



3330 Cameron Park Drive Suite 550 Cameron Park CA 95682

Phone: (530) 676-6004 ~ Fax (530) 676-6005

TRANSMITTAL

Date 7/18/03

Project 2007-0057-01

To:

Mr. Don Hwang

Alameda County Dept. of Environmental Health

1131 Harbor Bay Parkway, 2nd Floor

Alameda, CA 94502

Alameda County
JUL 23 2003
Environmental Health

Re: USA Station #57, 10700 MacArthur Boulevard, Oakland

Item	Description
1	Closure Information Proposal (GHH Engineering, Inc., April 2002)

Comments:

As discussed in our telephone conversation this afternoon, the attached report appears to be missing from your files. I'll attempt to get the foundation information for the proposed construction from the developer, and then call you late next week to discuss.

Steve Carter
Stratus Environmental.

Alameda County
JUL 23 2003
Environmental Health

**CLOSURE INFORMATION
PROPOSAL**

**USA STATION #57
10700 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA**

APRIL, 2002

PREPARED FOR:

**USA GASOLINE CORPORATION
AND
ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY**

PREPARED BY:

**GHH ENGINEERING, INC.
11960 HERITAGE OAK PLACE, SUITE 2B
AUBURN, CALIFORNIA 95603**



ENGINEERING, INC.

RCE #27011 Lic. #537901

April 26, 2002

Mr. Barney Chan
Alameda County
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

**SUBJECT: CLOSURE INFORMATION/PROPOSAL
10700 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA**

Dear Mr. Chan:

This letter provides data to supplement and support the risk assessment contained in the "Risk Assessment and Closure Request" for the subject site, dated January 11, 1999. Included with this proposal are the sample data requested in your letters dated October 5, 1998 and May 24, 1999.

A groundwater sampling round was conducted on November 2, 1998. Monitoring wells S-1, S-2, MW-3, MW-5 and MW-8 were purged and sampled. On June 10, 1999, S-1, S-2, MW-3 and MW-5 were sampled again. The samples were analyzed for TPH G, TPH D, BTEX and MTBE, utilizing EPA Methods M8015 modified and 8020. The MTBE sample collected on June 10, 1999 was confirmed by GCMS using EPA Method 8260. The groundwater elevations and gradients for November 2, 1998 and June 10, 1999 are presented on Figures 3 and 3a, respectively, and the data is presented in Table 1. The analytical results are shown on Figures 4 and 4a and presented in Table 2.

Bio-parameters were analyzed from groundwater samples collected on November 2, 1998 and June 10, 1999. These data, shown on Table 3, indicate dissolved oxygen levels between 1.9 to 2.6 mg/l in S-1, S-2 and MW-3. Oxygen levels between 5.0 -7.0 mg/l are necessary in groundwater for optimum aerobic biodegradation to take place. The analytical results indicate an aerobic environment is present at the site and biodegradation is occurring, but under less than optimum conditions. To enhance and expedite aerobic degradation the oxygen levels can be raised by the injection of Oxygen Release Compound (ORC®) into the subsurface.

Tier 1 Risk Based Corrective Action

The ASTM RBCA Tier 1 analysis has been used to evaluate the potential pathways, which are volatilization from soils to indoor and outdoor air, volatilization from the groundwater to indoor and outdoor air, and leaching of the fuel hydrocarbon compounds to the groundwater.

The potential routes for exposure at the site are inhalation, ingestion and adsorption. Historic groundwater and soil analytical results presented on Tables 2, 4 and 5 have been used to perform these evaluations.

A total carcinogenic risk of $1.00E-4$ and a toxic effect hazard quotient of $1.00E+0$ were used for this commercial site.

The conservative "look up table" included in Appendix B suggests that benzene must be at least 45.7 mg/kg in the soil for soil volatilization to outdoor air to be a risk. The soil concentrations found on the site are less than this threshold level. There is not any buildings above either the TPH residual in the soil or the groundwater plume and much of the area is paved. Therefore, while the Tier 1 Risk Based Screening Level (RBSL) for benzene of 1.69 mg/kg in soil for vapor intrusion to buildings is exceeded by the 9.6 mg/kg for the excavation soil sample TC2-11 at 13-feet and the 2.6 mg/kg from boring B-1 at 13-feet, the lack of buildings in the area reduces or eliminates the significance of these values.

The RBSL for groundwater volatilization to outdoor air is not exceeded for all possible dissolved levels for benzene. This level will never be present at this site. The RBSL groundwater ingestion level is 0.294 mg/l, which is exceeded only in well S-2. The remedy for this limited area of impacted groundwater is presented in the following proposal.

The RBSL's for all pathways of concern from ethylbenzene, toluene or xylenes are not exceeded, except xylenes in S-2. The Chronic Hazard Quotient of 1 is 409 ppb for groundwater ingestion in S-2. The fate and transport issues for impacted groundwater were addressed in the "Risk Assessment and Closure Request" dated September, 1998. The results for Domenico Model contained in the ASTM 1739 standard are presented in Appendix C of that report and also in Appendix C of this submittal.

Proposal

To optimize the oxygen levels in the soil and groundwater, oxygen will need to be placed into the subsurface. One of the oxygen enhancing materials available is ORC® manufactured by Regenisis®. ORC® is a formulation of magnesium peroxide, which slowly releases molecular oxygen as the material is hydrated. The addition of oxygen is expected to allow the existing microorganism population to become more active, thus accelerating the biodegradation of the residual petroleum hydrocarbon compounds and the remediation of the site to agency acceptable concentrations for site closure.

The placement of ORC® into the soil beneath the site is therefore proposed. The ORC® will be placed in a grout slurry. The slurry will be pressure injected to provide a sufficient coverage and amount of material to properly treat the residual impacted soil and groundwater at the site to acceptable levels. Forty-seven soil borings will be drilled to inject the ORC®. These borings will be discussed in more detail later in the proposal.

An estimate of the mass of residual petroleum hydrocarbons remaining in the plume was prepared using calculations provided in software provided by Regenisis®. From these calculations an estimate was made of the amount of oxygen and thus oxygen releasing compound needed to treat the amount of hydrocarbon residual present.

The residual soil and groundwater plumes are presented on Figure 5. This figure shows the impacted areas separated into zones A, B and C by average TPH concentrations. Backup data and calculations for each zone are included in Appendix A.

Zone A has an average dissolved hydrocarbon concentration of 16 ppm, resulting in a dissolved phase hydrocarbon mass of 1.6 pounds and a loaded hydrocarbon mass of 9.6 pounds. The oxygen required in this zone is 28.8 pounds or 288 pounds of ORC®.

Zone B has an average dissolved hydrocarbon concentration of 6.2 ppm, resulting in a dissolved phase hydrocarbon mass of 1.7 pounds and a loaded hydrocarbon mass of 15.3 pounds. The oxygen required in this zone is 45.9 pounds or 459 pounds of ORC®.

Zone C has an average dissolved hydrocarbon concentration of 1.2 ppm, resulting in a dissolved phase hydrocarbon mass of 0.9 pounds and a loaded hydrocarbon mass of 8.1 pounds. The oxygen required in this zone is 24.3 pounds or 243 pounds of ORC®.

A total of nine hundred and ninety pounds of ORC® is proposed to be injected at the site from between 13 and 23-foot bgs in zones A, B and C. Zone A will require 288 pounds of compound in 4 borings. Zone B will require 459 pounds of compound in 23 borings and Zone C will require 243 pounds of ORC® in 20 borings.


The proposed boring locations are presented on Figure 6. The borings will be drilled to the required depths and then the ORC® will be pressure injected into the soil at the above described depth intervals. The Material Safety Data Sheet for the ORC® is included in Appendix D. Before commencing drilling activities, Underground Service Alert will be notified to identify utilities that may be present beneath the former USA site.

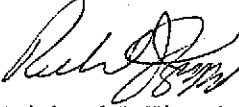
In conjunction with the ORC® injection program, it is proposed to abandon all monitoring wells to ensure these wells will not be potential conduits to the aquifer in the future. The wells will be abandoned by standard pressure injection techniques, approved and permitted through Alameda County Public Works.

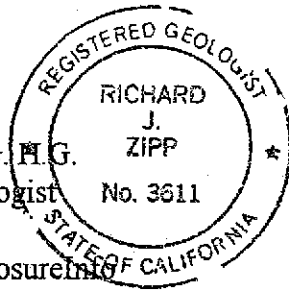
On behalf of USA Gasoline Corporation, GHH requests closure following implementation of this proposal for ORC® injection and proper abandonment of the monitoring wells on-site. We believe that after implementing this program, site closure can be obtained. We are prepared to proceed with the tasks in this proposal after receiving written approval from Alameda County.

If you have any questions or need additional information, please contact the undersigned at (530) 886-3100.

