BLAINE
TECH SERVICES

1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112
(408) 573-7771 FAX
(408) 573-0555 PHONE

January 26, 1998

Groundwater Monitoring and Sampling
Fourth Quarter, 1997
at the
Former Texaco Service Station
3810 Broadway
Oakland, CA

This report presents the results of groundwater monitoring and sampling conducted by Blaine Tech Services, Inc. on December 18, 1997 at the site referenced above (see Figure 1, Site Vicinity Map). The gradient map has been reviewed by a registered professional (see Figure 2, Groundwater Gradient Map). TPHg and benzene concentrations are shown on Figure 3. Tables 1 and 2 list historical groundwater monitoring data and analytical results, respectively.

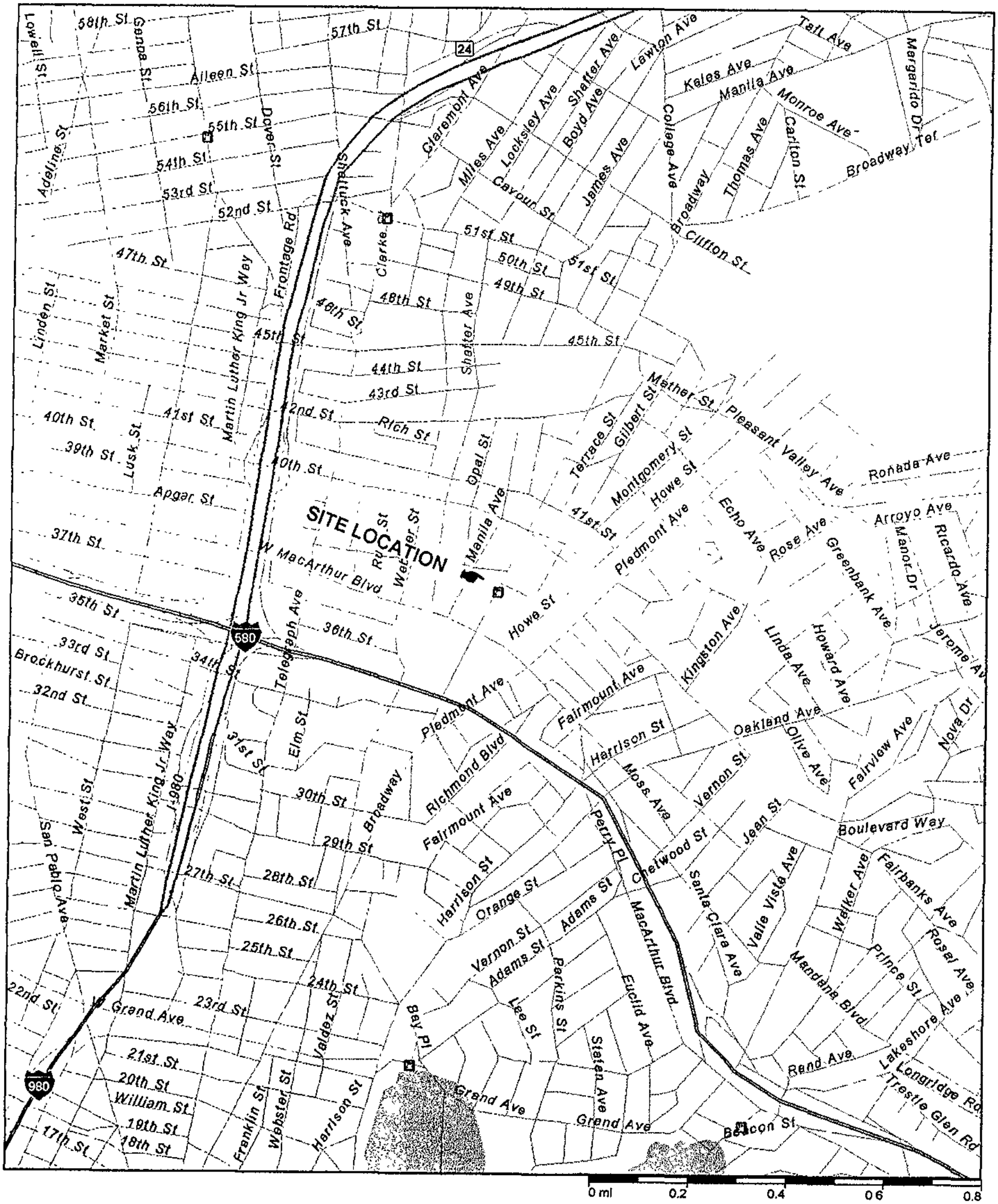
The certified analytical report, chain-of-custody, field data sheets, bill of lading, and quarterly summary report are in the Appendix, along with Texaco Refining and Marketing Inc., Environment Health & Safety's Standard Operating Procedures.

Kent Brown
Project Coordinator
Blaine Tech Services, Inc.

Steven E. Krcik
Registered Geologist No. 4976
RRM, Inc.

