 5 ml of head space remaining. The samples were allowed to equilibrate at room temperature for one hour prior to analysis. The sample head space was bleed directly into the TAGA sampling line and analyzed undiluted for the target compounds. Once the sample's target ion response equilibrated, a two minute file was collected and saved for each sample analyzed.

After the intensity data was downloaded off the hard disk, it was processed as described in the PC-Plessey Interface Manual. Basically, this calculates an average concentration for each target compound. This concentration is arrived at by taking the signal intensity of selected parent/daughter ion pairs of a compound, dividing them by the appropriate response factor, and averaging the resultant concentrations of the ion pairs. The results of the soil head space target compound analysis are reported in ppbv.

CENTURY ORGANIC VAPOR ANALYZER PROCEDURE

Methane Analysis

A Model Century Organic Vapor Analyzer 128 Gas Chromatograph (OVA 128GC) was set up in the "GC Mode", as described in the instrument manual, using a 12 inch Poropak T 60/80 Mesh Stainless Steel OVA column (PT-12 column). An injection port was added to the front end of the column to allow gas-tight syringe injections of Tedlar bag samples, and a strip chart recorder was attached to the OVA 128GC to record the signal response of the flame ionization detector (FID).

A gas cylinder containing 889 parts per million by volume (ppmv) of methane as certified by Scott Specialty Gases (see Appendix A) was used as the methane calibration standard. Injections of 5 and 10 microliters (ul) of the calibration standard were recorded with the OVA 128GC CALIBRATE Switch set to X10. This gave a methane peak response equivalent to 45.0 ppmv and 89.9 ppmv methane respectively, for a sample injection of 100 uL

A sample injection of 100 ul was used for analyzing the Tedlar bags for methane. The sample injection size was reduced to 10 or 5 ul if the signal response for a sample went off scale. The results of the methane analysis are present in ppmv methane.

RESULTS AND DISCUSSION

The TAGA 6000E laboratory performed both Tedlar bag and soil head space analyses for target compounds of samples from the Gulf States Creosote Site in Hattiesburg, Mississippi. The study was designed to monitor soil gas and head space using naphthalene as an indicator of creosote contamination. Naphthalene was chosen as an indicator as it was found to be present in a creosote contaminated soil sample from this site analyzed prior to mobilization. Additionally, benzene, toluene, and xylene were used as indicators of gas and/or oil contaminated soil.

The results of these analyses are broken down into five sampling periods which correspond to five calibration periods each having their own set of response factors, detection and quantitation limits, and maximum percent deviations. These are presented in the Quality Assurance/Quality Control section of this report. These sampling periods were:

Sampling Period I	January 22, 1990	14:30 - 17:00
Sampling Period II	January 22, 1990	17:00 - 19:14
Sampling Period III	January 22, 1990	19:14 - 21:00
Sampling Period IV	January 23, 1990	10:18 - 15:51
Sampling Period V	January 23, 1990	15:51 - 19:26

The results of this study are broken down by sampling period and are presented in Tables 2 - 6 respectively. These tables list the TAGA file, target compound results, Tedlar bag identification number (ID NO.), sampling date and time, and sample location. The tables present results of Tedlar bag soil gas analysis except TAGA file numbers AHT063, 64, 68 - 71, soil head space analysis results.

Additionally, selected Tedlar bags were analyzed for methane. The results of this analysis are presented in Table 7, including a list of the Tedlar bag ID No. and the methane results.

TABLE 2

SAMPLING PERIOD I TAGA RESULTS

CONCENTRATIONS IN PPBV

TAGA FILE	BEN	TOL	XYL	NAP	ID NO.	SAMPLING DATE	SAMPLING TIME	SAMPLE LOCATION
AHT007	DL=5	DL=15	DL=10	DL=35	SG01492	1-22-90	14:40	C03
AHT008	DL=5	DL=15	DL=10	DL=35	SG01521	1-22-90	14:32	AD1
AHT009	DL=5	DL=15	DL=10	DL=35	SG01497	1-22-90	15:40	C09
AHT010	10-J	17-J	14-J	DL=35	SG01491	1-22-90	14:20	C01
AHT011	DL=5	DL=15	DL=10	DL=35	SG01522	1-22-90	14:49	A02
AHT012	DL=5	DL=15	DL=10	DL=35	SG01526	1-22-90	15:28	A06
AHT013	DL=5	DL=15	DL=10	DL=35	SG01530	1-22-90	16:10	A010
AHT014	12-J	19-J	16-J	DL=35	SG01493	1-22-90	14:55	C05
AHT015	DL=5	DL=15	DL=10	DL=35	SG01523	1-22-90	14:58	A03
AHT016	DL=5	DL=15	DL=10	DL=35	SG01524	1-22-90	15:10	A04

DL = DETECTION LIMIT
J = VALUE ABOVE DETECTION LIMIT BUT BELOW QUANTITATION LIMIT

TABLE 3

SAMPLING PERIOD II TAGA RESULTS

CONCENTRATIONS IN PPBV

TAGA FILE	BEN	TOL	XYL	NAP	ID NO.	SAMPLING DATE	TIME	SAMPLE LOCATION
AHT019	11-J	DL=20	DL=12	DL=40	SG01494	1-22-90	15:00	C06
AHT020	DL=6	DL=20	DL=12	DL=40	SG01525	1-22-90	15:19	A05
AHT021	DL=6	DL=20	DL=12	DL=40	SG01527	1-22-90	15:43	A07
AHT022	DL=6	DL=20	DL=12	DL=40	SG01528	1-22-90	15:53	A08
AHT023	DL=6	DL=20	DL=12	DL=40	SG01529	1-22-90	16:01	A09
AHT024	31-J	31-J	18-J	DL=40	SG01498	1-22-90	16:10	C-11
AHT025	DL=6	DL=20	DL=12	DL=40	SG01500	1-22-90	16:20	C013
AHT026	DL=6	DL=20	DL=12	DL=40	SG00611	1-22-90	16:25	A011
AHT027	DL=6	DL=20	DL=12	DL=40	SG00612	1-22-90	16:33	A012
AHT028	DL=6	DL=20	DL=12	DL=40	SG01501	1-22-90	16:42	C015

DL = DETECTION LIMIT
J = VALUE ABOVE DETECTION LIMIT BUT BELOW QUANTITATION LIMIT

TABLE 4

SAMPLING PERIOD III TAGA RESULTS

CONCENTRATIONS IN PPBV

TAGA FILE	BEN	TOL	XYL	NAP	ID NO.	SAMPLING DATE	TIME	SAMPLE LOCATION
AHT030	DL=8	DL=25	DL=16	DL=38	SG01531	1-22-90	16:44	
AHT031	DL=8	DL=25	DL=16	DL=38	SG01532	1-22-90	16:58	E02
AHT032	DL=8	30-J	DL=16	DL=38	SG00613	1-22-90	16:06	E015
AHT033	DL=8	DL=25	DL=16	DL=38	SG00614	1-22-90	17:15	E014
AHT034	DL=8	DL=25	DL=16	DL=38	SG01534	1-22-90	17:14	E04
AHT035	DL=8	DL=25	DL=16	DL=38	SG01533	1-22-90	17:10	E03
AHT036	DL=8	DL=25	DL=16	DL=38	SG01535	1-22-90	17:25	E05
AHT037	DL=8	DL=25	DL=16	DL=38	SG01536	1-22-90	17:30	E06

DL = DETECTION LIMIT
J = VALUE ABOVE DETECTION LIMIT BUT BELOW QUANTITATION LIMIT

TABLE 5

SAMPLING PERIOD IV TAGA RESULTS

CONCENTRATIONS IN PPBV

TAGA FILE	BEN	TOL	XYL	NAP	ID NO.	SAMPLING DATE	TIME	SAMPLE LOCATION
AHT043	7-J	40-J	30-J	82-J	SG01538	1-23-90	09:07	B01
AHT044	7-J	30-J	24-J	57-J	SG01502	1-23-90	09:12	E07
AHT045	9-J	51-J	41-J	122-J	SG01540	1-23-90	09:30	B03
AHT046	7-J	36-J	27-J	73-J	SG01505	1-23-90	09:45	E10
AHT047	7-J	49-J	25-J	60-J	SG01503	1-23-90	09:30	E09
AHT049	DL=6	30-J	24-J	75-J	SG01504	1-23-90	09:39	E10
AHT050	10-J	31-J	23-J	75-J	SG01506	1-23-90	09:53	E11
AHT051	DL=6	28-J	20-J	53-J	SG00621	1-23-90	10:22	B06
AHT052	16-J	33-J	22-J	50-J	SG00622	1-23-90	10:35	B07
AHT055	14-J	40-J	26-J	53-J	SG00623	1-23-90	10:47	B012
AHT056	14-J	661	42-J	80-J	SG01508	1-23-90	10:57	E23
AHT057	DL=6	41-J	15-J	37-J	SG01509	1-23-90	11:16	E22
AHT058	7-J	37-J	23-J	52-J	SG01510	1-23-90	11:45	F1
AHT059	10-J	DL=25	DL=14	DL=29	SG00624	1-23-90		B09
AHT060	DL=6	33-J	22-J	47-J	SG01507	1-23-90		E24
AHT062	18-J	48-J	111	51-J	SG00625	1-23-90	12:08	B08
AHT063	11-J	51-J	102	938	BORE HOLE 9' DEEP			A01
AHT064	22	131	457	9709	E05321	SOIL HEAD SPACE		

DL = DETECTION LIMIT
J = VALUE ABOVE DETECTION LIMIT BUT BELOW QUANTITATION LIMIT

TABLE 6

SAMPLING PERIOD V TAGA RESULTS

CONCENTRATIONS IN PPBV

TAGA FILE	BEN	TOL	XYL	NAP	ID NO.	TITLE
AHT068	24	35-J	41-J	DL=38	F05308	SOIL HEAD SPACE
AHT069	27	37-J	46-J	DL=38	D05309	SOIL HEAD SPACE
AHT070	23	34-J	39-J	DL=38	K05322	SOIL HEAD SPACE
AHT071	24	32-J	34-J	DL=38	B05322	SOIL HEAD SPACE

DL = DETECTION LIMIT
J = VALUE ABOVE DETECTION LIMIT BUT BELOW QUANTITATION LIMIT

TABLE 7

METHANE ANALYSIS RESULTS

CONCENTRATION IN PPMV

DATE - January 23, 1990

SAMPLE ID NO.	METHANE
SG01538	ND
SG01540	ND
SG01505	ND
SG01506	ND
SG01502	ND
SG01504	ND
SG01503	ND
SG00622	ND
SG00621	800
SG00623	ND
SG01507	ND
SG01509	ND
SG01510	ND
SG01508	ND
SG00625	ND
SG00624	ND

ND = NOT DETECTED

The compound parent/daughter ion pairs used for ion profile quantitation and detection are listed below:

Compound	ID	Parent Mass/Daughter Mass
benzene	BNZ	78/39
benzene	BNZ	78/52
toluene	TOL	92/39
toluene	TOL	92/51
xylene	XYL	106/65
xylene	XYL	106/91
naphthalene	NAP	128/78
naphthalene	NAP	128/128

Additional ion pairs had been calibrated and monitored for, but due to background interferences or insensitivity, they were not used.

Calculations for the Summary of Actual and Intermediate Response Factors for the Target Compounds' Ion Pairs During the Sampling Period

Response factors (RF) were generated from the final and initial calibration events, as described in the procedure. Tables 8 - 12 contain the RFs in units of ion counts per second/parts per billion by volume (ICPS/ppbv). The actual RFs are used to calculate the intermediate RFs, which are used to calculate the concentrations reported in the results. The following is a list of the target compounds and the identification "ID" used in Tables 8 - 12.

ID	COMPOUND
BNZ	benzene
TOL	toluene
XYL	xylene
NAP	naphthalene

The following equation was used to calculate the intermediate response factors (IRF) found in Tables 8 - 12.

$$IRF = \frac{2\,(RF1 \times RF2)}{(RF1 + RF2)}$$

where:

IRF = intermediate response factor (ICPS/ppbv)
RF1 = the response factor for an ion pair measured during the initial calibration event (ICPS/ppbv)
RF2 = the response factor for the same ion pair measured during the final calibration event (ICPS/ppbv)

For example, the entry for the 78/39 ion pair of benzene from Table 8 is:

RF1 = 31.14 (ICPS/ppbv)
RF2 = 37.13 (ICPS/ppbv)

and then

$$\frac{2(31.14 \times 37.13)}{(31.14 + 37.13)} = \frac{2312.45}{68.27} = 33.87 \text{ ICPS/ppbv}$$

TABLE 8

THE SUMMARY OF ACTUAL AND INTERMEDIATE RESPONSE FACTORS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD I

ID	CALIBRATION TIME PM/DM	01/22/90 14:30 RESPONSE FACTOR	01/22/90 17:00 RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
BEN	78/ 39	31.14	37.13	33.87
BEN	78/ 52	44.63	53.21	48.54
TOL	92/ 39	6.23	8.19	7.08
TOL	92/ 51	17.11	22.49	19.43
XYL*	106/ 39	2.59	2.50	2.54
XYL*	106/ 51	2.49	2.42	2.45
XYL	106/ 65	9.87	9.56	9.71
XYL	106/ 91	65.90	63.84	64.85
NAP	128/ 78	2.12	2.29	2.20
NAP	128/128	106.56	115.42	110.81

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass

* Ion Pairs Not Used in Quantitation.

TABLE 9

THE SUMMARY OF ACTUAL AND INTERMEDIATE RESPONSE FACTORS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD II

	CALIBRATION TIME	01/22/90 14:30	01/22/90 19:14	
ID	PM/DM	RESPONSE FACTOR	RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
BEN	78/ 39	31.14	28.63	29.83
BEN	78/ 52	44.63	41.02	42.75
TOL	92/ 39	6.23	5.83	6.03
TOL	92/ 51	17.11	16.02	16.55
XYL*	106/ 39	2.59	1.78	2.11
XYL*	106/ 51	2.49	1.72	2.04
XYL	106/ 65	9.87	6.81	8.06
XYL	106/ 91	65.90	45.50	53.83
NAP	128/ 78	2.12	1.85	1.98
NAP	128/128	106.56	93.28	99.48

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass

* Ion Pairs Not Used in Quantitation.

TABLE 10

THE SUMMARY OF ACTUAL AND INTERMEDIATE RESPONSE FACTORS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD III

	CALIBRATION TIME	01/22/90 14:30	01/22/90 21:00	
ID	PM/DM	RESPONSE FACTOR	RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
BEN	78/ 39	31.14	23.24	26.61
BEN	78/ 52	44.63	33.56	38.31
TOL	92/ 39	6.23	4.09	4.94
TOL	92/ 51	17.11	10.07	12.68
XYL*	106/ 39	2.59	1.41	1.82
XYL*	106/ 51	2.49	1.16	1.58
XYL	106/ 65	9.87	4.82	6.48
XYL	106/ 91	65.90	34.10	44.94
NAP	128/ 78	2.12	2.10	2.11
NAP	128/128	106.56	94.70	100.28

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass

* Ion Pairs Not Used in Quantitation.

TABLE 11

THE SUMMARY OF ACTUAL AND INTERMEDIATE RESPONSE FACTORS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD IV

ID	CALIBRATION TIME PM/DM	01/23/90 10:18 RESPONSE FACTOR	01/23/90 15:51 RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
BEN	78/ 39	30.30	24.09	26.840
BEN	78/ 52	42.72	31.25	36.094
TOL	92/ 39	6.10	3.38	4.349
TOL	92/ 51	16.34	11.72	13.653
XYL*	106/ 39	3.14	1.78	2.268
XYL*	106/ 51	2.75	0.74	1.165
XYL	106/ 65	11.50	5.70	7.621
XYL	106/ 91	73.31	33.37	45.863
NAP	128/ 78	4.54	2.23	2.991
NAP	128/128	222.17	109.31	146.527

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass

* Ion Pairs Not Used in Quantitation.

TABLE 12

THE SUMMARY OF ACTUAL AND INTERMEDIATE RESPONSE FACTORS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD V

	CALIBRATION TIME	01/23/90 10:18	01/23/90 19:26	
ID	PM/DM	RESPONSE FACTOR	RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
BEN	78/ 39	30.30	21.33	25.04
BEN	78/ 52	42.72	31.01	35.93
TOL	92/ 39	6.10	3.03	4.05
TOL	92/ 51	16.34	9.72	12.19
XYL*	106/ 39	3.14	1.13	1.66
XYL*	106/ 51	2.75	1.08	1.55
XYL	106/ 65	11.50	4.92	6.89
XYL	106/ 91	73.31	31.16	43.73
NAP	128/ 78	4.54	1.65	2.42
NAP	128/128	222.17	49.50	80.96

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass

* Ion Pairs Not Used in Quantitation.