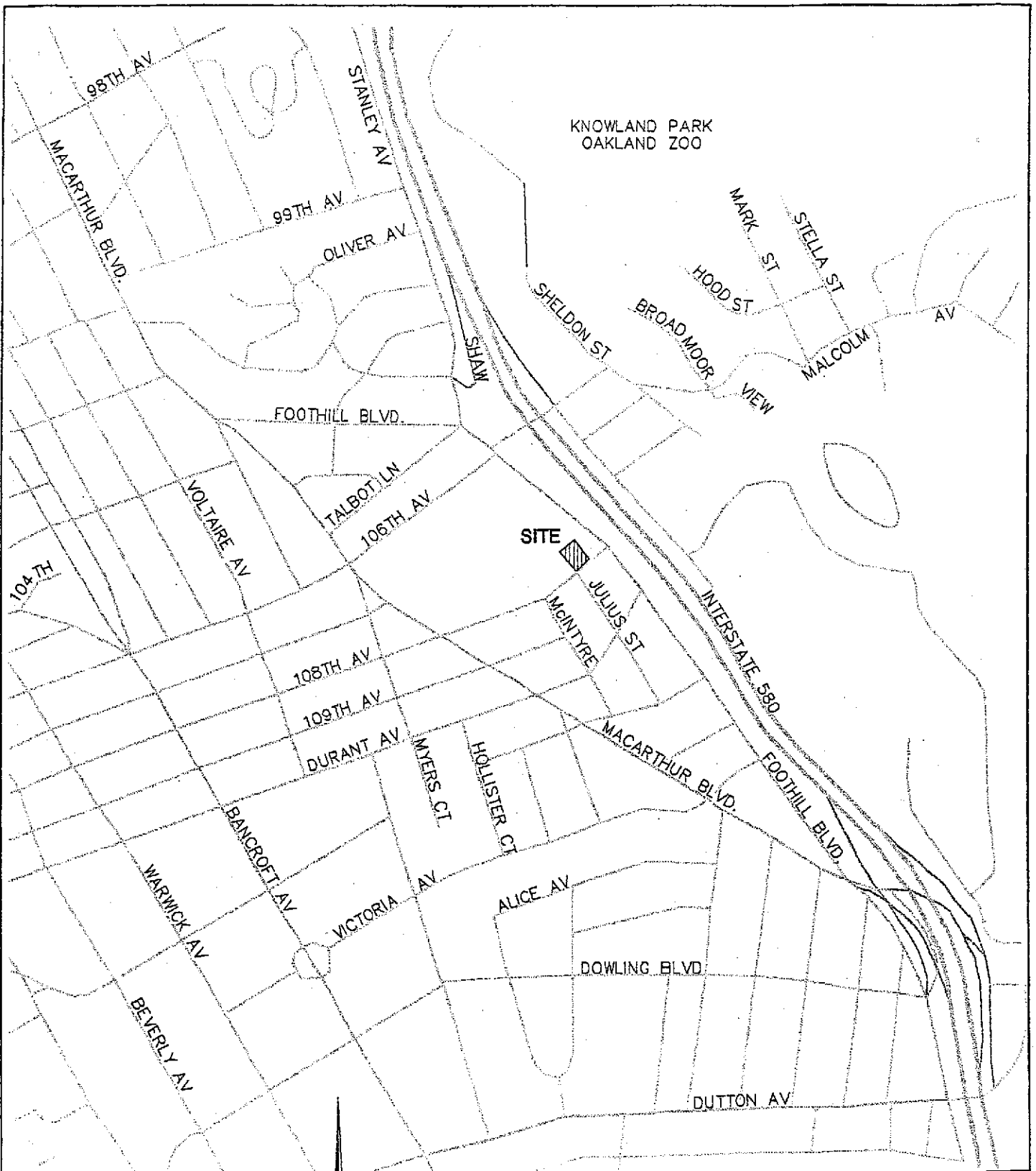
Thank You,


Vern A. Bennett
Project Manager


Richard J. Zipp, R.G. H.G.
Principal Hydrogeologist



F:\Staff\VB\5090\Closure.mxd



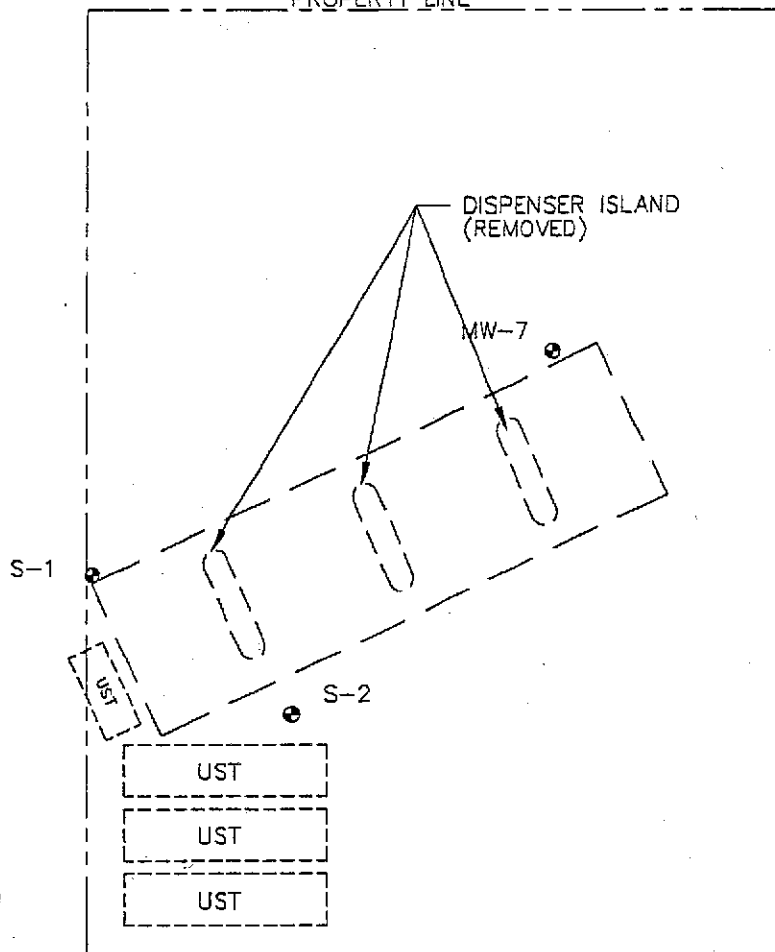
APPROX. SCALE: 1" = 800'

USA GASOLINE STATION #57 10700 MACARTHUR BLVD. OAKLAND, CALIFORNIA SITE LOCATION MAP	
GHH ENGINEERING, INC. 8084 Old Auburn Rd. Citrus Heights, CA 95610 (916) 723-7645	INITIAL M.A.R.
	DATE 10/28/97
	JOB # 5090
	FIG. # 1

MW-4

MW-5

PROPERTY LINE



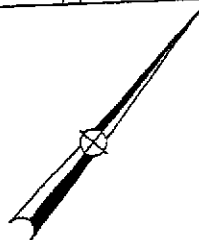
MW-3

MW-8

108TH AVENUE

LEGEND

● MONITORING WELL LOCATION



SCALE: 1" = 30'

USA GASOLINE STATION #57
OAKLAND, CALIFORNIA
SITE PLAN

GHH

ENGINEERING, INC.
8084 Old Auburn Rd.
Citrus Heights, CA 95610
(916) 723-7645

INITIAL	G.E.B.
DATE	7/1/99
JOB #	5090
FIG. #	2

MW-4
60.34'

MW-5
64.54'

PROPERTY LINE

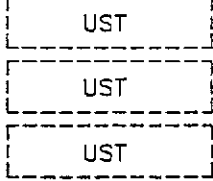
MW-6
63.67'

MW-7
63.71'

S-1
63.40'

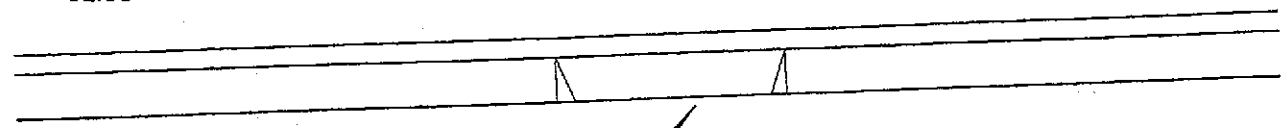
S-2
63.62'

MW-3
63.21'



11/2/98
0.004 ft/ft
S 26° W

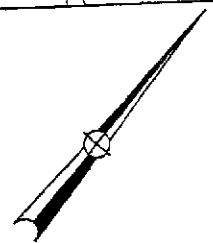
MW-8
62.65'



108TH AVENUE

LEGEND

● MONITORING WELL LOCATION



SCALE: 1" = 30'

* NOT USED IN GRADIENT CALCULATION

USA GASOLINE STATION #57
OAKLAND, CALIFORNIA
GROUNDWATER ELEVATION MAP
NOVEMBER 2, 1998

GWH

ENGINEERING, INC.
8084 Old Auburn Rd.
Citrus Heights, CA 95610
(916) 723-7645

INITIAL	G.E.S.
DATE	7/1/99
JOB #	5090
FIG. #	3

MW-4
61.61

MW-5
65.92

PROPERTY LINE

MW-6
64.72

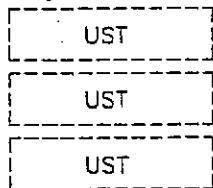
MW-7
64.63

S-1
64.33

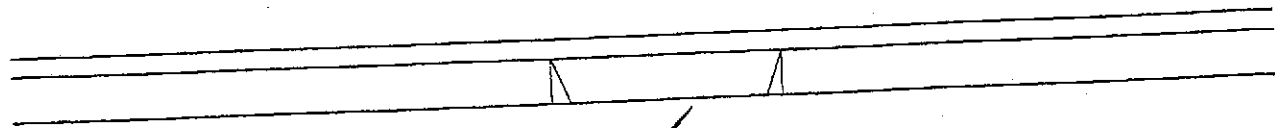
6/10/99
0.003 ft/ft
S 52° W

S-2
64.45

MW-3
65.08



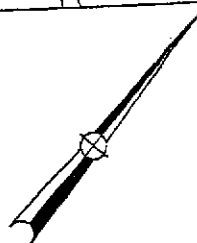
MW-8
64.57



108TH AVENUE

LEGEND

● MONITORING WELL LOCATION



SCALE: 1" = 30'

* NOT USED IN GRADIENT CALCULATION

USA GASOLINE STATION #57
OAKLAND, CALIFORNIA
GROUNDWATER ELEVATION MAP
JUNE 10, 1999

GHH

ENGINEERING, INC.
8084 Old Auburn Rd.
Citrus Heights, CA 95610
(916) 723-7645

INITIAL	G.E.B.
DATE	7/1/99
JOB #	5090
FIG. #	3 A

TPHD	ND
THPG	ND
B	ND
T	ND
E	ND
X	ND
MTBE	ND

MW-4
NS

MW-5

PROPERTY LINE

MW-6
NS

TPHD	1,200
THPG	1,000
B	ND
T	9.5
E	1.6
X	9.1
MTBE	100

MW-7
NS

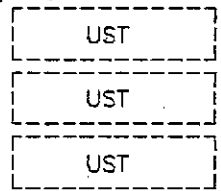
S-1

TPHD	1,600
THPG	4,900
B	220
T	16
E	13
X	13.7
MTBE	180

TPHD	ND
THPG	14,000
B	170
T	70
E	170
X	230
MTBE	490

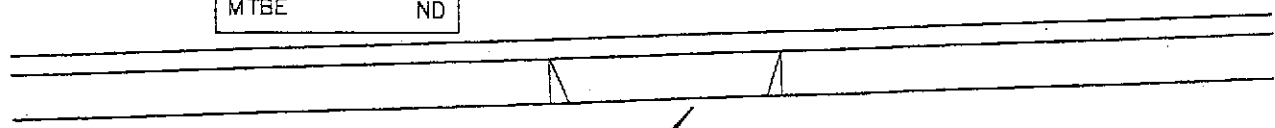
S-2

MW-3



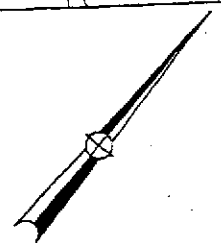
TPHD	ND
THPG	ND
B	ND
T	ND
E	ND
X	ND
MTBE	ND

MW-8



108TH AVENUE

LEGEND
 ● MONITORING WELL LOCATION
 SAMPLING LEGEND
 SAMPLED: NOVEMBER 2, 1998
 NS - NOT SAMPLED
 ND - NOT DETECTED AT THE METHOD DETECTION LIMIT



SCALE: 1" = 30'

USA GASOLINE STATION #57
 OAKLAND, CALIFORNIA
 TPHG, TPHD, BTEX & MTBE
 CONCENTRATIONS IN GROUNDWATER

GWH
 ENGINEERING, INC.
 8084 Old Auburn Rd.
 Citrus Heights, CA 95610
 (916) 723-7645