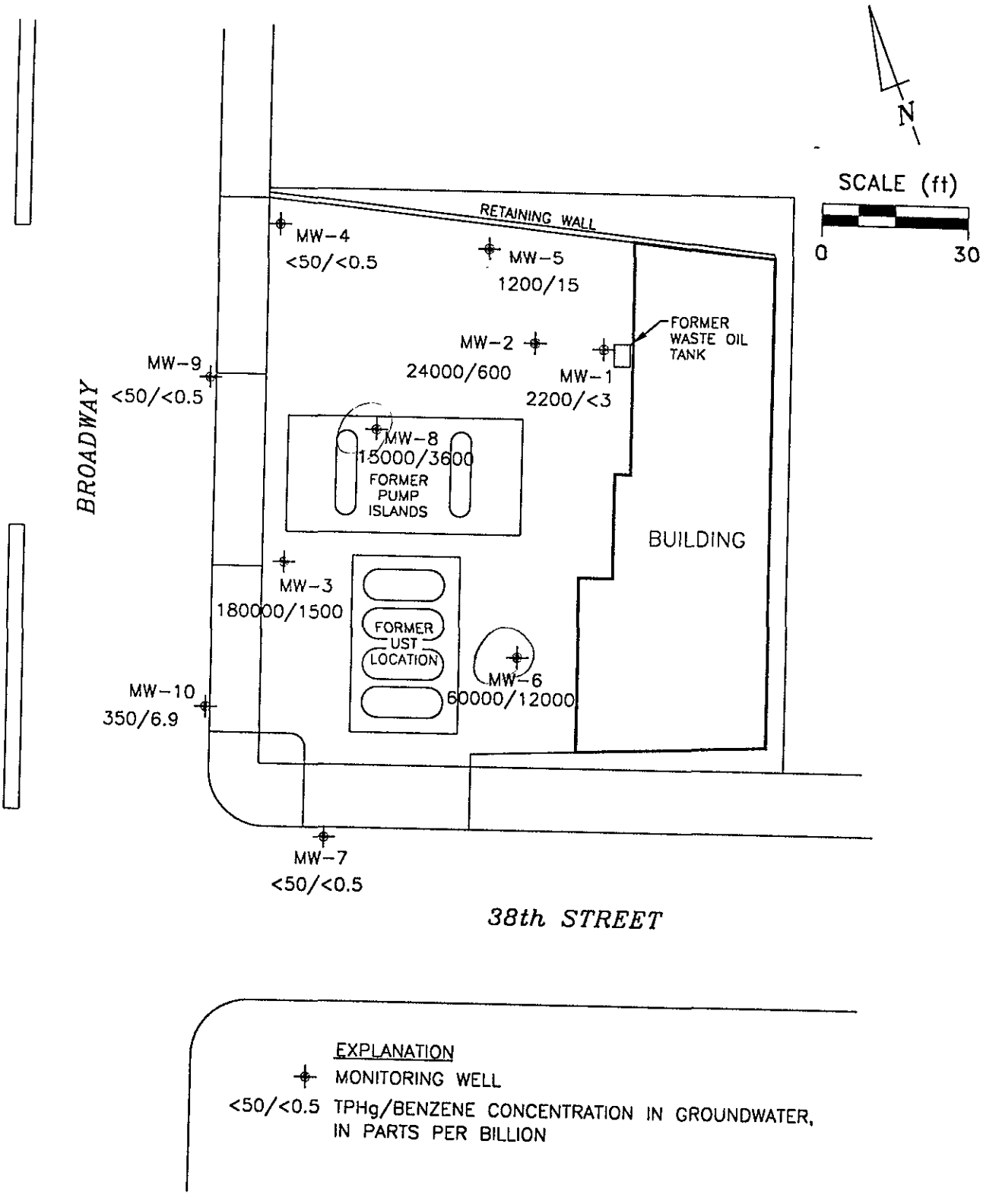
REGISTERED GEOLOGIST
STEVEN E. KRCIK
No. 4976
EXP.
STATE OF CALIFORNIA

KEB:dg



Site Vicinity Map

Former Texaco Service Station, 3810 Broadway, Oakland, CA



Reference: BR-0A.dwg
Basemap from Fluor Daniel GTI

PREPARED BY

RRM
engineering contracting firm

FORMER TEXACO SERVICE STATION
3810 Broadway
Oakland, California

TPHg/BENZENE CONCENTRATION MAP, DECEMBER 18, 1997

FIGURE: 3

PROJECT: DAC04

Table 1
Groundwater Elevation Data
3810 Broadway, Oakland, CA

Well Number	Date Gauged	Top of Casing Elevation (feet, MSL)	Depth to Water (feet, TOC)	Elevation of Groundwater (feet, MSL)	Floating Product
MW-1	06/28/96	86.69	21.77	64.92	0.00
	10/10/96	86.69	23.26	63.43	0.00
	11/07/96	86.69	23.27	63.42	0.00
	12/18/97	86.69	19.70	66.99	0.00
MW-2	06/28/96	85.83	22.10	63.73	1.35
	10/10/96	85.83	22.36	63.47	0.00
	11/07/96	85.83	22.39	63.45	0.01
	12/18/97	85.83	20.19	65.64	0.00
MW-3	06/28/96	83.18	19.04	64.14	0.00
	10/10/96	83.18	19.51	63.67	0.00
	11/07/96	NA	19.40	19.84	0.00
	12/18/97	83.18	18.79	64.39	0.00
MW-4	06/28/96	83.31	18.83	64.48	0.00
	10/10/96	83.31	19.84	63.47	0.00
	11/07/96	83.31	19.84	63.47	0.00
	12/18/97	83.31	17.77	65.54	0.00
MW-5	10/10/96	85.41	21.93	63.48	0.00
	11/07/96	85.41	21.96	63.45	0.00
	12/18/97	85.41	19.81	65.60	0.00
MW-6	10/10/96	86.09	22.44	63.65	0.00
	11/07/96	86.09	22.60	63.49	0.00
	12/18/97	86.09	22.28	63.81	0.00
MW-7	10/10/96	84.11	20.78	63.33	0.00
	11/07/96	84.11	20.80	63.31	0.00
	12/18/97	84.11	17.27	66.84	0.00
MW-8	10/10/96	84.01	20.82	63.19	0.00
	11/07/96	84.01	20.44	63.57	0.00
	12/18/97	84.01	19.36	64.65	0.00
MW-9	10/10/96	82.17	18.62	63.55	0.00
	11/07/96	NA	63.53	63.53	0.00
	12/18/97	82.17	16.42	65.75	0.00

Table 1
Groundwater Elevation Data
3810 Broadway, Oakland, CA

Well Number	Date Gauged	Top of Casing Elevation (feet, MSL)	Depth to Water (feet, TOC)	Elevation of Groundwater (feet, MSL)	Floating Product
MW-10	10/10/96	81.83	18.40	63.43	0.00
	11/07/96	81.83	18.43	63.40	0.00
	12/18/97	81.83	16.18	65.65	0.00
TOC= Top of Casing Elevation					
MSL= Mean Sea Level					
NA= Data Not Available					

Table 2
Groundwater Analytical Data
3810 Broadway, Oakland, CA

Well Number	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MTBE (ppb)	TPHd (ppb)
MW-1	06/28/96	<100	<0.5	<1.0	<1.0	<2.0	--	<50
	10/10/96	520	9.2	53	17	70	22/16*	<400
	11/07/96	--	--	--	--	--	--	--
	12/18/97	2,200	<3	<3	<3	<3	<200	<50
MW-2	06/28/96	--	--	--	--	--	--	
	10/10/96	99,000	4,100	9,400	2,300	9,900	390/<25*	1,800
	12/18/97	24,000	600	1,800	750	2,400	<2000	4,700
MW-3	06/28/96	--	--	--	--	--	--	
	10/10/96	110,000	6,600	16,000	2,200	12,000	<250	1,200
	11/07/96	--	--	--	--	--	--	--
	12/18/97	180,000	1,500	16,000	4,600	23,000	<3000	6,100,000
MW-4	06/28/96	<100	<0.5	<1.0	<1.0	<2.0	--	<50
	10/10/96	650	3.9	65	22	120	<5.0	<50
	11/07/96	--	--	--	--	--	--	--
	12/18/97	<50	<0.5	<0.5	<0.5	<0.5	<30	2,000
MW-5	10/10/96	1,800	34	4.7	11	44	21/5.0*	<50
	11/07/96	--	--	--	--	--	--	--
	12/18/97	1,200	15	<1	15	<1	72	<50
MW-6	10/10/96	45,000	8,300	2,900	810	3,100	190/40*	500
	11/07/96	--	--	--	--	--	--	--
	12/18/97	60,000	12,000	9,800	1,800	8,600	<2000	1,900
MW-7	10/10/96	<50	0.6	<0.5	<0.5	<0.5	<5.0	<50
	11/07/96	--	--	--	--	--	--	--
	12/18/97	<50	<0.5	<0.5	<0.5	<0.5	<30	<50
MW-8	10/10/96	17,000	1,300	1,200	64	1,300	110/<5.0*	110
	11/07/96	--	--	--	--	--	--	--
	12/18/97	15,000	3,600	1,800	410	930	<600	630

Table 2
Groundwater Analytical Data
3810 Broadway, Oakland, CA

Well Number	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MTBE (ppb)	TPHd (ppb)
MW-9	10/10/96	80	2.5	13	2.2	13	<5.0	520
	11/07/96	--	--	--	--	--	--	--
	12/18/97	<50	<0.5	<0.5	<0.5	<0.5	<30	<50
MW-10	10/10/96	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<50
	11/07/96	--	--	--	--	--	--	--
	12/18/97	350	6.9	0.87	0.88	0.77	<30	<50

MTBE =Methyl-tert-butylether
ppb = parts per billion
TPHd= Total Petroleum Hydrocarbons as diesel.
TPHg = Total Petroleum Hydrocarbons as gasoline
< = Less than the detection limit for the specified method of analysis
*= MTBE confirmation by EPA 8240.