Calculations for the Summary of the Detection and Quantitation Concentration Limits for the Target Compounds' Ion Pairs During the Sampling Periods

The ion pairs' detection concentration limits (DL) and quantitation concentration limits (QL) were generated from the ion pairs' intensity of the standard deviation (SD) of the measurement of an ambient air Tedlar bag; as well as its intermediate response factor. Tables 13 - 17 contain these IRFs that are in units of ion counts per second/part per billion by volume (ICPS/ppbv).
The following equation was used to calculate the detection concentration limits found in Table 13 to 17.

$$DL = \frac{3 \times SD}{IRF}$$

where:

DL = detection limit concentration for an ion pair (ppbv)
SD = Standard deviation of the ion intensity for an ion pair of the measurement of an ambient air Tedlar bag (ICPS)
IRF = intermediate response factor for an ion pair (ICPS/ppbv)

For example, the entry for the 78/39 ion pair of benzene from Table 13 is:

SD = 59 ICPS
IRF = 33.87 ICPS/ppbv

$$DL = \frac{3 \times 59}{33.87} = 5.2 \text{ ppbv}$$

The following equation was used to calculated the quantitation limit concentrations found in Table 13 to 17:

$$QL = \frac{10 \times SD}{IRF}$$

where:
QL = quantitation limit concentration for an ion pair (ppbv)
SD = ion intensity for an ion pair of the measurement of an ambient air Tedlar bag (ICPS)
IRF = intermediate response factor for an ion pair (ICPS/ppbv)

For example, the entry for the 78/39 ion pair of benzene from Table 13 is:

SD = 59 ICPS
IRF = 33.87 ICPS/ppbv

$$QL = \frac{10 \times 59}{33.87} = 17.4 \text{ ppbv}$$

TABLE 13

THE SUMMARY OF DETECTION AND QUANTITIATION CONCENTRATION LIMITS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD I

ID	PM/DM	IRF (ICPS)	ERROR BAR	DL (ICPS)	QL (ICPS)	DL (ppbv)	QL (ppbv)	INTENSITY (ICPS)	SD (ICPS)
BEN	78/ 39	33.87	0.088	177	590	5.2	17.4	71	59
BEN	78/ 52	48.54	0.088	162	540	3.3	11.1	92	54
TOL	92/ 39	7.08	0.136	150	500	21.2	70.7	42	50
TOL	92/ 51	19.43	0.136	153	510	7.9	26.2	71	51
XYL*	106/ 39	2.54	0.016	138	460	54.2	180.8	29	46
XYL*	106/ 51	2.45	0.016	153	510	62.4	207.8	58	51
XYL	106/ 65	9.71	0.016	156	520	16.1	53.5	48	52
XYL	106/ 91	64.85	0.016	228	760	3.5	11.7	292	76
NAP	128/ 78	2.20	0.040	141	470	64.0	213.5	32	47
NAP	128/128	110.81	0.040	630	2100	5.7	19.0	1379	210

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass
IRF = Intermediate Response Factors
DL = Detection Limit
QL = Quantitation Limit
SD = Standard Deviation

* Ion Pairs Not Used in Quantitation

TABLE 14

THE SUMMARY OF DETECTION AND QUANITATION CONCENTRATION LIMITS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD II

ID	PM/DM	IRF (ICPS)	ERROR BAR	DL (ICPS)	QL (ICPS)	DL (ppbv)	QL (ppbv)	INTENSITY (ICPS)	SD (ICPS)
BEN	78/ 39	29.83	0.042	210	700	7.0	23.5	131	70
BEN	78/ 52	42.75	0.042	204	680	4.8	15.9	195	68
TOL	92/ 39	6.03	0.033	177	590	29.4	97.9	61	59
TOL	92/ 51	16.55	0.033	171	570	10.3	34.4	125	57
XYL*	106/ 39	2.11	0.183	150	500	71.0	236.8	46	50
XYL*	106/ 51	2.04	0.183	174	580	85.4	284.8	63	58
XYL	106/ 65	8.06	0.183	147	490	18.2	60.8	103	49
XYL	106/ 91	53.83	0.183	279	930	5.2	17.3	439	93
NAP	128/ 78	1.98	0.066	147	490	74.4	247.9	38	49
NAP	128/128	99.48	0.066	591	1970	5.9	19.8	1561	197

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass
IRF = Intermediate Response Factors
DL = Detection Limit
QL = Quantitation Limit
SD = Standard Deviation

* Ion Pairs Not Used in Quantitation

TABLE 15

THE SUMMARY OF DETECTION AND QUANITATION CONCENTRATION LIMITS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD III

ID	PM/DM	IRF (ICPS)	ERROR BAR	DL (ICPS)	QL (ICPS)	DL (ppbv)	QL (ppbv)	INTENSITY (ICPS)	SD (ICPS)
BEN	78/ 39	26.61	0.145	207	690	7.8	25.9	205	69
BEN	78/ 52	38.31	0.142	243	810	6.3	21.1	291	81
TOL	92/ 39	4.94	0.207	171	570	34.6	115.4	94	57
TOL	92/ 51	12.68	0.259	189	630	14.9	49.7	191	63
XYL*	106/ 39	1.82	0.294	171	570	93.7	312.5	59	57
XYL*	106/ 51	1.58	0.365	165	550	104.3	347.6	65	55
XYL	106/ 65	6.48	0.344	147	490	22.7	75.7	120	49
XYL	106/ 91	44.94	0.318	345	1150	7.7	25.6	677	115
NAP	128/ 78	2.11	0.004	147	490	69.7	232.4	39	49
NAP	128/128	100.28	0.059	618	2060	6.2	20.5	1696	206

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass
IRF = Intermediate Response Factors
DL = Detection Limit
QL = Quantitation Limit
SD = Standard Deviation

* Ion Pairs Not Used in Quantitation

TABLE 16

THE SUMMARY OF DETECTION AND QUANITATION CONCENTRATION LIMITS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD IV

ID	PM/DM	IRF (ICPS)	ERROR BAR	DL (ICPS)	QL (ICPS)	DL (ppbv)	QL (ppbv)	INTENSITY (ICPS)	SD (ICPS)
BEN	78/ 39	26.84	0.114	168	560	6.3	20.9	91	56
BEN	78/ 52	36.09	0.155	183	610	5.1	16.9	113	61
TOL	92/ 39	4.35	0.287	159	530	36.6	121.9	51	53
TOL	92/ 51	13.65	0.164	162	540	11.9	39.6	84	54
XYL*	106/ 39	2.27	0.276	150	500	66.1	220.4	51	50
XYL*	106/ 51	1.17	0.576	177	590	151.9	506.2	82	59
XYL	106/ 65	7.62	0.337	165	550	21.6	72.2	85	55
XYL	106/ 91	45.86	0.374	249	830	5.4	18.1	427	83
NAP	128/ 78	2.99	0.341	150	500	50.2	167.2	77	50
NAP	128/128	146.53	0.340	876	2920	6.0	19.9	5209	292

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass
IRF = Intermediate Response Factors
DL = Detection Limit
QL = Quantitation Limit
SD = Standard Deviation

* Ion Pairs Not Used in Quantitation

TABLE 17

THE SUMMARY OF DETECTION AND QUANITATION CONCENTRATION LIMITS FOR THE TARGET COMPOUNDS' ION PAIRS DURING SAMPLING PERIOD V

ID	PM/DM	IRF (ICPS)	ERROR BAR	DL (ICPS)	QL (ICPS)	DL (ppbv)	QL (ppbv)	INTENSITY (ICPS)	SD (ICPS)
BEN	78/ 39	25.04	0.174	174	580	6.9	23.2	78	58
BEN	78/ 52	35.93	0.159	168	560	4.7	15.6	96	56
TOL	92/ 39	4.05	0.336	159	530	39.3	130.9	51	53
TOL	92/ 51	12.19	0.254	153	510	12.6	41.9	50	51
XYL*	106/ 39	1.66	0.471	258	860	155.6	518.6	46	86
XYL*	106/ 51	1.55	0.435	159	530	102.4	341.3	76	53
XYL	106/ 65	6.89	0.401	153	510	22.2	74.0	51	51
XYL	106/ 91	43.73	0.403	216	720	4.9	16.5	199	72
NAP	128/ 78	2.42	0.466	159	530	65.6	218.8	53	53
NAP	128/128	80.96	0.636	816	2720	10.1	33.6	2809	272

ID = Identification Code
PM = Parent Mass
DM = Daughter Mass
IRF = Intermediate Response Factors
DL = Detection Limit
QL = Quantitation Limit
SD = Standard Deviation

* Ion Pairs Not Used in Quantitation

Calculations for the Detection and Quantitation Concentration Limits for the Target Compounds During the Sampling Periods

The detection concentration limits (DL) and quantitation concentration limits (QL) for compound were generated by averaging the respective DLs and QLs of the target compounds' ion pairs. Only the designated ion pairs in Tables 13 -17 were used to determine the DLs and Qls, because others have background interferences or were insensitive.

The following equation was used to calculate the compound's detection limit concentration found in Table 18:

$$DL = \frac{DL1 + DL2 + \ldots + DLn}{n}$$

where:

DL = detection limit for a compound (ppbv)
DL1 = detection limit for the first ion pair (ppbv)
DL2 = detection limit for the second ion pair (ppbv)
DL3 = detection limit for the nth ion pair (ppbv)
n = number of ion pairs to be averaged

For example, the entry for the 78/39 and 78/52 ion pairs of benzene from Table 12 is:

$$DL = \frac{5.2 + 3.3}{2} = \frac{8.5}{2} = 4.25 \text{ ppbv}$$

This number was rounded up to the next whole number resulting in the detection limit equal to 5 ppbv.

The following equation was used to calculate the compound's quantitation limit concentration found in Table 18:

$$QL = \frac{QL1 + QL2 + \ldots + QLn}{n}$$

where:

QL = quantitation limit for a compound (ppbv)
QL1 = quantitation limit for the first ion pair (ppbv)
QL2 = quantitation limit for the second ion pair (ppbv)
QL3 = quantitation limit for the nth ion pair (ppbv)
n = number of ion pairs to be averaged

For example, the entry for the 78/39 and 78/52 ion pairs of benzene from Table 13 is:

$$QL = \frac{17.4 + 11.1}{2} = \frac{28.5}{2} = 14.25 \text{ ppbv}$$

This number was rounded up to the next whole number resulting in the quantitation limit equal to 15 ppbv.

TABLE 18

SUMMARY OF DETECTION AND QUANTITATION CONCERTRATION LIMITS FOR TARGET COMPOUNDS DURING THE SAMPLING PERIODS

CONCENTRATIONS IN PPBV

COMPOUND	SAMPLING PERIOD I		SAMPLING PERIOD II		SAMPLING PERIOD III		SAMPLING PERIOD IV		SAMPLING PERIOD V	
	DL	QL	DL	QL	DL	QL	DL	QL	DL	QL
benzene	5	15	6	20	8	24	6	19	6	20
toluene	15	49	20	67	25	83	25	81	26	87
xylene	10	33	12	40	16	51	14	46	14	46
naphthalene	35	116	40	134	38	127	29	94	38	127

DL = Detection Limit
QL = Quantitation Limit

Calculations for the Potential Maximum Concentration Percent Deviations for Target Compounds During the Sampling Periods

The potential maximum concentration percent deviations presented in Table 19 are called "error bars" for simplicity. They represent the potential bias in the concentration due to changes in the sensitivity of the TAGA. "Error bars" were calculated using the following equation:

$$\text{"error bars"} = \frac{|RF1 - RF2|}{(RF1 + RF2)} \times 100$$

where:

error bars = maximum concentration percent deviation (unitless)
RF1 = the response factor for an ion pair measured during the initial calibration event (ICPS/ppbv)
RF2 = the response factor for the same ion pair measured during the final calibration event (ICPS/ppbv)

The above calculation was repeated for each ion pair. The "error bars" for each compound were averaged to give a single value for each compound between the two calibrations each sampling period.

For example, using the BNZ data from Table 8 for the 78/39 ion pair:

RF1 = 31.14
RF2 = 37.13

and then

$$\frac{|RF1 - RF2|}{(RF1 + RF2)} \times 100 = \frac{|31.14 - 37.13|}{31.14 + 37.13} \times 100 = 8.8\%$$

and the other BNZ ion pair: 78/51 the "error bar" is 8.8%. These ion pair "error bars" are averaged to give an "error bar" for BNZ equal to 8.8%, which is the entry in Table 19.

TABLE 19

THE SUMMARY OF THE POTENTIAL MAXIMUM CONCENTRATION PERCENT DEVIATIONS FOR THE TARGET COMPOUNDS DURING THE SAMPLING PERIOD

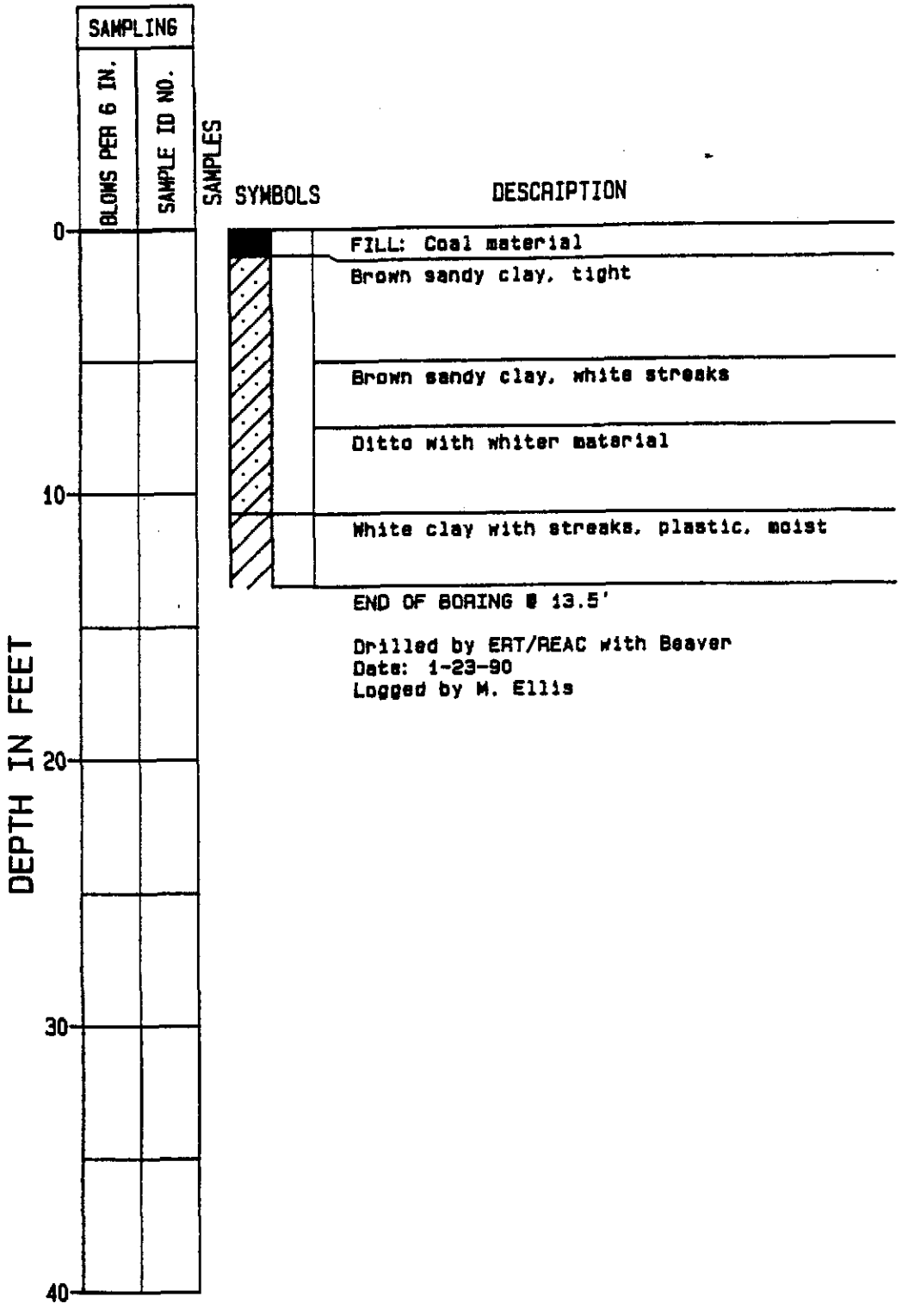
SAMPLING PERIOD	I	II	III	IV	V
COMPOUND	ERROR BAR PERCENTAGE	ERROR BAR PERCENTAGE	ERROR BAR PERCENTAGE	ERROR BAR PERCENTAGE	ERROR BA PERCENTAG
benzene	8.8	4.2	14.4	13.5	16.7
toluene	13.6	3.3	23.3	22.6	29.5
xylene	1.6	18.3	33.1	35.6	40.2
naphthalene	4.0	6.6	3.2	34.1	55.1

