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3/18/91
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Interim
Soil, groundwater
005354
Dnc# 2049

Applied Geotechnology Inc.

A report prepared for

Gull Industries Inc.
3404 Fourth Avenue South
Post Office Box 24687
Seattle, Washington 98134

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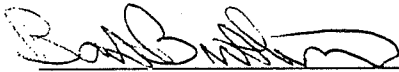
DEPT. OF ECOLOGY

Interim: Soil, groundwater
HYDROCARBON CONTAMINATION ASSESSMENT
TRUCK CITY TRUCK STOP
1731 OLD HIGHWAY 99 SOUTH
MOUNT VERNON, WASHINGTON

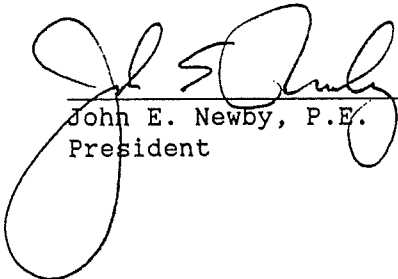
AGI Project No. 15,256.049

TRUCK CITY TRUCK STOP
1731 Hwy. 99 So.
Mount Vernon, WA 98273

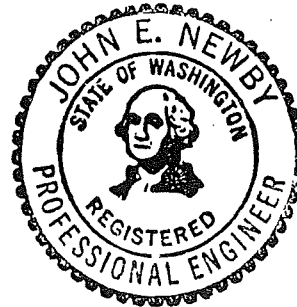
by



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November 13, 1989

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INTRODUCTION

This report summarizes work performed by Applied Geotechnology Inc. (AGI) on behalf of Gull Industries Inc. to assess potential hydrocarbon contamination at Truck City Truck Stop, located at 1731 Old Highway 99 South, Mount Vernon, Washington. Gull may purchase the property and requested AGI perform a contamination assessment.

Purpose and Scope of Services

The purpose of our assessment was to observe conditions at the site and evaluate the extent, if any, of subsurface hydrocarbon contamination. The objectives of the assessment were to:

- o Establish baseline soil and groundwater conditions for possible future comparison.
- o Document the existence or nonexistence of hydrocarbon contamination.
- o Evaluate potential off-site environmental impacts of any identified contamination.
- o Recommend which immediate corrective actions are required, if any.

The scope of our services to address these objectives included the following items:

- o Review published information concerning subsurface geological and hydrogeological conditions.
- o Drill and log 8 soil borings to between 15 and 20 feet.
- o Collect soil samples during boring, and perform on-site analysis of soil gases (headspace analysis) for volatile hydrocarbons.
- o Submit selected soil samples for analytical testing to quantify subsurface contamination, if present.
- o Install groundwater monitor wells in six of the soil borings to depths of 15 feet.
- o Perform well development and subsequent water sampling, and submit water samples for appropriate chemical analysis.
- o Document all observations, conditions and results in a final report.

SITE CONDITIONS

Surface

Truck City Truck Stop is located at 1731 Old Highway 99 South in Mount Vernon, Washington. The station has existed since 1952 and was purchased by the current owner in 1982. Figure 1 is a Site Sketch of the facility. The station incorporates approximately 8.5 acres and consists of a 24-hour truck stop/office building, a truck scale, four pump islands, a cafe, two storage buildings, five rental buildings, and two acres of open space. A total of fifteen underground storage tanks (USTs) have been identified on site. There are eleven USTs in three tank nests and one lube oil tank beneath the truck fueling area. The USTs range in capacity from 1,000 to 15,000 gallons. Three other USTs were found during our site reconnaissance. The former use and size of one UST is unknown, but its position relative to an old building site implies that it may be an abandoned fuel oil tank. Two other tanks are located between the truck fueling area and auto fueling area. These two tanks are uncapped and receive surface water runoff. Their purpose is unknown.

Past indications of contamination problems at this site include verbal indication by the owner of a 200 to 300-gallon diesel fuel spill near the current diesel UST nest (north of MW-6 on Figure 1). This reportedly occurred about two years ago (1987?). In addition, the owner reports that a tank in the southwestern tank nest (next to MW-1) admitted significant amounts of water prior to its abandonment 20 years ago. Finally, the owner says that the gasoline service station building burned down in 1976, with unknown effects on subsurface conditions.

Geology and Soils

The site lies in the floodplain of the Skagit River at an elevation of approximately 16 feet above Mean Sea Level. The Skagit River meanders west and then south approximately 1-1/2 mile from the site. Britt's Slough is located 1/2 to 3/4-mile west of the site. A hill, Little Mountain, rises approximately 500 feet, 3/4's of a mile east of the site.

The area encompassing the site has been mapped as recent alluvium and artificial fill. The alluvium includes fluvial sand, silt, and gravel with minor lacustrine deposits. These alluvial deposits range from well sorted to poorly sorted, depending on their association with the Skagit River or tributary stream flow to the Skagit River.

On September 27 to 29, 1989, eight soil borings were advanced to depths of 15 and 20 feet at the site. Groundwater monitoring wells were installed in six of these borings. Locations of the soil borings and monitor wells are noted on Figure 1. Soil units encountered in the borings were classified in accordance with the Unified Soil Classification System (U.S.C.S.) described in Figure 2. Figure 3 shows the typical monitor well construction. Logs of the borings, including well construction summaries, are presented as Figures 4 through 11.

Three generalized geologic units were encountered during drilling. Surficial fill consists of brown sandy gravel to gravelly sand, occasionally with only a trace of gravel. The fill extends to a depth between 1.5 and 3.5 feet below surface, and is gray where contamination is present. Beneath the fill lies a variable floodplain sequence ranging from silty sand to silt to organic clay and peat. These sediments tended toward silt and peat to the northeast, while silty sand was more common to the southwest. Only one boring (B4) encountered relatively silt-free sand beneath the surface fill. The variable composition of this sequence is characteristic of overbank floodplain deposits.

The top of the deepest sand deposit was encountered at a depth between 8.5 and 16 feet below land surface. This gray sand has fine to medium or coarse grain size. It represents the shallow groundwater aquifer in the area, and is characteristic of sand deposited by rivers.

Groundwater

Groundwater was typically encountered at a depth of 6.5 to 7.5 feet below ground surface during drilling. Depth to water measurements, corrected to an arbitrary datum of 16 feet above Mean Sea Level, were used to determine the groundwater gradient and flow direction. Water levels were measured on three occasions: September 28, September 29, and October 9, 1989. Water level measurements and elevations are tabulated in Appendix A.

Water level measurements taken on October 9, 1989 were used to construct Figure 12, a map showing elevation of the water table and groundwater flow direction. This figure shows a westerly to southwesterly direction of flow, and a change in slope of the water table between the eastern area (MW-3, MW-5, and MW-6) and the western area. This change in slope may approximately correspond to the transition within the flood plain soils between silts and clays to the northeast and silty sands to the southwest. The underlying sand aquifer may pass from confined to unconfined conditions along a transect from east to west.

Well MW-2 fluctuated radically during the two-week measurement period. The water level on September 28 was 2.94 to 1.65 feet higher than all upgradient wells. The next day, the water level was 0.3 feet higher than Well MW-4. Both these measurements imply a gradient reversal originating from a groundwater mound near Well MW-2. This mound might be due to leaking utilities (both water and sewer lines are present nearby). More likely, this change may be an artifact of drilling, which took place on September 27. Water level taken on October 9, 1989 were more consistent, showing MW-2 to have the lowest water elevation.

Hydrocarbon Contamination

During drilling, soil samples were taken at discrete intervals to determine contamination levels. The samples were analyzed in the field using an organic vapor meter (OVM) to measure organic vapor levels in the air space above a contained soil sample (headspace analysis). Results of the headspace analysis are indicated on the boring logs under the heading OVM. Values in the OVM listing are measured in parts per million (ppm). Based on the headspace analysis, selected soil and water samples were sent for laboratory analysis by Analytical Technologies Inc. in Renton, Washington.

Soil samples from B-1, B-4, B-5, and B-7 were analyzed for Total Petroleum Hydrocarbons (TPH) by EPA Method 8015 modified for hydrocarbons. The analytical results are summarized in the table below and are reported as milligrams per kilogram of soil (mg/kg) which is equivalent to parts per million (ppm) TPH.

<u>Soil Sample I.D.</u>	<u>Gasoline Concentration</u>	<u>Diesel Concentration</u>
B-1 @ 10.0	716	13,000
B-4 @ 12.5	<5	<5
B-5 @ 9.0	470	270
B-7 @ 9.0	<5	<5

After completion, the monitor wells were developed and samples taken to determine the level of hydrocarbons dissolved in groundwater. Water samples from MW-1, MW-2, and MW-4 were analyzed for benzene, ethylbenzene, toluene and xylenes (BETX) by EPA Method 8020. Results of the groundwater samples are summarized below in micrograms per liter (ug/l) or parts per billion (ppb):

<u>Constituent</u>	<u>MW-1</u>	<u>MW-2</u>	<u>MW-4</u>
Benzene	3,000	870	6,800
Ethylbenzene	250	51	790
Toluene	<50	72	11,000
Xylenes	<50	30	10,000

The water sample from MW-1 was also analyzed for TPH by modified EPA Method 8015. The analytical results indicate 1 ppm gasoline and 6 ppm diesel present in the sample. Copies of all analytical reports are attached as Appendix B.

CONTAMINATION ASSESSMENT

now 5 ppb

Analytical results indicate hydrocarbon contamination above Washington Department of Ecology (Ecology) cleanup action guidelines (200 ppm TPH in soil and 66 ppb benzene in water) exist in MW-1 (B-1), MW-2 (B-2), and MW-4 (B-5) at this site. These wells are sited in very permeable sands and it is likely that the contamination is not limited to the tank backfill materials.

