EMCON
Northwest, Inc.

TEXACO STATION #63232003
KING Co / Seattle
LUST # 2298

18912 North Creek Parkway • Suite 210 • Bothell, WA 98011-8016 • Office (206) 485-5000 • FAX (206) 486-9766

RD
SR - 4/22/96

May 7, 1992
Project U68-13.02

Mr. Mike Condon
Texaco Environmental Services
3400 188th Street S.W., Suite 630
Lynnwood, Washington 98037

Re: Quarterly Ground Water Sampling Report
Texaco Service Station
8701 Greenwood Avenue North
Seattle, Washington

Dear Mr. Condon:

EMCON Northwest, Inc., is pleased to present the results of the ground water sampling and monitoring activities conducted for the period of November 21, 1991, through March 6, 1992, at the Texaco service station located at 8701 Greenwood Avenue North in Seattle, Washington. All work was performed in accordance with our Contract Change Order, dated November 18, 1991, and our proposal for ground water monitoring dated March 4, 1992.

BACKGROUND

The site is an active Texaco service station located at 8701 Greenwood Avenue North in Seattle, Washington (Figure 1). Ground water monitoring wells were installed at the site in March 1991 as part of a pre-sale site assessment to evaluate the type and extent of any contamination that might be present. A report entitled "Report on Initial Site Assessment" was prepared by Texaco Environmental Services and forwarded to the Washington State Department of Ecology in August 1991. Since August 1991, Texaco Environmental Services has been conducting monthly monitoring of ground water elevations and quarterly ground water sampling at the site.

TEXA/COND-LR.421/car:5

GROUND WATER SAMPLING

Ground water samples were collected from monitoring wells AGW-1, AGW-2, AGW-4, and AGW-5 on November 21, 1991, and March 6, 1992. Monitoring well locations are shown on Figure 2. Prior to sampling, the depth to ground water was measured in each well to the nearest 0.01 foot.

Before ground water samples were collected, each well was visually checked for the presence of free-floating petroleum product with a clear PVC bailer. No floating product or sheen was observed in any of the wells at the time of sampling. All field sampling data were recorded on Field Sampling Data Sheets presented in Appendix A.

At least three casing volumes of ground water were purged with a peristaltic pump or disposable bailer before collecting ground water samples. Ground water temperature, pH, and specific conductance were measured after purging each casing volume. These data are provided in Table 1. Ground water samples were collected when the parameters stabilized to within 10 percent of the previous reading.

Ground water samples were collected using disposable PVC bailers. Nylon line was used to lower the bailer in each well, with new line and a new bailer used for each well. Samples were transferred to laboratory-supplied containers, stored in a chilled cooler, and transported under standard chain-of-custody procedures to Columbia Analytical Services, Inc., in Bothell, Washington, for analyses.

GROUND WATER CONDITIONS

Depth to ground water was measured in each well on November 21 and December 18, 1991, and on March 6, 1992. Depth-to-water measurements were converted to relative ground water elevations using previous survey data for the top of each well casing. Depth-to-water measurements and relative ground water elevation data are provided in Table 2. Relative ground water elevation (potentiometric) maps were prepared and the ground water gradients were evaluated for each date (Figures 3A, 3B, and 3C). The direction of the ground water gradient was toward the southwest on all dates monitored.

TPH-as-gasoline -as-other

LABORATORY ANALYSES

Ground water samples from all wells were submitted for analyses for total petroleum hydrocarbons (TPH) as gasoline and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Methods 5030/8020/8015 Modified and total lead by EPA Method 7421. Duplicates and field blank samples were submitted for analyses for TPH as gasoline and BTEX by EPA Methods 5030/8020/8015 Modified to test quality control procedures. In addition, ground water samples from AGW-4 and AGW-5 were analyzed for TPH as diesel and TPH as other by EPA Methods 3510/8015 Modified, and ethylene glycol by EPA Method 8015 Modified. A ground water sample collected from AGW-4 was analyzed for total coliform by SM Method 9221B.

LABORATORY ANALYTICAL RESULTS

Results of the ground water analyses, including those of all previous sampling episodes, are presented in Table 1. Benzene concentrations measured at each well from April 1991 through March 1992 are shown on Figure 4. Copies of the laboratory reports and chain-of-custody forms for the November 21, 1991, and March 6, 1992, sampling events are included in Appendix B.

Ground water samples collected November 21, 1991, contained benzene concentrations that exceeded the Model Toxics Control Act (MTCA)[1], Method A cleanup level in three of four wells (AGW-1, AGW-2, and AGW-4). MTCA Method A cleanup levels were also exceeded for toluene, ethylbenzene, total xylenes, and TPH as gasoline in AGW-1 and AGW-2, and toluene and total xylenes in AGW-4. Total coliform bacteria were detected at 110 organisms per 100 milliliters in the AGW-4 ground water sample. TPH as other concentrations exceeded the MTCA Method A cleanup level in AGW-2.

Ground water samples collected March 6, 1992, contained benzene concentrations that exceeded the MTCA Method A cleanup level in three of four wells (AGW-1, AGW-2, and AGW-4). The MTCA Method A cleanup levels were also exceeded for toluene, ethylbenzene, and total xylenes in

[1] Chapter 173-340 WAC, "The Model Toxics Control Act Cleanup Regulation, Method A Cleanup Levels." Amended February 1991.

AGW-1 and AGW-2, and for toluene in AGW-4. TPH as gasoline concentrations exceeded the MTCA Method A cleanup level in samples collected from AGW-1 and AGW-2. TPH as other concentrations exceeded the MTCA Method A cleanup level in the sample collected from AGW-2; however, the duplicate sample collected from AGW-2 contained TPH as other concentrations that were below the MTCA Method A cleanup level. The TPH as other concentrations from the March 6, 1992, sampling event were initially quantified using a diesel standard by Columbia Analytical Services, Inc. Subsequent review of the sample chromatographs indicated that the analytical results more closely resembled heavier weight hydrocarbons. The ground water sample analytical results were quantified again by Washington Department of Ecology Method WTPH-D using 30-weight motor oil as a standard and characterized as TPH as other.

Total coliform bacteria was not detected in the AGW-4 ground water sample. Ethylene glycol was not detected in samples collected from AGW-4 or AGW-5 on March 6, 1992.

CONCLUSIONS

The increase in dissolved hydrocarbon concentrations, beginning with the August 1991 sampling results, is probably due to a leak in the vicinity of the unleaded tank pump turbine in July 1991. The leak has been repaired. Except for samples collected from monitoring well AGW-2, dissolved hydrocarbon concentrations generally decreased from November 1991 to March 1992. Ground water samples collected from AGW-2 in March 1992 had concentrations of toluene, ethylbenzene, total xylenes, and TPH as gasoline that were higher than in the November 1991 sampling event.

Off-site monitoring well locations are being evaluated to assess potential off-site migration of the dissolved hydrocarbon plume.

We appreciate the opportunity to be of assistance to you on this project. If you have any questions or if we can be of further assistance to you, please call.

Sincerely,

EMCON Northwest, Inc.

Michael D. Noll, R.G.
Project Manager

David W. Ashcom, P.E.
Director, Hydrocarbon Services

Enclosures:

Figure 1	-	Site Location Map
Figure 2	-	Monitoring Well Location Map
Figure 3A	-	Potentiometric Surface Map — 11/21/91
Figure 3B	-	Potentiometric Surface Map — 12/18/91
Figure 3C	-	Potentiometric Surface Map — 03/06/92
Figure 4	-	Benzene in Ground Water
Table 1	-	Ground Water Sample Chemical Analyses
Table 2	-	Survey and Ground Water Elevation Summary
Appendix A	-	Field Sampling Data Sheets
Appendix B	-	Laboratory Reports and Chain-of-Custody Forms

ALLEY

CATCH BASIN

CATCH BASIN

W.O. TANK

F.O. TANK

AGW-4

STATION BUILDING

AGW-2

EDGE OF PAVING

PLANTER

TANK PIT DEWATERING PUMP

PUMP ISLAND

87th ST.

CATCH BASIN

EXISTING TANKS 4-10,000 GAL.

AGW-1

O/W SEPERATOR

AGW-5

PUMP ISLAND

CONC. SLAB

CANOPY

AGW-3

PLANTER

PLANTER

EDGE OF PAVING

GREENWOOD AVE. NO.