INITIAL	G.E.B.
DATE	7/1/99
JOB #	5090
FIG. #	4

● MW-4
NS

● MW-5
NS

PROPERTY LINE

TPHD	NS
THPG	NS
B	NS
T	NS
E	NS
X	NS
MTBE	NS

● MW-6
NS

TPHD	150
THPG	660
B	0.99
T	ND
E	ND
X	2.4
MTBE	80

MW-7 ●

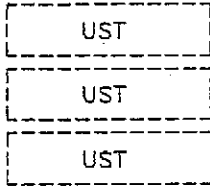
S-1 ●

TPHD	120
THPG	1,000
B	ND
T	ND
E	ND
X	1.1
MTBE	120

TPHD	ND
THPG	17,000
B	650
T	230
E	ND
X	750
MTBE	490

S-2 ●

MW-3 ●



● MW-8
NS

108TH AVENUE

LEGEND

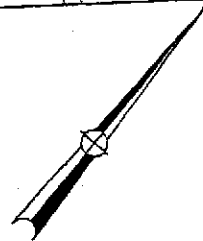
● MONITORING WELL LOCATION

SAMPLING LEGEND

SAMPLED: JUNE 10, 1999

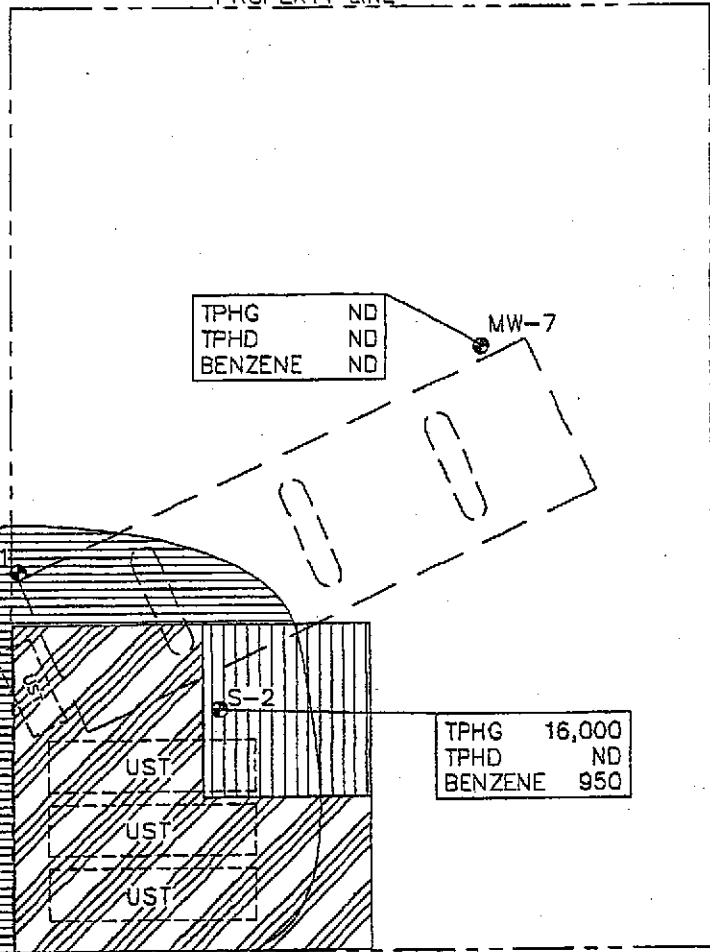
NS - NOT SAMPLED

ND - NOT DETECTED AT THE METHOD DETECTION LIMIT



SCALE: 1" = 30'

USA GASOLINE STATION #57 OAKLAND, CALIFORNIA TPHG, TPHD, BTEX & MTBE CONCENTRATIONS IN GROUNDWATER	
GHH	INITIAL G.E.B.
ENGINEERING, INC. 8084 Old Auburn Rd. Citrus Heights, CA 95610 (916) 723-7645	DATE 7/1/99
	JOB # 5090
	FIG. # 4 A



TPHG	310
TPHD	2,000
BENZENE	5.4

TPHG	ND
TPHD	ND
BENZENE	ND

TPHG	ND
TPHD	ND
BENZENE	ND




TPHG	16,000
TPHD	ND
BENZENE	950

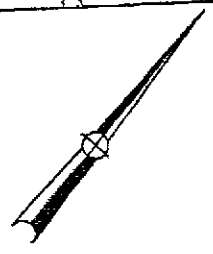
TPHG	2,200
TPHD	610
BENZENE	510

TPHG	ND
TPHD	ND
BENZENE	ND


108TH AVENUE

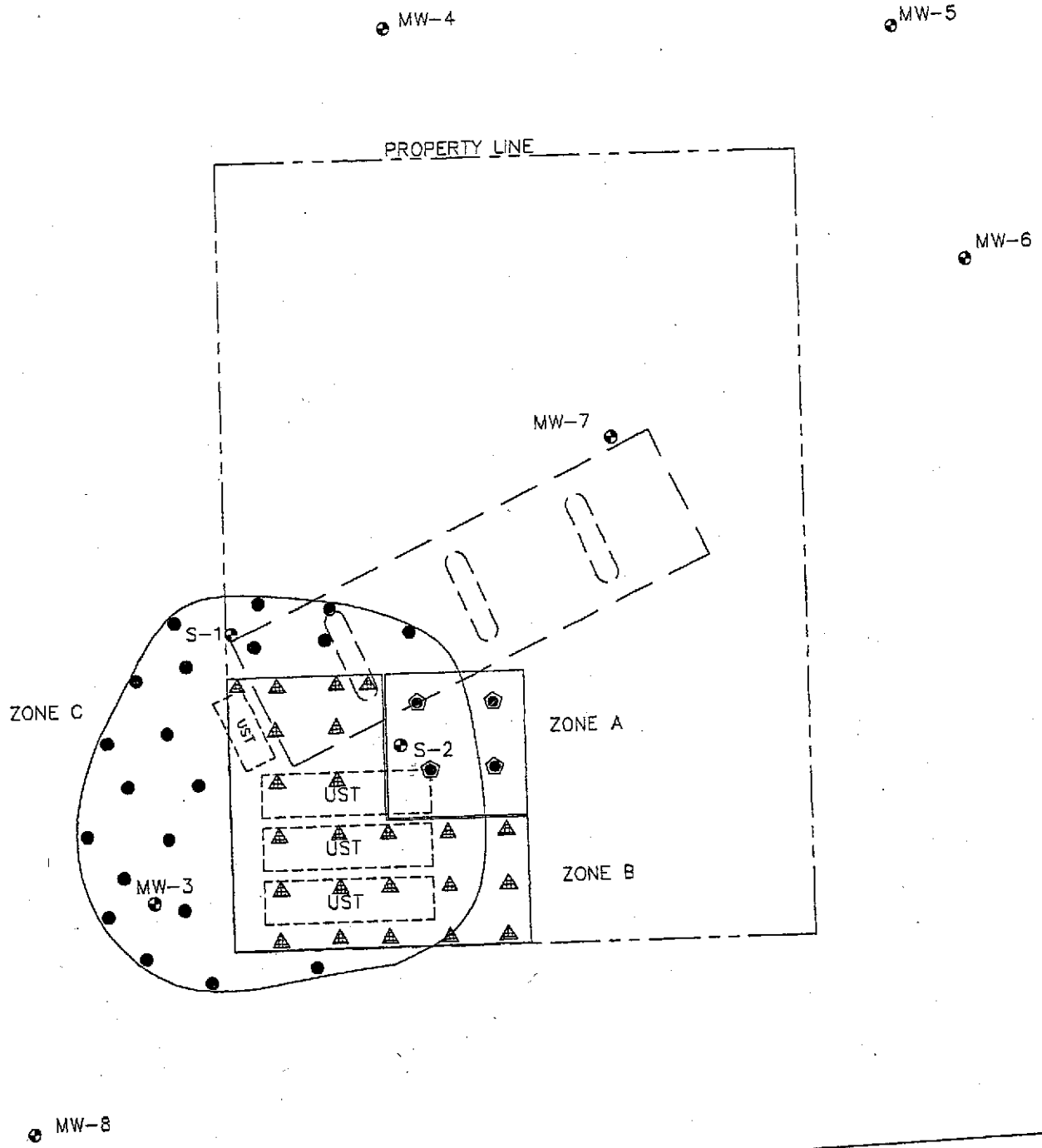
ANALYSIS TAKEN JULY 31, 1998
LEGEND

- MONITORING WELL LOCATION
-  ZONE A
-  ZONE B
-  ZONE C



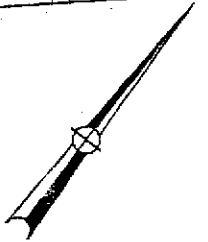
SCALE: 1" = 30'

USA GASOLINE STATION #57 OAKLAND, CALIFORNIA ZONES OF CONTAINMENT	
 ENGINEERING, INC. 8084 Old Auburn Rd. Citrus Heights, CA 95610 (916) 723-7645	INITIAL G.E.B.
	DATE 7/1/99
	JOB # 5090
	FIG. # 5



LEGEND

- MONITORING WELL LOCATION
- ⊙ ORC INJECTION LOCATION ZONE A
- ▲ ORC INJECTION LOCATION ZONE B
- ORC INJECTION LOCATION ZONE C



SCALE: 1" = 30'

USA GASOLINE STATION #57 OAKLAND, CALIFORNIA ORC INJECTION LOCATION MAP	
 ENGINEERING, INC. 8084 Old Auburn Rd. Citrus Heights, CA 95610 (916) 723-7645	INITIAL G.E.B.
	DATE 7/7/99
	JOB # 5090
	FIG. # 6

TABLE 1

GROUNDWATER ELEVATION DATA
FORMER USA STATION #57
10700 MacARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Well ID	Date of Measurement	Elevation Top of Casing (feet)	Depth to Groundwater	Elevation of Groundwater (feet MSL)	Product Thickness (feet)
S-1	03/03/95	74.74	13.10	61.64	0.00
	07/24/95		12.35	62.39	0.00
	11/22/95	78.68	19.30	59.38	0.00
	12/06/95		19.59	59.09	0.00
	01/04/96		19.52	59.16	0.00
	01/31/97		15.07	63.61	0.00
	10/10/97		18.90	59.78	0.00
	01/20/98		16.79	61.89	0.00
	04/28/98		8.37	70.31	0.00
	07/31/98		11.61	67.07	0.00
	11/02/98		15.28	63.40	0.00
	06/10/99		14.35	64.33	0.00
	S-2	03/03/95	76.86	15.39	61.47
07/24/95			14.47	62.39	0.00
11/22/95		80.93	21.52	59.41	trace
12/06/95			21.78	59.15	0.00
01/04/96			21.75	59.18	0.00
01/31/97			17.25	63.68	trace
10/10/97			21.21	59.72	trace
01/20/98			19.07	61.86	0.00
04/28/98			10.47	70.46	0.00
07/31/98			13.71	67.22	0.00
11/02/98			17.31	63.62	0.00
06/10/99			16.48	64.45	0.00
MW-3		03/03/95	76.30	13.99	62.31
	07/24/95		13.33	62.97	0.00
	11/22/95	80.32	20.94	59.38	0.00
	12/06/95		17.48	62.84	0.00
	01/04/96		20.01	60.31	0.00
	01/31/97		16.63	63.69	0.00
	10/10/97		20.62	59.70	0.00
	01/20/98		15.40	64.92	0.00
	04/28/98		10.51	69.81	0.00
	07/31/98		13.46	66.86	0.00
	11/02/98		17.11	63.21	0.00
	06/10/99		15.24	65.08	0.00
	MW-4	11/22/95	76.42	14.99	61.43
12/06/95			11.21	65.21	0.00
01/04/96			14.62	61.80	0.00
01/31/97			8.18	68.24	0.00
10/10/97			14.14	62.28	0.00
01/20/98			7.05	69.37	0.00
04/28/98			5.88	70.54	0.00
07/31/98			8.40	68.02	0.00
11/02/98			16.08	60.34	0.00
06/10/99			14.81	61.61	0.00

TABLE 1 (Continued)