*200 for Diesel
100 ppm TPH
for gas*

Information gathered for this assessment suggests diesel contamination in the vicinity of MW-1 may be extensive. Three USTs exist in the tank nest north of MW-1. All three USTs were diesel tanks before conversion of one UST to gasoline storage and abandonment of the other two. One UST was abandoned because water continually appeared in the pumped fuel. This implies a direct communication between the tank interior and the surrounding groundwater. The two idle tanks in this tank nest just north of MW-1 have not been used for 20 years. A sample from MW-1 shows diesel contamination of 13,000 ppm in the soil. A water sample from this well contained 3,000 ppb of benzene and 7 ppm of TPH, mostly diesel.

A second UST nest is located about 100 feet north of MW-1 in the vicinity of MW-4. This tank nest has a functioning diesel UST with 4,800-gallon capacity and two gasoline USTs with 5,000-gallon capacities. Analyses of soil and water samples taken during installation of MW-4 indicate the presence of both diesel and gasoline contamination in the vicinity of this second UST nest. The appearance of contamination in MW-4, laterally across gradient from diesel and gasoline contamination found in MW-1, implies contamination associated with this second nest of USTs or their distribution lines may be independent of the first tank nest. A water analysis from MW-4 showed 6,800 ppb of benzene; 11,000 ppb of toluene; and 10,000 ppb of xylenes. This is indicative of gasoline contamination.

Analytical results of soil and water samples taken in the vicinity of a third set of USTs, supplying diesel to the truck fueling area, found no contamination above Ecology guidelines. However, a 200 to 300 gallon surface spill apparently occurred approximately 2 years ago. This is also an area subject to spillage during routine truck fueling. The possibility exists in this area for unidentified surface soil contamination above Ecology action levels.

Borings B-6 (MW-5) and B-8 were located to detect possible contamination south of the diesel repair shop. Soil sample from both borings showed OVM readings of 0 to 12 ppm, with the highest reading in each case at 2.5 feet. The low OVM readings indicate low levels of contamination. Any contamination present is probably close to ground surface.

Two USTs of unknown character are located between the gasoline and diesel service areas. Their locations are indicated by the cover plates noted on Figure 1. Borings were not drilled close to these tanks due to their unknown dimensions and orientation. The owner had no information about their size, age, or past use. They are currently full of water, and may receive surface runoff. Well MW-1 is probably downgradient from these tanks. Influence on MW-1 from the two unknown tanks cannot be evaluated at this time because contamination in Well MW-1 is most likely due to a probable leak in an immediately adjacent tank,

CONCLUSIONS

Documented contamination above Ecology action guidelines exists around two of the three UST clusters on this site. Three borings in the gasoline service area, B-1 (MW-1), B-2 (MW-2), and B-5 (MW-4) show significant gasoline and diesel contamination.

Although no contamination was detected by laboratory analysis of soil near the eastern diesel tank cavity, the possibility of contamination exists here. This is the site of a truck refueling operations and a reported surface spill. If contamination is present above action guidelines in this area, evidence suggests it may be surficial.

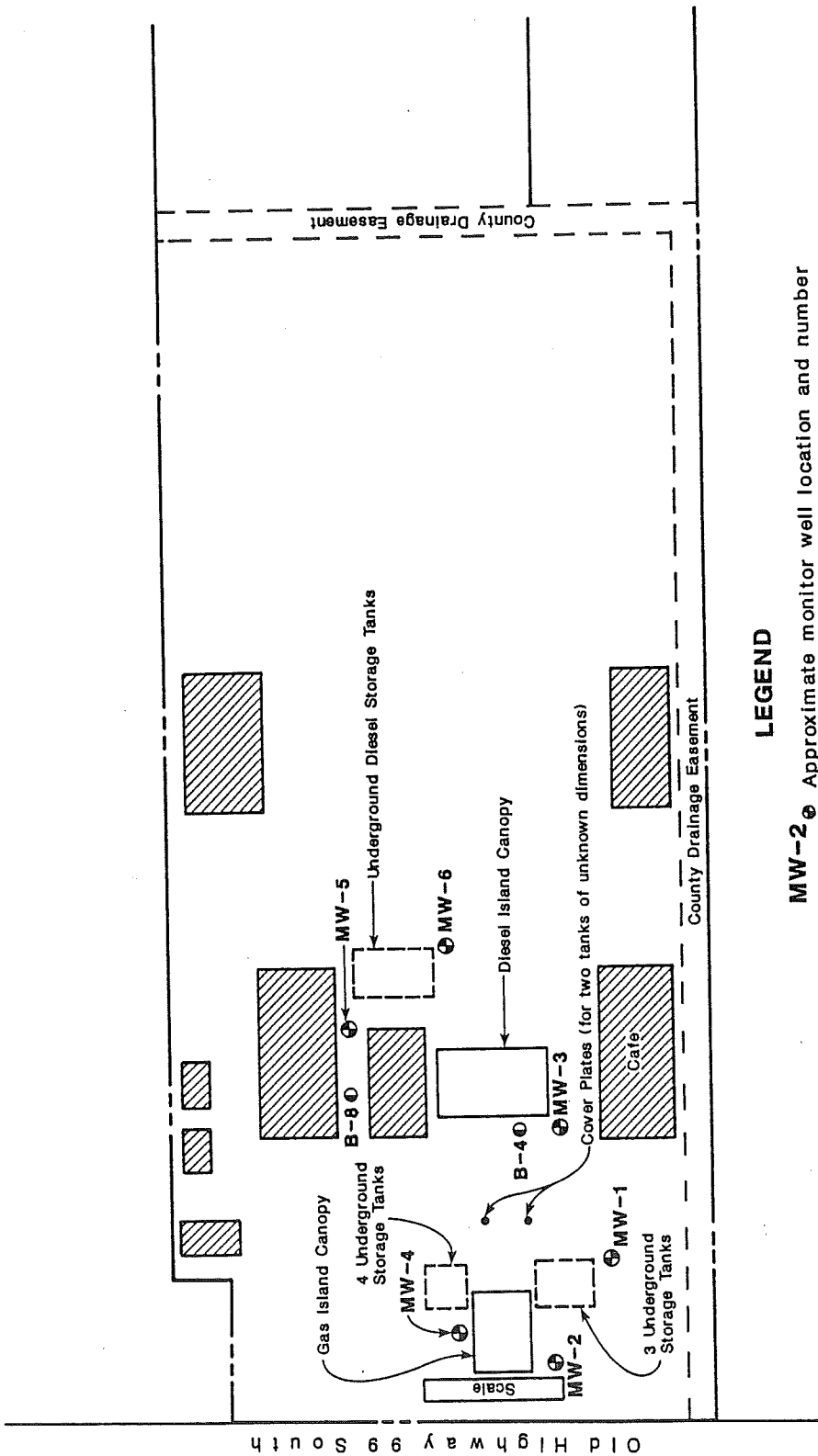
The aquifer beneath this site is highly permeable. Groundwater contamination has been detected in wells MW-1 and MW-4, and a plume may extend further downgradient (to the west) from this point. Further investigation may be warranted to determine if contamination has passed beyond the property boundary.

Anticipated remediation will involve a groundwater treatment system with an interceptor trench along the western property line. In addition, the two western tank nests (near MW-1 and MW-4) should be replaced. Associated contaminated soil should be excavated and transported to the east side of the property for remediation. We estimate 3,000 cubic yards of soil may contain high levels of gasoline and diesel contamination. The cost of these remedial actions will probably be in the range of \$200,000. Of this amount, approximately \$140,000 would be required for tank removal and soil remediation, and \$60,000 for groundwater remediation. If all the soil can be treated on site in a single lift, a cost savings of \$20,000 to \$30,000 might be realized.

LIMITATIONS

This report has been prepared for the exclusive use of Gull Industries and their other consultants for this project only. The analyses, conclusions, and recommendations in this report are based on conditions encountered at the time of our field investigation, design information you provided, and our experience and engineering judgment. AGI cannot be responsible for the interpretation of the data contained herein by others.

Our work has been performed in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty, express or implied, is made.



LEGEND

MW-2 ⊕ Approximate monitor well location and number

B-2 ⊕ Approximate boring location and number



0 100
Scale in Feet

FIGURE

1

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Geology & Hydrogeology

Site Sketch

Gull/Truck City Truck Stop
Mount Vernon, Washington

JOB NUMBER
15,256.049

DRAWN
TES

APPROVED

DATE

30 October 89

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DATE

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS					TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH FINES LESS THAN 5%	GW		WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND - SILT MIXTURES
		GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND - CLAY MIXTURES	
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	SW		WELL GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SP		POORLY GRADED SANDS, GRAVELLY SANDS
			SM		SILTY SANDS, POORLY GRADED SAND - SILT MIXTURES
		SC		CLAYEY SANDS, POORLY GRADED SAND - CLAY MIXTURES	
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS		Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS	

LEGEND

- SAMPLE**
- "Undisturbed"
 - Bulk/Grab
 - Not Recovered

- CONTACT BETWEEN UNITS**
- Well Defined Change
 - Gradational Change
 - Obscure Change
 - End of Exploration

BLOWS/FOOT

- Hammer is 140 pounds with 30 inch drop, unless otherwise noted
- S - SPT Sampler (2.0 inch O.D.)
- T - Thin Wall Sampler (2.8 inch Sample)
- H - Split Barrel Sampler (2.4 inch Sample)

MOISTURE DESCRIPTION

- Dry - Considerably less than optimum for compaction
- Moist - Near optimum moisture content
- Wet - Over optimum moisture content
- Saturated - Below water table, in capillary zone, or in perched groundwater