APPENDIX

ANALYTICAL REPORT

Our Quality Control Is Your Quality Assurance

LOG NO: G97-12-553

Received: 19 DEC 97

Mailed: JAN 6 1998

Mr. Kent Brown
Blaine Tech Services
1680 Rogers Avenue
San Jose, California 95112

Purchase Order: 94-1446346+4370

Requisition: 618571071
Project: FKEP9034L

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
12-553-1	MW-1	18 DEC 97
12-553-2	MW-2	18 DEC 97
12-553-3	MW-3	18 DEC 97
12-553-4	MW-4	18 DEC 97
12-553-5	MW-5	18 DEC 97

PARAMETER	12-553-1	12-553-2	12-553-3	12-553-4	12-553-5
TPH (8015M)					
Date Analyzed	12/30/97	12/30/97	1/6/98	12/30/97	12/30/97
Date Extracted	12/23/97	12/23/97	12/23/97	12/23/97	12/23/97
Dilution Factor, Times	1	1	2000	1	1
TPH (Diesel Range), mg/L	<0.05	4.7	6100	2.0	<0.05
Carbon Range, .	C10-C25	C10-C25	C10-C25	C10-C25	C10-C25
Surrogates **					
Naphthalene Reported, mg/L	0.0383	0.351	NC	0.163	0.0419
Naphthalene Theoretical, mg/L	0.0500	0.0500	0.320	0.0500	0.0500
o-Terphenyl Reported, mg/L	0.0399	0.0403	NC	0.0462	0.0401
o-Terphenyl Theoretical, mg/L	0.0500	0.0500	0.320	0.0500	0.0500

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12-553-1	MW-1	18 DEC 97
12-553-2	MW-2	18 DEC 97
12-553-3	MW-3	18 DEC 97
12-553-4	MW-4	18 DEC 97
12-553-5	MW-5	18 DEC 97

PARAMETER	12-553-1	12-553-2	12-553-3	12-553-4	12-553-5
GRO (8015M.TX)					
Date Analyzed	12/31/97	12/30/97	12/30/97	12/31/97	12/31/97
Dilution Factor, Times	5	50	100	1	2
Benzene, ug/L	<3	600	1500	<0.5	15
Toluene, ug/L	<3	1800	16000	<0.5	<1
Ethylbenzene, ug/L	<3	750	4600	<0.5	15
Methyl-tert-butylether, ug/L	<200	<2000	<3000	<30	72
Total Xylene Isomers, ug/L	<3	2400	23000	<0.5	<1
Carbon Range, .	C6-C12	C6-C12	C6-C12	C6-C12	C6-C12
TPH (Gasoline Range), ug/L	2200	24000	180000	<50	1200
Other GRO (8015M.TX)	---	---	---	---	---
Surrogates **					
a,a,a-Trifluorotoluene Rep., ug/L	254	2590	5210	53.6	86.8
a,a,a-Trifluorotoluene Th., ug/L	250	2500	5000	50.0	100
Data Review , Date	01/06/98	01/06/98	01/06/98	01/06/98	01/06/98

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LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
12-553-6	MW-6	18 DEC 97
12-553-7	MW-7	18 DEC 97
12-553-8	MW-8	18 DEC 97
12-553-9	MW-9	18 DEC 97
12-553-10	MW-10	18 DEC 97

PARAMETER	12-553-6	12-553-7	12-553-8	12-553-9	12-553-10
TPH (8015M)					
Date Analyzed	12/30/97	12/30/97	12/30/97	12/30/97	12/30/97
Date Extracted	12/23/97	12/23/97	12/23/97	12/23/97	12/23/97
Dilution Factor, Times	1	1	1	1	1
TPH (Diesel Range), mg/L	1.9	<0.05	0.63	<0.05	<0.05
Carbon Range, .	C10-C25	C10-C25	C10-C25	C10-C25	C10-C25
Surrogates **					
Naphthalene Reported, mg/L	0.190	0.0471	0.106	0.0297	0.0407
Naphthalene Theoretical, mg/L	0.0500	0.0500	0.0500	0.0500	0.0500
o-Terphenyl Reported, mg/L	0.0354	0.0459	0.0408	0.0403	0.0420
o-Terphenyl Theoretical, mg/L	0.0500	0.0500	0.0500	0.0500	0.0500

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
12-553-6	MW-6	18 DEC 97
12-553-7	MW-7	18 DEC 97
12-553-8	MW-8	18 DEC 97
12-553-9	MW-9	18 DEC 97
12-553-10	MW-10	18 DEC 97

PARAMETER	12-553-6	12-553-7	12-553-8	12-553-9	12-553-10
GRO (8015M.TX)					
Date Analyzed	12/31/97	12/31/97	12/31/97	12/31/97	12/31/97
Dilution Factor, Times	50	1	20	1	1
Benzene, ug/L	12000	<0.5	3600	<0.5	6.9
Toluene, ug/L	9800	<0.5	1800	<0.5	0.87
Ethylbenzene, ug/L	1800	<0.5	410	<0.5	0.88
Methyl-tert-butylether, ug/L	<2000	<30	<600	<30	<30
Total Xylene Isomers, ug/L	8600	<0.5	930	<0.5	0.77
Carbon Range, .	C6-C12	C6-C12	C6-C12	C6-C12	C6-C12
TPH (Gasoline Range), ug/L	60000	<50	15000	<50	350
Other GRO (8015M.TX)	---	---	---	---	---
Surrogates **					
a,a,a-Trifluorotoluene Rep., ug/L	2450	55.4	1030	54.2	55.1
a,a,a-Trifluorotoluene Th., ug/L	2500	50.0	1000	50.0	50.0
Data Review , Date	01/06/98	01/06/98	01/06/98	01/06/98	01/06/98

LOG NO: G97-12-553

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1680 Rogers Avenue
San Jose, California 95112

Purchase Order: 94-1446346+4370

Requisition: 618571071
Project: FKEP9034L

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
12-553-11	EB	18 DEC 97

PARAMETER	12-553-11
TPH (8015M)	
Date Analyzed	12/30/97
Date Extracted	12/23/97
Dilution Factor, Times	1
TPH (Diesel Range), mg/L	<0.05
Carbon Range, .	C10-C25
Surrogates **	
Naphthalene Reported, mg/L	0.0376
Naphthalene Theoretical, mg/L	0.0500
o-Terphenyl Reported, mg/L	0.0387
o-Terphenyl Theoretical, mg/L	0.0500

LOG NO: G97-12-553

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Requisition: 618571071
Project: FKEP9034L