LEGEND

AGW-1 MONITORING WELL LOCATION AND WELL NUMBER

AGW-3 ABANDONED MONITORING WELL LOCATION AND WELL NUMBER

N

0 20 40

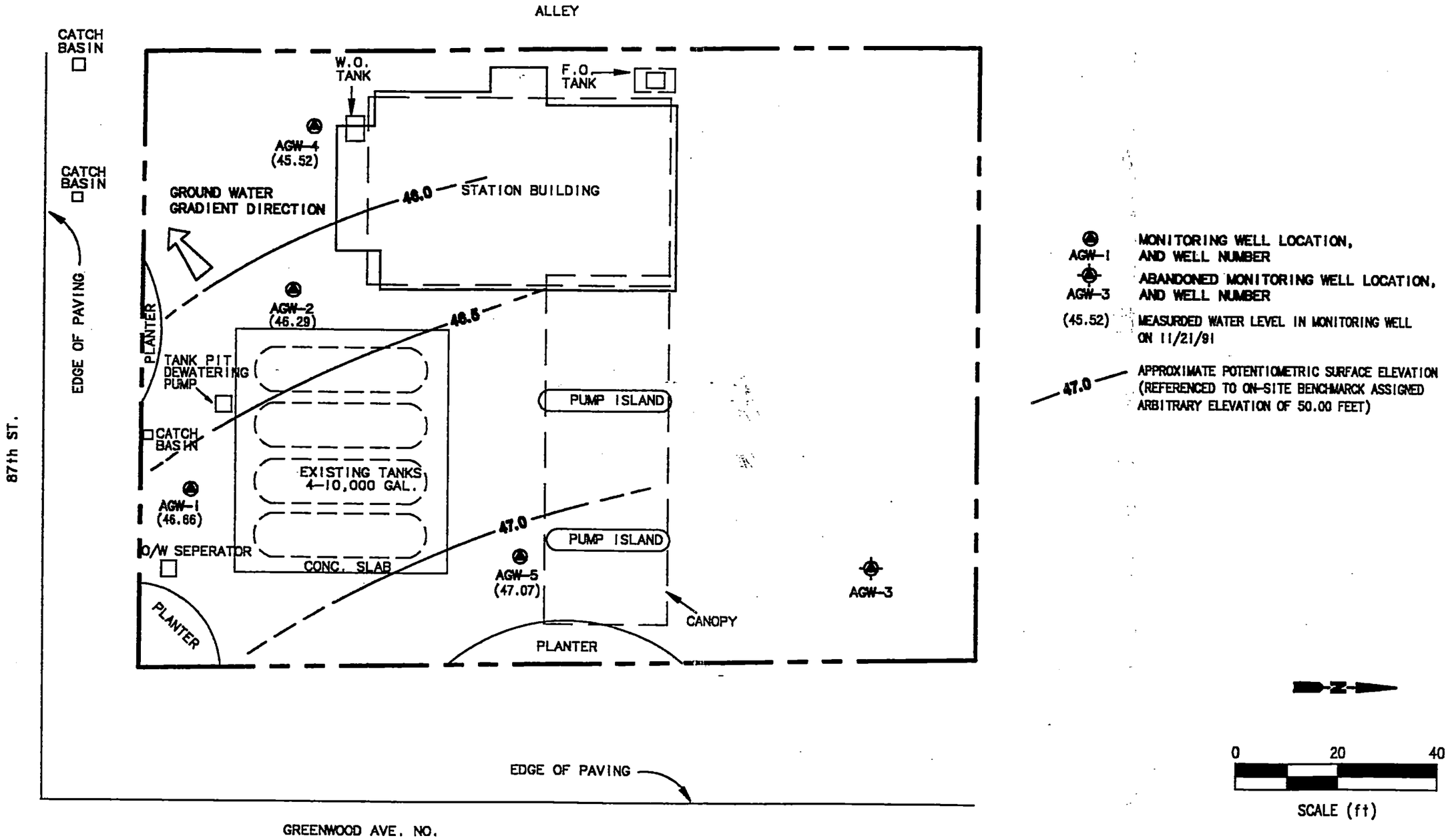
SCALE (ft)

Emcon Northwest, Inc.

DATE 3/3
DWN. KLM
REV.
APPR. MDN
PROJECT NO.
U681302

Figure 2
87th ST. & GREENWOOD AVE. NO.,
SEATTLE, WASHINGTON
MONITORING WELL LOCATION MAP

TEXACO U6800C15 5/5/92

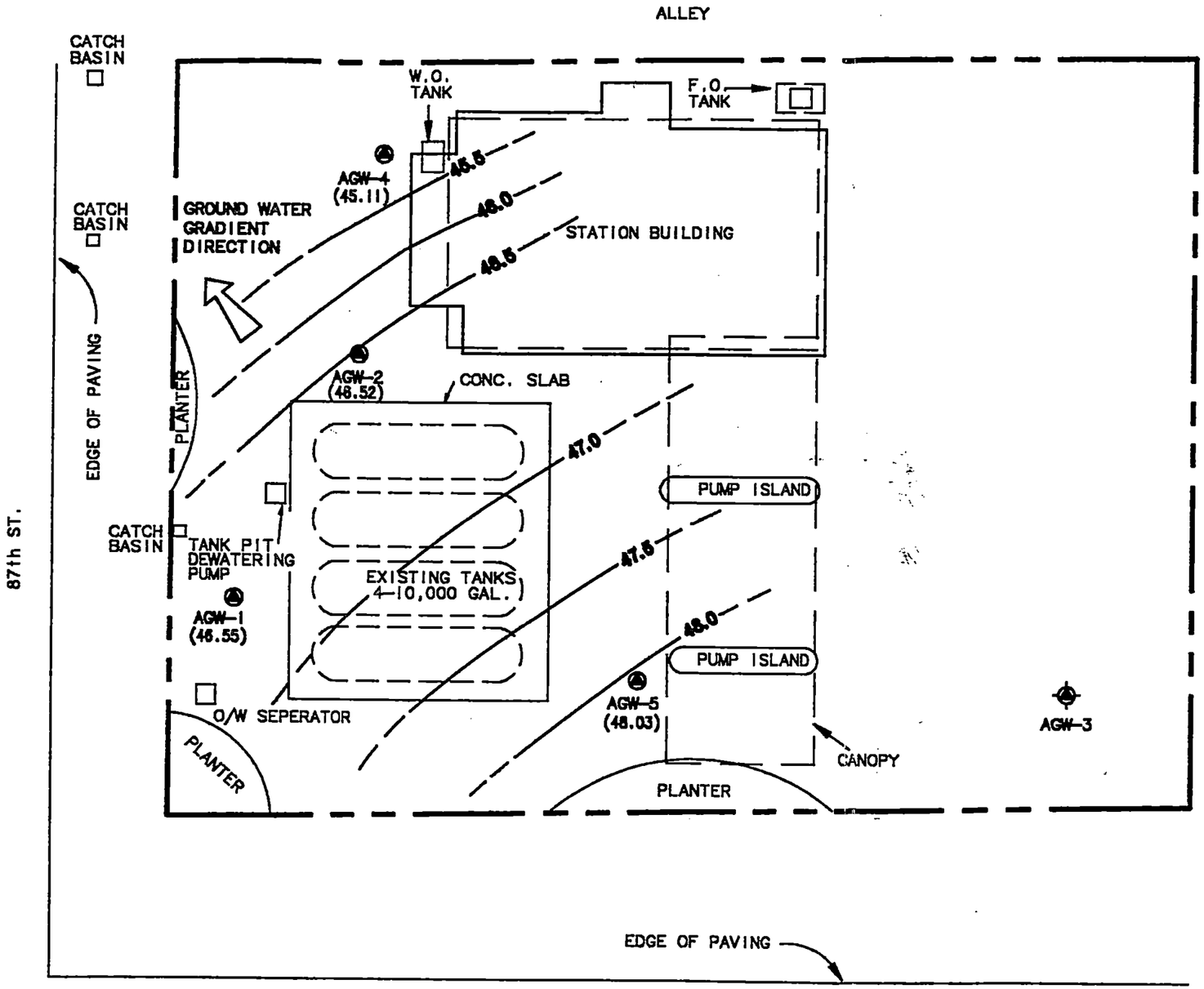


EMCON Northwest, Inc.