LABORATORY TESTS

- Consol - Consolidation
- LL - Liquid Limit
- PL - Plastic Limit
- Gs - Specific Gravity
- SA - Size Analysis
- TxS - Triaxial Shear
- TxP - Triaxial Permeability
- Perm - Permeability
- Po - Porosity
- MD - Moisture/Density
- DS - Direct Shear
- VS - Vane Shear
- Comp - Compaction
- UU - Unconsolidated • Undrained
- CU - Consolidated • Undrained
- CD - Consolidated • Drained



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Soil Classification/Legend

Gull/Truck City Truck Stop
Mount Vernon, Washington

FIGURE

2

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ECR

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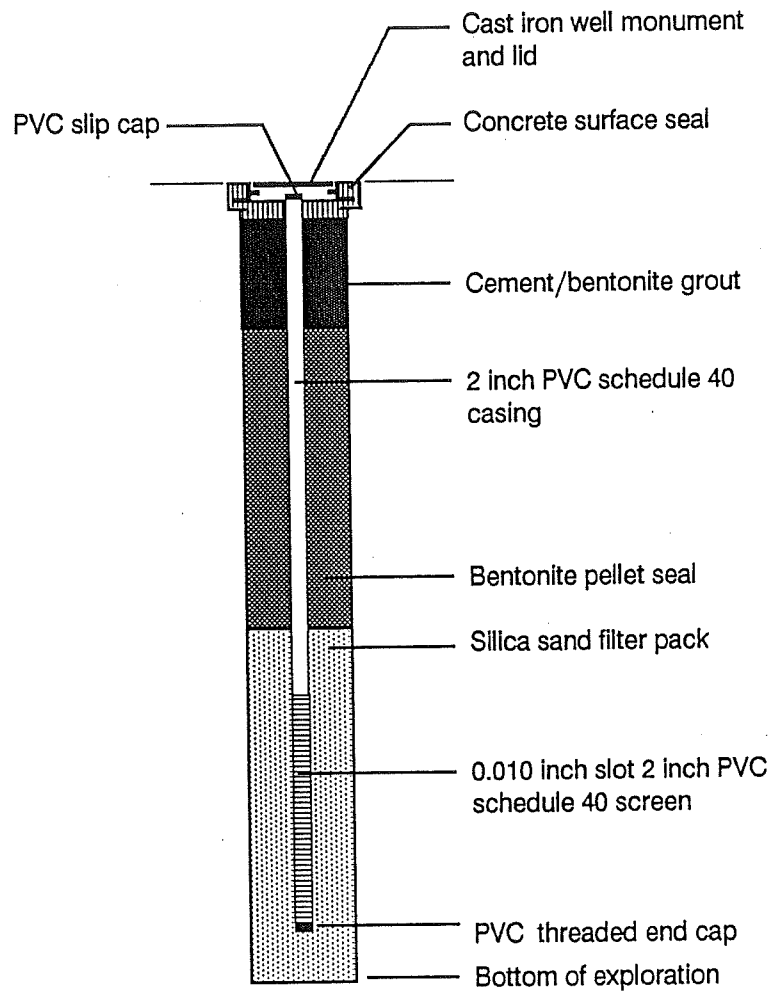
BLB

DATE

26 October 89

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DATE



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Monitor Well Construction
 Gull/Truck City Truck Stop
 Mount Vernon, Washington

FIGURE

3

JOB NUMBER
 15,256.049

DRAWN
 SES

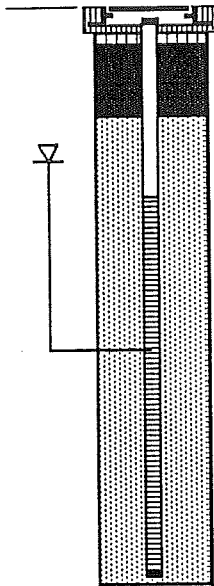
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SES

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 7 November 89

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DATE

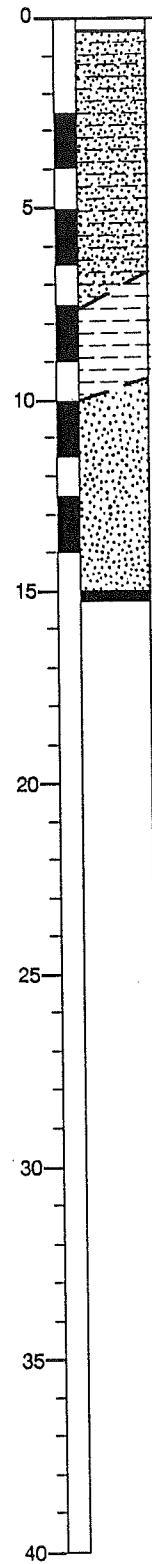
Well Construction Summary



O V M	B P F
370	
358	4
310	8
60	2
102	22
114	29

Depth
Sample

Equipment Mobile B-61
 Land Surface _____ Date 9/27/89
 Elevation _____



0 Asphalt Pavement.
 DARK GRAY SILTY SAND (SM) very loose, moist; trace gravel, strong diesel odor.

5 Becomes siltier, some silty clay with trace organics.

8 GRAY SILT (ML) soft, wet to saturated; with some clay and fine sand; strong petroleum odor.

10 GRAY SAND (SP) medium dense, saturated; fine to medium grained with trace fine gravel, slight to moderate petroleum odor.

15 Boring terminated at 15 feet on 9/27/89.
 Groundwater encountered at approximately 8 feet.



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Log of Boring MW-1 (B-1)
 Gull/Truck City Truck Stop
 Mount Vernon, Washington

FIGURE

4

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DRAWN
 SES

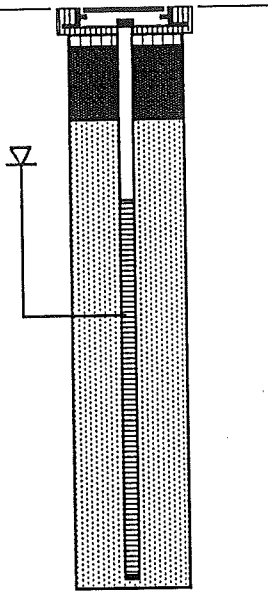
APPROVED
BES

DATE
 23 October 89

REVISED

DATE

Well Construction Summary



O
V
M

B
P
F

90

9

101

5

0

43

D
e
p
t
h

0

5

10

15

20

25

30

35

40

Equipment Mobile B-61

Land Surface _____ Date 9/27/89
Elevation _____

Asphalt Pavement.

BROWN TO GRAY SANDY GRAVEL (GP) loose, moist; with some silt present (Fill).

GRAY BROWN SILTY TO FINE SILTY SAND (ML/SM) loose, moist; slight petroleum odor.

GRAY SILT AND SILTY CLAY (ML/OL) medium stiff, saturated; interbedded, slight petroleum odor.

GRAY SAND (SP) dense, saturated; fine to coarse grained, very slight petroleum odor.

Boring terminated at 15 feet on 9/27/89.
Groundwater encountered at approximately 8 feet.



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Log of Boring MW-2 (B-2)