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
12-553-11	EB	18 DEC 97

PARAMETER	12-553-11
GRO (8015M.TX)	
Date Analyzed	12/31/97
Dilution Factor, Times	1
Benzene, ug/L	<0.5
Toluene, ug/L	<0.5
Ethylbenzene, ug/L	<0.5
Methyl-tert-butylether, ug/L	<30
Total Xylene Isomers, ug/L	<0.5
Carbon Range, .	C6-C12
TPH (Gasoline Range), ug/L	<50
Other GRO (8015M.TX)	---
Surrogates **	
a,a,a-Trifluorotoluene Rep., ug/L	54.5
a,a,a-Trifluorotoluene Th., ug/L	50.0
Data Review , Date	01/06/98

LOG NO: G97-12-553

Received: 19 DEC 97

Mr. Kent Brown
Blaine Tech Services
1680 Rogers Avenue
San Jose, California 95112

Purchase Order: 94-1446346+4370

Requisition: 618571071
Project: FKEP9034L

REPORT OF ANALYTICAL RESULTS

Marvin Katz
3800 Broadway, Oakland

Greta Galoustian, Laboratory Director

: ORDER PLACED FOR CLIENT: Blaine Tech Services 9712553 :
: VOC ANALYTICAL : GLEN LAB : 14:35:06 06 JAN 1998 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM.....	DATE..... ANALYZED	METHOD.....	EQUIP.	BATCH..	ID.NO
9712553*1	MW-1	DIESEL.3520.TES	12.30.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-21	976188	7424
		DATA.REVIEW	01.06.98			-	7524
9712553*2	MW-2	DIESEL.3520.TES	12.30.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.30.97	8015M.TX	536-23	975194	7424
		DATA.REVIEW	01.06.98				7524
9712553*3	MW-3	DIESEL.3520.TES	01.06.98	8015M	536-37	97277	8866
		GAS.MTBE.TESNC	12.30.97	8015M.TX	536-23	975194	7424
		DATA.REVIEW	01.06.98				7524
9712553*4	MW-4	DIESEL.3520.TES	12.30.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-21	976188	7424
		DATA.REVIEW	01.06.98				7524
9712553*5	MW-5	DIESEL.3520.TES	12.30.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-21	976188	7424
		DATA.REVIEW	01.06.98				7524
9712553*6	MW-6	DIESEL.3520.TES	12.30.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-21	976188	7424
		DATA.REVIEW	01.06.98				7524
9712553*7	MW-7	DIESEL.3520.TES	12.31.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-23	975194	7424
		DATA.REVIEW	01.06.98				7524
9712553*8	MW-8	DIESEL.3520.TES	12.31.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-21	976188	7424
		DATA.REVIEW	01.06.98				7524
9712553*9	MW-9	DIESEL.3520.TES	12.31.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-23	975195	7424
		DATA.REVIEW	01.06.98				7524
9712553*10	MW-10	DIESEL.3520.TES	12.31.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-23	975194	7424
		DATA.REVIEW	01.06.98				7524
9712553*11	EB	DIESEL.3520.TES	12.31.97	8015M	536-01	97277	7396
		GAS.MTBE.TESNC	12.31.97	8015M.TX	536-23	975194	7424
		DATA.REVIEW	01.06.98				7524

***

Notes: Equipment = VOC Analytical identification number for a particular piece of analytical equipment.

ID.NO = VOC Analytical employee identification number of analyst.

VOC ANALYTICAL, GLENDALE
QC REPORT FOR 9712553
DATE PRINTED: 06 JAN 1998

AQUEOUS SAMPLES		METHOD BLANK			LAB CONTROL								MATRIX QC								
					LCS		LCSD				RPD	RPD	MS		MSD				RPD	RPD	
	UNITS	RESULT	RDL	FLG	%REC	FLG	%REC	FLG	LCL	UCL	RPD	UCL	FLG	%REC	FLG	%REC	FLG	LCL	UCL	RPD	UCL	FLG
Batch: GAS*975194 Method: 8015M.TX - Modified 8015																						
Benzene	ug/L	0	0.5	-	95	-	-	-	76	155	-	-	-	89	-	89	-	70	153	1	25	-
Toluene	ug/L	0.16	0.5	-	96	-	-	-	72	121	-	-	-	86	-	83	-	69	119	4	25	-
Ethylbenzene	ug/L	0	0.5	-	96	-	-	-	72	115	-	-	-	89	-	92	-	68	116	3	25	-
Methyl-tert-butylether	ug/L	0.73	30	-	97	-	-	-	62	159	-	-	-	111	-	120	-	80	176	8	25	-
Total Xylene Isomers	ug/L	0	0.5	-	101	-	-	-	68	115	-	-	-	80	-	82	-	61	118	2	25	-
TPH (Gasoline Range)	ug/L	0	50	-	101	-	-	-	85	120	-	-	-	99	-	100	-	78	124	1	25	-
[a,a,a-Trifluorotoluene]	Percent	107	-	-	99	-	-	-	85	118	-	-	-	119	Q	115	-	85	118	-	-	-
Batch: GAS*975195 Method: 8015M.TX - Modified 8015																						
Benzene	ug/L	0	0.5	-	97	-	-	-	76	155	-	-	-	98	-	93	-	70	153	6	25	-
Toluene	ug/L	0.18	0.5	-	99	-	-	-	72	121	-	-	-	86	-	85	-	69	119	1	25	-
Ethylbenzene	ug/L	0	0.5	-	98	-	-	-	72	115	-	-	-	92	-	89	-	68	116	4	25	-
Methyl-tert-butylether	ug/L	0	30	-	97	-	-	-	62	159	-	-	-	116	-	108	-	80	176	3	25	-
Total Xylene Isomers	ug/L	0	0.5	-	103	-	-	-	68	115	-	-	-	81	-	80	-	61	118	1	25	-
TPH (Gasoline Range)	ug/L	0	50	-	101	-	-	-	85	120	-	-	-	98	-	97	-	78	124	1	25	-
[a,a,a-Trifluorotoluene]	Percent	115	-	-	102	-	-	-	85	118	-	-	-	121	Q	119	Q	85	118	-	-	-
Batch: GAS*976188 Method: 8015M.TX - Modified 8015																						
Benzene	ug/L	0	0.5	-	96	-	-	-	76	155	-	-	-	92	-	92	-	70	153	0	25	-
Toluene	ug/L	0.25	0.5	-	96	-	-	-	72	121	-	-	-	79	-	79	-	69	119	0	25	-
Ethylbenzene	ug/L	0	0.5	-	95	-	-	-	72	115	-	-	-	90	-	88	-	68	116	3	25	-
Methyl-tert-butylether	ug/L	0	30	-	103	-	-	-	62	159	-	-	-	111	-	115	-	80	176	4	25	-
Total Xylene Isomers	ug/L	0	0.5	-	97	-	-	-	68	115	-	-	-	76	-	72	-	61	118	5	25	-
TPH (Gasoline Range)	ug/L	0	50	-	100	-	-	-	85	120	-	-	-	100	-	98	-	78	124	2	25	-
[a,a,a-Trifluorotoluene]	Percent	114	-	-	101	-	-	-	85	118	-	-	-	98	-	90	-	85	118	-	-	-
Batch: DIESEL*97277 Method: 8015M - Modified 8015																						
TPH (Diesel Range)	mg/L	0	0.5	-	126	-	93	-	53	155	30	-	-	109	-	98	-	53	128	11	30	-
[Naphthalene]	Percent	86	-	-	83	-	73	-	55	127	-	-	-	87	-	74	-	55	127	-	-	-
[o-Terphenyl]	Percent	86	-	-	126	-	112	-	50	163	-	-	-	123	-	111	-	50	163	-	-	-