DATE 3/3
DWN. JBG
REV.
APPR. MDN
PROJECT NO.
U681301

Figure 3A
87th ST. & GREENWOOD AVE. NO.,
SEATTLE, WASHINGTON
POTENTIOMETRIC SURFACE MAP 11/21/91

TEXACO U6800C12 4-21-92



LEGEND

- AGW-1 — MONITORING WELL LOCATION, AND WELL NUMBER
- AGW-3 — ABANDONED MONITORING WELL LOCATION, AND WELL NUMBER
- (45.11) — MEASURE WATER LEVEL IN MONITORING WELL ON 12/18/91
- 47.0 — APPROXIMATE POTETIOMETRIC SURFACE ELEVATION (REFERENCED TO ON-SITE BENCHMARK ASSIGNED ARBITRARY ELEVATION OF 50.00 FEET)

N

0 20 40

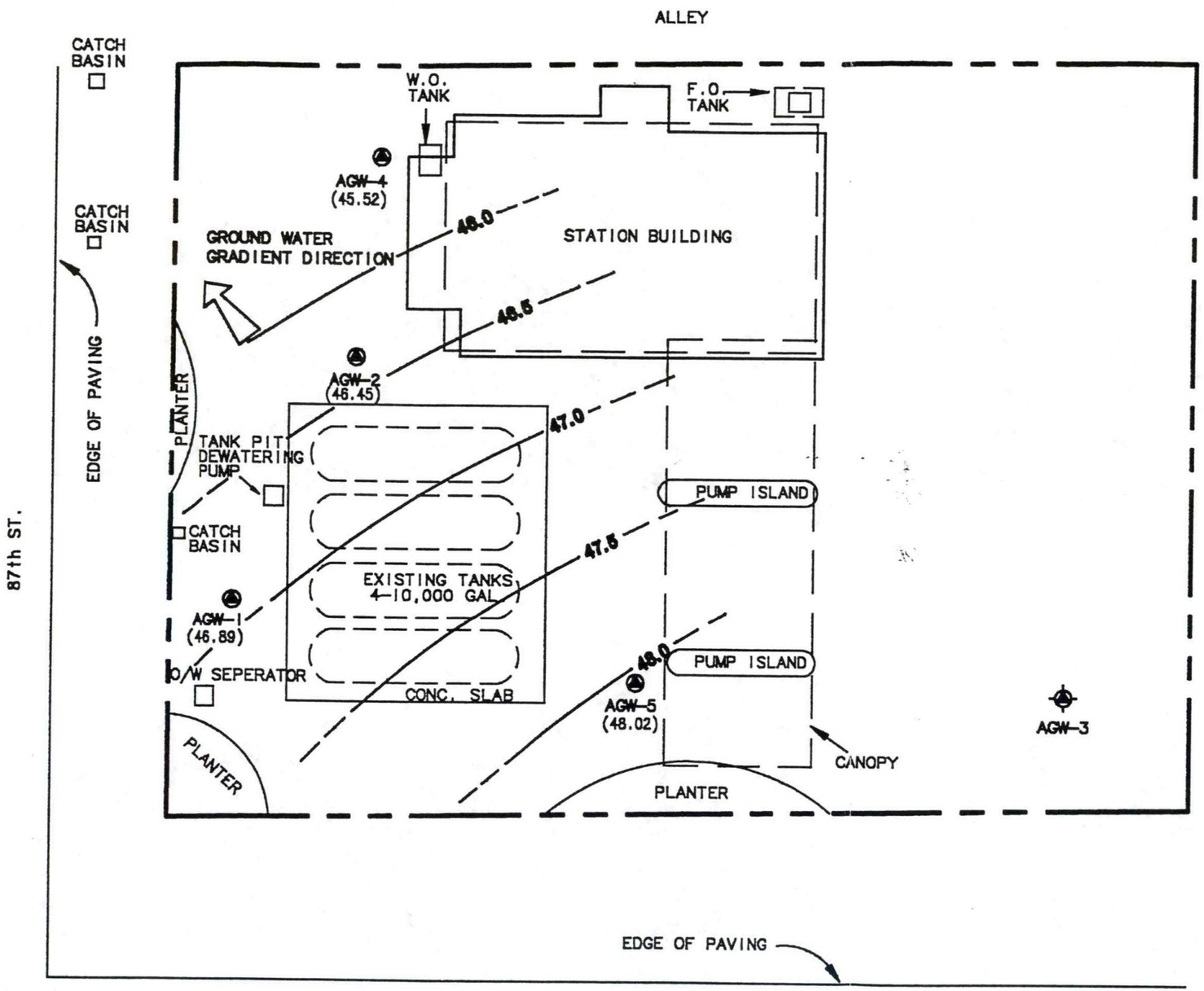
SCALE (ft)

EMCON Northwest, Inc.

DATE 3/3
DWN. KLM
REV.
APPR. MDN
PROJECT NO.
U681301

Figure 3B
87th ST. & GREENWOOD AVE. NO.,
SEATTLE, WASHINGTON
POTENTIOMETRIC SURFACE MAP 12/18/91

TEXACO U6800C13 5-5-92



LEGEND

AGW-1 — MONITORING WELL LOCATION, AND WELL NUMBER

AGW-3 — ABANDONED MONITORING WELL LOCATION, AND WELL NUMBER

(45.52) — MEASURED WATER LEVEL IN MONITORING WELL ON 3/6/92

47.5 — APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION (REFERENCED TO ON-SITE BENCHMARK ASSIGNED ARBITRARY ELEVATION OF 50.00 FEET)

N

0 20 40

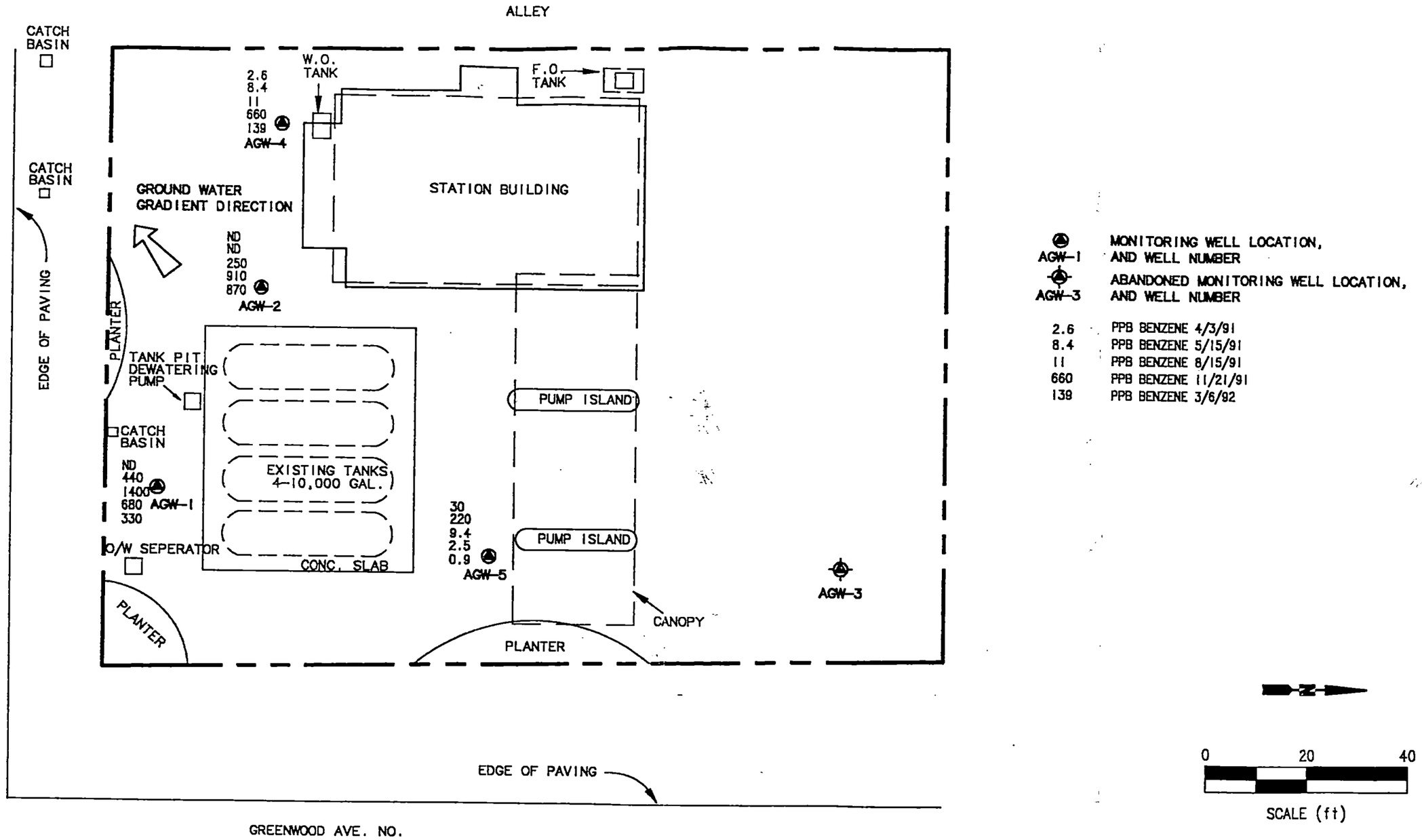
SCALE (ft)

EMCON Northwest, Inc.