APPENDIX C

SOIL BORING LOGS
GULF STATES CREOSOTE
APRIL, 1990

BORING B-01

GULF STATE CREOSOTE
HATTIESBURG, MS



BORING LOG

Response Engineering and Analytical Contract

BORING B-02.5

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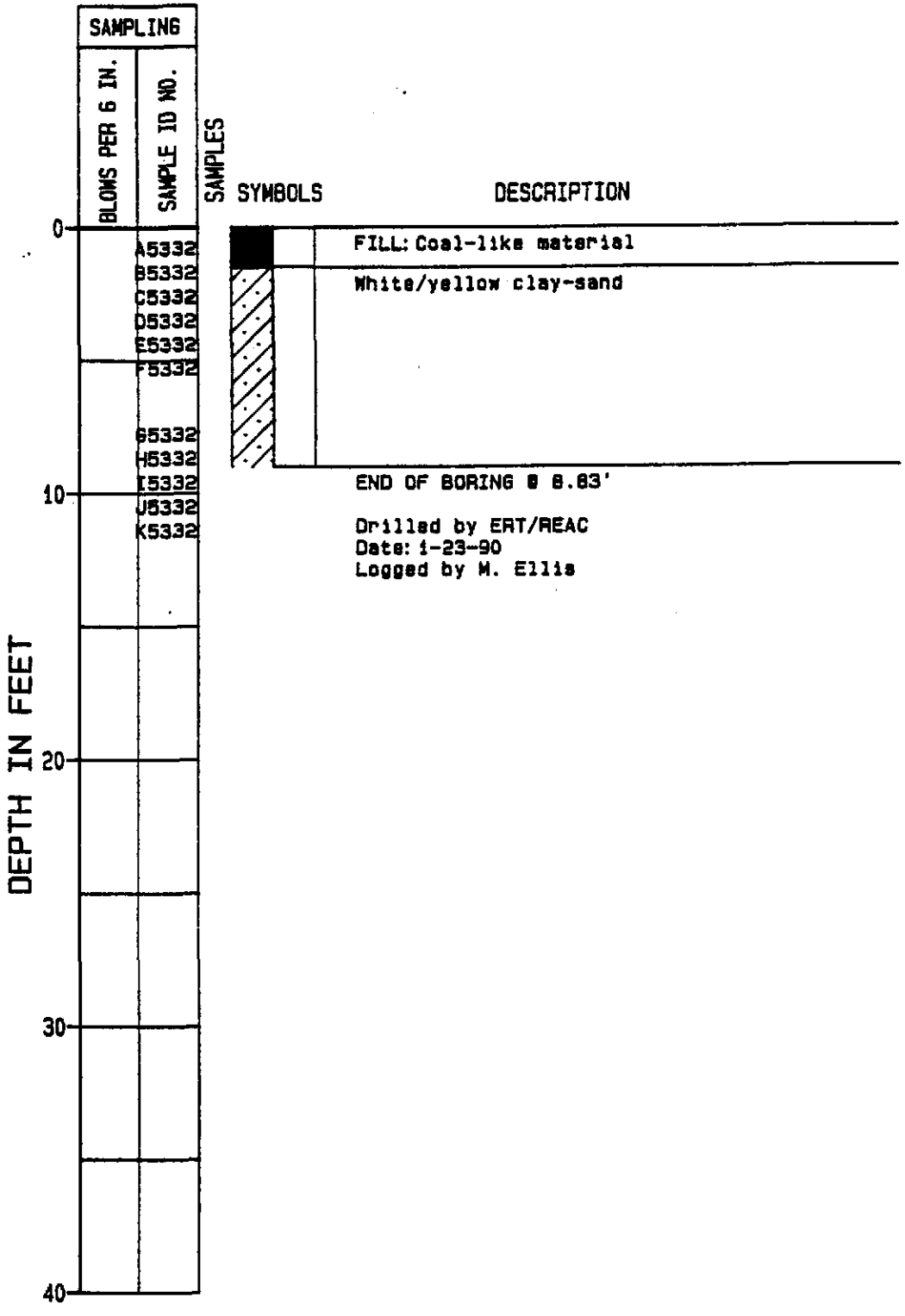

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BORING B-3

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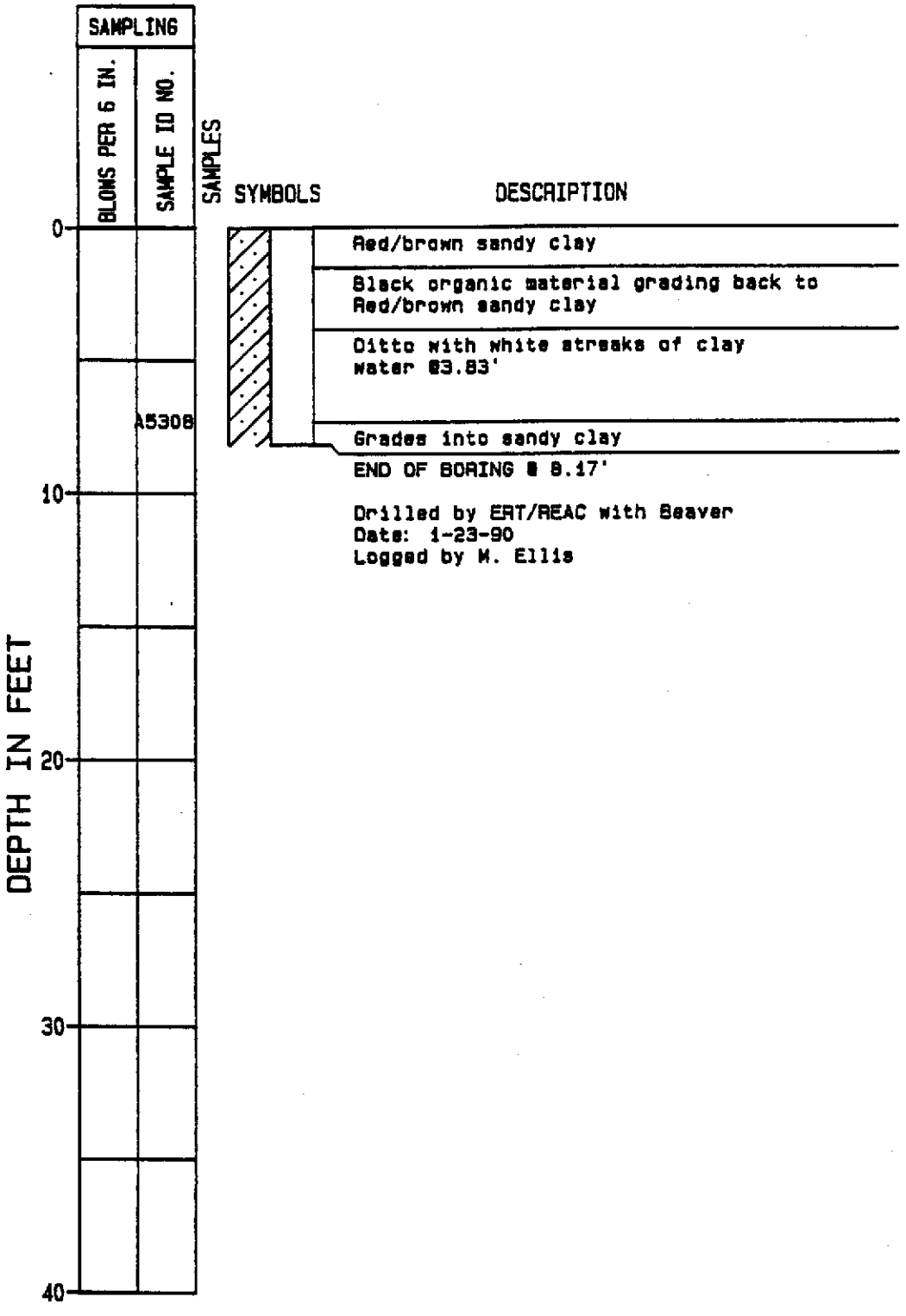

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BORING C-19

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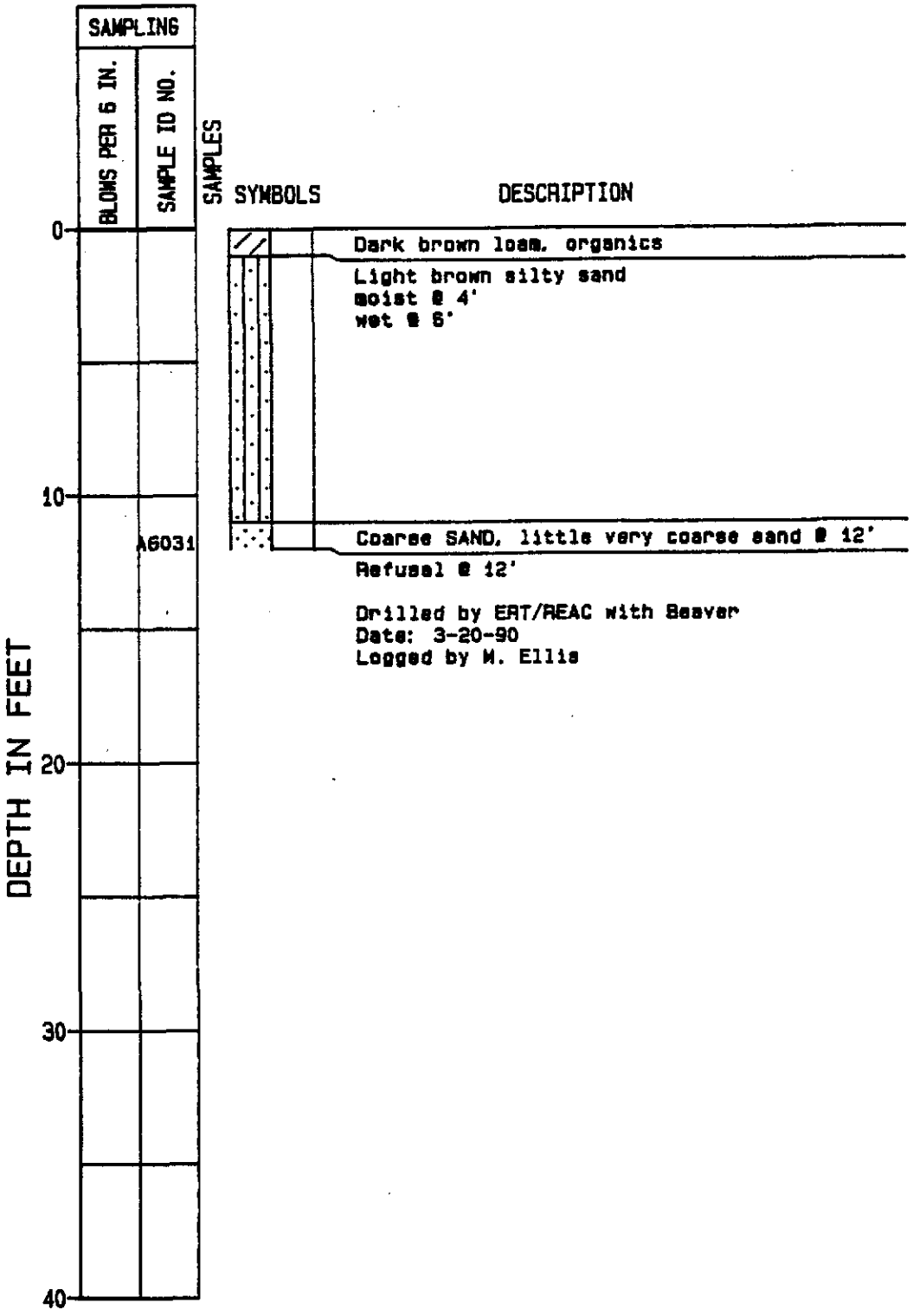

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BORING C-20

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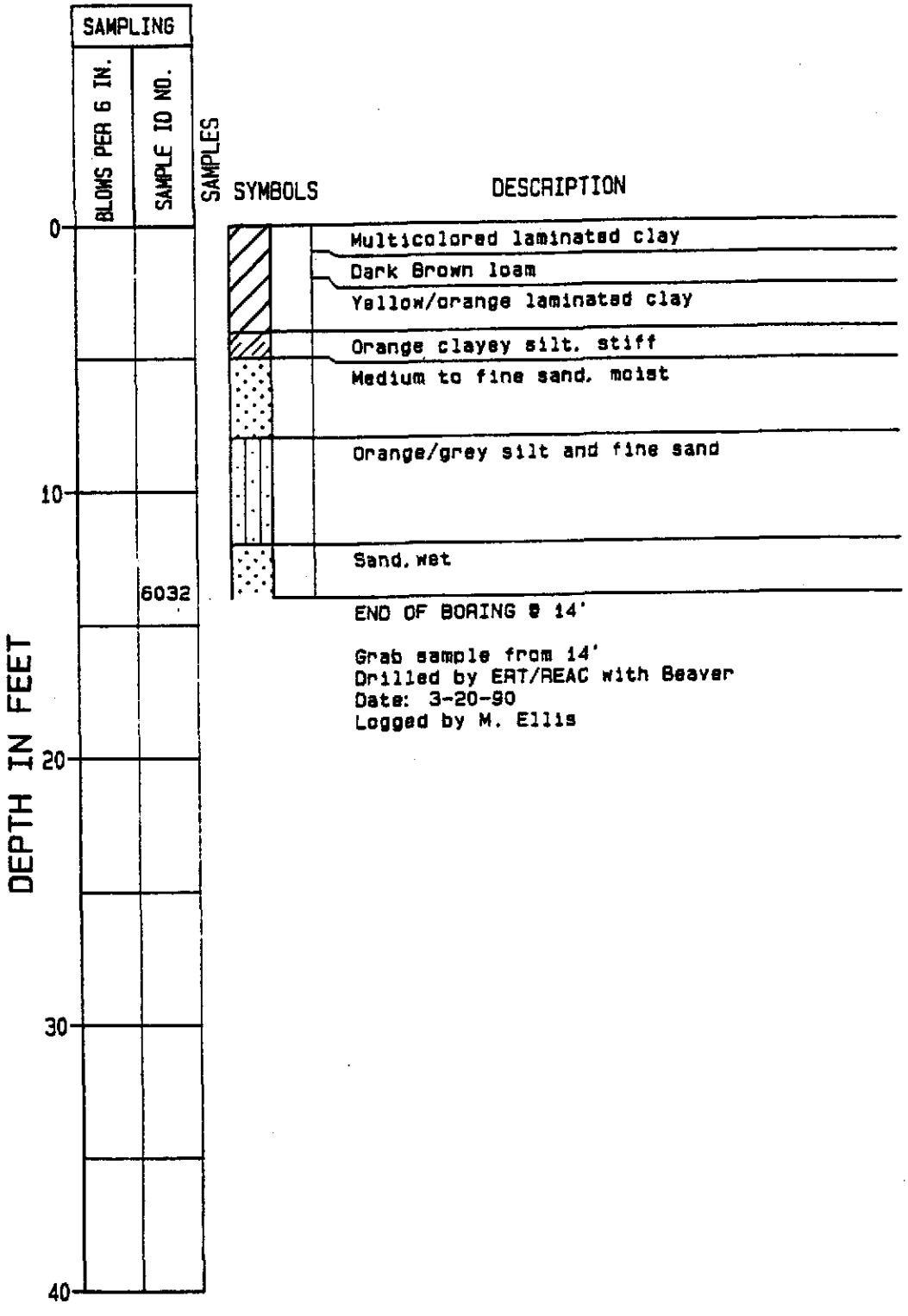