**GROUNDWATER ELEVATION DATA
FORMER USA STATION #57
10700 MacARTHUR BOULEVARD
OAKLAND, CALIFORNIA**

Well ID	Date of Measurement	Elevation Top of Casing (feet)	Depth to Groundwater	Elevation of Groundwater (feet MSL)	Product Thickness (feet)
MW-5	11/22/95	80.52	19.56	60.96	0.00
	12/06/95		15.84	64.68	0.00
	01/04/96		19.36	61.16	0.00
	01/31/97		13.31	67.21	0.00
	10/10/97		17.80	62.72	0.00
	01/20/98		12.58	67.94	0.00
	04/28/98		9.45	71.07	0.00
	07/31/98		7.38	73.14	0.00
	11/02/98		15.98	64.54	0.00
	06/10/99		14.60	65.92	0.00
MW-6	11/22/95	81.64	21.73	59.91	0.00
	12/06/95		18.03	63.61	0.00
	01/04/96		21.67	59.97	0.00
	01/31/97		16.01	65.63	0.00
	10/10/97		20.55	61.09	0.00
	01/20/98		15.74	65.90	0.00
	04/28/98		10.78	70.86	0.00
	07/31/98		13.97	67.67	0.00
	11/02/98		17.97	63.67	0.00
	06/10/99		16.92	64.72	0.00
MW-7	11/22/95	78.86	19.38	59.48	0.00
	12/06/95		19.72	59.14	0.00
	01/04/96		19.76	59.10	0.00
	01/31/97		15.25	63.61	0.00
	10/10/97		19.03	59.83	0.00
	01/20/98		17.11	61.75	0.00
	04/28/98		8.22	70.64	0.00
	07/31/98		11.53	67.33	0.00
	11/02/98		15.15	63.71	0.00
	06/10/99		14.23	64.63	0.00
MW-8	11/22/95	79.55	33.33	46.22	0.00
	12/06/95		17.57	61.98	0.00
	01/04/96		20.08	59.47	0.00
	01/31/97		18.72	60.83	0.00
	10/10/97		20.26	59.29	0.00
	01/20/98		15.91	63.64	0.00
	04/28/98		10.39	69.16	0.00
	07/31/98		12.93	66.62	0.00
	11/02/98		16.90	62.65	0.00
	06/10/99		14.98	64.57	0.00

MSL Mean sea level

MW-6 could not be found during the 10/18/00 sample round

MW-3 & 6 could not be found during the 03/12/02 sample round

TABLE 2

GROUNDWATER ANALYTICAL DATA
FORMER USA STATION #57
10700 MacARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Well ID	Date Sampled	TPH G (ug/l)	TPH D (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl- benzene (ug/l)	Total Xylene (ug/l)	MTBE 8020 (ug/l)
S-1	12/17/87	-	-	630	4.4	3.5	37	-
	01/27/94	6,900	ND(50)	880	ND(15)	ND(15)	ND(15)	-
	03/03/95	910	5900	260	7.6	16	14	-
	07/24/95	-	-	-	-	-	-	-
	11/22/95	460	6100	13	0.69	0.99	1.1	460
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	1,100	200	11	6	3	6	200
	10/10/97	530	2,000	ND(0.5)	2.1	ND(0.5)	ND(2)	230
	01/20/98	1,800	200	ND(0.5)	ND(0.5)	1.5	10	87
	04/28/98	130	7,300	1.9	3.2	ND(0.5)	ND(0.5)	310
	07/31/98	310	2,000	0.54	4.6	3.8	0.82	280
	11/02/98	1,000	1,200	ND(0.5)	9.5	1.6	9.1	100
	06/10/99	660	150	0.99	ND(0.5)	ND(0.5)	2.4	*80
S-2	12/17/87	-	-	3,400	3,800	1,300	11,000	-
	01/27/94	15,000	ND(50)	660	230	470	1,600	-
	03/03/95	24,000	6000	1900	440	600	2,500	-
	07/24/95	-	-	-	-	-	-	-
	11/22/95	-	-	-	-	-	-	-
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	-	-	-	-	-	-	-
	10/10/97	13,000	ND(50)	260	38	190	280	600
	01/20/98	1,900	2,300	4.6	6.3	ND(0.5)	4.6	190
	04/28/98	22,000	ND(100)	980	160	320	680	570
	07/31/98	16,000	ND(50)	950	290	550	1,700	550
	11/02/98	14,000	ND(500)	170	70	170	230	490
	06/10/99	17,000	ND(50)	650	230	ND(25)	750	*490
MW-3	03/03/95	2,500	1600	540	92	36	200	-
	07/24/95	-	-	-	-	-	-	-
	11/22/95	14,000	5400	5700	230	430	650	820
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	1,100	ND(50)	130	8	5	5	-
	10/10/97	3,400	1,100	830	4	100	ND(10)	160
	01/20/98	3,900	550	7.9	4.1	ND(0.5)	3.7	ND(5.0)
	04/28/98	800	1,000	82	5.2	5.7	5.4	240
	07/31/98	2,200	610	510	7.6	16	5.27	310
	11/02/98	4,900	1,600	220	16	13	13.7	180
06/10/99	1,000	120	ND(0.5)	ND(0.5)	ND(0.5)	1.1	*120	
MW-4	11/22/95	ND(50)	200	ND(0.5)	1.5	ND(0.5)	1.7	6.4
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	ND(50)	ND(50)	ND(0.5)	2	ND(0.5)	2	11
	10/10/97	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	ND(5.0)
	01/20/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	04/28/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	07/31/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
11/02/98	-	-	-	-	-	-	-	

TABLE 2 (Continued)

GROUNDWATER ANALYTICAL DATA
FORMER USA STATION #57
10700 MacARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Well ID	Date Sampled	TPH G (ug/l)	TPH D (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl- benzene (ug/l)	Total Xylene (ug/l)	MTBE 8020 (ug/l)
MW-5	11/22/95	ND(50)	280	ND(0.5)	1.8	ND(0.5)	3	2.2
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	80	ND(50)	ND(0.5)	0.6	ND(0.5)	2	6
	10/10/97	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	ND(5)
	01/20/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	04/28/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	07/31/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	11/02/98	ND(50)	ND(500)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
MW-6	11/22/95	ND(50)	140	ND(0.5)	1.2	ND(0.5)	1.5	5.3
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	70	ND(50)	ND(0.5)	2	ND(0.5)	ND(1)	5
	10/10/97	80	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	ND(5)
	01/20/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	04/28/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	07/31/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	11/02/98	-	-	-	-	-	-	-
MW-7	11/22/95	ND(50)	180	ND(0.5)	0.57	ND(0.5)	0.62	0.73
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	70	ND(50)	0.7	1	ND(0.5)	ND(1)	8
	10/10/97	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	15
	01/20/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	04/28/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	9.3
	07/31/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	11/02/98	-	-	-	-	-	-	-
MW-8	11/22/95	ND(50)	360	ND(0.5)	1.3	ND(0.5)	2.1	2.1
	12/06/95	-	-	-	-	-	-	-
	01/04/96	-	-	-	-	-	-	-
	01/31/97	80	ND(50)	0.6	1	ND(0.5)	1	8
	10/10/97	50	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	ND(5)
	01/20/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	04/28/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	07/31/98	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)
	11/02/98	ND(50)	ND(500)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)

TPH G Total petroleum hydrocarbons in the gasoline range
 TPH D Total petroleum hydrocarbons in the diesel range
 ug/l Micrograms per liter
 MTBE Methyl-tert-butyl-ether
 ND Not detected at the method detection limit
 - Not measured/not analyzed
 * Laboratory indicates the chromatogram does not match the diesel hydrocarbon range pattern

Note: MTBE was confirmed on 01/31/97 with EPA Method 8260 in MW-3 at a concentration of 180 ug/l

TABLE 3

**GROUNDWATER INORGANIC DATA
FORMER USA STATION #57
10700 MacARTHUR BOULEVARD
OAKLAND, CALIFORNIA**

Well ID	Date Sampled	pH (Units)	Specific Conductance (umhos/cm)	Total Alkalinity (mg/l)	Carbon Dioxide (mg/l)	Dissolved Oxygen (mg/l)	Phosphate (as P) (mg/l)	Ammonia (as N) (mg/l)	Nitrate (as N) (mg/l)	TKN (mg/l)	Redox Potential (Eh)	TDS (mg/l)
S-1	11/02/98	7.5	1188	608	84	1.9	0.51	2.12	1.50	2.40	+140	890
S-2	11/02/98	7.6	1140	590	88	2.2	0.14	2.40	1.80	2.70	+136	870
	06/10/99	6.9	1160	180	72	2.52	0.11	0.64	1.90	0.70	+101	790
MW-3	11/02/98	7.3	2770	640	98	2.6	0.25	4.70	1.40	5.30	+154	2110
MW-5	11/02/98	7.4	2930	100	96	6.5	0.31	1.48	9.40	1.70	+104	2200
	06/10/99	6.7	2780	640	84	3.36	0.10	0.75	6.90	0.82	+94	1980
MW-8	11/02/98	7.2	8923	140	102	7.0	0.32	4.20	3.60	4.70	+149	6300
Method No.		EPA 150.1	EPA 120.1	EPA 310.1	SM 4500	EPA 360.1	EPA 365.2	EPA 350.2	EPA 353.3	EPA 351.2	SM2580	EPA 160.1
Detection Limit		0.1	0.1	0.4	0.10	0.1	0.01	0.10	0.05	0.05	1	1.0

mg/l Milligrams per liter

G:\Data\5090\GWDATA.wb3:e

TABLE 4

SOIL ANALYTICAL DATA
FORMER USA STATION #57
10700 MacARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Well ID	Date	Depth (feet)	TPH G (ppm)	TPH D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl- benzene (ppm)	Total Xylene (ppm)
S-1	02/12/87	20.5	42	-	-	-	-	-
		20.5	16	-	-	-	-	-
S-2	02/12/87	24.5	600	-	-	-	-	-
B-1	02/28/95	5.5	ND	-	ND	ND	ND	ND
		9.5	44	-	0.12	ND	0.14	0.4
		13.0	540	55	2.6	10	7.5	48
		20.0	ND	-	0.012	0.016	ND	0.029
		25.0	3.9	-	0.048	0.14	0.062	0.37
		31.0	ND	-	ND	0.011	0.0057	0.045
		35.0	ND	-	0.014	0.018	0.012	0.079
		40.5	ND	ND	ND	ND	ND	ND
B-2	03/01/95	5.0	ND	-	ND	ND	ND	ND
		10.5	ND	-	ND	ND	ND	ND
		16.0	16	-	0.057	0.028	0.029	1.2
		21.0	110	-	0.96	0.41	0.33	1.5
		26.0	240	22	0.76	1.4	0.85	1.9
B-3	03/01/95	11.0	ND	-	ND	ND	ND	ND
		15.5	10	-	0.044	0.11	0.079	0.63
		20.5	15	1.3	0.041	0.37	0.15	1.1
B-4	03/02/95	3.0	ND	-	ND	ND	ND	ND
		6.0	ND	-	ND	ND	ND	ND
		12.0	ND	ND	ND	ND	ND	ND
B-5	03/02/95	5.5	ND	-	ND	ND	ND	ND
		12.0	ND	ND	ND	ND	ND	ND
B-6	03/02/95	4.0	33	5.3	0.093	0.065	0.33	2.0
		5.5	2.6	-	0.062	ND	0.030	0.047
		12.0	ND	-	ND	ND	ND	0.022

TABLE 4 (Continued)