DATE 3/3
DWN. KLM
REV.
APPR. MDN
PROJECT NO.
U681301

Figure 3C
87th ST. & GREENWOOD AVE. NO.,
SEATTLE, WASHINGTON
POTENTIOMETRIC SURFACE MAP 3/6/92

TEXACO U6800C14 5-5-92



AGW-1 — MONITORING WELL LOCATION, AND WELL NUMBER

AGW-3 — ABANDONED MONITORING WELL LOCATION, AND WELL NUMBER

2.6	PPB BENZENE 4/3/91
8.4	PPB BENZENE 5/15/91
11	PPB BENZENE 8/15/91
660	PPB BENZENE 11/21/91
139	PPB BENZENE 3/6/92

N

0 20 40

SCALE (ft)

Emcon Northwest, Inc.

DATE 3/3
DWN. KLM
REV.
APPR. MDN
PROJECT NO.
U681301

Figure 4
87th ST. & GREENWOOD AVE. NO.,
SEATTLE, WASHINGTON
BENZENE IN GROUND WATER, PPB

TEXACO U6800C15 4/21/92

Columbia Analytical Services, Inc.

March 24, 1992

Mike Condon
Texaco Environmental Services
3400 188th Street SW
Suite 630
Lynnwood, WA 98037

Re: Texaco - Greenwood/Project #PU68.10

Dear Mike:

Enclosed are the results of the samples submitted to our Bothell laboratory on March 6, 1992. For your reference, this service request has been assigned our work order number B920132.

All analyses were performed in accordance with both Washington State Department of Ecology Accreditation procedures and our laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Michael C. Higgins
Laboratory Manager

MCH/bdr

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	Texaco - Greenwood	**Work Order #:**	B920132
Sample Matrix:	Water		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/Modified 8015
µg/L (ppb)

Sample Name:		01-03-06-92	02-03-06-92	04-03-06-92
Lab Code:		B0132-1	B0132-2	B0132-3
Date Analyzed:		03/12/92	03/12/92	03/11/92
Analyte	MRL			
Benzene	0.5	330	870	139
Toluene	1	3,200	3,700	182
Ethylbenzene	1	1,400	760	3
Total Xylenes	1	8,700	4,900	18
TPH as Gasoline	50	48,000	24,000	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by _____ Date 920324

18912 North Creek Parkway, Suite 118 • Bothell, WA 98011 • 206/486-6983 • Fax 206/486-7695

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	Texaco - Greenwood	**Work Order #:**	B920132
Sample Matrix:	Water		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/Modified 8015
µg/L (ppb)

Sample Name:		05-03-06-92	03-03-06-92	06-03-06-92
Lab Code:		B0132-4	B0132-5	B0132-6
Date Analyzed:		03/11/92	03/12/92	03/11/92
Analyte	**MRL**			
Benzene	0.5	0.9	333	ND
Toluene	1	ND	3,200	ND
Ethylbenzene	1	ND	1,400	ND
Total Xylenes	1	ND	8,900	ND
TPH as Gasoline	50	ND	48,000	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by _____ Date 920324

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	Texaco - Greenwood	**Work Order #:**	B920132
Sample Matrix:	Water		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/Modified 8015
µg/L (ppb)

Sample Name:		07-03-06-92	08-03-06-92	Method Blank
Lab Code:		B0132-7	B0132-8	B0132-MB
Date Analyzed:		03/11/92	03/12/92	03/11/92
Analyte	MRL			
Benzene	0.5	ND	840	ND
Toluene	1	ND	3,500	ND
Ethylbenzene	1	ND	730	ND
Total Xylenes	1	ND	4,700	ND
TPH as Gasoline	50	ND	23,000	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by _____ Date 920324

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	Texaco - Greenwood	**Date Extracted:**	03/11/92
Sample Matrix:	Water	**Date Analyzed:**	03/14/92
		Work Order #:	B920132

Hydrocarbon Scan
EPA Methods 3510/Modified 8015
µg/L (ppb)

Sample Name	Lab Code	MRL	Diesel	Other♦
01-03-06-92	B0132-1	50	ND	ND
02-03-06-92	B0132-2	50	1,380	ND
04-03-06-92	B0132-3	50	570	ND
05-03-06-92	B0132-4	50	ND	ND
08-03-06-92	B0132-8	50	960	ND
Method Blank	B0132-MB	50	ND	ND

MRL Method Reporting Limit
♦ Quantitated using hydraulic oil as a standard. The MRL for this product is four times the listed MRL.
ND None Detected at or above the method reporting limit

Approved by _____ Date 920324

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COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	Texaco - Greenwood	**Date Analyzed:**	03/11,12/92
Sample Matrix:	Water	**Work Order #:**	B920132

QA/QC Report
Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/Modified 8015

Sample Name	Lab Code	Percent Recovery 4-Bromofluorobenzene
01-03-06-92	B0132-1	102
02-03-06-92	B0132-2	103
04-03-06-92	B0132-3	99
05-03-06-92	B0132-4	100
03-03-06-92	B0132-5	103
06-03-06-92	B0132-6	97
07-03-06-92	B0132-7	99
08-03-06-92	B0132-8	102
Method Blank	B0132-MB	100
	CAS Acceptance Criteria	60-120

TPH Total Petroleum Hydrocarbons

Approved by _____ Date 920324

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Texaco Environmental Services
Project: Texaco - Greenwood
Sample Matrix: Water

Date Received: 03/06/92
Date Analyzed: 03/11/92
Work Order #: B920132

QA/QC Report
Matrix Spike/Duplicate Matrix Spike Summary
BTEX
EPA Methods 5030/8020
µg/L (ppb)

Sample Name: Batch QC
Lab Code: B0129-1

Analyte	Spike Level	Sample Result	Spike Result		Percent Recovery		CAS Acceptance Criteria	Relative Percent Difference
			MS	DMS	MS	DMS		
Benzene	200	ND	203	204	102	102	39-150	<1
Toluene	200	ND	209	206	105	103	46-148	2
Ethylbenzene	200	ND	205	205	103	103	32-160	<1

ND None Detected at or above the method reporting limit

Approved by _____ Date 920324

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COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	Texaco - Greenwood	**Date Extracted:**	03/11/92
Sample Matrix:	Water	**Date Analyzed:**	03/14/92
		Work Order #:	B920132

QA/QC Report
Surrogate Recovery Summary
Hydrocarbon Scan
EPA Methods 3510/Modified 8015

Sample Name	Lab Code	Percent Recovery *p*-Terphenyl
01-03-06-92	B0132-1	89
02-03-06-92	B0132-2	93
04-03-06-92	B0132-3	92
05-03-06-92	B0132-4	92
08-03-06-92	B0132-8	81
Laboratory Control Sample	B0132-LCS	83
Laboratory Control Sample	B0132-DLCS	84
Method Blank	B0132-MB	87
	CAS Acceptance Criteria	66-120

Approved by _____ Date 920324

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Texaco Environmental Services
Project: Texaco - Greenwood
Sample Matrix: Water

Date Extracted: 03/11/92
Date Analyzed: 03/14/92
Work Order #: B920132

QA/QC Report
Laboratory Control Sample/Duplicate Laboratory Control Sample Summary
Hydrocarbon Scan
EPA Methods 3510/Modified 8015
µg/L (ppb)

Sample Name: Laboratory Control Sample

Analyte	Spike Level LCS	Spike Level DLCS	Spike Result LCS	Spike Result DLCS	Percent Recovery LCS	Percent Recovery DLCS	EPA Acceptance Criteria	Relative Percent Difference
Diesel	1,000	1,000	916	867	92	87	--	6

Approved by _____ Date 920324

ANALYSIS REPORT

AMTEST

AmTest Inc.
Professional Analytical Services
14603 N.E. 87th St.
Redmond, WA 98052
Fax: 206 883 3495
Tel: 206 885 1664

Columbia Analytical Services
18912 N. Creek Parkway
Suite 118
Bothell, WA 98011
Attention: Michael Higgins

Date Received: 3/ 9/92
Date Reported: 3/12/92

Project Name: PU68.10
Date Sampled: 3/ 6/92

PARAMETER	UNITS	RESULT
92-A005027		
Client ID: 04-03-06		
Total Coliforms	CFU/100ml	< 2
Fecal Coliforms	CFU/100ml	< 2

Reported by: Robin Forgey
Robin Forgey

Columbia Analytical Services, Inc.