BORING LOG

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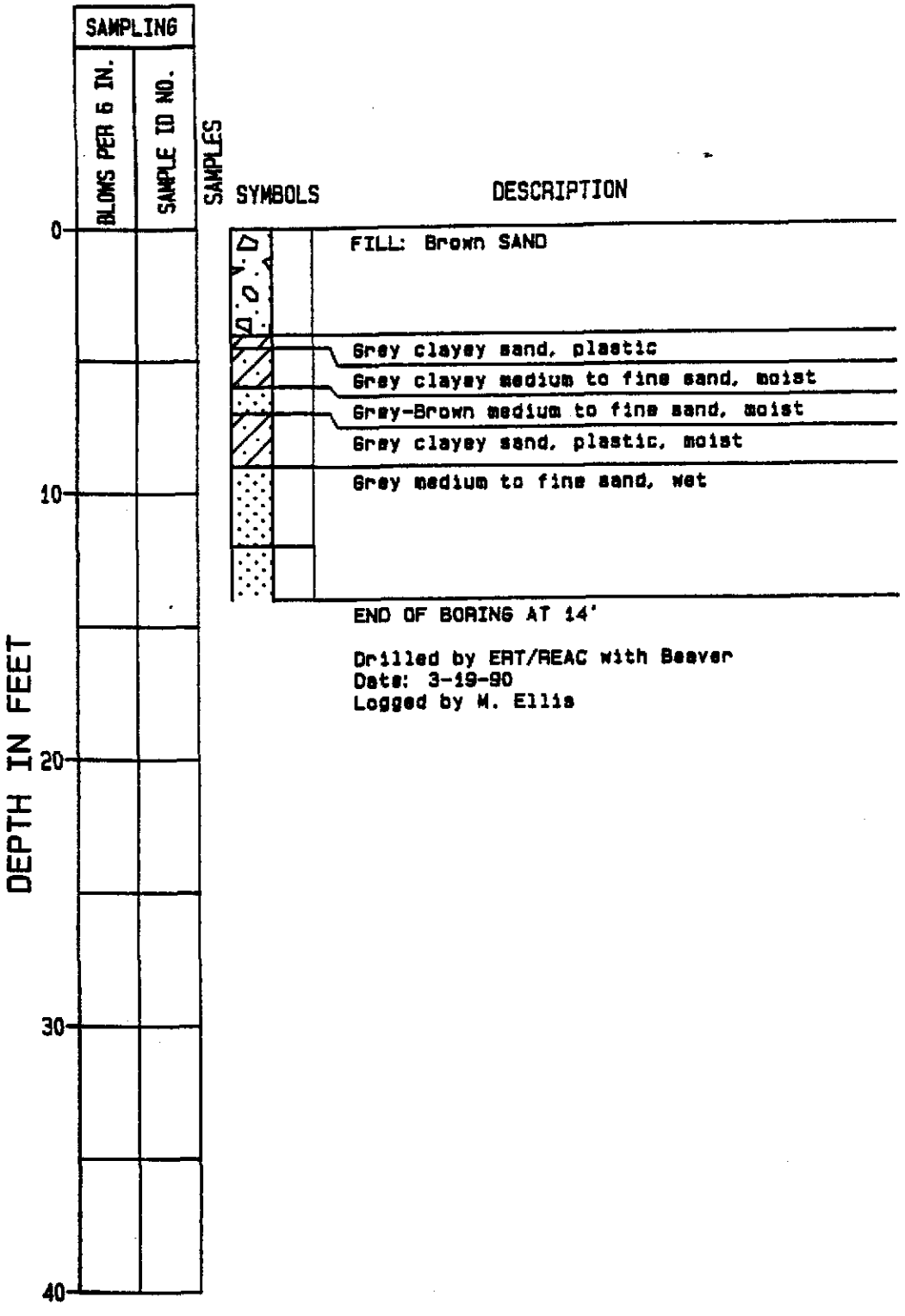
BORING D- -1

GULF STATE CREOSOTE
HATTIESBURG, MS



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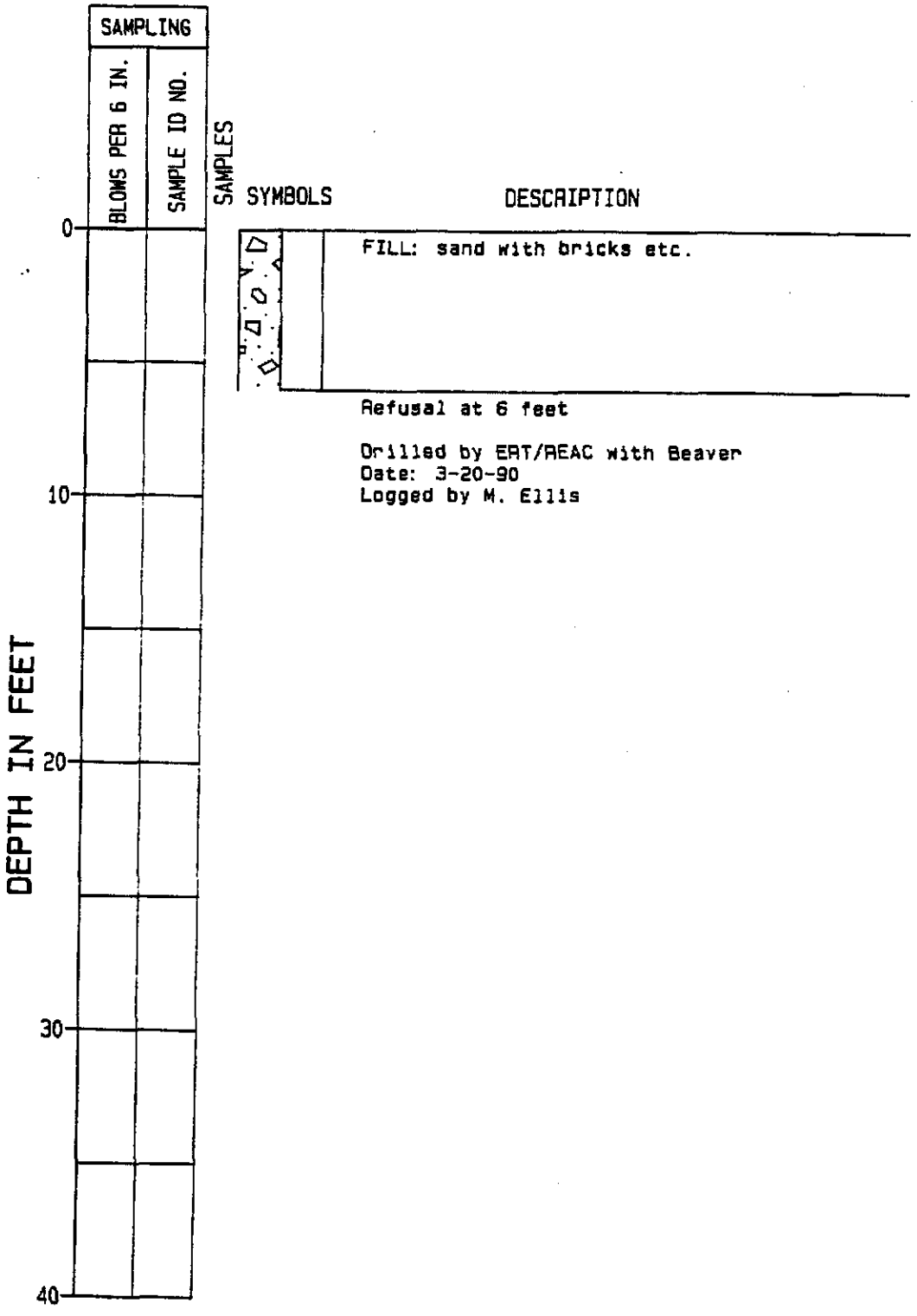

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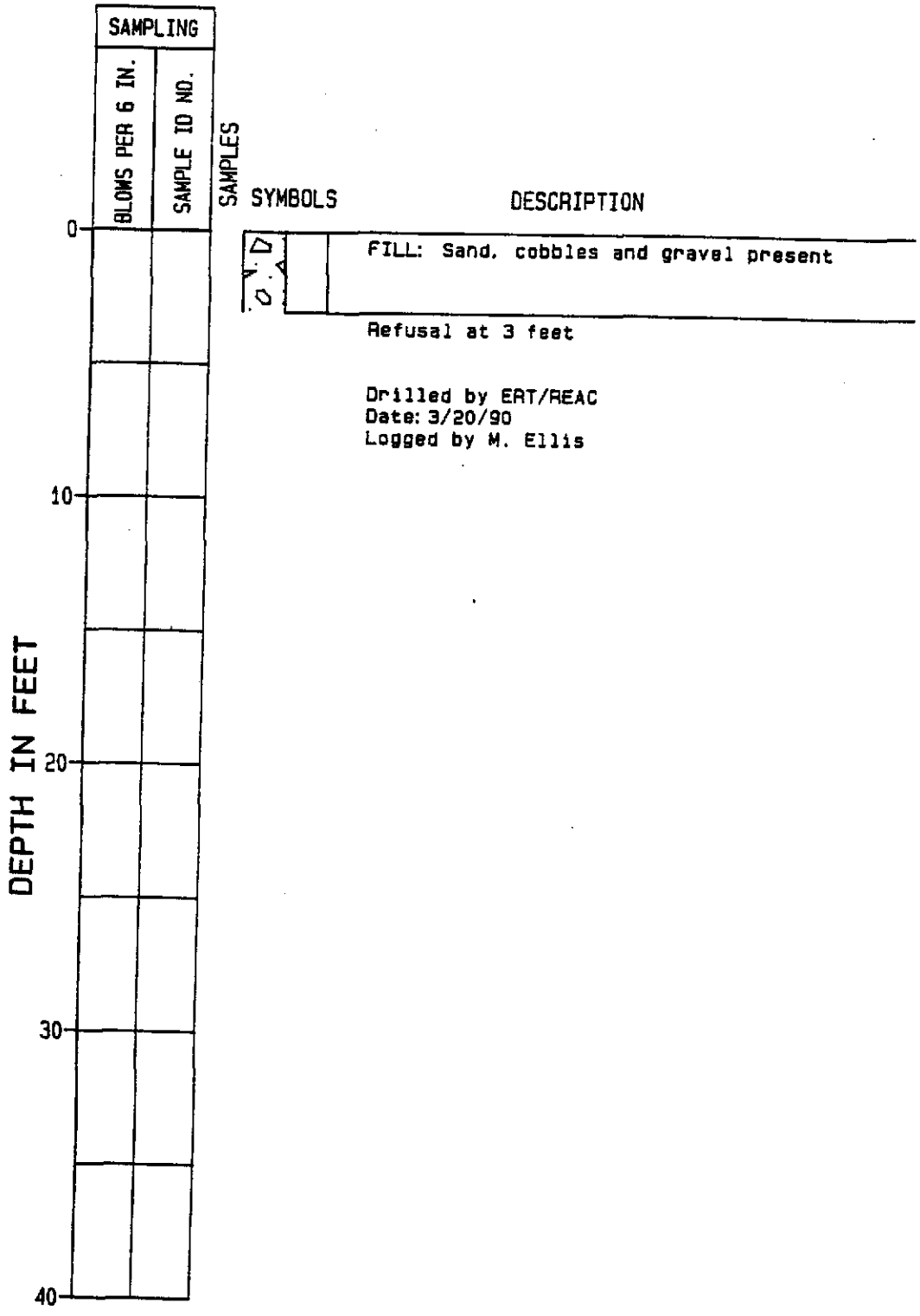

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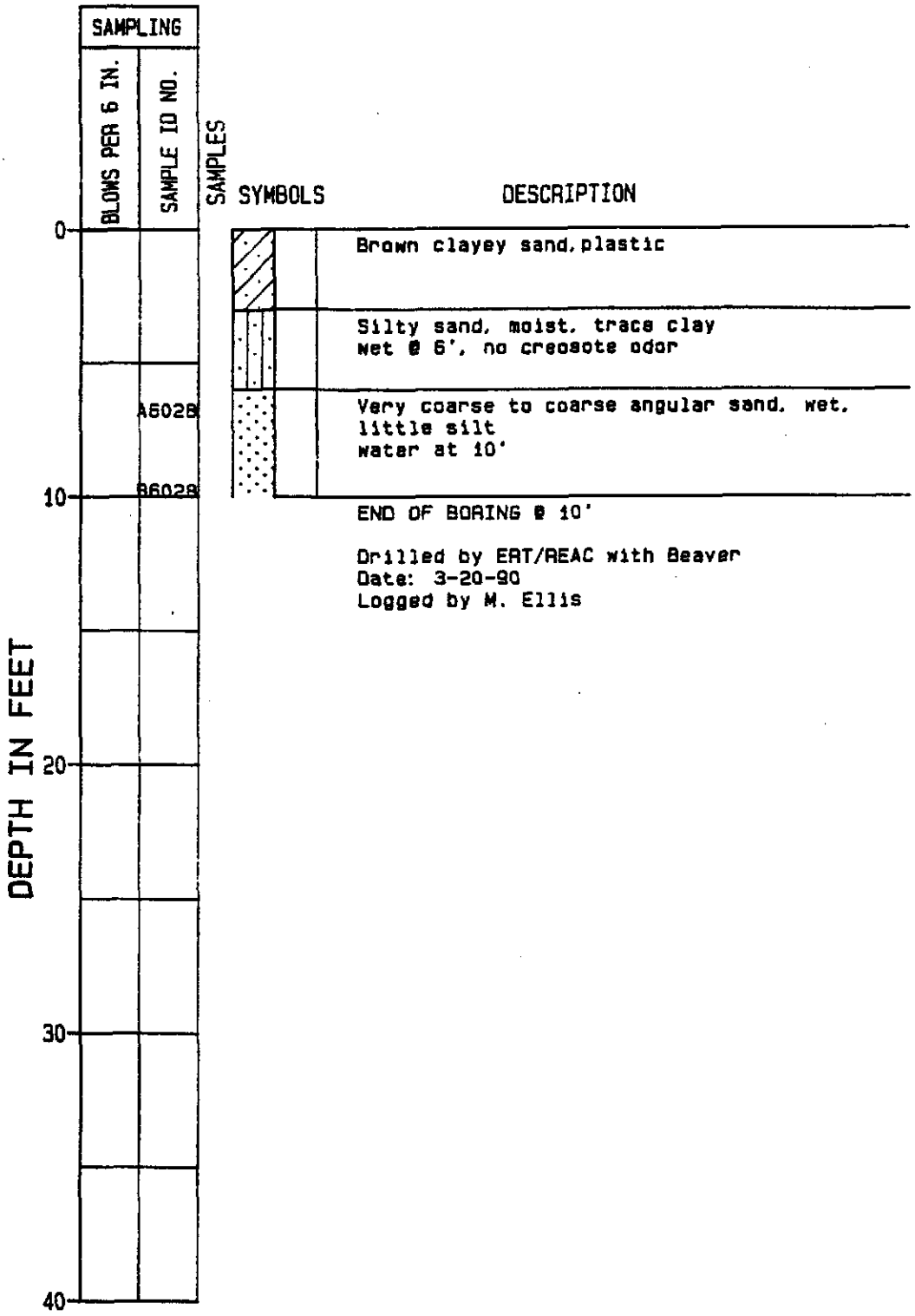

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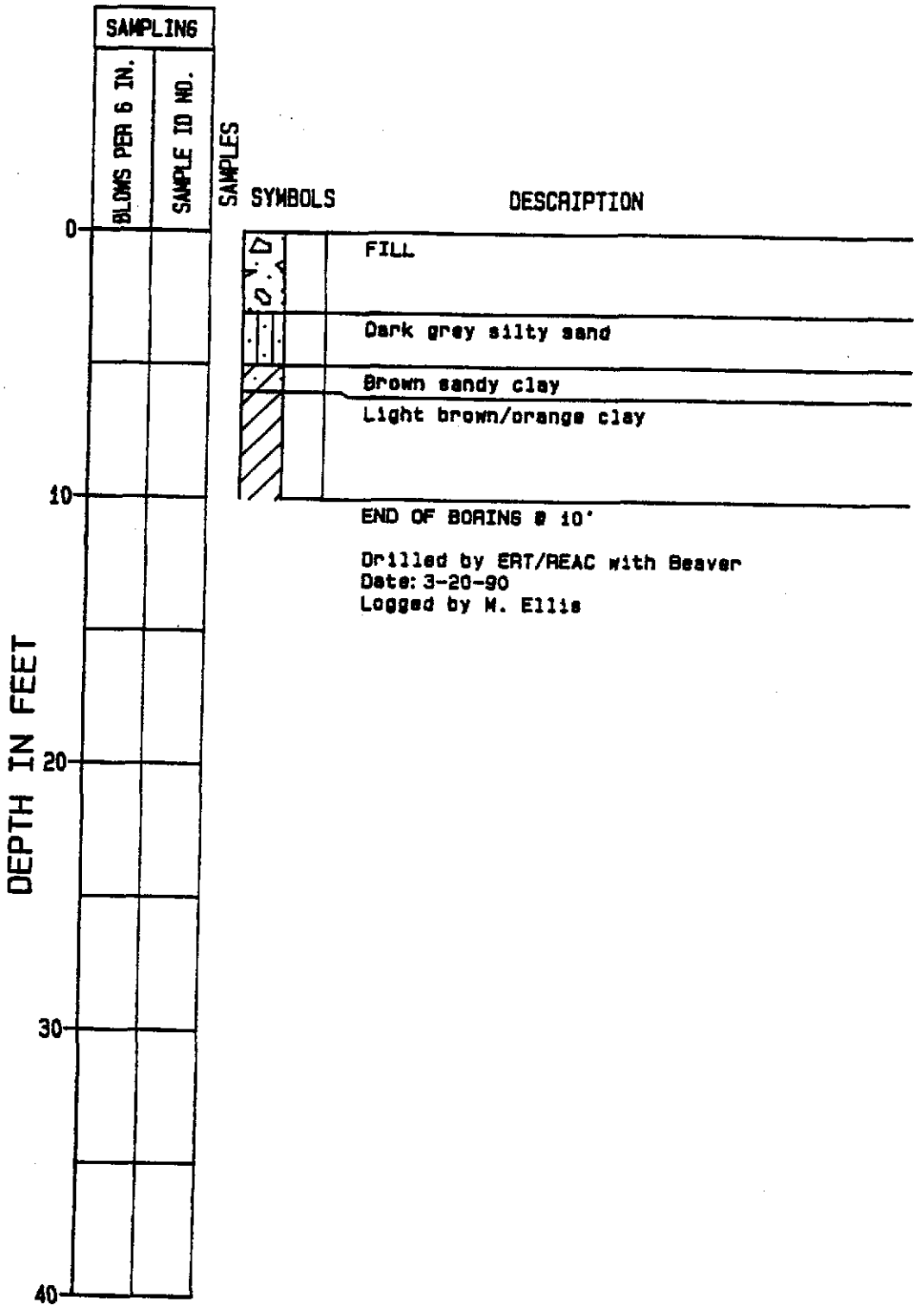
BORING D-04