Gull/Truck City Truck Stop
Mount Vernon, Washington

FIGURE

5

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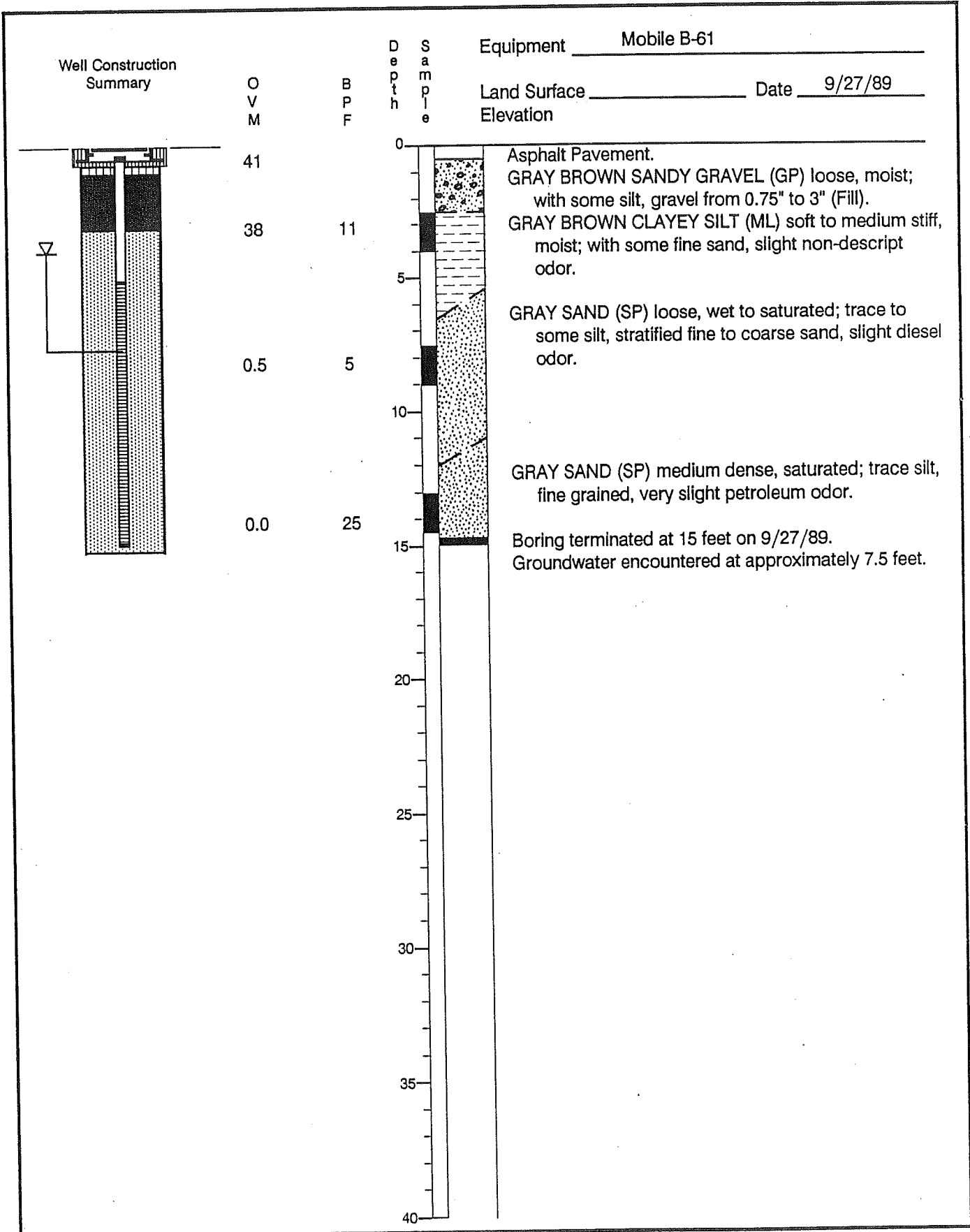
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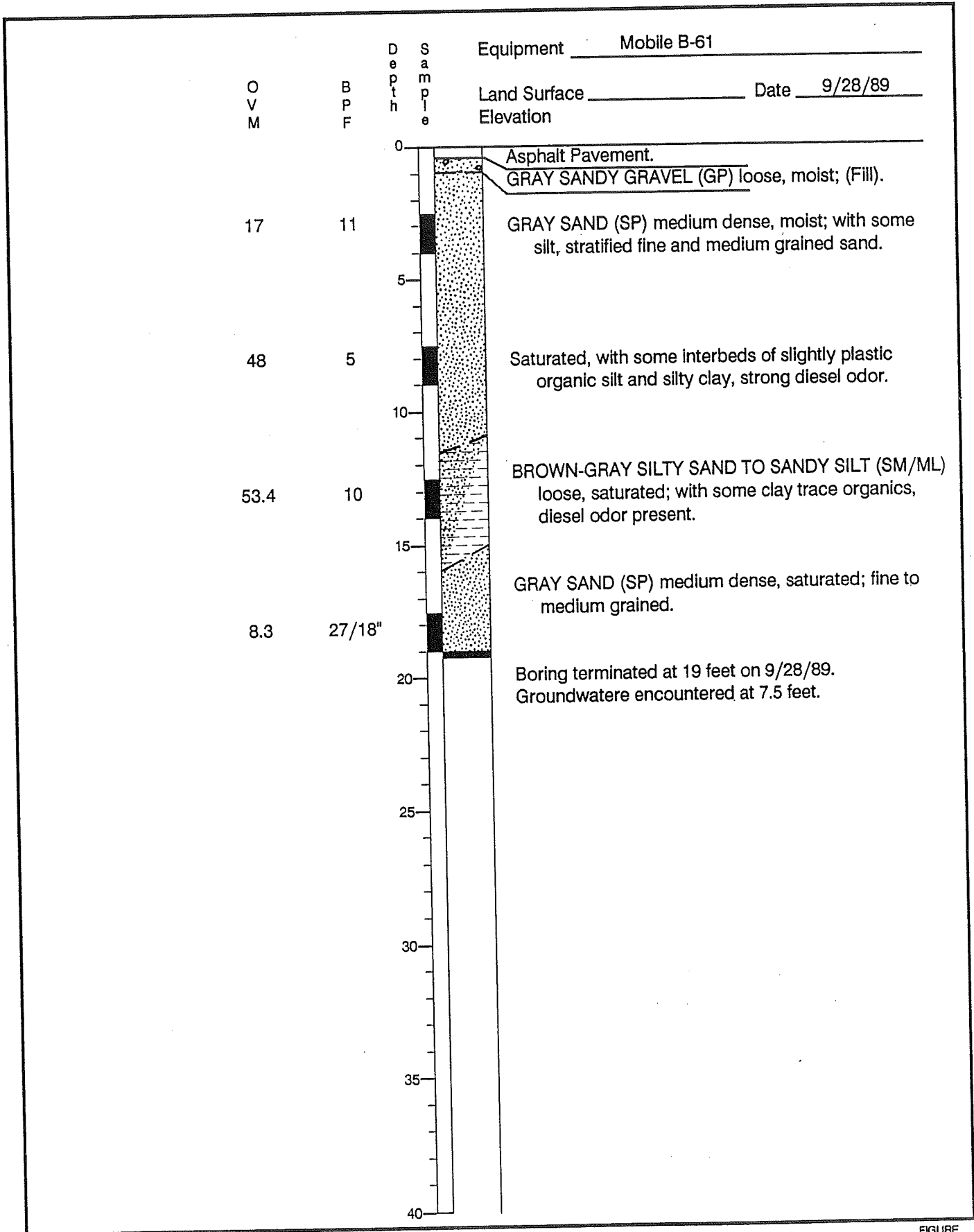
Log of Boring MW-3 (B-3)

Gull/Truck City Truck Stop
Mount Vernon, Washington

FIGURE

6

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15,256.049	SES	<i>SES</i>	23 October 89		



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Log of Boring B-4
 Gull/Truck City Truck Stop
 Mount Vernon, Washington

FIGURE

7

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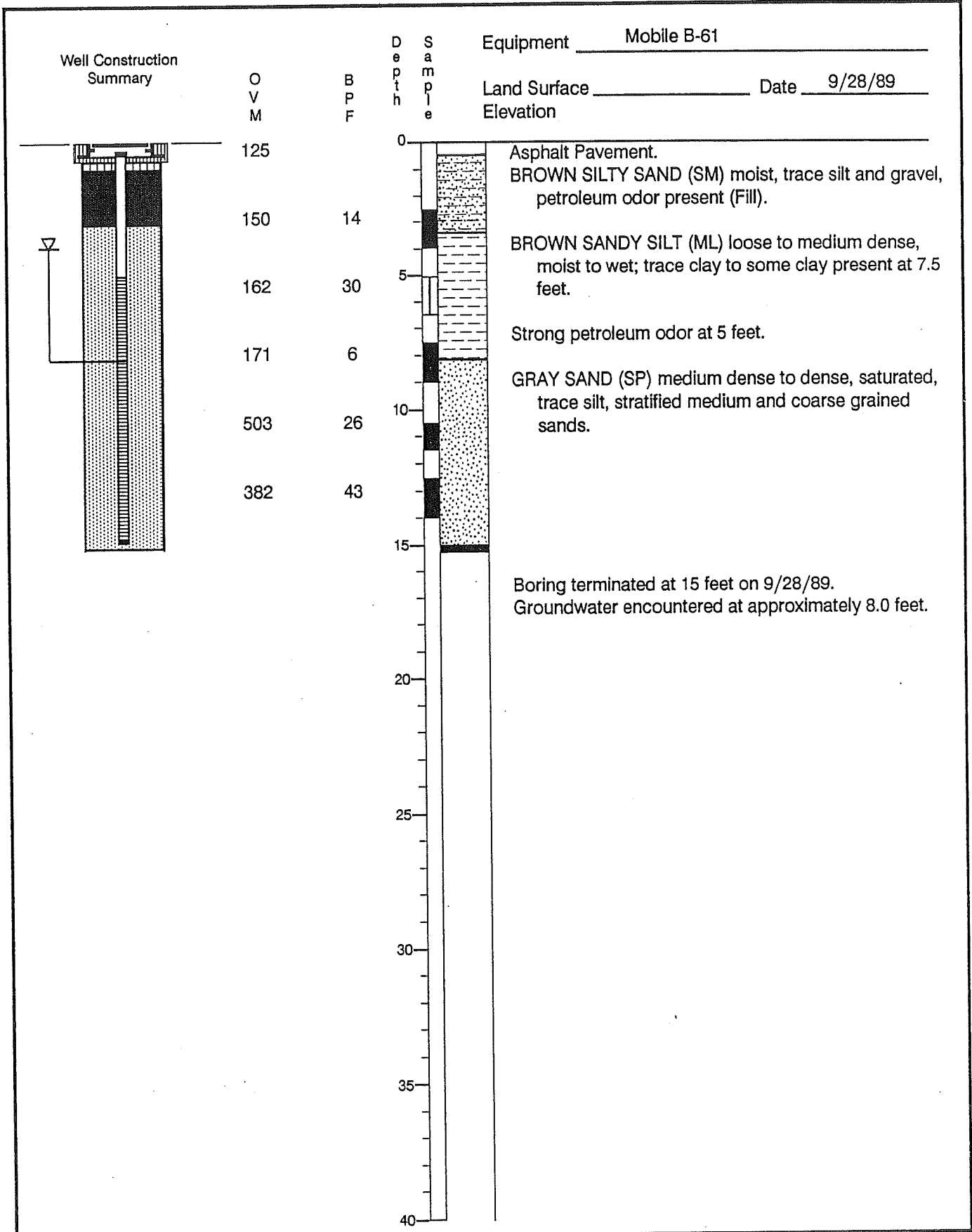
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Log of Boring MW-4 (B-5)
Gull/Truck City Truck Stop
Mount Vernon, Washington

FIGURE
8

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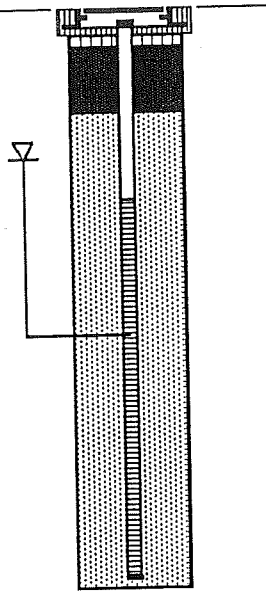
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DATE
23 October 89

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DATE

Well Construction Summary



O
V
M

24

9

14

B
P
F

12

7

2

D
e
p
t
h

0

5

10

15

20

25

30

35

40

Equipment Mobile B-61

Land Surface _____ Date 9/28/89
Elevation _____

Asphalt Pavement.