March 19, 1992

Michael Condon
Texaco Environmental Services
550 Kirkland Way, Suite 100
Kirkland, WA 98033

Re: **Project #PU68.10/B920132**

Dear Michael:

Enclosed are the results of the samples submitted to our lab on March 6, 1992. For your reference, these analyses have been assigned our work order number K921480B.

All analyses were performed in accordance with our laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Colin Elliott

Colin B. Elliott
Senior Project Chemist

CBE/krh

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Texaco Environmental Services
Project: #PU68.10
Sample Matrix: Water

Date Received: 03/06/92
Date Analyzed: 03/18/92
Work Order #: K921480B

Ethylene Glycol
EPA Method Modified 8015
mg/L (ppm)

Sample Name:			04-03-06-92	05-03-06-92	Method Blank
Lab Code:			K1480-3	K1480-4	K1480-MB
Analyte	**Method**	**MRL**			
Ethylene Glycol	8015X	25	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by John Elliott Date 3/19/92

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Texaco Environmental Services
Project: #PU68.10
Sample Matrix: Water

Date Received: 03/06/92
Date Analyzed: 03/14/92
Work Order #: K921480B

QA/QC Report
Duplicate Summary
Total Lead
EPA Method 7421
µg/L (ppb)

Sample Name	Lab Code	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
01-03-06-92	K1480-1	2	ND	ND	ND	--

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by John Elliott Date 3/19/92

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Texaco Environmental Services
Project: #PU68.10
Sample Matrix: Water

Date Received: 03/06/92
Date Analyzed: 03/14/92
Work Order #: K921480B

QA/QC Report
Matrix Spike Summary
Total Lead
EPA Method 7421
µg/L (ppb)

Sample Name	Lab Code	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
01-03-06-92	K1480-1	2	20	ND	21	105	75-125

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Glenn Elliott Date 3/19/92

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	#PU68.10	**Date Analyzed:**	03/18/92
Sample Matrix:	Water	**Work Order #:**	K921480B

QA/QC Report
Matrix Spike Summary
Ethylene Glycol
EPA Method Modified 8015
mg/L

Sample Name: 04-03-06-92
Lab Code: K1480-3

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery
Ethylene Glycol	50	ND	47	94

ND None Detected at or above the method reporting limit

Approved by Colin Elliott Date 3/19/92

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Texaco Environmental Services
Project: #PU68.10
Sample Matrix: Water

Date Analyzed: 03/18/92
Work Order #: K921480B

QA/QC Report
Laboratory Control Sample Summary
Ethylene Glycol
EPA Method Modified 8015
mg/L (ppm)

Sample Name: Laboratory Control Sample

Analyte	Spike Level	Spike Result	Percent Recovery
Ethylene Glycol	50	40	80

Approved by Glenn Elliott Date 3/19/92

Sweet-Edwards / EMCON, Inc.
Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE 3-6-92 PAGE 1 OF

PROJECT PU68,10 #

CLIENT INFO.
CONTACT Mike Condon
ADDRESS Texaco Environmental Services
TELEPHONE#
SAMPLERS NAME Bodle PHONE# 485-5000
SAMPLERS SIGNATURE T. Bodle

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K	BTEX/TPH gas	TPH-D	TOTAL Pb	Ethylene Glycol	total coliform		NUMBER OF CONTAINERS
1. 01-03-06-92		1402																X	X	X				
2. 02-03-06-92		1410																X	X	X				
3. 04-03-06-92		1510																X	X	X	X	X		4m
4. 05-03-06-92		1352																X	X	X	X			TEST
5. 03-03-06-92		11:02																X						3/6 MLH
6. 06-03-06-92		1119																X						
7. 07-03-06-92		?																X						
8. 08-03-06-92		1415																X	X					

Relinquished By-Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
T Bodle	Barbara D Bogan			
Signature: T. Bodle	Signature: Barbara D. Bogan	Signature	Shipping I.D. No.	Total No. of Containers
Printed Name: EMCON	Printed Name: CAS/Bothell	Printed Name	VIA	Chain of Custody Seals
Firm: 3-6-92 16:20	Firm: 03/09/92 1125	Firm	Project	Received in good condition
Date/Time	Date/Time	Date/Time		LAB NO. B92-0132
Received By	**Received By**	**Received By**	**SPECIAL INSTRUCTIONS/COMMENTS**	
Signature: Stan Spurgeon	Signature	Signature	VOA Refrig J	
Printed Name: CAS	Printed Name	Printed Name		
Firm: 3-6-92 1620	Firm	Firm		
Date/Time	Date/Time	Date/Time		

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-F/E 400-05

Sweet-Edwards / EMCON, Inc.
Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Laboratory Analysis Request

DATE 3-6-92 PAGE 1 OF

PROJECT PUG8,10 #

CLIENT INFO.
CONTACT Mike Condon
ADDRESS Texaco Environmental Services
TELEPHONE#
SAMPLERS NAME Bodle PHONE# 485-5000
SAMPLERS SIGNATURE T. Bodle

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K	BTEX/TPH gro	TPH-D	TOTAL Pb	Ethylene Glycol	total coliform		NUMBER OF CONTAINERS
1. 01-03-06-92		1402																X	X	X				
2. 02-03-06-92		1410																X	X	X				
3. 04-03-06-92		1510																X	X	X	X	X		Am TEST
4. 05-03-06-92		1352																X	X	X	X			
5. 03-03-06-92		1402																X						3/6 MLH
6. 06-03-06-92		1119																X						
7. 07-03-06-92		?																X						
8. 08-03-06-92		1415																X	X					

Relinquished By Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
T Bodle	Barbara D Bogan	Signature		
Signature T. Bodle	Barbara D. Bogan	Printed Name	Shipping I.D. No.	Total No. of Containers
Printed Name EMCON	Printed Name CAS/Bothell	Firm	VIA	Chain of Custody Seals
Firm 3-6-92 16:20	Firm 03/09/92 1125	Date/Time	Project	Received in good condition
Date/Time	Date/Time			LAB NO. B92-0132
Received By Stan Spurgeon	Received By	Received By	SPECIAL INSTRUCTIONS/COMMENTS	
Signature Stan Spurgeon	Signature FRED ADAMS	Signature	VOA Refrig J	
Printed Name CAS	Printed Name CAS	Printed Name		
Firm 3-6-92 1620	Firm 3/10/92 1000	Firm		
Date/Time	Date/Time	Date/Time		

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-E/E 400-05

Columbia Analytical Services, Inc.

March 31, 1992

Mike Condon
Texaco Environmental Services
3400 188th Street SW
Suite 630
Lynnwood, WA 98037

Re: **Texaco - Greenwood/Project #PU68.10**

Dear Mike:

Please find enclosed revised WTPH-D results for work order number B920132.

All analyses were performed in accordance with both Washington State Department of Ecology Accreditation procedures and our laboratory's quality assurance program.

Please call if we can be of further assistance.

Respectfully submitted,

Columbia Analytical Services, Inc.

Michael C. Higgins
Laboratory Manager

MCH/bdr

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Texaco Environmental Services	**Date Received:**	03/06/92
Project:	Texaco - Greenwood	**Date Extracted:**	03/11/92
Sample Matrix:	Water	**Date Analyzed:**	03/14/92
		Work Order #:	B920132

Total Petroleum Hydrocarbons as Diesel and Oil
Washington DOE Method WTPH-D
µg/L (ppb)

		Diesel		Oil♦	
Sample Name	**Lab Code**	**MRL**	**Result**	**MRL**	**Result**
01-03-06-92	B0132-1	50	ND	200	ND
02-03-06-92	B0132-2	50	ND	200	1,100
04-03-06-92	B0132-3	50	ND	200	800
05-03-06-92	B0132-4	50	ND	200	ND
08-03-06-92	B0132-8	50	ND	200	900
Method Blank	B0132-MB	50	ND	200	ND

♦ Quantified using 30-weight motor oil as a standard.
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by: _____ Date 920331

Appendix A

FIELD SAMPLING DATA SHEETS

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

* Duplicate

LOCATION/ADDRESS 8701 Greenwood Ave.
PROJECT NAME Texaco Greenwood # 116B-13.01
CLIENT/CONTACT Mike Condon

Well or Surface Site Number AGW-1
Sample Designation AGW-1
Date, Time 11-21-91 1200
Weather partly cloudy, 30°F

HYDROLOGY MEASUREMENTS: multiplier = .653 gal/ft

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
dtw = 0.7'		11-21-91	oil/water interface probe
dtb = 19.4'			

WELL EVACUATION: P.V. = 12 gal.