GULF STATE CREOSOTE
HATTIESBURG, MS

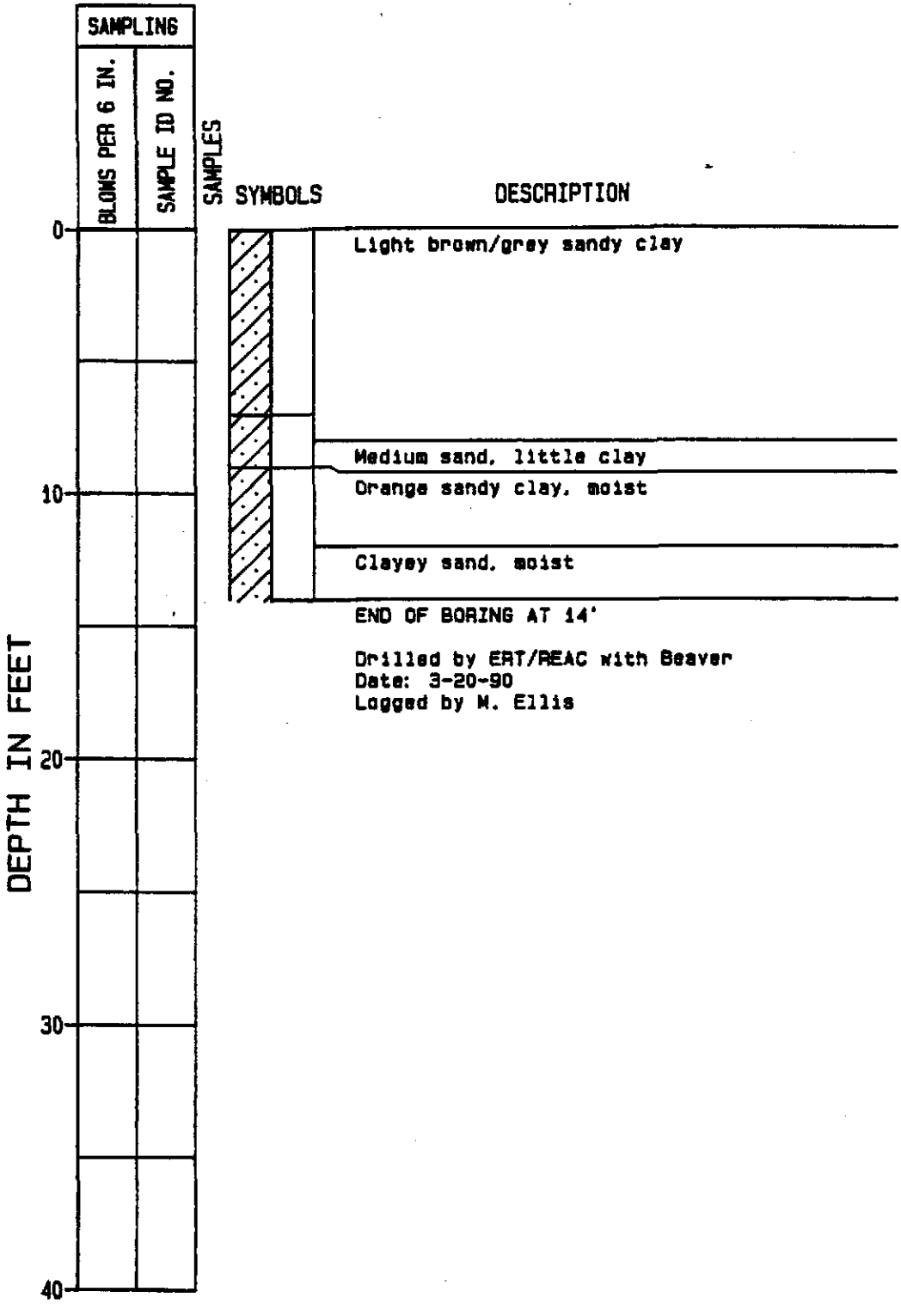


BORING LOG

Response Engineering and Analytical Contract

BORING D-06

GULF STATE CREOSOTE
HATTIESBURG, MS

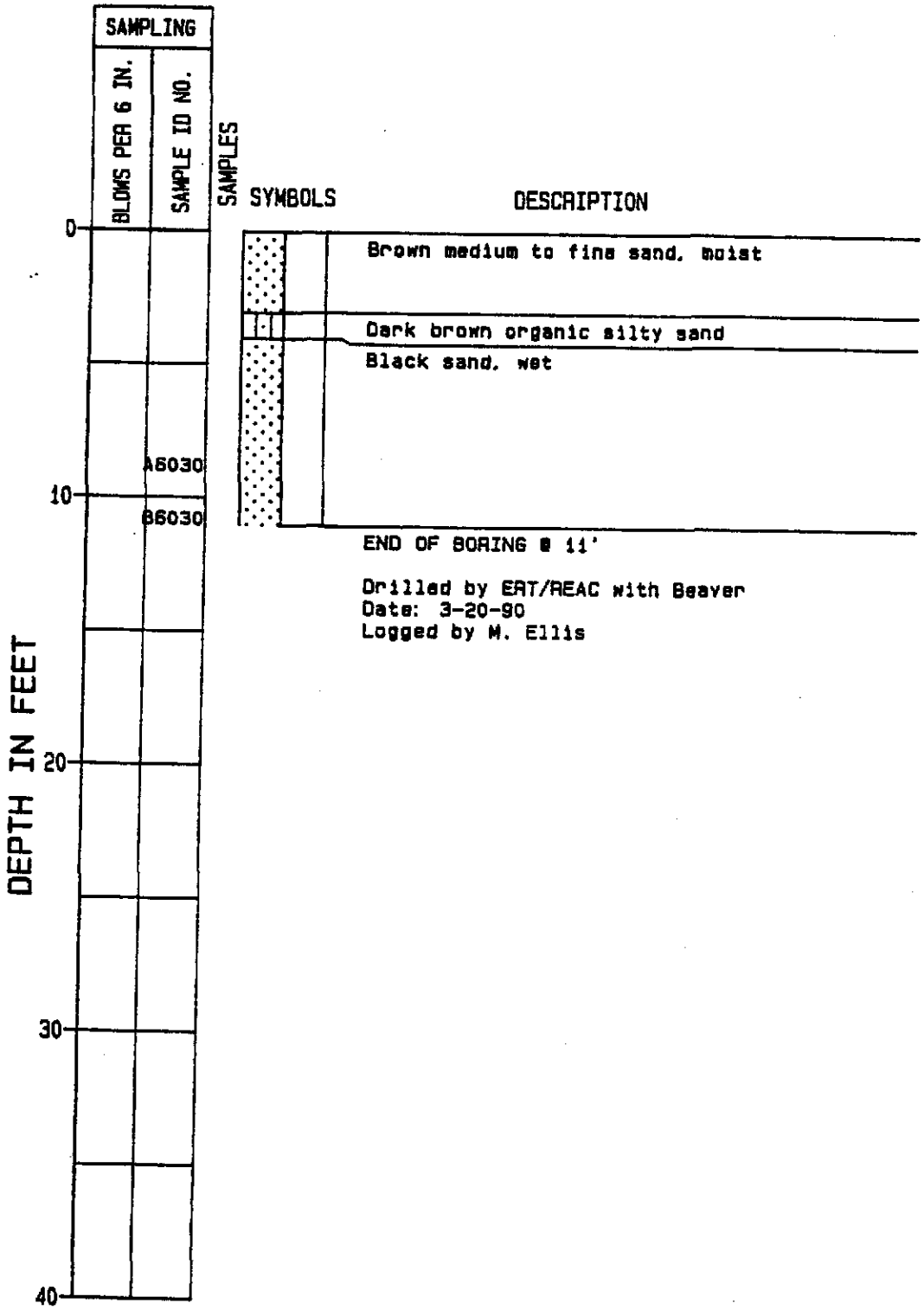


BORING LOG

Response Engineering and Analytical Contract

BORING E-19

GULF STATE CREOSOTE
HATTIESBURG, MS



BORING LOG

Response Engineering and Analytical Contract

BORING E-20

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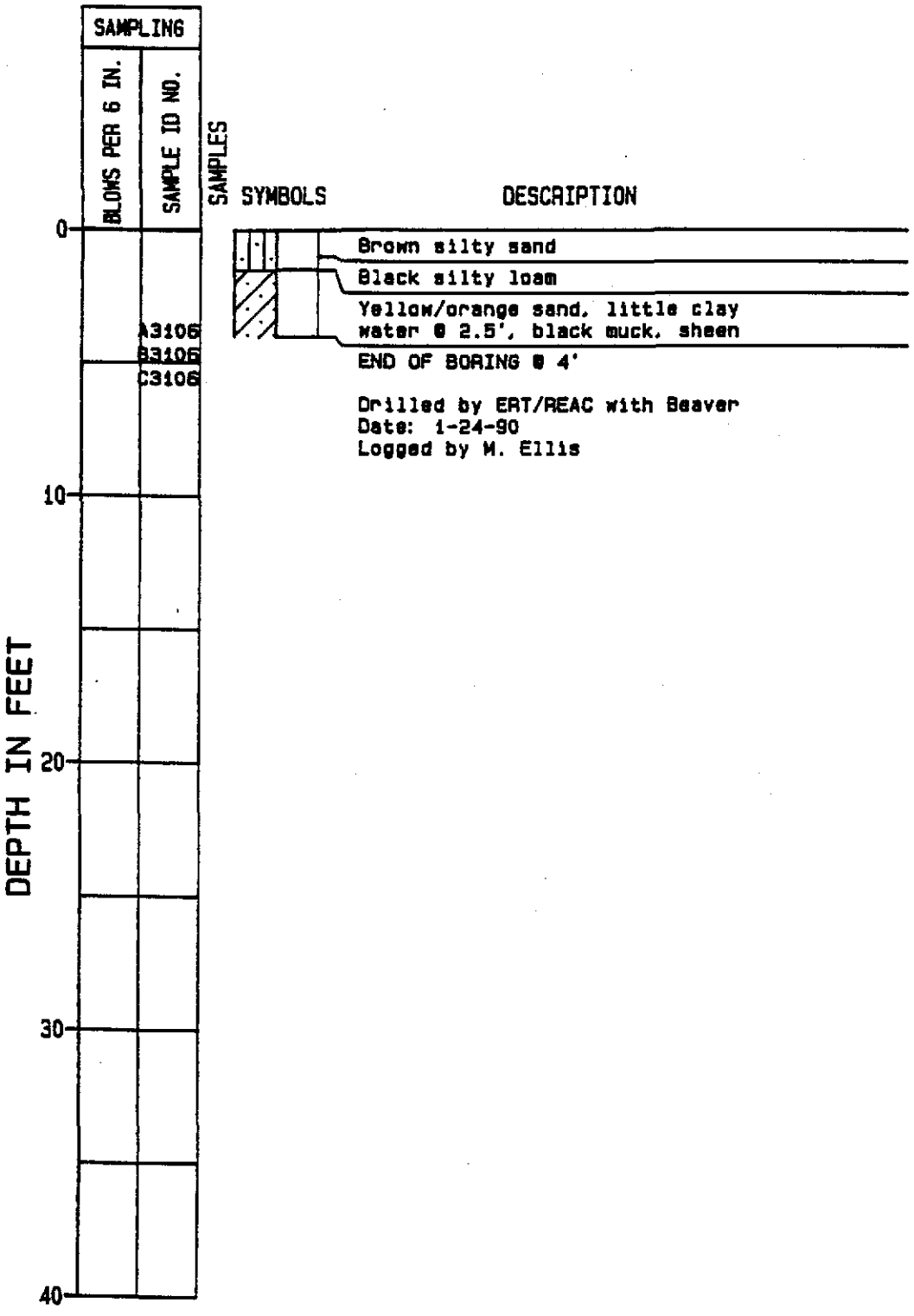
HATTIESBURG, MS