BROWN GRAVELLY SAND (SP) loose, moist; fine sand, trace silt (Fill).

GREEN AND GRAY SAND (SM) loose to medium dense, moist; trace gravel.

GREEN TO GRAY SAND AND SILT (SM/OH) loose to very soft, saturated; visible organic material in silt, trace clay, interbedded.

Boring terminated at 15 feet on 9/28/89.
Groundwater encountered at approximately 8.5 feet.



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Log of Boring MW-5 (B-6)

Gull/Truck City Truck Stop
Mount Vernon, Washington

FIGURE

9

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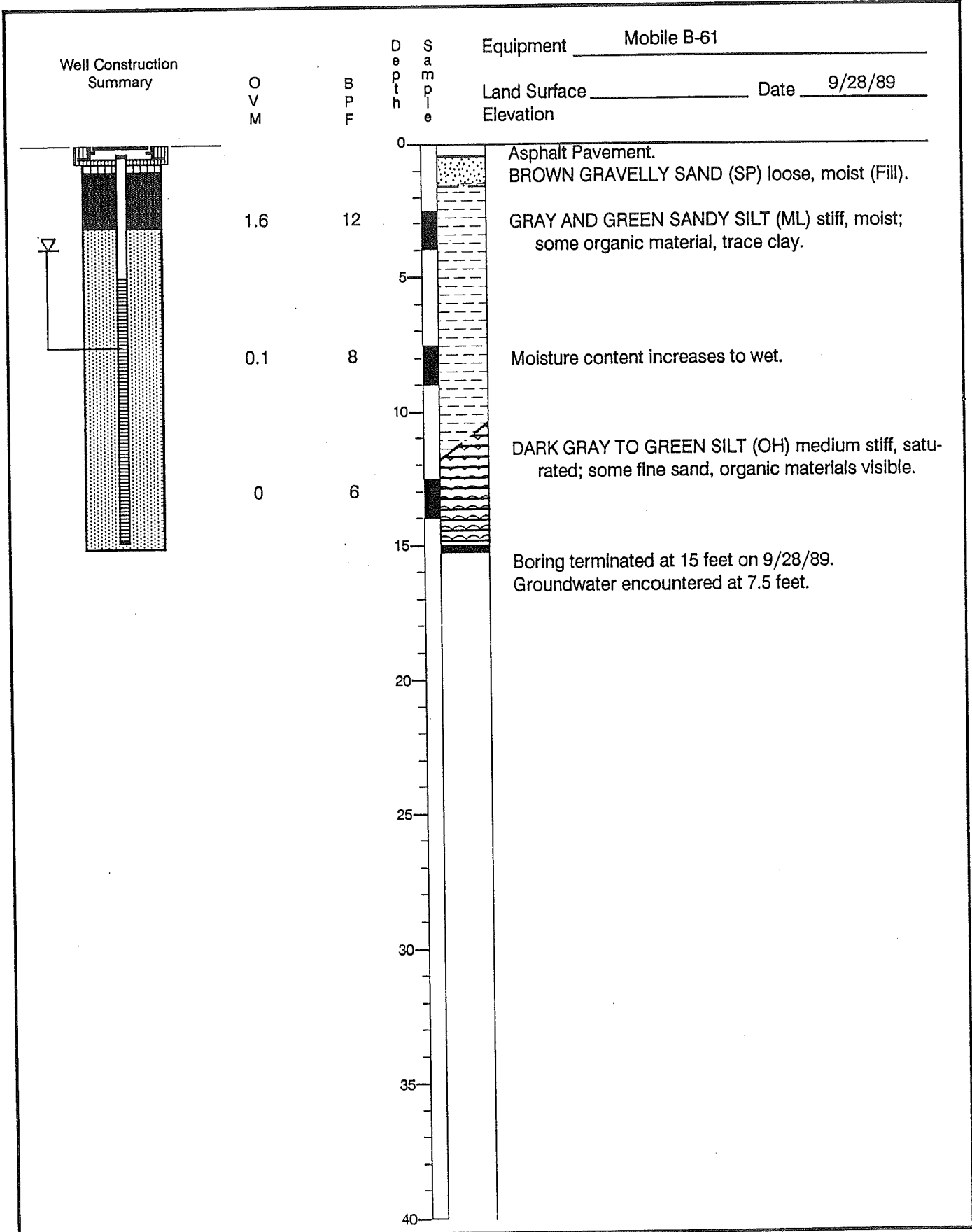
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[Signature]

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Log of Boring MW-6 (B-7)

Gull/Truck City Truck Stop
Mount Vernon, Washington

FIGURE

10

JOB NUMBER
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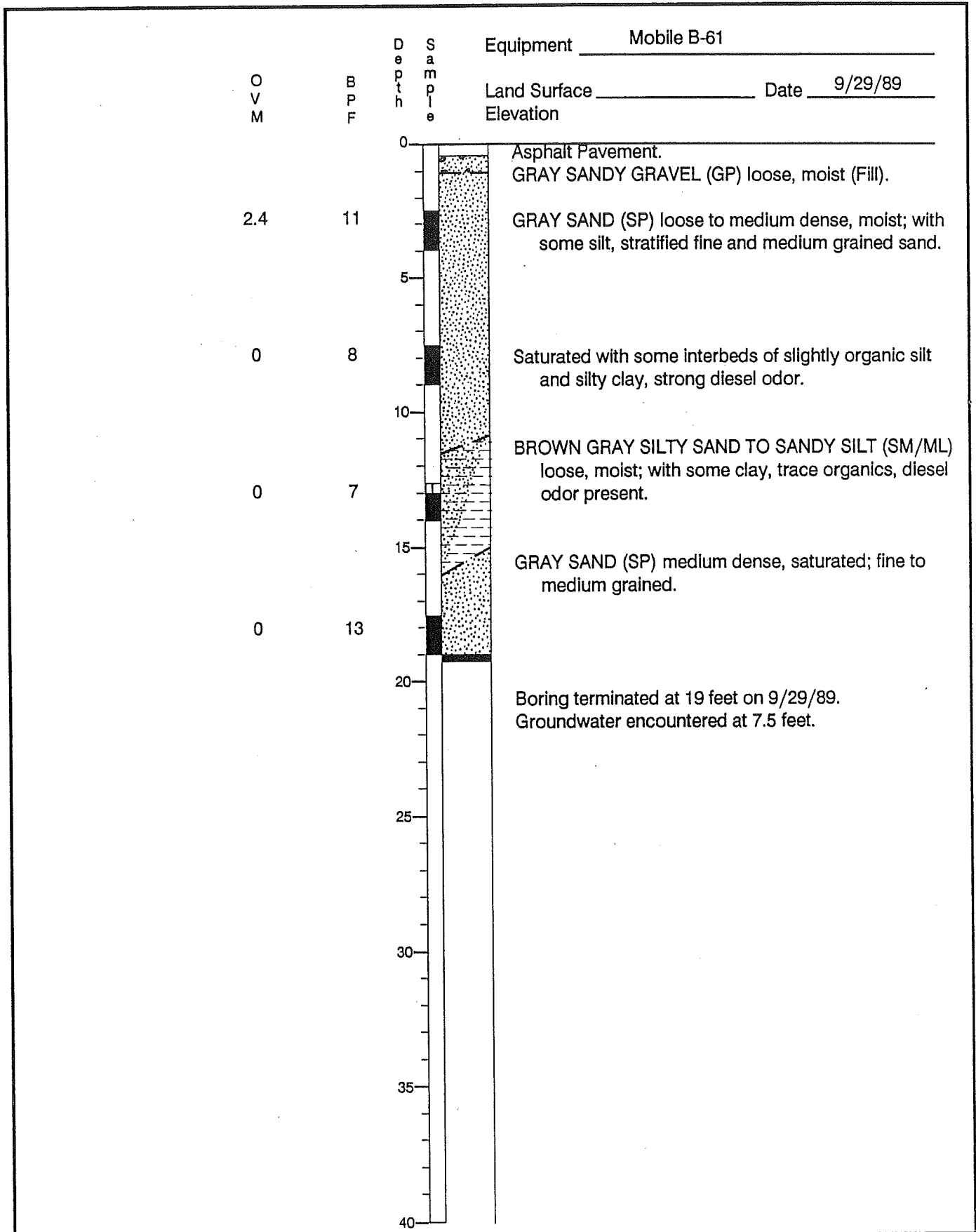
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SES

DATE
23 October 89

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Log of Boring B-8
 Gull/Truck City Truck Stop
 Mount Vernon, Washington