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
36	3+	peristaltic pump	liquinox, d.i	11-21-91

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
8015M	11-21-91 12:00 p.m.	disp bailer	1 L	Amber		NO	HCl	yes	Non-Phosphatic detergent wash H2O rinse MeOH rinse Distilled H2O rinse
02/8015M	12:15		2-40ml	VOA		NO	HCl	yes	

FIELD WATER QUALITY TESTS: Measured with a Corning Check-mate pH / conductivity / temp.

Pore Vol. Number	pH	Conductivity **	Temp (°C)	Eh	time
1	6.92	--	13.9		11:35
2	7.02	--	13.8		11:45
3	6.95	--	13.6		12:00

NOTES:

Duplicate sample of this will designated as MW-10.

* Conductivity meter would not calibrate - displayed "E1" error, batteries were changed but did not make a difference

Bailed water contained a slight sulfur like (WCB) smell similar to AGW-4. Sample appeared clear w/no noticable odor AGW-1, recovers well. No measurable floating product or sheen.

Total # of Bottles: 7

Signature: Wendy Bannon

SEA-400-01

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS 8701 Greenwood Ave.
PROJECT NAME Texaco Greenwood # 1168-13.01
CLIENT/CONTACT Mike Coulon

Well or Surface Site Number AGW-2
Sample Designation AGW-2
Date, Time 11-21-91 1300
Weather partly cloudy, 50°F

HYDROLOGY MEASUREMENTS: multiplier = .653 gal/ft

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
dtw = 1.30		11-21-91	oil/water interface probe
dtb = 19.65			

WELL EVACUATION: P.V. = 12 gallons

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
36	3+	peristaltic pump	liquinox, d.i.	11-21-91

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
8015M	11-21-91 13:00	disp. bailer	1L	Amber		NO	HCl	yes	Non-Phosphatic detergent wash H2O rinse MeOH rinse Distilled H2O rinse
11-02/8015M	13:30 dup		2-40ml	VOA		NO	HCl	yes	

FIELD WATER QUALITY TESTS: Measured with a Corning Check-mate pH/conductivity/temp.

Pore Vol. Number	pH	Conductivity*	Temp (°C)	Eh	time			
1	6.62	--	13.5		12:55			
2	6.69	--	13.1		13:05			
3	6.85	--	13.3		13:15			

NOTES:

*Conductivity meter would not calibrate.
A form of iron precipitate existed on top of the water inside the casing. Slight hydrocarbon-like odor. Sample was clear with black suspended specs. AGW-2 recovers well. No measurable floating product or sheen.

Total # of Bottles: 3 Signature: Wendy Bannon

SEA-400-01

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS 8701 Greenwood Ave
PROJECT NAME Texaco Greenwood # 1068-13.01
CLIENT/CONTACT Mike Coucher

Well or Surface Site Number AGW-4
Sample Designation AGW-4
Date, Time 11-21-91 1357
Weather partly cloudy, 50°F

HYDROLOGY MEASUREMENTS: multiplier = .653 gal/ft

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
dtw = 2.45		11-21-91	oil/water interface probe
dtb = 19.70			

WELL EVACUATION: P.V. = 11 gal.

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
28.50	2½	disp. bailer		11-21-91

Surface Water Flow Speed ______ Measurement Method ______ Date, Time ______

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
8015M	11-21-91 13:57WB	disp. bailer	1L	Amber		no	HCl	yes
602/8015M	~~13:55~~		2-40ml	VOA		no	HCl	yes
Form			40ml	plastic bag		NO	~~no~~ std	yes

Sampler Cleaning Method: Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse

FIELD WATER QUALITY TESTS: Measured with a Corning Check-mate pH/conductivity/temp.

Pore Vol. Number	pH	Conductivity *	Temp (°C)	Eh	time
1	6.73	--	13.6		9:10
2	6.46	--	13.6		11:00
3 **	6.79	--	14.0		13:50

NOTES:

* Conductivity would not calibrate.
** Purged dry after 2½ pore volumes. We allowed the well to recharge and took a final parameter reading before collecting a sample.
Very strong ~~sulfur~~ hydrogen sulfide (WLB) smell, bailed water was luke-warm.
No measurable product floating thickness or sheen.
Water inside ~~casing~~ monument, WLB ~~was~~ bright green in color (possibly antifreeze)

Total # of Bottles: 4

Signature: Wendy Barnum

SEA-400-01

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS 8701 Greenwood Ave.
PROJECT NAME Texaco Greenwood # 11e8-1301
CLIENT/CONTACT Mike Coudal

Well or Surface Site Number AGW-5
Sample Designation AGW-5
Date, Time 11-21-91 1340
Weather partly cloudy, 50°F

HYDROLOGY MEASUREMENTS: multiplier = .653 gal/ft

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
dtw = 2.40'		11-21-91	0'i/Water interface probe
dtb = 19.50'			

WELL EVACUATION: P.V. = 11 gal.

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
28.50	2½	disp. bailer		11-21-91

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
0/8015M	11-21-91	disp. bailer	1L	Amber		no	HCl	yes	Non-Phosphatic detergent wash H2O rinse MeOH rinse Distilled H2O rinse
602/8015M	13:40		2-40ml	VOA		no	HCl	yes	

FIELD WATER QUALITY TESTS: Measured with a Corning Check-mate pH/conductivity/temp.

Pore Vol. Number	pH	Conductivity *	Temp °C	Eh	time
1	7.07	--	13.3		10:45
2	6.89	--	12.6		11:15
3**	7.17	--	12.6		13:35

NOTES:

* Conductivity meter would not calibrate.
** Purged dry after 2½ pore volumes. We allowed the well to recharge and took a final parameter reading before collecting a sample. Sample was brownish in color with sand particles. No noticable odor. No measurable floating product thickness or sheen.

Total # of Bottles: 3 Signature: Mindy Bauman

SEA-400-01

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data + duplicates =

LOCATION/ADDRESS 8701 Greenwood Ave North
PROJECT NAME Texaco Greenwood #468-10.02
CLIENT/CONTACT Mike Condon

Well or Surface Site Number AGW-1
Sample Designation 01-03-06-92
Date, Time 1402 3-6-92
Weather Cloudy

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
dtw = 0.47'			
dtb = 19.4			

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
50	4+			

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
01-06-92	1402 3-6-92	bail	(2) 40	VOA		no	HCl	Y	Non-Phosphatic detergent wash H2O rinse MeOH rinse Distilled H2O rinse
			(2) 40	VOA		no	HCl	Y	
			(1) 1000	amber		no	HCl	Y	
			(1) 1000	plastic		no	HCl	Y	

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Eh				
1	7.00	314	11.9		12:14			
2	7.88	322	12.1		12:22			
3	7.93	322	11.9		12:35			
4	7.19	325	12.1		12:50			

NOTES:

water above top of PVC casing - bailed out - water level visibly rising after well cap was removed - will remeasure all wells for W.L. 12.4 gal = casing vol
duplicate = 03-03-06-92 Gas/BTEX (4) 40ml VOA containers
fast recharge
Field Blank = 06-03-06-92

Total # of Bottles: 4 Signature: P Brady

SEA-400-01

Sweet-Edwards/EMCON, Inc.