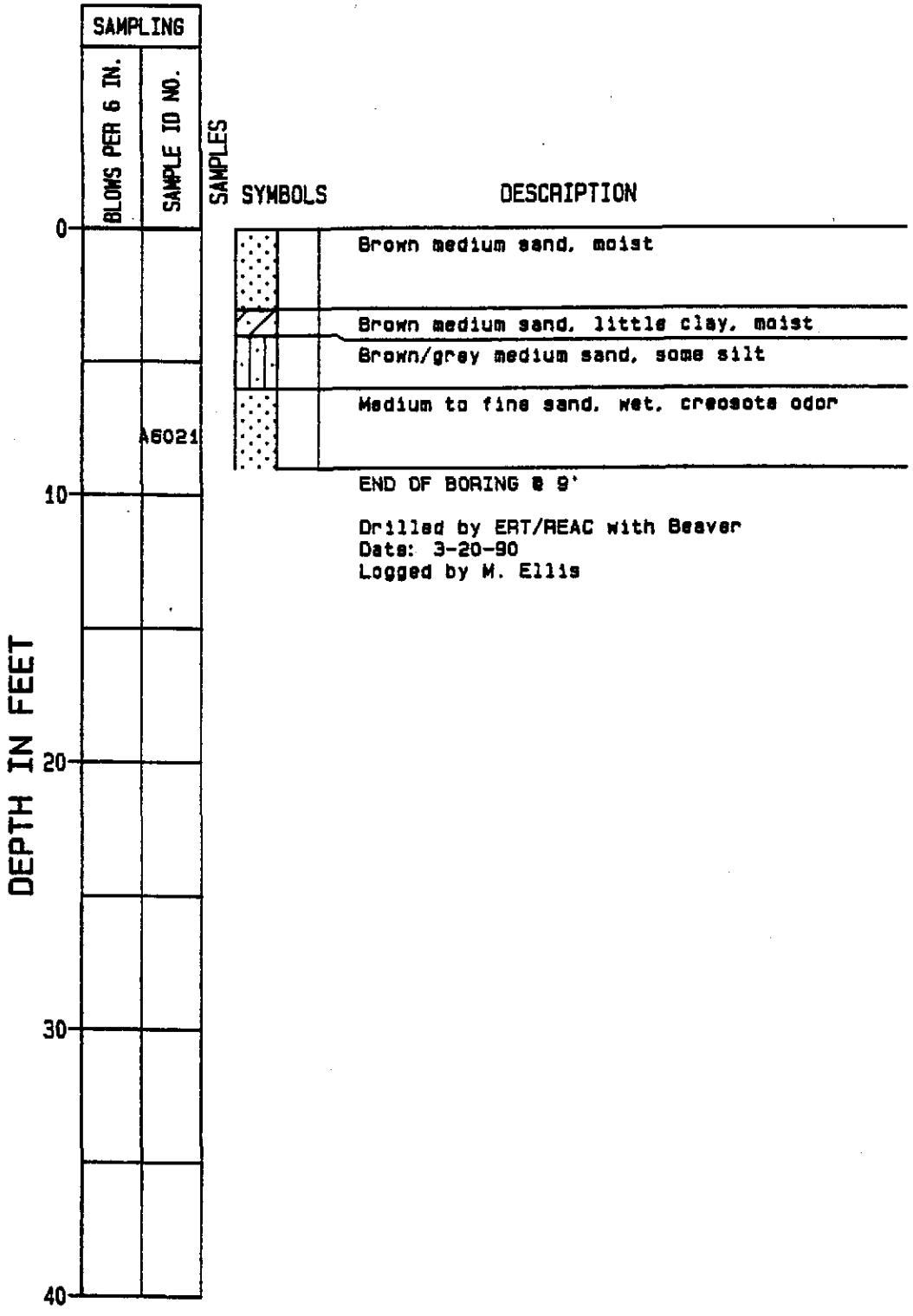


BORING LOG

Response Engineering and Analytical Contract

BORING E-24

GULF STATE CREOSOTE
HATTIESBURG, MS

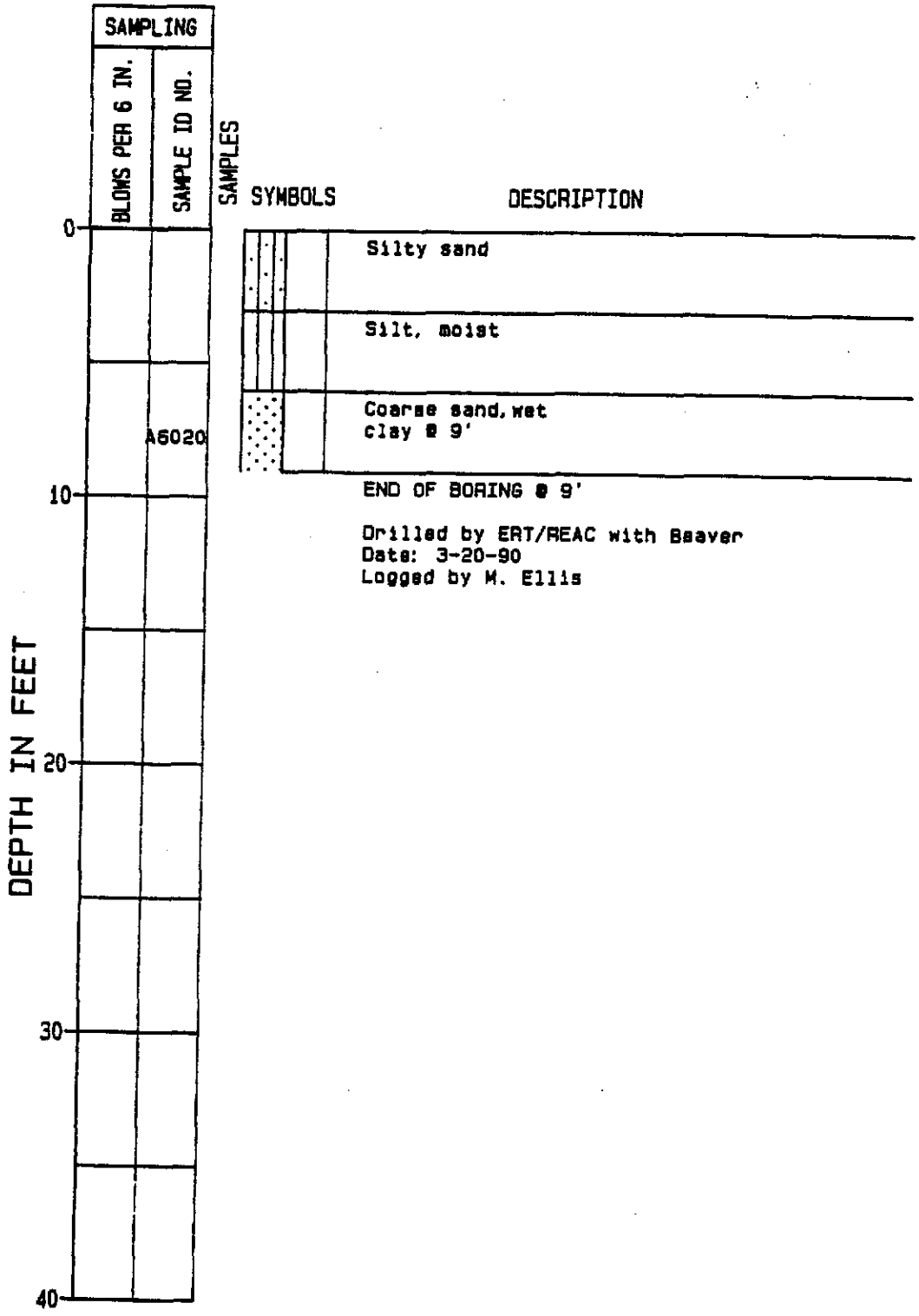


BORING LOG

Response Engineering and Analytical Contract

BORING E-25

GULF STATE CREOSOTE
HATTIESBURG, MS

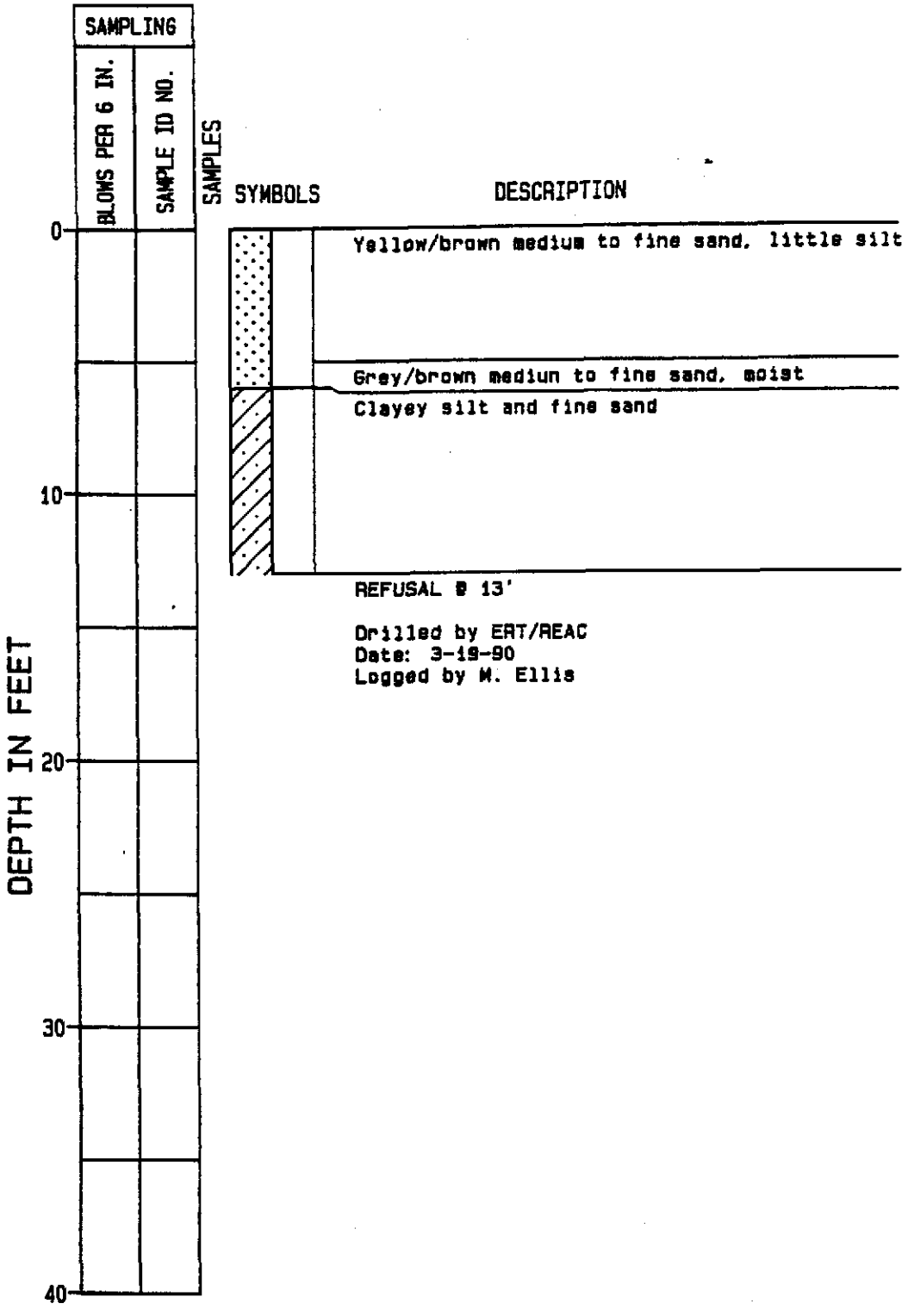


BORING LOG

Response Engineering and Analytical Contract

BORING E-26

GULF STATE CREOSOTE
HATTIESBURG, MS

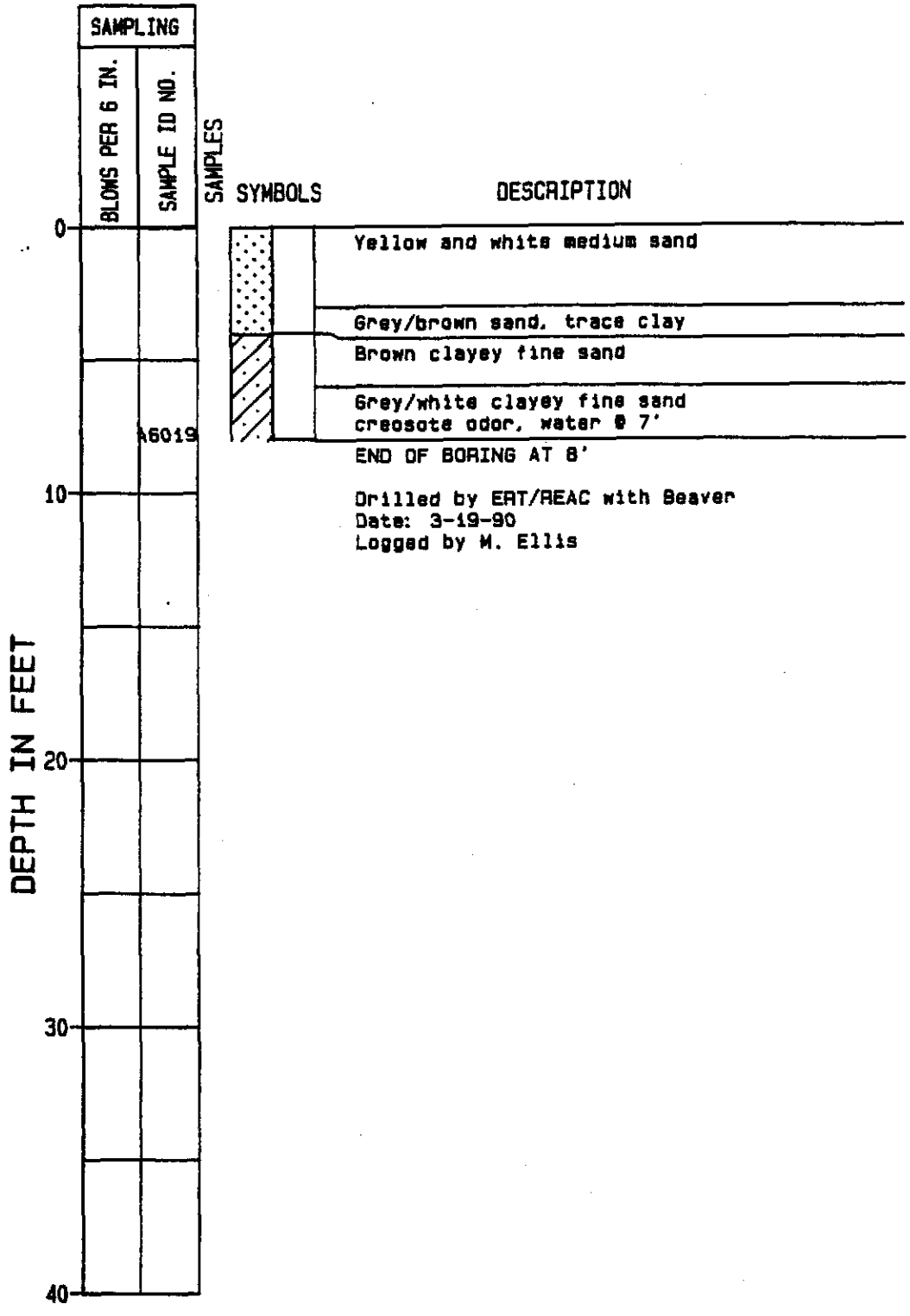


BORING LOG

Response Engineering and Analytical Contract

BORING E-27

GULF STATE CREOSOTE
HATTIESBURG, MS



BORING LOG

Response Engineering and Analytical Contract

APPENDIX D

FIELD DATA SHEETS
GULF STATES CREOSOTE
APRIL, 1990

ENVIRONMENTAL RESPONSE TEAM
AIR SAMPLING WORKSHEET

Roy F. Weston, Inc.
REAC Project, Edison, NJ
EPA Contract No. 68-03-3482

SITE Gulf State Creosote W.A. # 3347-11D1-2335
SAMPLERS WB EPA WAM HARRY Compton
DATE 1/23/90 REAC TL M. O'Neill

SAMPLE NO.	3203 F T	3204 F T	3206 F T	Field Blank F 03201	
Sample Location	Near Tracks.	Near creek on fence	behind Hotel near creek	Field blank	
Remarks					
Pump No.	3404	7325	7342	—	
Collection Media	XAD+filter	XAD+filter	XAD+filter	XAD+filter	
Analysis Requested	5515	5515	5515	5515	
Time of Day	9:45	10:00	10:10	9:00	
Time/Counter (Start)	0	0	0	—	
Time/Counter (Stop)	480 Min	454min	453min	—	
Total Sampling Time	480 Min	454min	453min.	—	
Pump Fault	Y/(N)	Y/N	Y/N	Y/N	Y/N
Flow Rate (Start)	2 l/m	2 l/m	2 l/m	—	
Flow Rate (Stop)	2 l/m	2 l/m	2 l/m	—	
Flow Rate (Average)	2 l/m	2 l/m	2 l/m	—	
Volume Sampled	960 lit.	908	906	—	
Air Monitoring Data					
HNU					
OVA					
LEL/RAM					

WEATHER PARAMETERS
Weather Conditions Sunny Temperature 27°C Windspeed 2 m/h
Wind direction See Site map Pressure 30.3 Humidity 22% Met ID

GENERAL COMMENTS:

rd/BATZ/WORKSHEET

ENVIRONMENTAL RESPONSE TEAM
AIR SAMPLING WORKSHEET

Roy F. Weston, Inc.
REAC Project, Edison, NJ
EPA Contract No. 68-03-3482

SITE Gulf State | W.A. # 2335
SAMPLERS WB | EPA WAM Harry Compton
DATE 1/23/90 | REAC TL BWell

SAMPLE NO. Real time →

Sample Location	D01	B012	E014	E16	E18
Remarks	Headspace above Bore hole	Headspace Above bore hole	Headspace above bore hole	Headspace above Borehole	Headspace above bore hole
Pump No.	OVA 5 HNU1	HNU 1 OVA 5	OVA HNU 5	CVd 5 HNU 1	OVA 5 HNU 1
Collection Media	HNU OVA	HNU OVA	HNU OVA	HNU OVA	HNU OVA
Analysis Requested	none →				
Time of Day	410	415	420	445pm	5:00 pm
Time/Counter (Start)	—	—	—	—	—
Time/Counter (Stop)	—	—	—	—	—
Total Sampling Time	—	—	—	—	—
Pump Fault	Y/N	Y/N	Y/N	Y/N	Y/N
Flow Rate (Start)	—	—	—	—	—
Flow Rate (Stop)	—	—	—	—	—
Flow Rate (Average)	—	—	—	—	—
Volume Sampled	—	—	—	—	—
Air Monitoring Data					
HNU	3.5	0	0	0	0
OVA	3.5	0	0	0	0
LEL/RAM					

WEATHER PARAMETERS
Weather Conditions Sunny | Temperature 27°C | Windspeed —
Wind direction See Site map | Pressure 30.3c | Humidity 22% | Met ID —