FIGURE

11

JOB NUMBER
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DATE

Elevation of Water Table
Gull/Truck City Truck Stop
Mount Vernon, Washington

DATE

REVISED

DATE
30 October 89

APPROVED

CAS

DRAWN

TES

JOB NUMBER

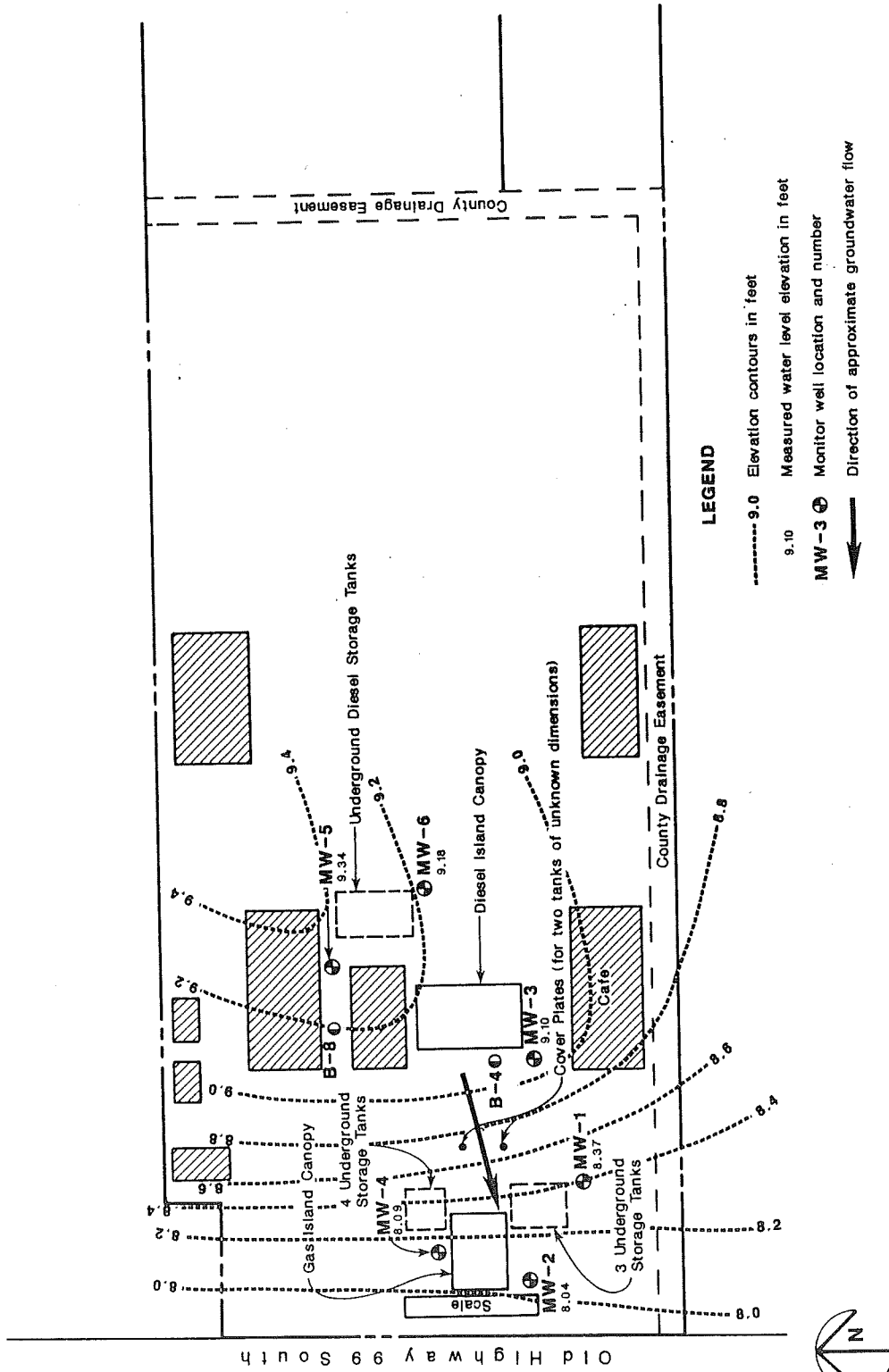
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NOTE:
1. Groundwater elevations measured 10/9/89.
2. Arbitrary datum: assumed elevation - 18 feet.



LEGEND

- 9.0 Elevation contours in feet
- 9.10 Measured water level elevation in feet
- MW-3 ⊕ Monitor well location and number
- Direction of approximate groundwater flow

DISTRIBUTION

3 Copies

Gull Industries, Inc.
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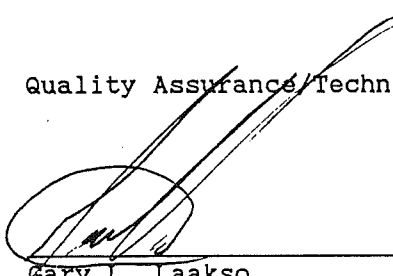
Attention: Mr. William T. Vivian

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Attention: Mr. E. J. Olmstead

Quality Assurance/Technical Review by:



Gary L. Laakso
Remediation Services Manager

BGB/JEN/tag

APPENDIX A

Groundwater Elevation Survey Data

GROUNDWATER ELEVATION SURVEY DATA

<u>Well</u>	<u>Date</u>	<u>Top/PVC Casing (Feet)</u>	<u>Depth to Water (Feet)</u>	<u>Elevation of Water (Feet)</u>
MW-1	9/28/89	16.00	7.64	8.36
MW-2	9/28/89	16.39	4.88	11.12
MW-3	9/28/89	13.23	6.79	9.21
MW-4	9/28/89	16.39	7.82	8.18
MW-5	9/28/89	13.26	6.53	9.47
MW-6	9/28/89	13.36	6.76	9.24
MW-1	9/29/89	16.00	7.54	8.46
MW-2	9/29/89	16.39	7.87	8.13
MW-3	9/29/89	13.23	6.73	9.27
MW-4	9/29/89	16.39	7.90	8.10
MW-5	9/29/89	13.26	6.52	9.48
MW-6	9/29/89	13.26	6.77	9.23
MW-1	10/9/89	16.00	7.63	8.37
MW-2	10/9/89	16.39	7.96	8.04
MW-3	10/9/89	13.23	6.90	9.10
MW-4	10/9/89	16.39	7.91	8.09
MW-5	10/9/89	13.26	6.66	9.34
MW-6	10/9/89	13.26	6.82	9.18

APPENDIX B

Laboratory Analyses



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8909-157

October 20, 1989

RECEIVED

OCT 23 1989

Applied Geotechnology, Inc.
P.O. Box 3885
Bellevue, WA 98009

APPLIED GEOTECHNOLOGY INC

Attention : Rod Struck

Project Number : 15,256.049

Project Name : Gull/Truck City

On September 29, 1989 Analytical Technologies, Inc. received four water samples and four soil samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Karen L. Mixon

Karen L. Mixon
Project Manager

FWG/hbb

Frederick W. Grothkopp

Frederick W. Grothkopp
Technical Manager



SAMPLE CROSS REFERENCE SHEET

CLIENT : APPLIED GEOTECHNOLOGY, INC.
PROJECT # : 15,256.049
PROJECT NAME : GULL/TRUCK CITY

Table with 4 columns: ATI #, CLIENT DESCRIPTION, MATRIX, DATE SAMPLED. Contains 8 rows of sample data.

----- TOTALS -----

Summary table with 2 columns: MATRIX, # SAMPLES. Shows 4 WATER and 4 SOIL samples.

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



ANALYTICAL SCHEDULE

CLIENT : APPLIED GEOTECHNOLOGY, INC.
PROJECT # : 15,256.049
PROJECT NAME : GULL/TRUCK CITY

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
BETX	GC/PID	EPA 8020
FUEL HYDROCARBONS	GC/FID	EPA 8015 MODIFIED

PURGEABLE AROMATICS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: N/A
PROJECT #	: 15,256.049	DATE RECEIVED	: N/A
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/06/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
META & PARA XYLENE	<0.5
ORTHO XYLENE	<0.5

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	86
--------------------	----

PURGEABLE AROMATICS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: N/A
PROJECT #	: 15,256.049	DATE RECEIVED	: N/A
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/12/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
----------	--------

BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
META & PARA XYLENE	<0.5
ORTHO XYLENE	<0.5

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

87

PURGEABLE AROMATICS ANALYSIS
DATA SUMMARY

CLIENT : APPLIED GEOTECHNOLOGY, INC. DATE SAMPLED : N/A
PROJECT # : 15,256.049 DATE RECEIVED : N/A
PROJECT NAME : GULL/TRUCK CITY DATE EXTRACTED : N/A
CLIENT I.D. : REAGENT BLANK DATE ANALYZED : 10/16/89
SAMPLE MATRIX : WATER UNITS : ug/L
EPA METHOD : 8020 (BETX) DILUTION FACTOR : 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
META & PARA XYLENE	<0.5
ORTHO XYLENE	<0.5

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 102

PURGEABLE AROMATICS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/23/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1	DATE ANALYZED	: 10/06/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 100

COMPOUND	RESULT
BENZENE	3,000
ETHYLBENZENE	250
TOLUENE	<50
META & PARA XYLENE	<50
ORTHO XYLENE	<50

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	99
--------------------	----

PURGEABLE AROMATICS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/23/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-2	DATE ANALYZED	: 10/16/89*
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 10

-----	-----
COMPOUND	RESULT
-----	-----

BENZENE	870
ETHYLBENZENE	51
TOLUENE	72
META & PARA XYLENE	80
ORTHO XYLENE	37

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	85
--------------------	----

* Originally injected on 10/12/89.