: SURROGATE RECOVERIES :
: BC ANALYTICAL : GLEN LAB : 14:34:48 06 JAN 1998 - P. 1 :

METHOD	ANALYTE	BATCH	ANALYZED	REPORTED	TRUE	%REC	FLAG
9712553*1							
8015M	Naphthalene	97277	12/30/97	0.0383	0.0500	77	
	o-Terphenyl	97277	12/30/97	0.0399	0.0500	80	
8015M.TX	a,a,a-Trifluorotoluene	Re976188	12/31/97	254	250	102	
9712553*2							
8015M	Naphthalene	97277	12/30/97	0.351	0.0500	702	
	o-Terphenyl	97277	12/30/97	0.0403	0.0500	81	
8015M.TX	a,a,a-Trifluorotoluene	Re975194	12/30/97	2590	2500	104	
9712553*3							
8015M	Naphthalene	97277	01/06/98	NC	0.320	0	
	o-Terphenyl	97277	01/06/98	NC	0.320	0	
8015M.TX	a,a,a-Trifluorotoluene	Re975194	12/30/97	5210	5000	104	
9712553*4							
8015M	Naphthalene	97277	12/30/97	0.163	0.0500	326	
	o-Terphenyl	97277	12/30/97	0.0462	0.0500	92	
8015M.TX	a,a,a-Trifluorotoluene	Re976188	12/31/97	53.6	50.0	107	
9712553*5							
8015M	Naphthalene	97277	12/30/97	0.0419	0.0500	84	
	o-Terphenyl	97277	12/30/97	0.0401	0.0500	80	
8015M.TX	a,a,a-Trifluorotoluene	Re976188	12/31/97	86.8	100	87	
9712553*6							
8015M	Naphthalene	97277	12/30/97	0.190	0.0500	380	
	o-Terphenyl	97277	12/30/97	0.0354	0.0500	71	
8015M.TX	a,a,a-Trifluorotoluene	Re976188	12/31/97	2450	2500	98	
9712553*7							
8015M	Naphthalene	97277	12/31/97	0.0471	0.0500	94	
	o-Terphenyl	97277	12/31/97	0.0459	0.0500	92	
8015M.TX	a,a,a-Trifluorotoluene	Re975194	12/31/97	55.4	50.0	111	
9712553*8							
8015M	Naphthalene	97277	12/31/97	0.106	0.0500	212	
	o-Terphenyl	97277	12/31/97	0.0408	0.0500	82	
8015M.TX	a,a,a-Trifluorotoluene	Re976188	12/31/97	1030	1000	103	
9712553*9							
8015M	Naphthalene	97277	12/31/97	0.0297	0.0500	59	
	o-Terphenyl	97277	12/31/97	0.0403	0.0500	81	
8015M.TX	a,a,a-Trifluorotoluene	Re975195	12/31/97	54.2	50.0	108	
9712553*10							

METHOD	ANALYTE	BATCH	ANALYZED	REPORTED	TRUE	%REC	FLAG
8015M	Naphthalene	97277	12/31/97	0.0407	0.0500	81	
	o-Terphenyl	97277	12/31/97	0.0420	0.0500	84	
8015M.TX	a,a,a-Trifluorotoluene Re	975194	12/31/97	55.1	50.0	110	
9712553*11							
8015M	Naphthalene	97277	12/31/97	0.0376	0.0500	75	
	o-Terphenyl	97277	12/31/97	0.0387	0.0500	77	
8015M.TX	a,a,a-Trifluorotoluene Re	975194	12/31/97	54.5	50.0	109	

9712553

Chain-of-Custody

TRMI EH&S
108 Cutting Boulevard
Richmond, California 94804
Phone: (510) 236-3541
FAX: (510) 237-7021

Site Name: Texaco Loc. #61-857-1071
Site Address: 3800 Broadway, Oakland, CA.
Contractor Project Number: 971218-A1
Contractor Name: Blaine Tech Services, Inc.
Address: 1680 Rogers Ave., San Jose, CA.
Project Contact: Kent Brown
Phone/FAX: (408) 573-0555/(408) 573-7771

Forward Results to Blaine Tech Services, Attn: Kent Brown
Texaco Project Coordinator: Marvin Katz

Laboratory: B C Analytical
Turn Around Time: normal (10 day)
Samplers (PRINT NAME): AL GENTRY
Sampler Signature: Al Gentry
Date Samples Collected: 12-18-97

MMK
61857107
FKEP9034

Sample Number	Lab Sample Number	Date/Time Collected	No. of Containers	Type of Containers	Sample Matrix	Preservative	TPH gas/BTEX	TPH Diesel	O&G/TRPH (418.1)	TPH Ex. (C8-C36+)	VOCs 8240/624	P. Halocarbons 8010/60	P. Aromatics 8020/602	Organic Lead	MTBE		Comments
MW-1	X	12-18-97/1309	8	VOA/AMB		HCL/NP	X	X							X		
MW-2	X	/1500	8				X	X							X		CONFIRM MTBE BY 8260.
MW-3	X	/1527	8				X	X							X		
MW-4	X	/1235	8				X	X							X		
MW-5	X	/1344	8				X	X							X		
MW-6	X	/1554	8				X	X							X		
MW-7	X	/1123	8				X	X							X		
MW-8	X	/1424	8				X	X							X		
MW-9	X	/1158	8				X	X							X		
MW-10	X	/1040	8				X	X							X		
EB	X	1100	8				X	X							X		

ANALYSIS

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
AL GENTRY / Al Gentry	12-18-97	11:15	Monica Martinez	12/19/97	11:15
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Method of Shipment:			Lab Comments:		

P:\GWMP\FORMS\TEX-COC.XLS

Project Name: TEXACO

Project Number: 618571071

Well Gauging Data

Date: 12-18-97

Recorded By: AL GENTRY

Well ID	TOC Elev.	DTB (ft. TOC)	Well Dia. (in.)	DTP (ft.)	DTW (ft.)	PT (ft.)	Comments
MW-1	TOC	29.51	2		19.70		
MW-2	↓	33.42	2		20.19		ODOR
MW-3		34.58	2		18.79		ODOR SHEEN
MW-4		34.90	2	~~34.90~~	17.77		
MW-5		33.23	2		19.81		
MW-6		33.00	2		22.28		ODOR
MW-7		33.60	2	~~33.60~~	17.27		
MW-8		33.88	2		19.36		ODOR SHEEN
MW-9		33.93	2	~~33.93~~	16.42		
MW-10		33.40	2	~~33.40~~	16.18		

TOC = Top of casing
DTB = Depth to bottom in feet below TOC
DTP = Depth to product in feet below TOC
DTW = Depth to water in feet below TOC
PT = Product thickness in feet

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710 71
Sampler: AL	Date: 12-18-97
Well I.D.: MW 1	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 29.51	Depth to Water: 19.70
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius² * 0.164

Purge Method: S.S. Bailer ✗
Teflon Bailer
Middleburg
Electric Submersible
Extraction Pump
Other: _____

Sampling Method: S.S. Bailer ✗
Teflon Bailer
Extraction Port
Other: _____

1.6 (1 Case Volume (Gals.)) x 3 (Specified Volumes) = 5.00 (Calculated Volume) Gals.