18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS 8701 Greenwood Ave NORTH
PROJECT NAME TEXACO Greenwood #U68-13.02
CLIENT/CONTACT Mike Condon

Well or Surface Site Number AGW-2
Sample Designation 02-03-06-92
Date, Time 1410 3-6-92
Weather Cloudy

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
dtw = 1.14			
dtb = 19.65			

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
38	3+			

Surface Water Flow Speed ______ Measurement Method ______ Date, Time ______

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
03-06-92	3-6-92 13:52	bail	(2) 40	VOA		no	HCl	y	Non-Phosphatic detergent wash H2O rinse MeOH rinse Distilled H2O rinse
↓	↓		~~(2) 40~~	~~VOA~~		no	HCl	y	
			(1) 1000	~~steel~~ amber		no	HCl	y	
			(1) 16oz	plastic		no	HNO_3	y	

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Eh				
1	6.52	~~6~~ 606	12.4		1:20			
2	6.63	491	13.0		1:28			
3	6.75	447	13.5		1:38			

NOTES:

Water above top of PVC casing - bailed out brown froth on water surface (bio-growth?) 12.1 gal = casing vol Slightly cloudy + hydrocarbon-like odor fast recharge

Also collected 08-03-06-92 for Lab QA/QC (2) VOA and (1) 1l amber

Total # of Bottles: 4 Signature: P Brooks

SEA-400-01

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS 8701 Greenwood Avenue North
PROJECT NAME Texaco Greenwood #468-13.02
CLIENT/CONTACT Mike Condon

Well or Surface Site Number AGW-4
Sample Designation 04-03-06-92
Date, Time 1510 3-6-92
Weather Cloudy

HYDROLOGY MEASUREMENTS:

	(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
0909	~~2.52~~ dtw = 2.45			
	dtw = 11.70			

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
3-06-92	3-6-92 1510	bail	(2) 40	VOA		no	HCl	Y
			~~(2) 40~~	~~vial~~		no	HCl	Y
			(1) 1000	amber		no	HCl	Y
			(1) 1000	amber		no	HCl	Y
			(1) 1000	plastic		no	HNO_3	Y
			(1) bag	plastic		no		Y

Sample Cleaning Method: Non-Phosphatic detergent wash; H2O rinse; MeOH rinse; Distilled H2O rinse

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Eh				
1	6.74	341 µS	12.6					11:54
2	6.66	313 µS	13.5					13:12
	6.54	301	13.0					14:46

NOTES:

Water above top of PVC casing - bailed out - froth (brown) on water surface
11.3 gal = casing vol cloudy discharge - sewer odor very slow recharge

Total # of Bottles: 6 Signature: T. Bodle

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS 8701 Greenwood Avenue North
PROJECT NAME Texaco Greenwood #468-13.02
CLIENT/CONTACT Mike Carden
Well or Surface Site Number AGW-5
Sample Designation 05-03-06-92
Date, Time 1352 3-6-92
Weather Cloudy

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
~~1.58~~ dtw=1.45			
dtb= 11.50			

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
37	3+			

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
3-06-92	3-6-92 13:52		(2) 40	VOA		No	HCl	X	Non-Phosphatic detergent wash H2O rinse MeOH rinse Distilled H2O rinse
			~~(3) 40~~	~~VOA~~		No	HCl	Y	
			(1) 1000	Amber		No	HCl	Y	
			(1) 1000	amber		No	HCl	Y	
			(1) 1000	plastic		No	HNO_3	Y	

FIELD WATER QUALITY TESTS: Corning Checkmate #7

Pore Vol. Number	pH	Conductivity µS	Temp	Eh				
1	5.89	265	12.8		10:03			
2	6.32	266	11.9		10:20			
3	6.27	250	13.0		11:48			

NOTES:

Water above top of PVC casing - bailed out .. 4" well 0.653 gal/ft 11.5 gal = casing vol
hydrocarbon-like odor - Clear discharge slow recharge

Total # of Bottles: 5 Signature: P Brady

SEA-400-01

Appendix B

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

Columbia Analytical Services, Inc.

December 18, 1991

Mike Noll
Sweet-Edwards/EMCON, Inc.
18912 N Creek Parkway
Suite 210
Bothell, WA 98011

Re: **Texaco - Greenwood/Project #U68-13.01**

Dear Mike:

Enclosed are the results of the samples submitted to our lab on November 21, 1991. Preliminary results were telephoned on December 5, and were transmitted via facsimile on December 6, 1991. For your reference, these analyses have been assigned our work order number B916840.

All analyses were performed in accordance with our laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Charles Morgan for
Colin B. Elliott
Senior Project Chemist

CBE/tlt

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-106

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Sweet-Edwards/EMCON, Inc.	**Date Received:**	11/21/91
Project:	Texaco - Greenwood	**Date Extracted:**	11/25/91
Sample Matrix:	Water	**Date Analyzed:**	11/26/91
		Work Order #:	B916840

Hydrocarbon Scan
EPA Methods 3510/Modified 8015
µg/L (ppb)

Sample Name	Lab Code	MRL	Diesel	Other♦
AGW-1	B6840-1	50	ND	ND
AGW-2	B6840-2	50	ND	1,200
AGW-4	B6840-3	50	ND	2,040
AGW-5	B6840-4	50	ND	ND
AGW-10	B6840-5	50	ND	ND
Method Blank	B6840-MB	50	ND	ND

MRL Method Reporting Limit
♦ Quantitated using hydraulic oil as a standard. The MRL for this product is four times the listed MRL.
ND None Detected at or above the method reporting limit

Approved by Charles Morris Date 12/18/91

0-1101

317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Sweet-Edwards/EMCON, Inc.	**Date Received:**	11/21/91
Project:	Texaco - Greenwood	**Work Order #:**	B916840
Sample Matrix:	Water		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/Modified 8015
µg/L (ppb)

Sample Name:		AGW-1	AGW-2	AGW-4
Lab Code:		B6840-1	B6840-2	B6840-3
Date Analyzed:		12/03/91	12/03/91	12/03/91
Analyte	**MRL**			
Benzene	0.5	680	910	660
Toluene	1	6,400	1,300	700
Ethylbenzene	1	2,000	260	21
Total Xylenes	1	13,000	1,200	133
TPH as Gasoline	50	47,000	7,300	3,500

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit

Approved by Charles Morrow Date 12/18/91

00002

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Sweet-Edwards/EMCON, Inc.	**Date Received:**	11/21/91
Project:	Texaco - Greenwood	**Work Order #:**	B916840
Sample Matrix:	Water		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/Modified 8015
µg/L (ppb)

Sample Name:		AGW-5	AGW-10	Method Blank
Lab Code:		B6840-4	B6840-5	B6840-MB
Date Analyzed:		12/02/91	12/03/91	12/02/91
Analyte	**MRL**			
Benzene	0.5	2.5	710	ND
Toluene	1	ND	6,700	ND
Ethylbenzene	1	ND	2,100	ND
Total Xylenes	1	ND	14,000	ND
TPH as Gasoline	50	ND	49,000	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morris Date 12/18/91

00003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Sweet-Edwards/EMCON, Inc.	**Date Received:**	11/21/91
Project:	Texaco - Greenwood	**Date Test Started:**	11/22/91
Sample Matrix:	Water	**Date Test Ended:**	11/26/91
		Work Order #:	B916840

Total Coliform Bacteria
SM Method 9221B
organisms/100 mL

Sample Name	Lab Code	MRL	Result
AGW-4	K6840-3	2	110
Method Blank	K6840-MB	2	ND

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 12/18/91

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COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Sweet-Edwards/EMCON, Inc.	**Date Received:**	11/21/91
Project:	Texaco - Greenwood	**Date Analyzed:**	12/02,03/91
Sample Matrix:	Water	**Work Order #:**	B916840

QA/QC Report
Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/Modified 8015

Sample Name	Lab Code	Percent Recovery 4-Bromofluorobenzene
AGW-1	B6840-1	102
AGW-2	B6840-2	101
AGW-4	B6840-3	104
AGW-5	B6840-4	102
AGW-10	B6840-5	102
Method Blank	B6840-MB	103
	CAS Acceptance Criteria	60-120

TPH Total Petroleum Hydrocarbons

Approved by Charles Morrow Date 12/18/91

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COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Sweet-Edwards/EMCON, Inc.	**Date Received:**	11/21/91
Project:	Texaco - Greenwood	**Date Extracted:**	11/25/91
Sample Matrix:	Water	**Date Analyzed:**	11/26/91
		Work Order #:	B916840

QA/QC Report
Surrogate Recovery Summary
Hydrocarbon Scan
EPA Methods 3510/Modified 8015

Sample Name	Lab Code	Percent Recovery *p*-Terphenyl
AGW-1	B6840-1	73.6
AGW-2	B6840-2	71.3
AGW-4	B6840-3	72.3
AGW-5	B6840-4	77.8
AGW-10	B6840-5	70.1
AGW-1	B6840-1MS	70.8
AGW-1	B6840-1DMS	71.1
Method Blank	B6840-MB	77.1
	CAS Acceptance Criteria	66-120

Approved by Charles Morris Date 12/18/91

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COLUMBIA ANALYTICAL SERVICES, INC.