SOIL ANALYTICAL DATA
 FORMER USA STATION #57
 10700 MacARTHUR BOULEVARD
 OAKLAND, CALIFORNIA

Well ID	Date	Depth (feet)	TPH G (ppm)	TPH D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl- benzene (ppm)	Total Xylene (ppm)
B-7	03/02/95	3.5	ND	ND	ND	ND	ND	ND
		5.0	ND	-	ND	ND	ND	ND
		12.0	ND	-	ND	ND	ND	ND
B-8	03/02/95	3.0	17	-	0.012	0.021	0.12	0.16
		5.5	ND	ND	0.019	ND	0.050	ND
		12.0	2.0	-	0.042	ND	ND	0.016
MW-3	02/28/95	5.5	ND	-	ND	ND	ND	ND
		11.5	1.9	-	0.026	0.011	0.0061	0.019
		13.5	240	12	0.41	0.64	2.0	5.4
		15.5	110	-	0.37	3.8	1.5	10
		21.5	3.0	-	0.26	0.24	0.059	0.50
		24.5	ND	-	0.030	0.0069	0.0056	0.016
		29.5	ND	-	ND	0.0054	ND	0.0092
39.5	ND	-	ND	ND	ND	ND		
MW-4	11/21/95	10.0	ND	5.0	ND	ND	ND	ND
MW-5	11/21/95	10.0	ND	5.2	ND	ND	ND	ND
		15.0	ND	4.2	ND	ND	ND	ND
MW-6	11/21/95	10.0	ND	4.4	ND	ND	ND	ND
MW-7	11/21/95	10.0	ND	4.7	ND	ND	ND	ND
		15.0	ND	4.3	ND	ND	ND	ND
		20.0	25	8.7	0.071	0.11	0.043	0.1
MW-8	11/21/95	10.0	ND	5.5	ND	ND	ND	ND
		15.0	ND	5.1	ND	ND	ND	ND
		20.0	ND	4.5	ND	ND	ND	ND

TPH G Total petroleum hydrocarbons in the gasoline range
 TPH D Total petroleum hydrocarbons in the diesel range
 ppm Parts per million
 ND Not detected at the method detection limit
 - Not measured/not analyzed
 Boring locations are presented in Alton Geo Sciences' "Supplementary Site Assessment Report "
 which are included in Appendix C.

TABLE 5

SOIL ANALYTICAL DATA - TANK REMOVAL
FORMER USA STATION #57
10700 MacARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Sample Location	Sample ID	Date	Depth (feet)	TPH G (ppm)	TPH D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Total Xylene (ppm)	TTL Lead (ppm)
Product Trench	PI-E-3.5	07/19/94	3.5	ND(0.2)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	7
	PI-2	07/19/94	3.5	4,500	ND(50)	ND(1.0)	6	60	440	4
	PI-3	07/19/94	3.5	ND(0.2)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	5
	PI-4	07/19/94	4	ND(0.2)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	6
	PI-5	07/19/94	3.5	ND(1.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	7
	PI2-0	09/19/94	9	15	-	0.02	0.04	0.07	0.19	-
Tank Field	TP1	07/19/94	12.5	-	60	ND(0.005)	0.015	0.007	0.008	-
	TP2	07/19/94	12.5	-	230	ND(1.0)	0.79	2.2	0.7	-
	TP3	07/19/94	13	94	-	0.18	0.25	1	5.9	3
	TP4	07/19/94	13	1400	-	1.9	3.5	12	150	4
	TP5	07/19/94	13	300	-	ND(0.5)	0.74	4.8	20	3
	TP6	07/19/94	13	0.7	-	ND(0.005)	ND(0.005)	0.006	ND(0.005)	3
	TP7	07/19/94	13	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	3
Tank Cavity	TC-1	08/19/94	16	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC-2	08/19/94	16	93	-	ND(1.0)	0.28	0.63	3.1	-
	TC-3	08/19/94	17.5	2.4	1	0.008	0.02	0.02	0.11	-
	TC-4	08/19/94	15.5	0.7	2	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC-5	08/19/94	17	190	-	0.17	0.38	0.99	7.9	-
	TC-6	08/19/94	18	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	SM-1	08/19/94	19.5	0.4	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-1	09/27/94	417	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-2	09/27/94	13	13	-	0.06	0.019	0.026	ND(0.005)	-
	TC2-3	09/27/94	16	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-4	09/27/94	13	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-5	09/27/94	12	100	200	0.13	0.12	0.1	0.26	-
	TC2-7	09/27/94	13	6.3	37	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-8	09/27/94	13	ND(1.0)	16	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-9	09/27/94	19	0.4	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	TC2-11	09/27/94	13	2200	-	9.6	21	40	260	-
	TC2-12	09/27/94	12	130	-	0.33	0.29	0.66	7.9	-
	TC2-13	09/27/94	20	620	-	1.1	4.9	6.4	66	-
	TC2-14	09/27/94	11	92	-	0.096	0.1	0.17	1.7	-
	TC2-15	09/27/94	17	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
TC2-16	09/27/94	14	ND(1.0)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-	
(Alton)	TC3-3	10/94	12-13	300	330	-	-	-	-	-
(Alton)	TC3-4	10/94	12-13	510	ND	-	-	-	-	-
(Alton)	TCE-5	10/94	12-13	2400	ND	-	-	-	-	-
(Alton)	TC3-6	10/94	12-13	940	ND	-	-	-	-	-
Dispenser Island	DI-1	09/27/94	3.5	720	-	0.19	2	9	53	-
	DI-2	09/27/94	3.5	280	-	0.12	0.8	4.6	33	-
	DI-3	09/27/94	3	ND(0.2)	-	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	-
	DI-4	09/27/94	3	590	-	0.7	2.5	13	81	-
	DI-5	09/27/94	3.5	570	-	0.1	1.5	2.7	17	-
	DI-6	09/27/94	3.5	1800	-	0.72	5.2	31	180	-

SOIL SAMPLES BY WESTERN GEO-ENGINEERS UNLESS OTHERWISE NOTED

TPH G Total petroleum hydrocarbons in the gasoline range
 TPH D Total petroleum hydrocarbons in the diesel range
 ppm Parts per million
 ND Not detected at the method detection limit
 - Not measured/not analyzed

APPENDIX A

ORC® INJECTION CALCULATIONS

ORC SLURRY INJECTION

Dissolved Hydrocarbon Level (ppm) <i>(For gasoline sites use BTEX measurements)</i>	16
Treatment Zone Width (ft)	20
Treatment Zone Length (ft)	20
Thickness of Saturated Treatment Zone (ft)	10
Porosity <i>(sand = 0.3, silt = 0.35, clay = 0.4)</i>	0.4
Total Treatment Zone Volume (cu. ft)	4,000
Dissolved Phase Hydrocarbon Mass (lbs)	1.6
Additional Demand Factor <i>(REGENESIS recommends a factor of about 8)</i>	6
Loaded Hydrocarbon Mass (lbs)	9.6
Oxygen Required (lbs)	28.8
ORC Required (lbs)	288.0
ORC Unit Cost	\$ 10.00
Total Cost of ORC	\$ 2,880.00

Solids Content (%)	40%
Hole Spacing (ft)	10
Number of Holes in Grid	4
ORC per Hole (lbs)	72.0
Water needed per Hole for Slurry (gal)	12.9

APPLICATION COMMENTS

* ORC per hole is above lower limit of 1 pound per linear foot.

FOR SOLUTE TRANSPORT MODEL ENTER VALUES BELOW

GW Velocity (ft / day)	0.4
Compliance Pt. (ft)	35
Ratio of O2 provided : O2 required (percent)	75%
HC Level at compliance point after selected ratio of oxygen in ppm	2.675

ORC SLURRY INJECTION

Dissolved Hydrocarbon Level (ppm) <i>(For gasoline sites use BTEX measurements)</i>	6.2
Treatment Zone Width (ft)	50
Treatment Zone Length (ft)	45
Thickness of Saturated Treatment Zone (ft)	5
Porosity <i>(sand = 0.3, silt = 0.35, clay = 0.4)</i>	0.4
Total Treatment Zone Volume (cu. ft)	11,250
Dissolved Phase Hydrocarbon Mass (lbs)	1.7
Additional Demand Factor <i>(REGENESIS recommends a factor of about 8)</i>	9
Loaded Hydrocarbon Mass (lbs)	15.3
Oxygen Required (lbs)	45.9
ORC Required (lbs)	459.0
ORC Unit Cost	\$ 10.00
Total Cost of ORC	\$ 4,590.00

Solids Content (%)	40%
Hole Spacing (ft)	10
Number of Holes in Grid	23
ORC per Hole (lbs)	20.0
Water needed per Hole for Slurry (gal)	3.6

APPLICATION COMMENTS

* ORC per hole is above lower limit of 1 pound per linear foot.

FOR SOLUTE TRANSPORT MODEL ENTER VALUES BELOW

GW Velocity (ft / day)	0.4
Compliance PL (ft)	35
Ratio of O2 provided : O2 required (percent)	75%
HC Level at compliance point after selected ratio of oxygen in ppm	1.036

ORC SLURRY INJECTION

Dissolved Hydrocarbon Level (ppm) <i>(For gasoline sites use BTEX measurements)</i>	1.2	Solids Content (%)	40%
Treatment Zone Width (ft)	55	Hole Spacing (ft)	12
Treatment Zone Length (ft)	52	Number of Holes in Grid	20
Thickness of Saturated Treatment Zone (ft)	10	ORC per Hole (lbs)	12.2
Porosity <i>(sand = 0.3, silt = 0.35, clay = 0.4)</i>	0.4	Water needed per Hole for Slurry (gal)	2.2
Total Treatment Zone Volume (cu. ft)	28,600	APPLICATION COMMENTS	
Dissolved Phase Hydrocarbon Mass (lbs)	0.9	* ORC per hole is above lower limit of	
Additional Demand Factor <i>(REGENESIS recommends a factor of about 8)</i>	9	1 pound per linear foot.	
Loaded Hydrocarbon Mass (lbs)	8.1		
Oxygen Required (lbs)	24.3		
ORC Required (lbs)	243.0		
ORC Unit Cost	\$ 10.00		
Total Cost of ORC	\$ 2,430.00		

FOR SOLUTE TRANSPORT MODEL ENTER VALUES BELOW

GW Velocity (ft / day)	0.4
Compliance Pt. (ft)	35
Ratio of O2 provided : O2 required (percent)	75%
HC Level at compliance point after selected ratio of oxygen in ppm	0.201

About ORC

ABOUT OXYGEN RELEASE COMPOUND, ORC®

Oxygen Release Compound (ORC) is a patented formulation of magnesium peroxide, MgO_2 , which slowly releases oxygen when moist. The hydrated product is magnesium hydroxide, $Mg(OH)_2$. The oxygen release rate is dependent upon the level of the contaminant flux. Generally, the product will continue to release oxygen for about 6 months.

We have found, and the literature supports, that oxygen is the limiting factor in aerobic bioremediation. The microorganisms, nutrients and moisture are typically present, but most sites are oxygen deficient with bioremediation proceeding anaerobically. The addition of oxygen significantly increases the rate of remediation, by one or two orders of magnitude. Throughout this software, a conservative 3:1 ratio of oxygen usage to carbon contamination has been used.