PURGEABLE AROMATICS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/23/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-4	DATE ANALYZED	: 10/12/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1000

COMPOUNDRESULT

BENZENE	6,800
ETHYLBENZENE	790
TOLUENE	11,000
META & PARA XYLENE	3,000
ORTHO XYLENE	700

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

88

PURGEABLE AROMATICS
 QUALITY CONTROL DATA

CLIENT : APPLIED GEOTECHNOLOGY INC. SAMPLE I.D. : BLANK 10/9
 PROJECT # : 15,256.049 DATE ANALYZED : 10/09/89
 PROJECT NAME : GULL/TRUCK CITY SAMPLE MATRIX : WATER
 EPA METHOD : 8020 (BETX) UNITS : ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP	DUP	RPD
					SPIKED SAMPLE	% REC	
BENZENE	<0.5	8.00	6.92	86	7.04	88	2
TOLUENE	<0.5	8.00	6.96	87	6.90	86	1
META & PARA XYLENE	<0.5	21.9	19.0	87	18.2	83	4

$$\begin{aligned}
 \% \text{ Recovery} &= \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100
 \end{aligned}$$

$$\begin{aligned}
 \text{RPD (Relative \% Difference)} &= \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100
 \end{aligned}$$

FUEL HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: N/A
PROJECT #	: 15,256.049	DATE RECEIVED	: N/A
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: 10/09/89
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/10/89
SAMPLE MATRIX	: WATER	UNITS	: mg/L
EPA METHOD	: 8015 MODIFIED	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	<1
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	GASOLINE
FUEL HYDROCARBONS	<1
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	DIESEL



FUEL HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/23/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: 10/09/89
CLIENT I.D.	: MW-1	DATE ANALYZED	: 10/10/89
SAMPLE MATRIX	: WATER	UNITS	: mg/L
EPA METHOD	: 8015 MODIFIED	DILUTION FACTOR	: 1

COMPOUND

RESULT

FUEL HYDROCARBONS	1
HYDROCARBON RANGE	C6 - C8
HYDROCARBONS QUANTITATED USING	GASOLINE

FUEL HYDROCARBONS	6
HYDROCARBON RANGE	C10 - C26
HYDROCARBONS QUANTITATED USING	DIESEL

BEST ESTIMATE OF FUEL TYPE - 1 PART GASOLINE : 6 PARTS DIESEL

FUEL HYDROCARBONS
 QUALITY CONTROL DATA

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	SAMPLE I.D.	: 8910-006-3
PROJECT #	: 15,256.049	DATE ANALYZED	: 10/03/89
PROJECT NAME	: GULL/TRUCK CITY	SAMPLE MATRIX	: WATER
EPA METHOD	: 8015 MODIFIED	UNITS	: mg/L

COMPOUND	SAMPLE RESULT	CONC SPIKED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % RECOVERY	RPD
FUEL HYDROCARBONS	<1	100	106	106	104	104	2

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



FUEL HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: N/A
PROJECT #	: 15,256.049	DATE RECEIVED	: N/A
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: 10/02/89
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/04/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8015 MODIFIED	DILUTION FACTOR	: 20

COMPOUND

RESULT

FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	GASOLINE
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	DIESEL

FUEL HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/27/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: 10/02/89
CLIENT I.D.	: B-1-10.0	DATE ANALYZED	: 10/09/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8015 MODIFIED	DILUTION FACTOR	: 20

COMPOUND

RESULT

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBONS QUANTITATED USING

716
C6 - C8
GASOLINE

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBONS QUANTITATED USING

13,000
C10 - C26
DIESEL

BEST ESTIMATE OF FUEL TYPE - 1 PART GASOLINE : 18 PARTS DIESEL



FUEL HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/28/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: 10/02/89
CLIENT I.D.	: B-5-9.0	DATE ANALYZED	: 10/05/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8015 MODIFIED	DILUTION FACTOR	: 1

COMPOUND

RESULT

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBONS QUANTITATED USING

470
C6 - C10
GASOLINE

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBONS QUANTITATED USING

270
C12 - C26
DIESEL

BEST ESTIMATE OF FUEL TYPE - 2 PARTS GASOLINE : 1 PART DIESEL



FUEL HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/28/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: 10/02/89
CLIENT I.D.	: B-7-9.0	DATE ANALYZED	: 10/05/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8015 MODIFIED	DILUTION FACTOR	: 1

COMPOUND

RESULT

FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	GASOLINE
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	DIESEL



FUEL HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	DATE SAMPLED	: 09/28/89
PROJECT #	: 15,256.049	DATE RECEIVED	: 09/29/89
PROJECT NAME	: GULL/TRUCK CITY	DATE EXTRACTED	: 10/02/89
CLIENT I.D.	: B-4-12.5	DATE ANALYZED	: 10/04/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8015 MODIFIED	DILUTION FACTOR	: 1

COMPOUND

RESULT

FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	GASOLINE
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	DIESEL

FUEL HYDROCARBONS
 QUALITY CONTROL DATA

CLIENT	: APPLIED GEOTECHNOLOGY, INC.	SAMPLE I.D.	: 8909-157-8
PROJECT #	: 15,256.049	DATE ANALYZED	: *
PROJECT NAME	: GULL/TRUCK CITY	SAMPLE MATRIX	: SOIL
EPA METHOD	: 8015 MODIFIED	UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	CONC SPIKED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % RECOVERY	RPD
FUEL HYDROCARBONS	<5	500	448	90	501	100	11

* Analyzed 10/04/89 and 10/06/89

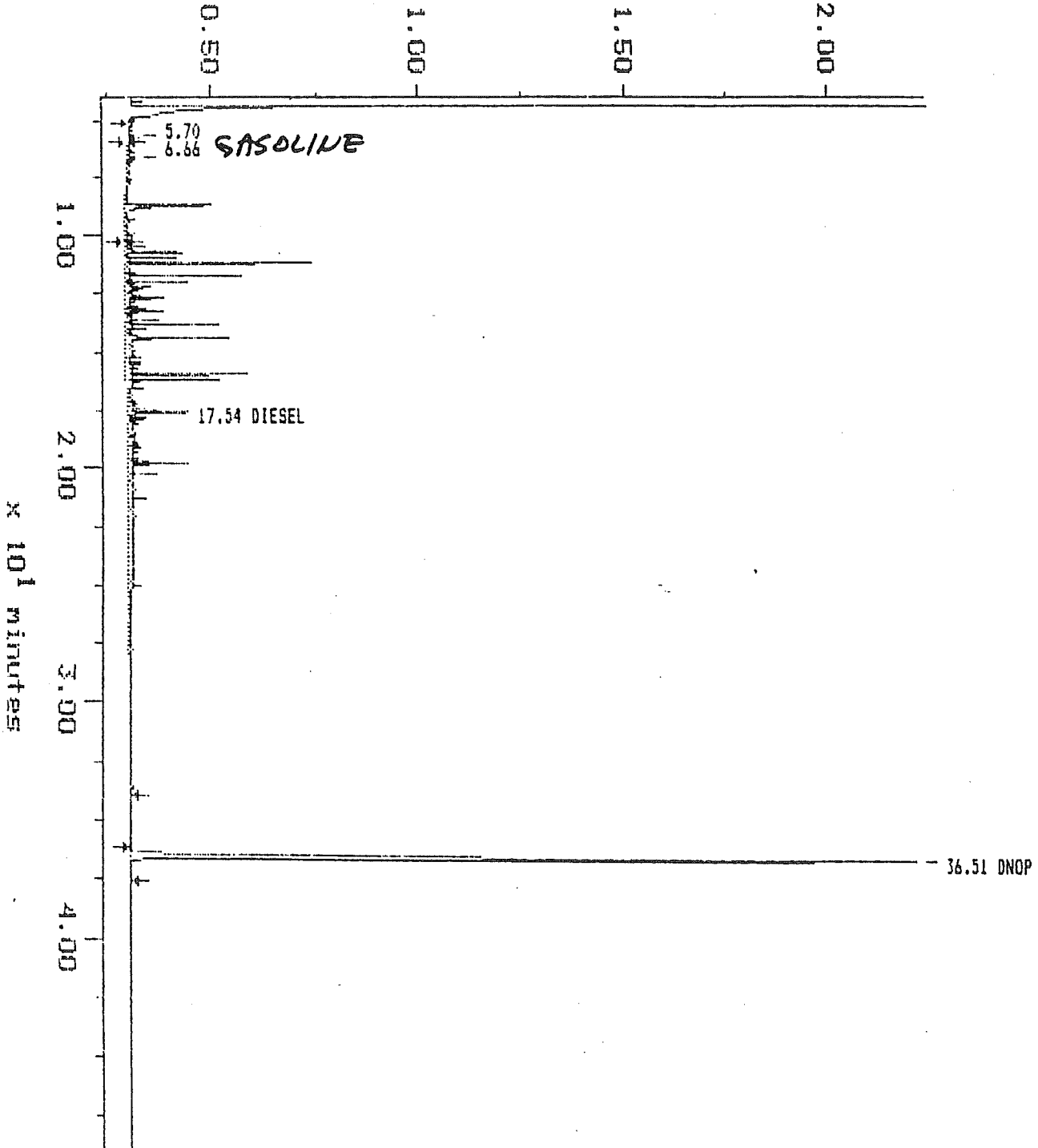
$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Sample: W8909-157-1 Channel: FID FRONT-A
Acquired: 10-OCT-89 3:00 Method: C:\MAX\DATA3\FAGBTX25
Comments: DIESEL AND BTEX PROGRAM FOR DIESEL/BTEX STDS, MS, MSD, FPB, FPBN