GENERAL COMMENTS:

rd/BATZ/WORKSHEET

MIE INC. Model PDL-1 SN 2151 V2.8 12/87

CURRENT DATE: 1/23/90
CURRENT TIME: 22:35:59

CALIBRATION
0.014 V = 0.000 mgm3
2.223 V = 4.500 mgm3

LOWER ALARM: 0.000 mgm3
UPPER ALARM: 0.000 mgm3

UNITS: mgm3

INPUT READS: 0.046 mgm3
TEST STARTING DATE: 1/23/90
TEST STARTING TIME: 14:40:31
ELAPSED TIME: 0 DAYS 2:22:47
OVERALL AVG: 0.008 mgm3
OVERALL MIN: - 0.014 mgm3
MIN OCCURRED 1/23/90 @ 15:21:08
OVERALL MAX: 1.086 mgm3
MAX OCCURRED 1/23/90 @ 16:59:24
STEL: 0.058 mgm3
STEL OCCURRED 1/23/90 @ 16:48:11

TIME HISTORY
PERIOD LENGTH: 0:15:00
OF PERIODS COMBINED: 10

	MIN	AVG	MAX	ID
DATE: 1/23/90	TIME: 14:40:31	TAG #:	1	
@-	0.014	0.012	1.086	*

AMP DIST
SAMPLES LOGGED: 8567

mgm3	SAMPLES		%
- 0.374	8203	**********	095.75
0.028	356	****	004.15
0.430	4	.	000.04
0.833	4	.	000.04

FIELD DATA SHEET

N: 005309

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: Pierce / Powell Chain of Custody No. _____

Date: 11/23/90 Site Name: Gulf States creosote REAC Task Leader: Compton

Time: _____ Sample Location: B-201 EPA Task Monitor: O'Neil

Project No.: _____

SITE DESCRIPTION			SOIL TYPE		SURFACE WATER	STREAM	BOTTOM	
landfill	old field	upland palustrine	rock	clay	color _____	width _____	rock	silt
industrial	wooded	lowland riverine	gravel	muck	odor _____	depth _____	rubble	clay
commercial	farmland	lacustrine	sand	loam	flow _____	velocity _____ cm/s	gravel	organic
residential	gully		silt	peat	direction _____	pools _____ %	shell	other _____
hedgerows	floodplain		color ORANGE			riffles _____ %	sand	

SAMPLE TYPE		DEVICE		SAMPLE INFORMATION		WEATHER PARAMETERS
stream/surface	soil	kemmerer	ponar	color _____	pH _____	ambient temp _____
groundwater	pond/lake	trowl	other _____	odor ND	ORP _____	barometric pressure _____
brackish	river	bucket		temp _____	salinity _____	relative humidity _____
ocean/saline	effluent	sugar		DO _____	sample depth 2'3"	weather conditions _____
sediment	sludge	ekman		cond _____	tide stage _____	

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? X Yes _____ No
If No, explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity_____pH_____
- D. reactivity

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____ Collection Media _____
Sample Flow Rate _____ Special Shipping Instructions _____
Sampling Time _____
Volume Collected _____ #Field Blanks ___ #Sample Blanks ___

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

COMMENTS:

8:45 AM START

0-12" - Fill / coal material
12"-5' Brown sandy clay Tight
5'-7' Brown sandy clay / white streaks / mottled
7.5' - white material
10' 8' - moist white plastic clay w/ streaks
13.5' clay white / mottled

FIELD DATA SHEET

N: 005322

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: Prince / Powell Chain of Custody No. _____
Date: 1/23/90 Site Name: Gulf States Creosote REAC Task Leader: O'Neill
Time: _____ Sample Location: B-02-S EPA Task Monitor: Compton
Project No.: _____

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows; old field, wooded, farmland, gully, floodplain; upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, gravel, sand, silt, color _____; clay, muck, loam, peat

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____ cm/s, pools _____ %, riffles _____ %

BOTTOM
rock, rubble, gravel, shell, sand; silt, clay, organic, other _____

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment; soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, trowl, bucket, sugar, ekman, ponar, other _____

SAMPLE INFORMATION
color ORANGE, odor _____, temp _____, DO _____, cond _____; pH _____, ORP _____, salinity _____, sample depth _____, tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

Jars at
- 0-12"
- B' 10"

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

OVA = ND

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

Collection Media
Special Shipping Instructions _____
#Field Blanks ___ #Sample Blanks ___

COMMENTS: 0-6" 12" Dark coal material / sample taken B JARS + VOA
Jars C&D, E&F + VOA-A only + OVA = ND
Through dark stuff → 1'5" - B' 10" white/yellow/clay-sand

B' 10" → G,H,I,J,K JARS OVA = NP

FIELD DATA SHEET

N: 005308

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Sampiers: COMPTON I
Date: 1/23/90 Site Name: Gulf States CREOSOTE
Time: 1210 Sample Location: B-103 w of A-12

Chain of Custody No. _____
REAC Task Leader: O'NEAL
EPA Task Monitor: COMPTON
Project No.: _____

SITE DESCRIPTION
landfill, industrial, (commercial), residential, hedgerows; old field, wooded, farmland, gully, floodplain; upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, (clay), gravel, muck, (sand), loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____cm/s, pools _____%, riffles _____%

BOTTOM
rock, silt, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, (soil), groundwater, pond/lake, brackish, river, ocean/saline, effluent, sediment, sludge

DEVICE
kemmerer, ponar, trowel, other _____, (bucket), sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor NO ORP _____
temp _____ salinity _____
DO _____ sample depth 7'6"
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? X Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity_____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
(glass jar)	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

Collection Media
Special Shipping Instructions _____
_____
#Field Blanks ___ #Sample Blanks ___

COMMENTS: 1135 Augers START 0-1.5' Red BROWN SANDY Clay (RBSC)
1.5-2'4" Black organic material grading back to RBSC
5'10" WATER-Sampl RBSC w/white streaks clay
7'4 RBSC Grading to Kaolinitic sandy clay
- T.D. 8' 2"

FIELD DATA SHEET

Nº 006031

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. ______
REAC Task Leader: ______
EPA Task Monitor: ______
Project No.: 2335

Lab No.: ______
Date: 3/20/80
Time: 1415

Samplers: ______
Site Name: ______
Sample Location: C-~~[illegible]~~ 19

SITE DESCRIPTION			SOIL TYPE		SURFACE WATER	STREAM	BOTTOM	
landfill	old field	upland palustrine	rock	clay	color ______	width ______	rock	silt
industrial	wooded	lowland riverine	gravel	muck	odor ______	depth ______	rubble	clay
commercial	farmland	lacustrine	sand	loam	flow ______	velocity ______ cm/s	gravel	organic
residential	gully		silt	peat	direction ______	pools ______ %	shell	other ______
hedgerows	floodplain		color ______			riffles ______ %	sand	

SAMPLE TYPE		DEVICE		SAMPLE INFORMATION		WEATHER PARAMETERS
stream/surface	soil	kemmerer	ponar	color ______	pH ______	ambient temp ______
groundwater	pond/lake	trowl	other ______	odor ______	ORP ______	barometric pressure ______
brackish	river	bucket		temp ______	salinity ______	relative humidity ______
ocean/saline	effluent	sugar		DO ______	sample depth ______	weather conditions ______
sediment	sludge	ekman		cond ______	tide stage ______	______

ANALYSES TO BE PERFORMED

TOC required? ______ Yes ______ No
If No, explain ______

Grain size analysis required? ______ Yes ______ No
If No, explain ______

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other ______

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
______
______

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other ______

STORAGE
- wet ice
- dry ice
- ambient

BIOASSESSMENT
- See attached data sheet
- See comments

RCRA
- A. EP toxicity ______ metals ______ pesticides ______ herbicides
- B. ignitability
- C. corrosivity ______ pH ______
- D. reactivity

AIR SAMPLING
- Sampling Method ______
- Sample Flow Rate ______
- Sampling Time ______
- Volume Collected ______

Collection Media
Special Shipping Instructions ______
#Field Blanks ____ #Sample Blanks ____

COMMENTS:

3' off Pine St C-transect C-18.5

0-1' dk brown loam, organic
1-2' lt brown silty sand
2-3' ditto
3-4' ditto
4-5' ditto, moist
5-6' ditto
6-8' ditto, wet
8-12 ditto
12' coarse wet sands little v. coarse sand
fingers binding B.O.B.

A: Btm Samp sands

FIELD DATA SHEET

№ 006032

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. _____

Lab No.: _____ Samplers: _____ REAC Task Leader: _____

Date: 3/20/90 Site Name: _____ EPA Task Monitor: _____

Time: 1440 Sample Location: C-20 Project No.: 2335

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows; old field, wooded, farmland, gully, floodplain; upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, clay, gravel, muck, sand, loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____cm/s, pools _____%, riffles _____%

BOTTOM
rock, silt, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment; soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket, sugar, ekman

SAMPLE INFORMATION
color _____, pH _____, odor _____, ORP _____, temp _____, salinity _____, DO _____, sample depth _____, cond _____, tide stage _____

WEATHER PARAMETERS
ambient temp _____, barometric pressure _____, relative humidity _____, weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity_____pH_____
- D. reactivity

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____ Collection Media _____
Sample Flow Rate _____ Special Shipping Instructions _____
Sampling Time _____
Volume Collected _____ #Field Blanks ___ #Sample Blanks ___

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

COMMENTS:

20' off Pine
C19-5

0-1' multi-colored laminated clays
1-2' dk brown loam
2-3' yellow/orange clay laminated
3-4' ditto
4-5' dense orange clay/fine silt
5-7' fine-med sand moist
7-8' ditto
8-9' orange/gray silt+fine sa
9-12' ditto
12-14' wet sands

A-☒ bucket auger sample No odor

FIELD DATA SHEET

Nº 006017

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: Rigger / Ellis Chain of Custody No. _____

Date: 3/19/90 Site Name: Gulf State Creasote REAC Task Leader: M O'D

Time: 1600 Sample Location: D-1 EPA Task Monitor: H C

Project No.: 2335

SITE DESCRIPTION
landfill, (old field), upland palustrine
industrial, wooded, lowland rivernne
commercial, farmland, lacustrine
residential, gully
hedgerows, ~~floodplain~~

SOIL TYPE
rock, clay
gravel, muck
sand, loam
silt, peat
color _____

SURFACE WATER
color _____
odor _____
flow _____
direction _____

STREAM
width _____
depth _____
velocity _____ cm/s
pools _____ %
riffles _____ %

BOTTOM
rock, silt
rubble, clay
gravel, organic
shell, other _____
sand

SAMPLE TYPE
stream/surface, soil
groundwater, pond/lake
brackish, river
ocean/saline, effluent
sediment, sludge

DEVICE
kemmerer, ponar
trowl, other _____
bucket
sugar
ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____ Collection Media
Sample Flow Rate _____ Special Shipping Instructions _____
Sampling Time _____
Volume Collected _____ #Field Blanks ___ #Sample Blanks ___

COMMENTS:
0-4' Sandy fill, brown
4' grey clayey sand, plastic
4.5-6' grey clayey med-fine sand, moist
7' grey fine sand w/ brown red parts
7-9' grey & clayey sands, moist plastic
10.5-12' grey fine-med sand, wet
12-14' "
At 14' auger bit has grey clay on it.

FIELD DATA SHEET

№ 006023

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: _____ Chain of Custody No. _____

Date: 3/26/90 Site Name: _____ REAC Task Leader: _____

Time: _____ Sample Location: D-02 EPA Task Monitor: _____

Project No.: _____

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows; old field, wooded, farmland, gully, floodplain; upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, gravel, sand, silt, color _____; clay, muck, loam, peat

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____ cm/s, pools _____ %, riffles _____ %

BOTTOM
rock, rubble, gravel, shell, sand; silt, clay, organic, other _____

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment; soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, trowl, bucket, sugar, ekman; ponar, other _____

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity_____pH_____
- D. reactivity

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____
Sample Flow Rate_____
Sampling Time _____
Volume Collected _____
Collection Media
Special Shipping Instructions _____
#Field Blanks ___ #Sample Blanks ___

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

COMMENTS:
0-3 fill material
3-6' more fill, bricks etc.
drill augers are binding
Stopped drilling

FIELD DATA SHEET

N: 005510

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: Cile, Powell
Date: 1-24 Site Name: Gulf State Creosote
Time: 1330 Sample Location: DRC - 8ft

Chain of Custody No. _____
REAC Task Leader: _____
EPA Task Monitor: _____
Project No.: _____

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows, old field, wooded, farmland, gully, floodplain, upland palustrine, lowland riverrine, lacustrine

SOIL TYPE
rock, clay, gravel, muck, sand, loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____cm/s, pools _____%, riffles _____%

BOTTOM
rock, slit, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment, soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket, sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity 100 %
weather conditions Rain

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity_____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____
Sample Flow Rate_____
Sampling Time _____
Volume Collected _____

Collection Media
Special Shipping Instructions _____
_____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:

FIELD DATA SHEET

N°: 005511

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: Cole, Powell
Date: 1-24-96 Site Name: Gulf State Creosote
Time: 1320 Sample Location: DSO - 5 ft.

Chain of Custody No. _____
REAC Task Leader: _____
EPA Task Monitor: _____
Project No.: _____

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows, old field, wooded, farmland, gully, floodplain, upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, clay, gravel, muck, sand, loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____cm/s, pools _____%, riffles _____%

BOTTOM
rock, silt, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment, soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket, sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity 100%
weather conditions Cloudy, lt R

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity_____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____
Sample Flow Rate_____
Sampling Time _____
Volume Collected _____

Collection Media
Special Shipping Instructions _____
_____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:
OVA - 2 ppm

FIELD DATA SHEET

N: 005321

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: Powell / Compton Chain of Custody No. _____
Date: 1/23/90 Site Name: Gulf States REAC Task Leader: O'NEIL
Time: _____ Sample Location: D-01 EPA Task Monitor: COMPTON
Project No.: _____

SITE DESCRIPTION
landfill, industrial, ~~commercial~~, residential, hedgerows; old field, wooded, farmland, gully, floodplain; upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, clay, gravel, ~~mud~~, loam, sand, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____cm/s, pools _____%, riffles _____%

BOTTOM
rock, slit, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment; soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket, sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
~~glass jar~~	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient ✓

BIOASSESSMENT
See attached data sheet
See comments

D-01 (Across from C-20 on Pine St

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

Collection Media
Special Shipping Instructions _____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:
Sample A & B 5' deep gray, odorous, in water
C & D 8' deep gray, odorous, in water
E. VOA for TAGA

FIELD DATA SHEET

№ 006028

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. _____

Lab No.: _____ Samplers: _____ REAC Task Leader: _____

Date: 3/20/90 Site Name: _____ EPA Task Monitor: _____

Time: _____ Sample Location: D-03A Project No.: 2335

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows, old field, wooded, farmland, gully, floodplain, upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, clay, gravel, muck, sand, loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____ cm/s, pools _____ %, riffles _____ %

BOTTOM
rock, silt, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment, soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket, sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No. explain _____

Grain size analysis required? _____Yes _____No
If No. explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity _____pH_____
- D. reactivity

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

Collection Media
Special Shipping Instructions _____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:

In Woods
side creek
East of D-03

0-2' brown clayey sand, plastic
3' ditto
3-6' Silty sand, mod trace clay.
6': cuttings up wet, coarse sandy, no creosote odor
6-8' V. coarse - coarse angular sand ... with silt
8-9' ditto
10' - water, no odor. will take sample

D-03A A: wet sandy zone
B: Btm auger sample/clay

FIELD DATA SHEET

№ 006025

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: _____ Chain of Custody No. _____
Date: 3/26/90 Site Name: _____ REAC Task Leader: _____
Time: _____ Sample Location: D-04 EPA Task Monitor: _____
Project No.: _____

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows, old field, wooded, farmland, gully, floodplain, upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, clay, gravel, muck, sand, loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____cm/s, pools _____%, riffles _____%

BOTTOM
rock, silt, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment, soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket, sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

Collection Media
Special Shipping Instructions _____
_____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:
0-3' fill mat'l
3' silty sand, dk gry
5' brown sandy clay
6' lt brown/orange clay
7' ditto moist
9' ditto,
10' ditto
Stopped

FIELD DATA SHEET

№ 006026

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: _____ Chain of Custody No. _____

Date: 7/20/90 Site Name: _____ REAC Task Leader: _____

Time: _____ Sample Location: D-06 EPA Task Monitor: _____

Project No.: _____

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows, old field, wooded, farmland, gully, floodplain, upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, clay, gravel, muck, sand, loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____ cm/s, pools _____ %, riffles _____ %

BOTTOM
rock, silt, rubble, clay, gravel, organic, shell, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment, soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket, sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

Collection Media
Special Shipping Instructions _____
_____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:

0-3' lt brown/grey sandy clay
3-6' ditto
7' ditto, moist
8' med sand, little clay
9' orange sandy clay, moist
12' clayey sand, moist
14' ditto
Stopped drilling