Client: Sweet-Edwards/EMCON, Inc.
Project: Texaco - Greenwood
Sample Matrix: Water

Date Received: 11/21/91
Date Extracted: 11/25/91
Date Analyzed: 11/26/91
Work Order #: B916840

QA/QC Report
Matrix Spike/Duplicate Matrix Spike Summary
Hydrocarbon Scan
EPA Methods 3510/Modified 8015
µg/L (ppb)

Sample Name: AGW-1
Lab Code: B6840-1

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria	Relative Percent Difference
Diesel	2,000	ND	1,440	1,130	72.0	56.5	55-110	24.1

ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 12/18/91

00007

Sweet-Edwards / EMCON, Inc.
Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE 11/21/91 PAGE 1 OF 1

PROJECT Greenwood - Texaco # 1108-13.01
CLIENT INFO.
CONTACT SE/E
ADDRESS Bothell, WA
TELEPHONE# 485-5000
SAMPLERS NAME Wendy Bamford PHONE# 485-5000
SAMPLERS SIGNATURE Wendy Bamford

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE
1. AGW-1	11/21/91	12:00	AGW-1	H_2O
2. AGW-2	11/21/91	13:00	AGW-2	H_2O
3. AGW-4	11/21/91	13:57	AGW-4	H_2O
4. AGW-5	11/21/91	13:40	AGW-5	H_2O
5. AGW-10	11/21/91	12:05	AGW-10	H_2O
6.				
7.				
8.				

ANALYSIS REQUESTED

BASE/NEU/ACID ORGAN: GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K	GENERAL CHEMISTRY (Specify): 5030/8020/8015M Gas - BTEX	3510/8015M Diesel	OTHER (Specify): Coliform				NUMBER OF CONTAINERS
													X	X					4
													X	X					3
													X	X	X				4
													X	X					3
													X	X					3

Relinquished By Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
Signature Wendy Bamford	Signature	Signature		
Printed Name SE/E	Printed Name	Printed Name	Shipping I.D. No.	Total No. of Containers
Firm	Firm	Firm	VIA	Chain of Custody Seals
Date/Time 11/21/91 3:40pm	Date/Time	Date/Time	Project	Received in good condition
Received By C. Atkins	Received By	Received By		LAB NO. B91-6840
Signature C. Atkins	Signature	Signature	SPECIAL INSTRUCTIONS/COMMENTS	
Printed Name C. ATKINS	Printed Name	Printed Name		
Firm CAS	Firm	Firm		
Date/Time 11-21-91 1540	Date/Time	Date/Time		

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

8000108

Table 1

Texaco Environmental Services
Ground Water Sample Chemical Analyses
8701 Greenwood Avenue North
Seattle, Washington

Sample Location	Sample Date	Sample ID	BTEX Compounds[a] (ppb)				418.1 (ppm)	Total Petroleum Hydrocarbons[b] (ppm)			Total Lead[c] (ppb)
			Benzene	Toluene	Ethyl-benzene	Total Xylenes		Gasoline	Diesel	Other	
MTCA Method A Cleanup Levels			5	40	30	20	1	1	1	1	5
AGW-1	4/3/91	AGW-1	ND	ND	ND	ND	---	---	---	---	---
AGW-1	5/15/91	AGW-1	440	1,000	92	670	---	---	---	---	---
AGW-1	8/15/91	AGW-1	1,400	7,400	1,000	8,100	---	361	---	---	ND
AGW-1 (dup)	8/15/91	AGW-7	1,300	6,900	930	7,500	---	340	---	---	ND
AGW-1	11/21/91	AGW-1	680	6,400	2,000	13,000	---	47	ND	ND	---
AGW-1 (dup)	11/21/91	AGW-10	710	6,700	2,100	14,000	---	49	ND	ND	---
AGW-1	3/6/92	01-03-06-92	330	3,200	1,400	8,700		48	ND	ND	ND
AGW-1 (dup)	3/6/92	03-03-06-92	333	3,200	1,400	8,900		48	---	---	---
AGW-2	4/3/91	AGW-2	ND	ND	ND	ND	---	---	---	---	---
AGW-2 (dup)	4/3/91	AGW-22	ND	ND	ND	ND	---	---	---	---	---
AGW-2	5/15/91	AGW-2	ND	ND	ND	ND	---	---	---	---	---
AGW-2	8/15/91	AGW-2	250	220	15	86	---	1.03	---	---	ND
AGW-2	11/21/91	AGW-2	910	1,300	260	1,200	---	7.3	ND	1.2	---
AGW-2	3/6/92	02-03-06-92	870	3,700	760	4,900	---	24	ND	1.1	ND
AGW-2 (dup)	3/6/92	08-03-06-92	840	3,500	730	4,700	---	23	ND	0.9	---
AGW-3	3/29/91	AGW-3	ND	ND	ND	ND	---	---	---	---	---
AGW-4	4/3/91	AGW-4	2.6	20	2.7	31	---	---	---	---	---
AGW-4	5/15/91	AGW-4	8.4	19	2.4	20	ND	---	---	---	---

Table 1

Texaco Environmental Services
Ground Water Sample Chemical Analyses
8701 Greenwood Avenue North
Seattle, Washington
(Continued)

Sample Location	Sample Date	Sample ID	BTEX Compounds[a] (ppb)				418.1 (ppm)	Total Petroleum Hydrocarbons[b] (ppm)			Total Lead[c] (ppb)
			Benzene	Toluene	Ethyl-benzene	Total Xylenes		Gasoline	Diesel	Other	
MTCA Method A Cleanup Levels			5	40	30	20	1	1	1	1	5
AGW-4	8/15/91	AGW-4	11	4	1	7	---	12	3.26	---	4
AGW-4*	11/21/91	AGW-4	660	700	21	133	---	3.5	ND	2.04	---
AGW-4**	3/6/92	04-03-06-92	139	182	3	18	---	ND	ND	0.8	ND
AGW-5	4/3/91	AGW-5	30	10	5	7	---	---	---	---	---
AGW-5	5/15/91	AGW-5	220	53	3.5	12	---	---	---	---	---
AGW-5 (Dup)	5/15/91	AGW-10	190	53	3.5	11	---	---	---	---	---
AGW-5	8/15/91	AGW-5	9.4	ND	ND	ND	---	0.10	---	---	ND
AGW-5	11/21/91	AGW-5	2.5	ND	ND	ND	---	ND	ND	ND	---
AGW-5*	3/6/92	05-03-06-92	0.9	ND	ND	ND	---	ND	ND	ND	ND

NOTES: ND No detection
– Not analyzed
AGW4* Total Coliform Bacteria = 110 organisms per liter
AGW4** Total Coliform Bacteria = ND; Ethylene Glycol = ND
AGW5* Ethylene Glycol = ND
MTCA Model Toxics Control Act, Chapter 173-340 WAC, adopted February 1991
Dup Duplicate sample
Shaded cells indicate that values exceed MTCA Method A levels

[a] Results for analyses of ground water samples for BTEX were obtained using EPA Methods 5030/8020 (Purge and Trap) and reported as µg/l (ppb)
[b] Results for analyses of ground water samples for total petroleum hydrocarbons were obtained using EPA Methods 5030/8015 Modified (GC/FID), reported as µg/l (ppb), and presented here in ppm
[c] Results for analyses of ground water samples for total lead were obtained using EPA Method 7421 and reported as µg/l (ppb)

Table 2

Survey and Ground Water Elevation Summary
Texaco Service Station
8701 Greenwood Avenue North
Seattle, Washington

Well	Elevation at Top PVC (ft)	Date Monitored	Depth to Water (ft)	Ground Water Elevation (ft)
AGW - 1	47.36	04/03/91	3.18	44.18
		08/15/91	0.62	46.74
		09/20/91	0.48	46.88
		10/17/91	0.91	46.45
		11/21/91	0.70	46.66
		12/18/91	0.81	46.55
		03/06/92	0.47	46.89
AGW - 2	47.59	04/03/91	3.43	44.16
		08/15/91	1.65	45.94
		09/20/91	1.26	46.33
		10/17/91	1.27	46.32
		11/21/91	1.30	46.29
		12/18/91	1.07	46.52
		03/06/92	1.14	46.45
AGW - 3	49.10	(abnd'd)	(flowing)	(49.10 +)
AGW - 4	47.97	04/03/91	4.61	43.36
		08/15/91	2.76	45.21
		09/20/91	2.20	45.77
		10/17/91	2.40	45.57
		11/21/91	2.45	45.52
		12/18/91	2.86	45.11
		03/06/92	2.45	45.52
AGW - 5	49.47	04/03/91	2.78	46.69
		08/15/91	1.53	47.94
		09/20/91	<2.06 *	47.41 +
		10/17/91	1.59	47.88
		11/21/91	2.40	47.07
		12/18/91	1.44	48.03
		03/06/92	1.45	48.02

NOTES: Elevations are referenced to an on-site benchmark location; the benchmark was assigned an arbitrary elevation of 50.00 feet

* Water level continued to rise after one hour; this is last reading and represents a minimum ground water elevation