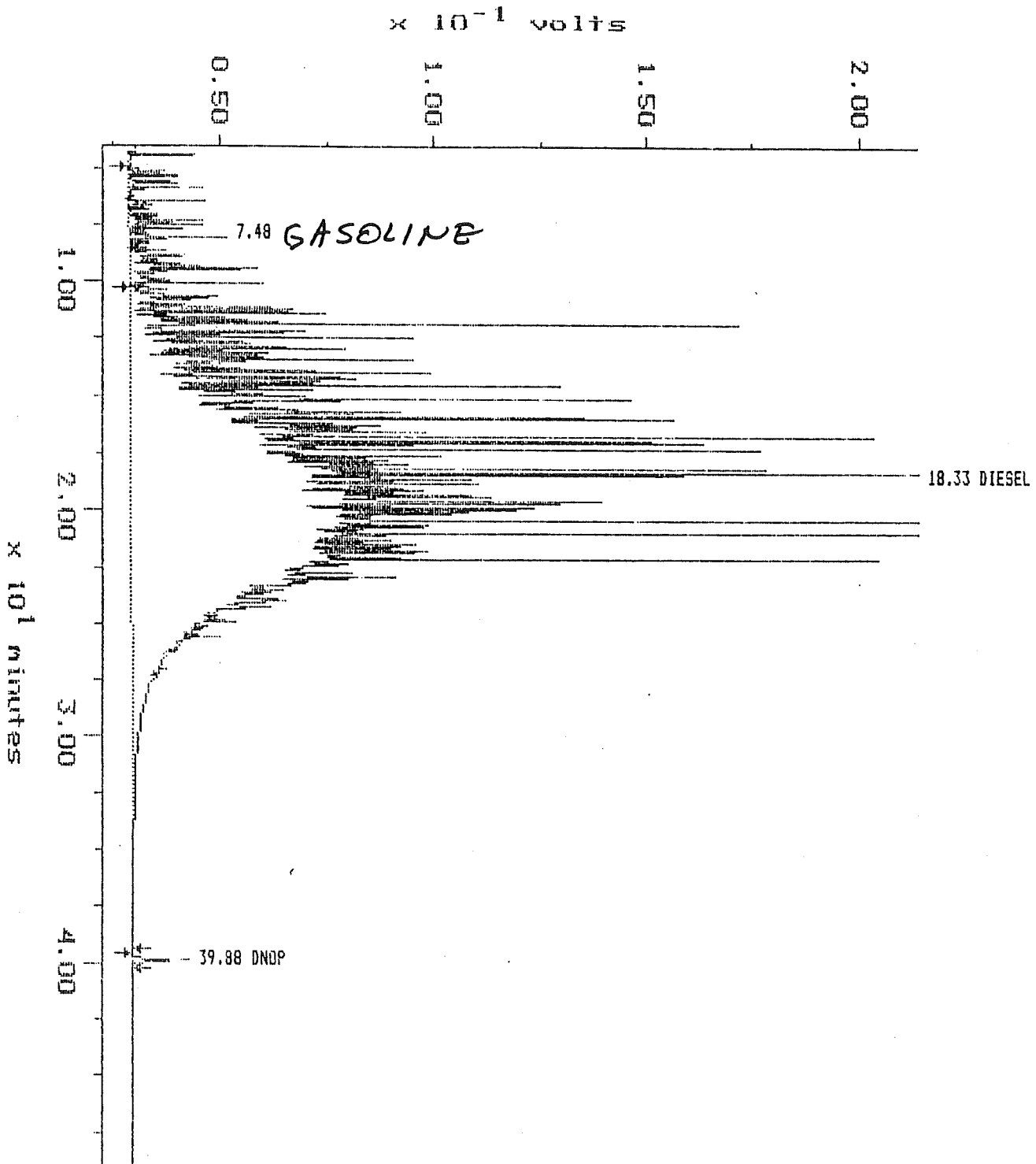
Filename: 9FF01871
Operator: RWH

$\times 10^{-1}$ volts



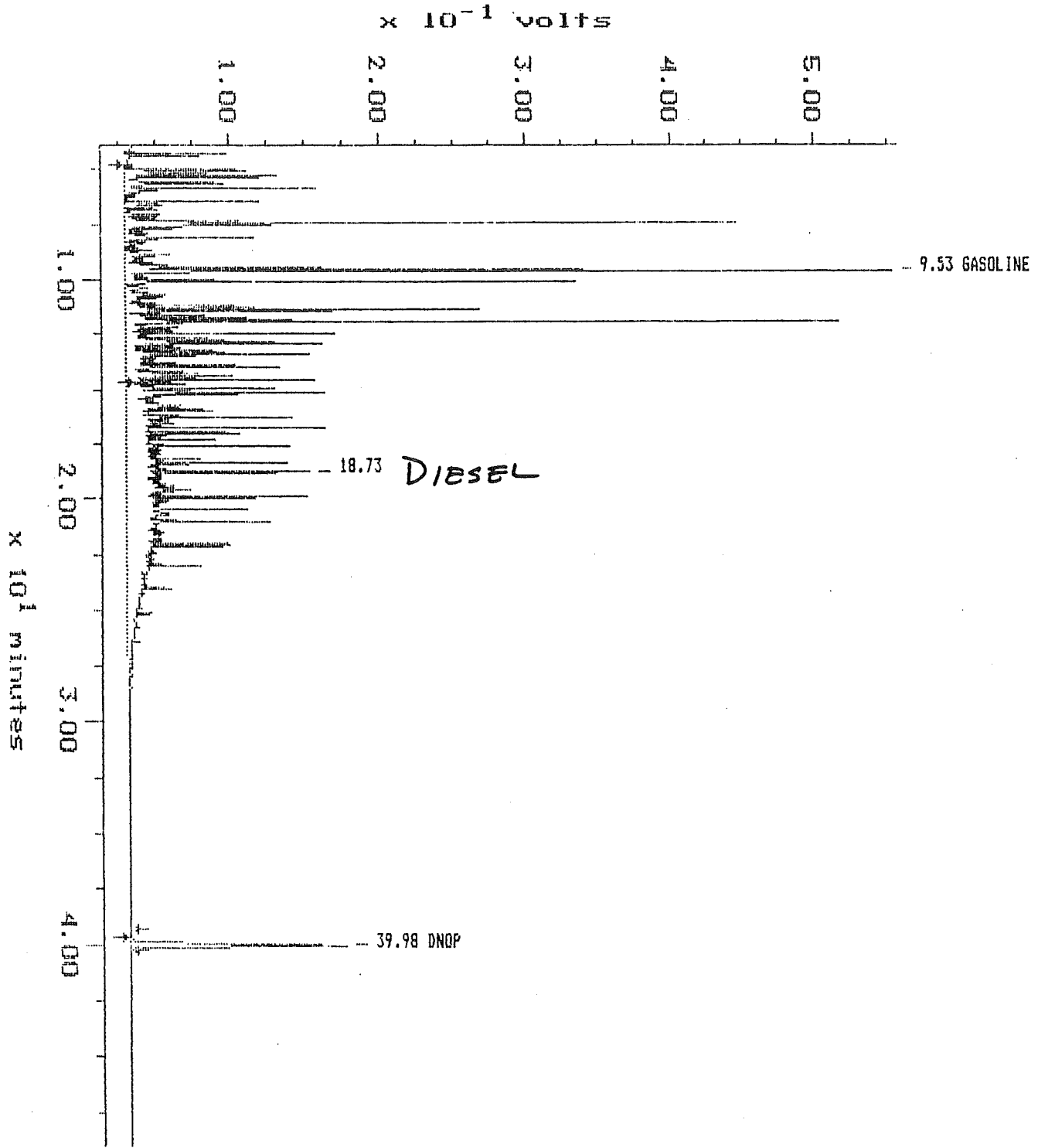
Sample: S8909-157-50.05 Channel: FID REAR-A
Acquired: 09-OCT-89 17:54 Method: C:\MAX\DATA4\RAQBTX22
Dilution: 1 : 20.000
Comments: DIESEL AND BTEX PROGRAM FOR DIESEL/BTXE STDS, HS, MSD, FPB, FPBN

Filename: 9RF01743
Operator: RWM



Sample: 88909-157-6 Channel: FID REAR-A
Acquired: 05-OCT-89 18:32 Method: C:\MAX\DATA4\RAQBTX21
Comments: DIESEL AND BTEX PROGRAM FOR DIESEL/BTEX STDS, MS, MSD, FPB, FPBN

Filename: 9RF01670
Operator: RWH



89091517

Applied Geotechnology Inc.
Geotechnical Engineering
Geology & Hydrogeology



Chain of Custody

PAGE 1 OF 1

PROJECT NAME Gull / Truck City

PROJECT NUMBER 15256.049

LOCATION 1731 Old Highway 95 South
MT. Vernon, WA.

SAMPLER (Signature)
[Signature]

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	ANALYSIS REQUEST																				
					GC/MS 625/8270	GC/MS 624/8240	PESTICIDES/PCBS 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS 604/8040	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	BETX	6015												
MW-1	7/24/05	6:50 PM	140	-1										X	X										
MW-2		6:46 PM		-2										X											
MW-4		0710 PM		-3										X											
MW-5		7:20 PM		-4										hold for further instructions											
B-1-10.2	7/27/05	0735	soil	-5										X											
B-5-7.0	7/23/05	1005	soil	-4										X											
B-7-9.0	7/29/05	3:20 PM	soil	-1										X											
B-4-12.5	7/23/05	9:00	soil	-8										X											

RELINQUISHED BY			RELINQUISHED BY			RELINQUISHED BY		
(Signature)	(Time)	(Date)	(Signature)	(Time)	(Date)	(Signature)	(Time)	(Date)
[Signature]	1:30 PM	7/27/05	[Signature]			[Signature]		
[Signature]			[Signature]			[Signature]		

RECEIVED BY			RECEIVED BY			RECEIVED BY		
(Signature)	(Time)	(Date)	(Signature)	(Time)	(Date)	(Signature)	(Time)	(Date)
[Signature]			[Signature]			[Signature]		
[Signature]			[Signature]			[Signature]		

SHIPPING INFORMATION				SAMPLE RECEIPT BY LAB			
Total No. of Containers	Chain of Custody Seals	Shipping I.D. No.	Date Shipped	Total No. of Containers	Chain of Custody Seals	Rec'd Good Condition/Cold	Conforms to Record
				12	12	045	045
Shipped Via:				Lab No.	Date Received		
				89091517	9/29/09		

SPECIAL INSTRUCTIONS/COMMENTS:

Normal TAT

Rev BETX 1st then 8015