FIELD DATA SHEET

N: 005314

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: Prince / Ellis Chain of Custody No. _____

Date: _____ Site Name: Gulf States REAC Task Leader: _____

Time: _____ Sample Location: E 014 EPA Task Monitor: _____

Project No.: _____

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows; old field, wooded, farmland, gully, floodplain; upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, clay, gravel, muck, sand, loam, silt, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____cm/s, pools _____%, riffles _____%

BOTTOM
rock, silt, rubble, clay, gravel, organic, snail, other _____, sand

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment; soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, ponar, trowl, other _____, bucket auger, sugar, ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____
Collection Media
Special Shipping Instructions _____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:
Soil sample @ 8' Brown. ~~Sandy Clay~~ Silty, Sand @ 8' W.L. @ 4.5' ▽
poorly sorted

FIELD DATA SHEET

№ 006030

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. _____

Lab No.: _____ Samplers: _____ REAC Task Leader: _____

Date: 3/20/92 Site Name: _____ EPA Task Monitor: _____

Time: _____ Sample Location: E-19 Project No.: _____

SITE DESCRIPTION			SOIL TYPE		SURFACE WATER	STREAM	BOTTOM	
landfill	old field	upland palustrine	rock	clay	color _____	width _____	rock	silt
industrial	wooded	lowland riverine	gravel	muck	odor _____	depth _____	rubble	clay
commercial	farmland	lacustrine	sand	loam	flow _____	velocity _____ cm/s	gravel	organic
residential	gully		silt	peat	direction _____	pools _____ %	shell	other _____
hedgerows	floodplain		color _____			riffles _____ %	sand	

SAMPLE TYPE		DEVICE		SAMPLE INFORMATION		WEATHER PARAMETERS
stream/surface	soil	kemmerer	ponar	color _____	pH _____	ambient temp _____
groundwater	pond/lake	trowl	other _____	odor _____	ORP _____	barometric pressure _____
brackish	river	bucket		temp _____	salinity _____	relative humidity _____
ocean/saline	effluent	sugar		DO _____	sample depth _____	weather conditions _____
sediment	sludge	ekman		cond _____	tide stage _____	

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity _____pH_____
- D. reactivity

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

Collection Media_
Special Shipping Instructions _____
_____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:

along bank of creek

0-3' brown sand/mud fines moist
4' dk brown silty sand organic
4-5' Black wet sands
6-8' no feed
8-9 wet coarse sands
11' no cuttings will sample at bottom

A: Hand auger, clay sample
B: top of auger, sands

FIELD DATA SHEET

№ 003106

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. _____

Lab No.: _____ Samplers: _____

Date: 1/24/90 Site Name: Gulf St. Genesto

Time: 1250 Sample Location: E-20

REAC Task Leader: M. O'Neil

EPA Task Monitor: H. Compton

Project No.: 2335

SITE DESCRIPTION
landfill, old field, upland palustrine
industrial, wooded, lowland riverine
commercial, farmland, lacustrine
residential, gully
hedgerows, floodplain

SOIL TYPE
rock, clay
gravel, muck
sand, loam
silt, peat
color _____

SURFACE WATER
color _____
odor _____
flow _____
direction _____

STREAM
width _____
depth _____
velocity _____ cm/s
pools _____ %
riffles _____ %

BOTTOM
rock, silt
rubble, clay
gravel, organic
shell, other _____
sand

SAMPLE TYPE
stream/surface, soil
groundwater, pond/lake
brackish, river
ocean/saline, effluent
sediment, sludge

DEVICE
kemmerer, ponar
trowl, other _____
bucket
sugar
ekman

SAMPLE INFORMATION
color _____ pH _____
odor _____ ORP _____
temp _____ salinity _____
DO _____ sample depth _____
cond _____ tide stage _____

WEATHER PARAMETERS
ambient temp 65
barometric pressure _____
relative humidity 100
weather conditions wet, rainy

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____
Sample Flow Rate _____
Sampling Time _____
Volume Collected _____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

Collection Media
Special Shipping Instructions _____
_____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:

0-0.0' brown silty sand

1 - 1.5' black silty loam

1.5 - 2.0 yellow-orange sand, little clay

2.5 water (black muck) sheen

A, B, C - 4.0' sample (black sand)

D - No sample, hole collapsing

Samples at 4.0' w/ bucket auger (Sandy blk

FIELD DATA SHEET

№ 006021

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. _____

Lab No.: _____ Samplers: 1 REAC Task Leader: _____

Date: 3/20/90 Site Name: _____ EPA Task Monitor: _____

Time: 0840 Sample Location: E-24 Project No.: 2335

SITE DESCRIPTION			SOIL TYPE		SURFACE WATER	STREAM	BOTTOM	
landfill	old field	upland palustrine	rock	clay	color _____	width _____	rock	silt
industrial	wooded	lowland riverine	gravel	muck	odor _____	depth _____	rubble	clay
commercial	farmland	lacustrine	sand	loam	flow _____	velocity _____ cm/s	gravel	organic
residential	gully		silt	peat	direction _____	pools _____ %	shell	other _____
hedgerows	floodplain		color _____			riffles _____ %	sand	

SAMPLE TYPE		DEVICE		SAMPLE INFORMATION		WEATHER PARAMETERS
stream/surface	soil	kemmerer	ponar	color _____	pH _____	ambient temp _____
groundwater	pond/lake	trowl	other _____	odor _____	ORP _____	barometric pressure _____
brackish	river	bucket		temp _____	salinity _____	relative humidity _____
ocean/saline	effluent	sugar		DO _____	sample depth _____	weather conditions _____
sediment	sludge	ekman		cond _____	tide stage _____	

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity _____pH_____
- D. reactivity

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____ Collection Media
Sample Flow Rate _____ Special Shipping Instructions _____
Sampling Time _____
Volume Collected _____ #Field Blanks ___ #Sample Blanks ___

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
- wet ice
- dry ice
- ambient

BIOASSESSMENT
- See attached data sheet
- See comments

COMMENTS:

Duplicate

0-3' brown, med sand, moist
3-4' brown med sand little clay, moist
4-6' brown-grey med sand some silt
6' fine-med sand-not creosote odor
6.5-9' no cuttings

sample at 8'

FIELD DATA SHEET

№ 006020

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Lab No.: _____ Samplers: _____ Chain of Custody No. _____
Date: 3/29/90 Site Name: _____ REAC Task Leader: _____
Time: _____ Sample Location: E-25 EPA Task Monitor: _____
Project No.: 2395

SITE DESCRIPTION
landfill, industrial, commercial, residential, hedgerows, old field, wooded, farmland, gully, floodplain, upland palustrine, lowland riverine, lacustrine

SOIL TYPE
rock, gravel, sand, silt, clay, muck, loam, peat, color _____

SURFACE WATER
color _____, odor _____, flow _____, direction _____

STREAM
width _____, depth _____, velocity _____ cm/s, pools _____ %, riffles _____ %

BOTTOM
rock, rubble, gravel, shell, sand, silt, clay, organic, other _____

SAMPLE TYPE
stream/surface, groundwater, brackish, ocean/saline, sediment, soil, pond/lake, river, effluent, sludge

DEVICE
kemmerer, trowl, bucket, sugar, ekman, ponar, other _____

SAMPLE INFORMATION
color _____, odor _____, temp _____, DO _____, cond _____, pH _____, ORP _____, salinity _____, sample depth _____, tide stage _____

WEATHER PARAMETERS
ambient temp _____
barometric pressure _____
relative humidity _____
weather conditions _____

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
A. halogenated & aromatic volatiles
B. volatiles-USEPA 624
C. trihalomethanes
D. pesticides/PCB
E. PCB
F. base neutral/acid extractables-USEPA 625
G. pesticides, drinking water
H. herbicides, drinking water

INORGANICS
A. metals, priority pollutant
B. metals scan (ICP)
C. metals, other _____

RCRA
A. EP toxicity _____metals _____pesticides _____herbicides
B. ignitability
C. corrosivity _____pH_____
D. reactivity

LIMITED CHEMISTRY
A. total cyanide
B. total phenol
C. petroleum hydrocarbons
D. pH
E. alkalinity
F. hardness
G. total dissolved solids
H. total suspended solids
I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

AIR SAMPLING
Sampling Method _____ Collection Media
Sample Flow Rate _____ Special Shipping Instructions _____
Sampling Time _____
Volume Collected _____ #Field Blanks ___ #Sample Blanks ___

COMMENTS:

Along bank creek

0-3' silty sand
3' moist silt
6-7' wet coarse sand
9' : hit clay layer
creosote present

E-25 A: Sample at 8' MS/MSD

FIELD DATA SHEET

№ 006018

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. _____

Lab No.: _____ Samplers: _____ REAC Task Leader: _____

Date: 3/19/91 Site Name: Gulf St. Creek EPA Task Monitor: _____

Time: _____ Sample Location: E-26 Project No.: 2335

SITE DESCRIPTION			SOIL TYPE		SURFACE WATER	STREAM	BOTTOM	
landfill	old field	upland palustrine	rock	clay	color _____	width _____	rock	silt
industrial	wooded	lowland riverine	gravel	muck	odor _____	depth _____	rubble	clay
commercial	farmland	lacustrine	sand	loam	flow _____	velocity _____ cm/s	gravel	organic
residential	gully		silt	peat	direction _____	pools _____ %	shell	other _____
hedgerows	floodplain		color _____			riffles _____ %	sand	

SAMPLE TYPE		DEVICE		SAMPLE INFORMATION		WEATHER PARAMETERS
stream/surface	soil	kemmerer	ponar	color _____	pH _____	ambient temp _____
groundwater	pond/lake	trowl	other _____	odor _____	ORP _____	barometric pressure _____
brackish	river	bucket		temp _____	salinity _____	relative humidity _____
ocean/saline	effluent	sugar		DO _____	sample depth _____	weather conditions _____
sediment	sludge	ekman		cond _____	tide stage _____	

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
- wet ice
- dry ice
- ambient

BIOASSESSMENT
- See attached data sheet
- See comments

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity _____pH_____
- D. reactivity

AIR SAMPLING
- Sampling Method _____
- Sample Flow Rate _____
- Sampling Time _____
- Volume Collected _____

Collection Media
Special Shipping Instructions _____
#Field Blanks ___ #Sample Blanks ___

COMMENTS:

100' into field from D-1 towards creek

0-3' yellow-brown fine med. sand little silt

3-5' ditto

5-6' grey-brown fine-med sand moist

6-9' clayey silt and fine sand

clay on bit when withdrawn

no feed after 9' locked up at 13'

FIELD DATA SHEET

№ 006019

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Chain of Custody No. _____

Lab No.: _____ Samplers: _____ REAC Task Leader: _____

Date: 3/19/90 Site Name: Gulf St. Creosote EPA Task Monitor: _____

Time: _____ Sample Location: E-27 Project No.: _____

SITE DESCRIPTION			SOIL TYPE		SURFACE WATER	STREAM	BOTTOM	
landfill	old field	upland palustrine	rock	clay	color _____	width _____	rock	silt
industrial	wooded	lowland riverine	gravel	muck	odor _____	depth _____	rubble	clay
commercial	farmland	lacustrine	sand	loam	flow _____	velocity _____ cm/s	gravel	organic
residential	gully		silt	peat	direction _____	pools _____ %	shell	other _____
hedgerows	floodplain		color _____			riffles _____ %	sand	

SAMPLE TYPE		DEVICE		SAMPLE INFORMATION		WEATHER PARAMETERS
stream/surface	(soil)	kemmerer	ponar	color _____	pH _____	ambient temp _____
groundwater	pond/lake	trowl	other _____	odor _____	ORP _____	barometric pressure _____
brackish	river	bucket		temp _____	salinity _____	relative humidity _____
ocean/saline	effluent	sugar		DO _____	sample depth _____	weather conditions _____
sediment	sludge	ekman		cond _____	tide stage _____	

ANALYSES TO BE PERFORMED

TOC required? _____Yes _____No
If No, explain _____

Grain size analysis required? _____Yes _____No
If No, explain _____

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles-USEPA 624
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- (F.) base neutral/acid extractables-USEPA 625
- G. pesticides, drinking water
- H. herbicides, drinking water

INORGANICS
- A. metals, priority pollutant
- B. metals scan (ICP)
- C. metals, other _____

RCRA
- A. EP toxicity _____metals _____pesticides _____herbicides
- B. ignitability
- C. corrosivity _____pH_____
- D. reactivity

LIMITED CHEMISTRY
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate

OTHER ANALYSES (specify)
_____
_____

AIR SAMPLING
Sampling Method _____ Collection Media_____
Sample Flow Rate_____ Special Shipping Instructions _____
Sampling Time _____ _____
Volume Collected _____ #Field Blanks ___ #Sample Blanks ___

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
(glass jar)	HNO3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCL
plastic bucket	Na2SO4
4L plastic	other _____

STORAGE
wet ice
dry ice
ambient

BIOASSESSMENT
See attached data sheet
See comments

COMMENTS:
0-3' yellow + white med. sand
3-4' grey-brown sand Trace clay
4-6' brown clayey fine sand
6-8': grey-white clayey fine sand creosote smell (mild hydrocarbons)
water at 7'

A: Sample at 8'

Center of field
N of E26

E-27

Called Don Rigsee 7/29/93. To send Analysis.

On drawing, but NOT in report

A13
B1
E13
E14
E15
~~E16~~
E17
~~E18~~

In report, but NOT on drawing

?B-2?
B0
B05
B09
B10
B11
C14
C15
C16
C17
D01
E012
E014
~~E16~~
~~E18~~

E-PA

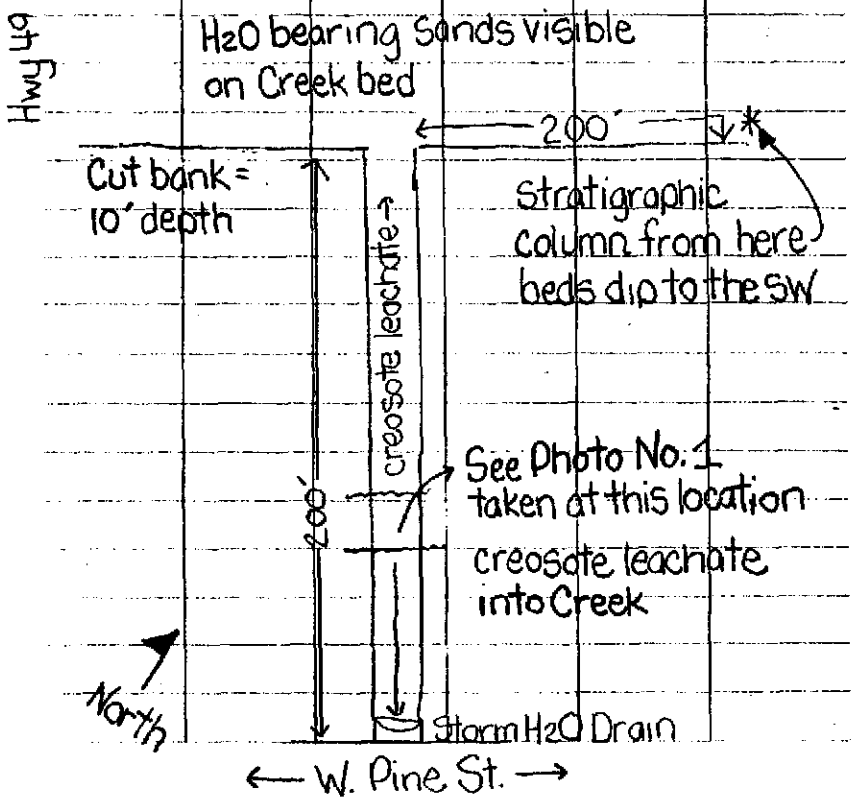
APPENDIX D

SITE RECONNAISSANCE OF GORDON'S CREEK

S. Kirchoff Field Notes

5-25-94

temp = 90's, no rain for weeks
clear → cloudy skies
drought-like
2 weeks ago H_2O in Gordons creek ~ 2 ft. higher; more leachate evident today compared to yesterday



5-25-94

Stratigraphic Column from Cut-Bank of Gordon's Creek

1 ft.	soil, vegetation
4 ft.	grey, yellow, brown f.gr sand
4 ft.	compact grey clayey-sand, f. gr., non-plastic
3 ft.	yellow-white H_2O bearing sands currently creek bank
creosote thickness varied & some on edge of H_2O too difficult to estimate ~ 1 ft thick on some outcrops to 2 ft.	grey compact dense clay, v. fine grained

See Photo No. 3 for Sand-clay interface w/ oozing creosote detail