ORC will not harm an aquifer. It is virtually insoluble. Biofouling is inhibited by an elevated, but localized pH. Iron fouling is avoided, particularly when compared to air sparging, by the long, gentle release of dissolved oxygen which is dispersed widely. The hydrated product is a solid form of ordinary Milk of Magnesia.

ORC is useful as a slow release source of oxygen in the remediation of any compound that is aerobically degradable. It has been used in the successful remediation of dissolved phase compounds such as BTEX, MTBE, PAH's and certain chlorinated compounds such as vinyl chloride and PCP. ORC is most frequently used to address dissolved phase contamination plus sorbed material in the saturated, capillary fringe, and smear zones. It should not be used when more than a sheen of free product is evident.

ORC can be applied to meet several objectives. The product may be used in the bottom of a tank excavation to eliminate one of the toughest and most persistent sources of contamination at, or near, the soil/groundwater interface. ORC can create a highly oxygenated zone near the original source of the contamination, reducing the contaminant mass, and thereby collapsing the plume so that compliance may be achieved at a point closer to the source. ORC can also, be applied as an "oxygen barrier" which prevents contaminant migration off site. This ORC Application Software will assist in the proper design and application of ORC to meet any of these objectives.

More specific information about ORC may be found in the Appendix of this disk and in Technical Bulletins available from the company. Also, the Regenesys web site has expanded technical and product performance information. The web site may be accessed at <http://www.regenesys.com>, and is best viewed through MS Explorer v 3.0, Netscape v. 3.0, or AOL v. 3.0

APPENDIX B

RBCA "TIER 1" LOOKUP TABLE

TABLE X2.1 Example Tier 1 Risk-Based Screening Level (RBSL) Look-up Table^a

Note—This table is presented here only as an example set of Tier 1 RBSLs. It is not a list of proposed standards. The user should review all assumptions prior to using any values. Appendix X2 describes the basis of these values.

Exposure Pathway	Receptor Scenario	Target Level	Benzene	Ethylbenzene	Toluene	Xylenes (Mixed)	Napthalenes	Benzo (a)pyrene
Air								
Indoor air screening levels for inhalation exposure, $\mu\text{g}/\text{m}^3$	residential	cancer risk = $1\text{E}-06$	3.92E-01					1.86E-03
		cancer risk = $1\text{E}-04$ chronic HQ = 1	3.92E+01					1.86E-01
Outdoor air screening levels for inhalation exposure, $\mu\text{g}/\text{m}^3$	commercial/ Industrial	cancer risk = $1\text{E}-06$	4.93E-01	1.39E+03	5.56E+02	9.73E+03	1.93E+01	2.35E-03
		cancer risk = $1\text{E}-04$ chronic HQ = 1	4.93E+01	1.46E+03	5.84E+02	1.02E+04	2.04E+01	2.35E-01
OSHA TWA PEL, $\mu\text{g}/\text{m}^3$	residential	cancer risk = $1\text{E}-06$	2.94E-01					1.40E-03
		cancer risk = $1\text{E}-04$ chronic HQ = 1	2.94E+01					1.40E-01
Mean odor detection threshold, $\mu\text{g}/\text{m}^3$ ^b	commercial/ Industrial	cancer risk = $1\text{E}-06$	4.93E-01	1.04E+03	4.17E+02	7.30E+03	1.46E+01	2.35E-03
		cancer risk = $1\text{E}-04$ chronic HQ = 1	4.93E+01	1.46E+03	5.84E+02	1.02E+04	2.04E+01	2.35E-01
National indoor background concentration range, $\mu\text{g}/\text{m}^3$ ^c			3.20E+03	4.35E+05	7.53E+05	4.35E+06	5.00E+04	2.00E+02 ^d
			1.95E+05	6.00E+03	8.70E+04	2.00E+02		
Soil								
Soil volatilization to outdoor air, mg/kg	residential	cancer risk = $1\text{E}-06$	2.72E-01					RES ^e
		cancer risk = $1\text{E}-04$ chronic HQ = 1	2.73E+01	RES	RES	RES	RES	RES
Soil-vapor intrusion from soil to buildings, mg/kg	commercial/ Industrial	cancer risk = $1\text{E}-06$	4.57E-01	RES	RES	RES	RES	RES
		cancer risk = $1\text{E}-04$ chronic HQ = 1	4.57E+01	RES	RES	RES	RES	RES
Surficial soil (0 to 3 ft) (0 to 0.9 m) ingestion/dermal, mg/kg	residential	cancer risk = $1\text{E}-06$	5.37E-03					RES
		cancer risk = $1\text{E}-04$ chronic HQ = 1	5.37E-01	4.27E+02	2.06E+01	RES	4.07E+01	RES
Soil leachate to protect ground water ingestion target level, mg/kg	commercial/ Industrial	cancer risk = $1\text{E}-06$	1.69E-02	1.10E+03	5.45E+01	RES	1.07E+02	RES
		cancer risk = $1\text{E}-04$ chronic HQ = 1	1.69E+00					RES
Soil leachate to protect ground water ingestion target level, mg/kg	residential	MCLs	2.93E-02	1.10E+02	1.77E+01	3.05E+02	N/A	9.42E+00
		cancer risk = $1\text{E}-06$	1.72E-02					5.50E-01
Ground water volatilization to outdoor air, mg/L	commercial/ Industrial	cancer risk = $1\text{E}-04$ chronic HQ = 1	1.72E+00	5.75E-02	1.29E-02	RES	2.29E+01	RES
		cancer risk = $1\text{E}-06$	5.78E-02	1.61E+03	3.51E+02	RES	6.42E+01	1.85E+00
Ground water ingestion, mg/L	residential	cancer risk = $1\text{E}-06$	5.78E-02					RES
		cancer risk = $1\text{E}-04$ chronic HQ = 1	5.78E+00					RES
Ground Water								
Ground water volatilization to outdoor air, mg/L	residential	cancer risk = $1\text{E}-06$	1.10E+01					>S ^e
		cancer risk = $1\text{E}-04$ chronic HQ = 1	1.10E+03	>S	>S	>S	>S	>S
Ground water ingestion, mg/L	commercial/ Industrial	cancer risk = $1\text{E}-06$	1.84E+01					>S
		cancer risk = $1\text{E}-04$ chronic HQ = 1	>S	>S	>S	>S	>S	>S
Ground water—vapor intrusion from ground water to buildings, mg/L	residential	MCLs	5.00E-03	7.00E-01	1.00E-00	1.00E+01	N/A	2.00E-04
		cancer risk = $1\text{E}-06$	2.94E-03					1.17E-05
Ground water—vapor intrusion from ground water to buildings, mg/L	commercial/ Industrial	cancer risk = $1\text{E}-06$	2.94E-01	3.63E-00	7.30E+00	7.30E+01	1.46E-01	1.17E-03
		cancer risk = $1\text{E}-04$ chronic HQ = 1	9.87E-03	9.87E-01	1.02E+01	2.04E+01	>S	4.06E-01
Ground water—vapor intrusion from ground water to buildings, mg/L	residential	cancer risk = $1\text{E}-06$	2.38E-02					>S
		cancer risk = $1\text{E}-04$ chronic HQ = 1	2.38E+00	7.75E-01	3.23E-01	>S	4.74E+00	>S
Ground water—vapor intrusion from ground water to buildings, mg/L	commercial/ Industrial	cancer risk = $1\text{E}-06$	7.39E-02					>S
		cancer risk = $1\text{E}-04$ chronic HQ = 1	7.39E+00	>S	6.50E-01	>S	1.23E-01	>S

^a As benzene soluble coal tar pitch volatiles.

^b See Ref (22).

^c See Refs (23-25).

^d RES—Selected risk level is not exceeded for pure compound present at any concentration.

^e >S—Selected risk level is not exceeded for all possible dissolved levels (± pure component solubility).

APPENDIX C

**Dominico Model
With Steady State Concentrations**

**DOMINICO MODEL FOR CALCULATING CONCENTRATIONS
OF IMPACTED GROUNDWATER AT STEADY STATE**

Directions: input all data requested in unshaded areas

Benzene Concentration (ug/l)	Distance to Nearest Receptor (feet)	Decay Rate (/days)	Groundwater Velocity (feet/year)	Width of impacted soil (feet)	Depth of impacted soil (feet)	Dispersion in the Y Direction erf ()	Dispersion in the Z Direction erf ()	Error Function of dispersion in the Y Direction	Error Function of dispersion in the Y Direction
5,700	1,800	0.0009	10	20	40	0.015	0.056	0.0172	0.0626

alpha X (feet)	180
alpha Y (feet)	60.00
alpha Z (feet)	18
Groundwater Velocity (feet/day)	0.0274

*At steady state the concentration of benzene at the nearest receptor will be approximately 1.50E-08 ug/l

*If the decay is assumed to be first order reaction then the approx. time to reach steady state will be 81 years

- ASSUMPTIONS**
- one-dimensional flow and 3-dimensional dispersion
 - first-order decay rate based on dissolved and adsorbed phases decaying at the same rate
 - medium is isotropic and homogeneous
 - source concentration is constant
 - aerial source perpendicular to the direction of flow

APPENDIX D

Oxygen Release Compound (ORC®)

Material Safety Data Sheet

MATERIAL SAFETY DATA SHEET

Last Revised : July 1, 1997

SECTION 1 - MATERIAL IDENTIFICATION

SUPPLIER:

REGENESIS Bioremediation Products
27130A Paseo Espada, Suite 1407
San Juan Capistrano, CA 92675
714-443-3136 phone
714-443-3140 fax

CHEMICAL DESCRIPTION:

A mixture of Magnesium Peroxide [MgO₂], Magnesium Oxide [MgO],
and Magnesium Hydroxide [Mg(OH)₂]

CHEMICAL FAMILY:

Inorganic Chemicals

PRODUCT NAME:

Oxygen Release Compound (ORC®)

PRODUCT USE:

Used for environmental remediation of contaminated soil and groundwater

SECTION 2 - CHEMICAL IDENTIFICATION

CHEMICAL CHARACTERIZATION

Magnesium Peroxide [MgO ₂]	CAS Reg. No.	14452-57-4
Magnesium Oxide [MgO]:	CAS Reg. No.	1309-48-4
Magnesium Hydroxide ((Mg(OH) ₂)):	CAS Reg. No.	1309-42-8
FORM	powder	
COLOR:	white	
ODOR:	odorless	
ASSAY:	25 - 35% Magnesium Peroxide (MgO ₂)	

SECTION 3 - PHYSICAL AND TECHNICAL SAFETY DATA

MELTING POINT:	Not Determined
BOILING POINT:	Not Determined
DENSITY:	.6 - .8 g/cc
BULK DENSITY:	---
VAPOR PRESSURE:	Data not available
VISCOSITY:	---
SOLUBILITY:	Reacts with water. Soluble in acid
pH VALUE:	Approx. 10 in saturated solution
FLASH POINT:	Not applicable
SELF-IGNITION TEMPERATURE:	Not applicable
EXPLOSION LIMITS % BY VOLUME:	---

THERMAL DECOMPOSITION:	Spontaneous decomposition possible about 150° C
HAZARDOUS DECOMPOSITION PRODUCTS:	Not known
HAZARDOUS REACTIONS:	Hazardous polymerization will not occur
FURTHER INFORMATION:	Non-combustible, but will support combustion

SECTION 4 - REACTIVITY DATA

STABILITY:	Product is stable unless heated above 150°C. Magnesium Peroxide reacts with water to slowly release oxygen. React by product is magnesium hydroxide
CONDITIONS TO AVOID:	Heat above 150°C. Open flames
INCOMPATIBILITY:	Strong Acids Strong chemical agents
HAZARDOUS POLYMERIZATION:	None known

SECTION 5 - REGULATIONS

PERMISSIBLE EXPOSURE LIMITS IN AIR:	Not established. Should be treated as a nuisance dust.
-------------------------------------	---

SECTION 6 - PROTECTIVE MEASURES, STORAGE, AND HANDLING

TECHNICAL PROTECTIVE MEASURES

STORAGE:	Keep container tightly closed. Keep away from combustible material
HANDLING:	Use only in well-ventilated areas

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION:	Recommended (HEPA Filters)
HAND PROTECTION:	Wear suitable gloves
EYE PROTECTION:	Use chemical safety goggles
OTHER:	—
INDUSTRIAL HYGIENE:	Avoid contact with skin and eyes
PROTECTION AGAINST FIRE AND EXPLOSION:	—
DISPOSAL:	Dispose via sanitary landfill per state/local authority
FURTHER INFORMATION:	Not flammable, but may intensify fire

SECTION 7 - MEASURES IN CASE OF ACCIDENTS AND FIRE

AFTER SPILLAGE/LEAKAGE/GAS LEAKAGE:	Collect in suitable containers. Wash remainder with copious quantities of water.
EXTINGUISHING MEDIA SUITABLE:	Carbon dioxide, dry chemicals, foam
NOT TO BE USED:	—
FURTHER INFORMATION:	Self contained breathing apparatus or

approved gas mask should be worn due to small particle size. Use extinguishing media appropriate for surrounding fire.