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1300	68.8	7.0	1200	>200	2.0	
1302	68.6	7.0	1000	>200	4.0	
1304	68.4	6.8	1000	>200	5.0	

Did well dewater? Yes (No) Gallons actually evacuated: 5.0

Sampling Time: 1309 Sampling Date: 12-18-97

Sample I.D.: MW 1 Laboratory: BC Analytical

Analyzed for: (Tph-G) (BTEX) (Tph-D) Other: MTBE 8260

Equipment Blank I.D.: Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185716711
Sampler: AL	Date: 12-18-97
Well I.D.: MW2	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 33.42	Depth to Water: 20.19
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius^2 * 0.164

Purge Method: S.S. Bailer x
Teflon Bailer
Middleburg
Electric Submersible
Extraction Pump
Other: ___

Sampling Method: S.S. Bailer x
Teflon Bailer
Extraction Port
Other: ___

2.24 (1 Case Volume (Gals.)) x 3 (Specified Volumes) = 6.74 (Calculated Volume) Gals.

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1450	68.8	7.2	2000	7200	2.0	
1452	68.8	7.0	1900	7200	5.0	
1454	68.4	6.8	1800	190	7.0	

Did well dewater? Yes (No)	Gallons actually evacuated: 7.0
Sampling Time: 1500	Sampling Date: 12-18-97
Sample I.D.: MW2	Laboratory: BC Analytical
Analyzed for: (Tph-G) BTEX (Tph-D)	Other: MTBE 8260
Equipment Blank I.D.:	Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710171
Sampler: AL	Date: 12-18-97
Well I.D.: MW 3	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 34.58	Depth to Water: 18.79
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius^2 * 0.164

Purge Method: S.S. Bailer ✓, Teflon Bailer, Middleburg, Electric Submersible, Extraction Pump, Other: ____

Sampling Method: S.S. Bailer ✓, Teflon Bailer, Extraction Port, Other: ____

2.68 (1 Case Volume (Gals.)) x 3 (Specified Volumes) = 8.05 (Calculated Volume) Gals.

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1519	68.0	7.8	2000	7200	3.0	YELLOW/BROWN/ SHEEN ODOR
1521	68.0	7.6	2000	7200	6.0	
1523	67.6	7.6	2000	7200	9.0	

Did well dewater? Yes (No) Gallons actually evacuated: 8.0

Sampling Time: 1527 Sampling Date: 12-18-97

Sample I.D.: MW 3 Laboratory: BC Analytical

Analyzed for: Tph-G BTEX Tph-D Other: MTBE 8260

Equipment Blank I.D.: Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710711
Sampler: AL	Date: 12-18-97
Well I.D.: MW4	Well Diameter: ② 3 4 6 8 ___
Total Well Depth: 34.90	Depth to Water: 17.77
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius² * 0.164

Purge Method: S.S. Bailer X
Teflon Bailer
Middleburg
Electric Submersible
Extraction Pump
Other: _____

Sampling Method: S.S. Bailer X
Teflon Bailer
Extraction Port
Other: _____

2.91 (1 Case Volume (Gals.)) x 3 (Specified Volumes) = 8.73 (Calculated Volume) Gals.

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1228	68.8	7.0	1000	180		
1230	68.6	6.8	900	160		
1232	68.2	6.8	800	150		

Did well dewater? Yes (No) Gallons actually evacuated: 9.0

Sampling Time: 1235 Sampling Date: 12-18-97

Sample I.D.: MW-4 Laboratory: BC Analytical

Analyzed for: (Tph-G) BTEX (Tph-D) Other: MTBE 8260

Equipment Blank I.D.: Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710711
Sampler: AL	Date: 12-18-97
Well I.D.: MW5	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 33.23	Depth to Water: 19.81
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius² * 0.164

Purge Method: S.S. Bailer* / Teflon Bailer / Middleburg / Electric Submersible / Extraction Pump / Other: ___

Sampling Method: S.S. Bailer* / Teflon Bailer / Extraction Port / Other: ___

2.28	x	3	=	6.84 Gals.
1 Case Volume (Gals.)		Specified Volumes		Calculated Volume

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1335	69.0	7.2	2000	>200	2.0	
1337	68.8	7.0	2000	>200	4.0	
1338	68.6	6.8	1800	180	7.0	

Did well dewater? Yes (No) Gallons actually evacuated: 7.0

Sampling Time: 1344 Sampling Date: 12-18-97

Sample I.D.: MW5 Laboratory: BC Analytical

Analyzed for: (Tph-G) (BTEX) (Tph-D) Other: MTBE 8260

Equipment Blank I.D.: Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710711
Sampler: AL	Date: 12-18-97
Well I.D.: mw6	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 33.00	Depth to Water: 22.28
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius^2 * 0.164

Purge Method: S.S. Bailer X
Teflon Bailer
Middleburg
Electric Submersible
Extraction Pump
Other: _____

Sampling Method: S.S. Bailer X
Teflon Bailer
Extraction Port
Other: _____

1.8 (1 Case Volume (Gals.)) x 3 (Specified Volumes) = 5.46 (Calculated Volume) Gals.

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1546	67.8	8.0	1900	>200	1.0	
1548	67.8	7.8	1900	>200	3.0	
1550	67.6	7.8	1800	>200	6.0	

Did well dewater? Yes (No)	Gallons actually evacuated: 6.0
Sampling Time: 1554	Sampling Date: 12-18-97
Sample I.D.: mw6	Laboratory: BC Analytical
Analyzed for: ~~Tph-G~~ BTEX ~~Tph-D~~	Other: MTBE 8260
Equipment Blank I.D.:	Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710 71
Sampler: AL	Date: 12-18-97
Well I.D.: MW7	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 33.60	Depth to Water: 17.27
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius² * 0.164

Purge Method: S.S. Bailer ✓ Teflon Bailer Middleburg Electric Submersible Extraction Pump Other: ___

Sampling Method: S.S. Bailer ✓ Teflon Bailer Extraction Port Other: ___

2.77 (1 Case Volume (Gals.)) x 3 (Specified Volumes) = 8.32 (Calculated Volume) Gals.

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1115	68.0	7.0	1600	7200	3.0	
1117	67.8	6.8	1400	7200	6.0	
1119	67.4	6.8	1200	7200	9.0	

Did well dewater? Yes (No) Gallons actually evacuated: 9.0

Sampling Time: 1123 Sampling Date: 12-18-97

Sample I.D.: MW7 Laboratory: BC Analytical

Analyzed for: (Tph-G) (BTEX) (Tph-D) Other: (MTBE 8260)

Equipment Blank I.D.: Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185/1071
Sampler: AL	Date: 12-18-97
Well I.D.: MW8	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 33.88	Depth to Water: 19.36
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius^2 * 0.164

Purge Method: S.S. Bailer ✓ Teflon Bailer Middleburg Electric Submersible Extraction Pump Other: ___

Sampling Method: S.S. Bailer ✓ Teflon Bailer Extraction Port Other: ___

2.46 (1 Case Volume (Gals.)) x 3 (Specified Volumes) = 7.40 (Calculated Volume) Gals.