FIRST AID:

After contact with skin, wash immediately with plenty of water and soap. In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.

FURTHER INFORMATION:

—

SECTION 8 - INFORMATION ON TOXICOLOGY

TOXICITY DATA:

Data not available

SECTION 9 - INFORMATION ON ECOLOGY

WATER POLLUTION HAZARD RATING (WGK):

0

SECTION 10 - FURTHER INFORMATION

After the reaction of magnesium peroxide to form oxygen the resulting material, magnesium hydroxide is mildly basic. The amounts of magnesium oxide (magnesia) and magnesium hydroxide in the initial product have an effect similar to lime, but with lower a alkalinity.

The information contained in this document is the best available to the supplier at the time of writing, but is provided without warranty of any kind. Some possible hazards have been determined by analogy to similar classes of material. The items in this document are subject to change and clarification as more information becomes available.

APPENDIX E

HYDRO DATA & GROUNDWATER SAMPLE DATA

June 10, 1999

DATE: 11/2/98

PROJECT: USA-DALLAS

EVENT: DETRY

SAMPLER: C

NO	WELL OR LOCATION	DATE			TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YE	HR	MIN			
1	MW-4	11	2	98			16.08	SNL	
2	MW-5						15.98		
3	MW-6						17.97		
4	MW-7						15.15		
5	MW-8						16.90		
6	MW-3						17.11		
7	S-1						15.28		
8	S-2						17.31		
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

CODE

- *SWL - Static water level (feet)
- *IWL - Instant Water Level; Non Static (feet)
- *OIL - Oil Level (feet)
- *OWI - Oil/Water Interface (feet)
- *MTD - Measured Total Depth (feet)
- FLO - Flow Rate (Gallons/Minutes)
- CUM - Cumulative (Gallons)

- HRS - Total (Hours)
- PSI - Pressure (psi)
- VAC - Vacuum
- pH - 1 to 14
- Ec - Conductivity
- TMP - Temperature
- TRB - Turbidity

* All levels are depth from inner casing - describe any other reference points in comments column.
 Note in comments column if well is not properly labeled, locked, or able to be locked. Describe corrective action.
 Note flooding of vault box, odor, access problems.



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA - OAKLAND Job # S090.09 Well # S-1
 Date 11/2/98 Sample ID S-1
 Sampling Team CL
 Purpose of Sampling: Initial Quarterly Verification Other: _____
 Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		15.28	40.80	25.52	136	9
After Development/Purging	1403	36.42				
At Time of Sampling	1458	19.77				

Three Casing Volumes 27 Gals
 Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailer Sandpiper Other: _____
 Method: 2" Bedrock Description _____
 Decontamination Method: TSP / RINSE Description _____
 Water Containment: Drums Baker Tank Treatment System Other: _____
 Labeled: PURGED WATER

Start Time	Volume Water Extracted	Temperature °F/C	ES pH	Observations (Color, Turbidity, Oils, Odor)
1346	0		-24.8 = 7.39	
1351	9		-21.0 = 7.31	
1356	10		-20.5 = 7.29	
1401	27		-20.1 = 7.24	

SAMPLE INFORMATION

Lab: S-1

Sampling Containers/No. of Containers: PA-D

1 Liter Amber PA-D
 40 ml VOA PA-D + BTEX, NITR
 Other CO, etc

Preservation: Ice Other 1/4L
 Ice Other _____
 Ice Other _____

Device: Bailer, Disposable Other _____

Pertinent Field Observations: _____

Deviations From Standard Sampling Protocol: _____



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA - OAKLAND Job # 5070.09 Well # S-2

Date 11/2/98 Sample ID S-2

Sampling Team CU

Purpose of Sampling: Initial Quarterly Verification Other: _____

Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		17.31	42.85	25.54	0.36	9
After Development/ Purging	1427	39.39				
At Time of Sampling	1509	26.41				

Three Casing Volumes 27 Gals
Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailor Sandpiper Other: _____

Method: 2" Bed Flo Description _____

Decontamination Method: 1SP / RINSE Description _____

Water Containment: Drums Baker Tank Treatment System Other: _____

Labeled: PURGE WATER

Start Time	Volume Water Extracted	Temperature °F/C	^{MV} EC (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
1410	0		21.8	7.20	
1415	9		20.7	7.21	
1420	18		20.0	7.23	
1425	27		20.2	7.24	

SAMPLE INFORMATION

Lab: SIERRA

Sampling Containers/No. of Containers: 1 PN-D
 1 Liter Amber 1 PN-D
 40 ml VOA 1 PN-D + BULK NITR
 Other SD, etc.

Preservation: Ice Other Ice
 Ice Other _____
 Ice Other _____

Device: Bailor, Disposable Other _____

Pertinent Field Observations: Drilled 20' etc.

Deviations From Standard Sampling Protocol: Sampled Prior to 80%



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA-UKIAH Job # S090.09 Well # NN-3

Date 11/2/98

Sample ID NN-3

Sampling Team CL

Purpose of Sampling: Initial Quarterly Verification Other: _____

Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		17.11	47.75	30.64	.65	20
After Development/ Purging	1332	32.60				60
At Time of Sampling	1416	24.73				

Three Casing Volumes 60 Gals
Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailer Sandpiper Other: _____

Method: 2" REDUCED Description _____

Decontamination Method: ISD/RINSE Description _____

Water Containment: Drums Baker Tank Treatment System Other: _____

Labeled: PURGE WATER

Start Time	Volume Water Extracted	Temperature °F/C	EC (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
1300	0		29.5	7.51	
1310	20		27.1	7.49	
1320	40		24.8	7.44	
1330	60		23.9	7.40	

SAMPLE INFORMATION

Lab: 81900A

Sampling Containers/No. of Containers: 1 PA-1
 1 Liter Amber 1 PA-1
 40 ml VOA 1 PA-1 + BTEX, NITR
 Other 80, etc.

Preservation: Ice Other ALL
 Ice Other _____
 Ice Other _____

Device: Bailer, Disposable Other _____

Pertinent Field Observations: _____

Deviations From Standard Sampling Protocol: SAMPLE 1210R to 80%



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA OAKLAND Job # S090.09 Well # MW-5
 Date 11/2/88 Sample ID MW-5
 Sampling Team CE
 Purpose of Sampling: Initial Quarterly Verification Other: _____
 Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		15.90	37.60	21.62	.65	14
After Development/ Purging	11:20	27.53				
At Time of Sampling	1:15	16.60				

Three Casing Volumes 42 Gals
 Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailor Sandpiper Other: _____
 Method: 2" REDIFLO Description _____
 Decontamination Method: TSP/RINSE Description _____
 Water Containment: Drums Baker Tank Treatment System Other: _____
 Labeled: PURGE WATER

Start Time	Volume Water Extracted	Temperature °F/C	EC EC (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
11:55	0		2809 ^{MV}	11.75	
12:02	14		266.8	11.53	
12:09	26		255.0	11.32	
12:10	42				

SAMPLE INFORMATION

Lab: SIERRA

Sampling Containers/No. of Containers: 1A-D
 1 Liter Amber 40 ml VOA Other DD, TL, ALK, NITRATE, AMMONIUM, TRIS, PHOSPHATE, CO2, REOX, SULPHATE

Preservation: Ice Other f
 Ice Other _____
 Ice Other _____

Device: Bailor, Disposable Other _____
 Pertinent Field Observations: Dry Spot 30 sec. Purged

Deviations From Standard Sampling Protocol: _____



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA - OAKLAND Job # 6090.09 Well # MN-8

Date 11/2/98 Sample ID SN-8

Sampling Team CL

Purpose of Sampling: Initial Quarterly Verification Other: _____

Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial	<u>11:10</u>	<u>16.90</u>	<u>37.70</u>	<u>20.80</u>	<u>.65</u>	<u>13.5</u>
After Development/ Purging	<u>12:52</u>	<u>33.40</u>				
At Time of Sampling	<u>13:27</u>	<u>20.71</u>				

Three Casing Volumes 40.5 Gals
Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailer Sandpiper Other: _____

Method: 2" RED FLO Description _____

Decontamination Method: RSP/RINSE Description _____

Water Containment: Drums Baker Tank Treatment System Other: _____

Labeled: PURGE WATER

Start Time	Volume Water Extracted	Temperature °F/C	EC ^{AN} (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
<u>12:29</u>	<u>0</u>		<u>-113.1</u>	<u>8.76</u>	
<u>12:36</u>	<u>13.5</u>		<u>-87.8</u>	<u>8.51</u>	
<u>12:43</u>	<u>27</u>		<u>-73.1</u>	<u>8.23</u>	
<u>12:50</u>	<u>40.5</u>				

SAMPLE INFORMATION

Lab: SIEDA

Sampling Containers/No. of Containers: 1PK-D
 1 Liter Amber 1PK-D
 40 ml VOA 1PK-6 + BTEX, METE
 Other DO, FE

Preservation:
 Ice Other _____
 Ice Other ALL
 Ice Other _____

Device: Bailer, Disposable Other _____

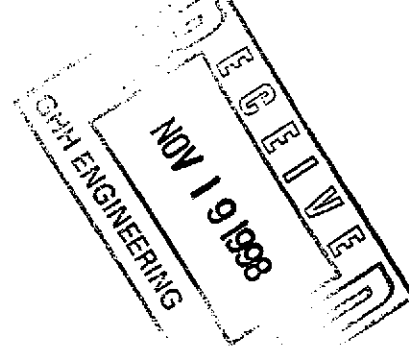
Pertinent Field Observations: Dry After 20 Cdn Purge

Deviations From Standard Sampling Protocol: _____

APPENDIX F

GROUNDWATER ANALYTICAL RESULTS

June 10, 1999



Date: 11/12/98

GHH Engineering, Inc.
8084 Old Auburn Road, Suite E
Citrus Heights, CA 95610
Attention: Mr. Vern Bennett

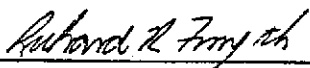
Client Project Number: USA-Oakland / 5090.10
Date Sampled: 11/2/98
Date Samples Received: 11/3/98
Sierra Project No.: 9811-034

Attached are the results of the chemo-physical analysis of the sample(s) from the project identified above.