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1415	68.8	7.4	2000	7200	3.0	SHEEN/ODOR
1417	68.4	7.4	1900	7200	6.0	
1419	68.2	7.2	1900	7200	8.0	

Did well dewater? Yes (No) Gallons actually evacuated: 8.0

Sampling Time: 1424 Sampling Date: 12-18-97

Sample I.D.: MW8 Laboratory: BC Analytical

Analyzed for: Tph-G BTEX Tph-D Other: MTBE 8260

Equipment Blank I.D.: Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710071
Sampler: AL	Date: 12-18-97
Well I.D.: MW 9	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 33.93	Depth to Water: 16.42
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius^2 * 0.164

Purge Method: S.S. Bailer x
Teflon Bailer
Middleburg
Electric Submersible
Extraction Pump
Other: _____

Sampling Method: S.S. Bailer x
Teflon Bailer
Extraction Port
Other: _____

2.97	x	3	=	8.93 Gals.
1 Case Volume (Gals.)		Specified Volumes		Calculated Volume

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1150	68.2	6.8	1200	>200		
1152	68.8	6.8	1000	190		
1154	68.6	6.8	1000	180		

Did well dewater? Yes (No)	Gallons actually evacuated: 9.0
Sampling Time: 1158	Sampling Date: 12-18-97
Sample I.D.: MW 9	Laboratory: BC Analytical
Analyzed for: Tph-G BTEX Tph-D	Other: MTBE 8260
Equipment Blank I.D.:	Analyzed for same as primary sample

TEXACO WELL MONITORING DATA SHEET

Project #: 971218-A1	Texaco ID#: 6185710 71
Sampler: AL	Date: 12-18-97
Well I.D.: MW 10	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 33.40	Depth to Water: 16.18
Depth to Free Product:	Thickness of Free Product:

All Measurements are referenced to TOC. Meter used is Myron LpDS pH/EC Meter. All temperatures taken in degrees Fahrenheit.

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.17	5"	1.02
3"	0.38	6"	1.50
4"	0.66	8"	2.60
4.5"	0.83	Other	radius^2 * 0.164

Purge Method: S.S. Bailer X; Teflon Bailer; Middleburg; Electric Submersible; Extraction Pump; Other: _____

Sampling Method: S.S. Bailer X; Teflon Bailer; Extraction Port; Other: _____

2.95	x	3	=	8.78 Gals.
1 Case Volume (Gals.)		Specified Volumes		Calculated Volume

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Color/Odor
1030	67.6	7.8	2000	>200	3.0	
1033	67.0	7.4	1900	>200	6.0	
1036	67.0	7.2	1800	7200	9.0	

Did well dewater? Yes (No)	Gallons actually evacuated: 9.0
Sampling Time: 1040	Sampling Date: 12-18-97
Sample I.D.: MW-10	Laboratory: BC Analytical
Analyzed for: (Tph-G) (BTEX) (Tph-D)	Other: MTBE 8260
Equipment Blank I.D.: EB	Analyzed for same as primary sample YES

SOURCE RECORD

BILL OF LADING

FOR NON-HAZARDOUS PURGEWATER RECOVERED FROM GROUNDWATER WELLS AT TEXACO FACILITIES IN THE STATE OF CALIFORNIA. THE NON-HAZARDOUS PURGE-WATER WHICH HAS BEEN RECOVERED FROM GROUND-WATER WELLS IS COLLECTED BY THE CONTRACTOR, MADE UP INTO LOADS OF APPROPRIATE SIZE AND HAULED TO THE DESTINATION DESIGNATED BY TRMI EH&S.

Contractor: Blaine Tech Services, Inc.
Address: 1680 Rogers Ave.
City, State, ZIP: San Jose, CA 95112
Phone: (408) 573-0555

is authorized by TRMI EH&S to recover, collect, apportion into loads, and haul the NON HAZARDOUS WELL PURGEWATER that is drawn from wells at the Texaco facility listed below and to deliver that purgewater to an appropriate destination designated by TRMI EH&S in either Redwood City, California or in Richmond, California. Transport routing of the Non-Hazardous Well Purgewater may be direct from one Texaco facility to the designated destination point; from one Texaco facility to the designated destination point via another Texaco facility; from a Texaco facility to the designated destination point via the contractor's facility, or any combination thereof. The Non-Hazardous Well Purgewater is and remains the property of TRMI EH&S.

This **SOURCE RECORD BILL OF LADING** was initiated to cover the recovery of Non-Hazardous Well Purgewater from wells at the Texaco facility described below:

Texaco#: 61857107
Address: 3800 BROADWAY
City, State, ZIP: OAKLAND, CA.

WELL I.D.	GALS.	WELL I.D.	GALS.
MW-1	5.0		
MW-2	7.0		
MW-3	8.0		
MW-4	9.0		
MW-5	7.0		
MW-6	6.0		
MW-7	9.0		
MW-8	8.0		
MW-9	9.0		
MW-10	9.0		

Total gals. 5

added rinse water 74.0

Total Gals. Recovered 74.0

Job#: 971218-A1
Date: 12-18-97
Time: 1630
Signature: Al Henry

REC'D AT: BLAINE TECH. SERVICES INC.
Date: 12-18-97
Time: 1830
Signature: Al Henry

Texaco Refining and Marketing Inc., Environmental Health and Safety
Standard Operating Procedures
for Groundwater Monitoring and Sampling

The following are routine procedures to be followed by personnel obtaining field information concerning petroleum product thickness and samples of groundwater during the monitoring and sampling of Texaco sites. These procedures are designed to assure that:

- Information and samples are properly collected.
- Samples are identified, preserved and transported in a manner such that they are representative of field conditions.
- Monitoring and sampling results are reproducible.

Water Level Measurements

Water level measurements are needed to document groundwater flow directions and calculate gradient. By gauging the level of water in a groundwater monitoring well and comparing the compiled data, calculations can be made that determine the direction the groundwater at the monitored well is flowing and the groundwater gradient between successive monitoring wells.

- An interface probe or electronic probe is generally used to gauge the level of water in a monitoring well. When using either probe, it is slowly lowered into the well until the oscillating alarm indicating water is heard. Raise the interface probe above the water level and lower back into the water at least three times to verify that the true depth to water is measured. The depth to water should always be measured form the same spot on the top of the well casing. The designate "Top of Casing" mark should be at the North side of the casing. Without moving the probe, read the numbers on the tape to determine the distance to water from the top of the well casing. A chalked, steel add-tape may also be used to gauge the level of water in a monitoring well. When using the steel tape, it is slowly lowered into the well until the chalked portion of the tape encounters water. Read the numbers on the tape to determine the distance from the predetermined top of the well casing. Raise the tape to the surface grade, re-chalk and lower it back into the water at least tow times to verify that the true depth to water is measured. Record the depth to water on the Well Gauging Form and Groundwater Sampling Form.

Petroleum Product Thickness Measurements

If free phase petroleum hydrocarbons (product) are observed floating on the groundwater surface during the water level measurement, the thickness of the product will be measured in each appropriate well. Groundwater samples will not be collected for chemical analysis from wells containing product (even a sheen) unless specifically requested by the Project Coordinator. If the Project Coordinator requests that wells containing product be sampled, only those wells with product thickness of less than 0.01 foot will be sampled. Arrangements to bail, store, and dispose of product must be made separately. When product is stored, according to Texaco policy, it will be double-contained and disposed of within 90 days of generation. Product thickness will be measured using interface probes, and/or acrylic (clear plastic) bailers. The procedures for obtaining level and thickness measurements using each instrument are:

- The level of the top of the product will be measured with an interface probe. When product is suspected but not measurable with the interface probe, a visual evaluation can be made using clear bailers. A bailer will be lowered into the water/product surface so that the top of the bailer is NOT submerged; the bailer is then removed from the well

and the thickness of the product visually measured and documented on the Well Gauging Form.

- When the interface probe contact liquid, the visual/audible alarm on the reel will be activated. An oscillating alarm indicates water, a continuous alarm indicates hydrocarbon*. To determine the exact thickness of a hydrocarbon layer, the probe should be slowly lowered to the air/hydrocarbon interface until the alarm is activated. With the probe at the exact point where the alarm comes on, read the numbers on the tape to determine the distance from the top of casing elevation mark. Next, lower the probe through the hydrocarbon layer and well into the water. An oscillating alarm will be obtained. The probe alarm changes from oscillating to continuous. The thickness of the hydrocarbon layer is determined by subtracting the first reading from the second reading. Record the calculated value on the Well Gauging Form and Groundwater Sampling Form.

* The process described here is equipment specific. Follow the procedures applicable for your monitoring equipment.

Groundwater Sampling

Groundwater samples will be collected from selected groundwater monitoring wells to provide data which will be statistically representative of local groundwater conditions at the site. Groundwater samples will be collected as follows:

- All measuring and sampling equipment will be decontaminated prior to sample collection from each well and documented on the Groundwater Sampling Form.

- Prior to sampling activity, the water level in the well will be measured and the minimum purge volume of each well will be calculated using the purge volume calculation portion of the Groundwater Sampling Form. A minimum of three casing volumes will be purged prior to sample collection. The actual total volume purged will be recorded on Groundwater Sampling Form.

- Prior to sampling, a submersible pump, centrifugal pump, peristaltic pump, or a Teflon or stainless steel bailer will be used to purge a minimum of three casing volumes from each well. Purge volumes will be estimated using a flow meter of a stopwatch and a bucket to estimate flow rate, from which a time to purge the required volume will be calculated. The pump will be lowered to a depth of two to three feet from bottom of the well. When bailers are used for purging, the bailer should be gently lowered into the water and allowed to fill, then removed. Purged water may be placed into 5-gallon buckets to determine the volume of groundwater removed. Care should be taken to not agitate the water which could release volatile organics.

- Whenever possible, groundwater parameters pH, temperature (in degrees Celsius [C]), specific conductance (in micromhos per centimeters squared [umhos]), and turbidity (in National Turbidity Units [NTU]) will be monitored and recorded on the Groundwater Sampling Form.

- If a well is purged dry before three casing volumes have been removed, the sample will be taken after the well has recovered to at least 80 percent of the static water level prior to purging or after 4 hours when sufficient water volume is available to meet analytical requirements, whichever comes first. Reasonable efforts will be made to avoid dewatering wells by using low-yield pumps as necessary.

- Water samples will be collected with a stainless steel or Teflon bailer. To reduce potential cross contamination, sampling should take place in order from least to most

contaminated wells. Bailer strings should be replaced between each well to avoid cross contamination form a bailer string which has absorbed contamination.

- Sample containers will be filled directly from the bailer.

- Use only sample containers prepared and provided by an analytical laboratory. Preservatives are required for some types of samples. Sample containers containing preservatives should be supplied by an analytical laboratory.

- For volatile organics analysis, each sample vial will be filled with sample water so that water stands above the lip of the vial. The cap should then be quickly placed on the vial and tightened securely. The vial should then be checked to ensure that no air bubbles are present prior to labeling the sample.

- Take site blank samples (trip and rinsate) using distilled water or laboratory supplied water from a known uncontaminated source. One trip blank and one rinsate blank sample for each site will be analyzed for each site sampling event.

- Once collected and labeled, all samples will be stored in a cooler maintained at 4 degrees Celsius using frozen water ice.

Sample Custody Procedures

Sample custody procedures will be followed through sample collection, transfer, analysis and ultimate disposal. The purpose of these procedures is to assure that the integrity of samples is maintained during their collection and transfer. Sample quantities, types and locations will be determined before the actual field work begins. As few people as possible will handle samples. The field sampler is personally responsible for the care and custody of the collected samples until they are properly transferred.

Each sample will be labeled and sealed properly immediately after collection. Sample identification documents will be carefully prepared so that identification and chain-of-custody records can be maintained and sample identification documents that will be utilized during the field operations.

- Sample Identification Label
- Chain-of-Custody

Each separate sample will be identified using a label obtained from the laboratory. The sampler will complete all information, using a black waterproof pen, as follows:

The Site ID This is the name assigned to the particular sampling station.

The Sample Source This will be the name of the well location.

The Analysis Required This will be indicated for each sample using proper EPA reference number indicating analytical method.

The Date Taken This will be the date the sample was collected, using the format MM-DD-YY Example: 06-15-91

Noting the Time The time the sample was collected will be given in military time. Example: 1430

The Method of Preservation Preservation methods will be provided, specifying the type of preservation. For non-acidified samples, "ice" will be indicated.

The Sampler's Name This will be printed in the "Sampled By" section. The sampler's signature will be written in the "Signed" section.

There is potential that samples and analyses could be of an evidentiary nature. Therefore, the possession of samples must be traceable from the time samples are collected in the field until the analysis is completed and the data are entered as evidence. The tracing of the samples through the laboratory is accomplished by "chain-of-custody" procedures. Chain-of-Custody Forms will be completed for each set of samples. The sampler will sign the first "Relinquished By" line at the bottom of the chain of custody record, and will indicate the date and time of the custody transfer. Samples will not leave custody of the field technician until relinquished to another party. Custody is defined by the following criteria.

In the Actual Physical Possession When field personnel have sample in possession, they have "custody".

In View The samples are in the field personnel's view after being in their physical possession.

Special Areas Sample is kept in a locked area after being in physical possession.

Designated Area Sample is in a designated, locked-storage area.

Transfer of samples to an analytical laboratory will be done by use of a common carrier or personal delivery. Carrier personnel will personally secure samples and sample containers in such a way that no containers can be opened in transit. The person to whom the custody is being transferred will sign on the first "Received By" line of the chain-of-custody record, indicating that custody is being accepted by the carrier for all the samples listed on the sheet. For subsequent transfers of custody, the succeeding relinquish and receipt lines will be used.

Equipment Decontamination

All equipment that comes in contact with potentially contaminated soil or water will be decontaminated prior to and after each use (for example, after each sampling event). All purging and sampling equipment will be decontaminated with an Alconox wash and rinsed with deionized water. Decontamination water generated will be added to the purge water.