The samples were received by Sierra Laboratories, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analysis were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report. If you require additional retaining time, please advise us.


Richard K. Forsyth
Laboratory Director


Reviewed

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

GHH Engineers, Inc.
 8084 Old Auburn Road, Suite E
 Citrus Heights, CA 95610

Date Sampled: 11/2/98
 Date Received: 11/3/98
 Date Prepared: 11/3/98
 Date Analyzed: 11/3-11/6/98
 Analyst: RF
 Report Date: 11/6/98

Sierra Project No.: 9811-034
 Client Project ID: USA-Oakland / 5090.10
 Sample Matrix: Water

INDIVIDUAL INORGANIC ANALYSIS

Client Sample No.		MW-5	MW-8	MW-3	Method No.	Detection Limit
Sierra Sample No.		17151	17152	17153		
TEST PARAMETERS	UNITS					
pH	Units	7.4	7.2	7.3	EPA 150.1	0.1
Specific Conductance	µmhos/cm	2930	8923	2770	EPA 120.1	0.1
Alkalinity, Total	mg/l	100	140	640	EPA 310.1	0.4
Carbon Dioxide	mg/l	96	102	98	SM 4500 CO ₂	0.10
Dissolved Oxygen	mg/l	6.5	7.0	2.6	EPA 360.1	0.1
Phosphate (as P)	mg/l	0.31	0.32	0.25	EPA 365.2	0.01
Ammonia (as N)	mg/l	1.48	4.20	4.70	EPA 350.2	0.10
Nitrate (as N)	mg/l	9.40	3.60	1.40	EPA 353.3	0.05
T.K.N.	mg/l	1.70	4.70	5.30	EPA 351.2	0.05
Redox Potential	Eh	+104	+149	+154	SM 2580	1
T.D.S.	mg/l	2200	6300	2110	EPA 160.1	1.0

ND means Not Detected.

GHH Engineers, Inc.		Date Sampled: 11/2/98
8084 Old Auburn Road, Suite E		Date Received: 11/3/98
Citrus Heights, CA 95610		Date Prepared: 11/3/98
Sierra Project No.:	9811-034	Date Analyzed: 11/3-11/6/98
Client Project ID:	USA-Oakland / 5090.10	Analyst: RF
Sample Matrix:	Water	Report Date: 11/6/98

INDIVIDUAL INORGANIC ANALYSIS

Client Sample No.		S-1	S-2		Method No.	Detection Limit
Sierra Sample No.		17154	17155			
TEST PARAMETERS	UNITS					
pH	Units	7.5	7.6		EPA 150.1	0.1
Specific Conductance	µmhos/cm	1188	1140		EPA 120.1	0.1
Alkalinity, Total	mg/l	608	590		EPA 310.1	0.4
Carbon Dioxide	mg/l	84	88		SM 4500 CO ₂	0.10
Dissolved Oxygen	mg/l	1.9	2.2		EPA 360.1	0.1
Phosphate (as P)	mg/l	0.51	0.14		EPA 365.2	0.01
Ammonia (as N)	mg/l	2.12	2.40		EPA 350.2	0.10
Nitrate (as N)	mg/l	1.50	1.80		EPA 353.3	0.05
T.K.N.	mg/l	2.40	2.70		EPA 351.2	0.05
Redox Potential	Eh	+140	+136		SM 2580	1
T.D.S.	mg/l	890	870		EPA 160.1	1.0

ND means Not Detected.

GHH Engineering, Inc.
 8084 Old Auburn Road
 Citrus Heights, CA 95610

Date Sampled: 11/2/98
 Date Received: 11/3/98
 Date Prepared: 11/10/98
 Date Analyzed: 11/11/98
 Analyst: LT

Sierra Project No.: 9811-034
 Client Project ID: USA.-Oakland / 5090.10
 Sample Matrix: Water

Report Date: 11/12/98

TOTAL PETROLEUM HYDROCARBONS
EPA 8015 MODIFIED - Diesel Range Hydrocarbons (C10-C23)

SIERRA Sample No.	Client Sample No.	Concentration (mg/l)	Dilution Factor	% Surrogate Recovery	MDL (mg/l)
17151	MW-5	ND	1	80	0.5
17152	MW-8	ND	1	88	0.5
17153	MW-3	1.6	1	61	0.5
17154	S-1	1.2	1	100	0.5
17155	S-2	ND	1	101	0.5
		1,000			0.500
					500

Quality Assurance/Quality Control Data

QC Sample ID: 9811-007

Compound	LCS % Rec.	QC Limits	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits
TPH as Diesel	100	50-120	90	95	50-150	5	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor

GHH Engineers, Inc. 8084 Old Auburn Road, Suite E Citrus Heights, CA 95610		Date Sampled: 11/2/98
Sierra Project No.: 9811-034		Date Received: 11/3/98
Client Project ID: USA-Oakland / 5090.10		Date Prepared: 11/5/98
Sample Matrix: Water		Date Analyzed: 11/5/98
		Analyst: SM
		Report Date: 11/9/98

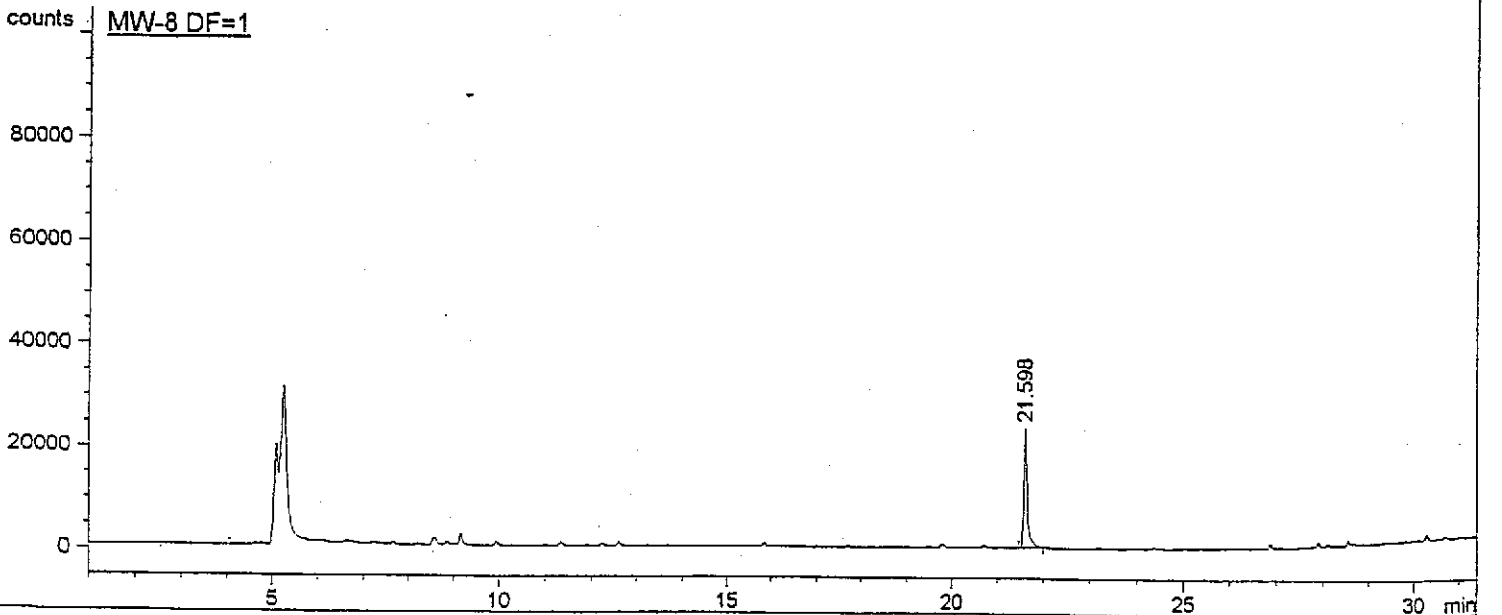
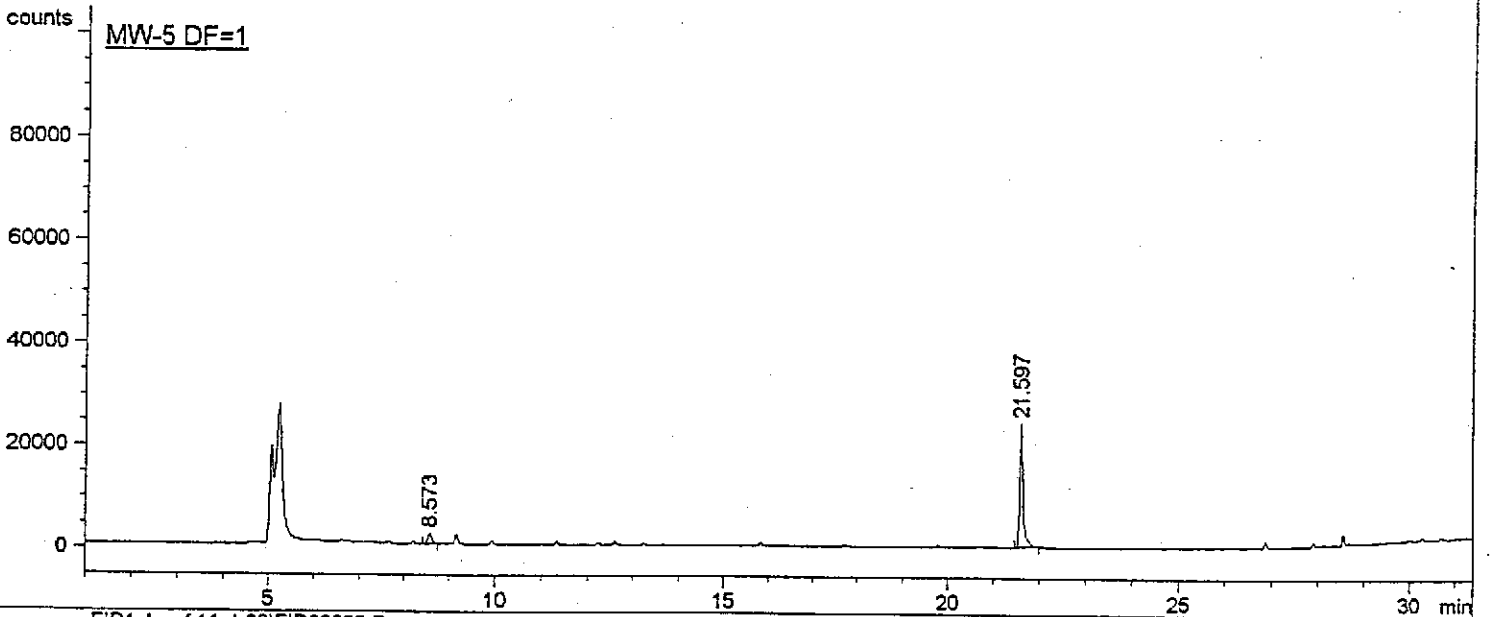
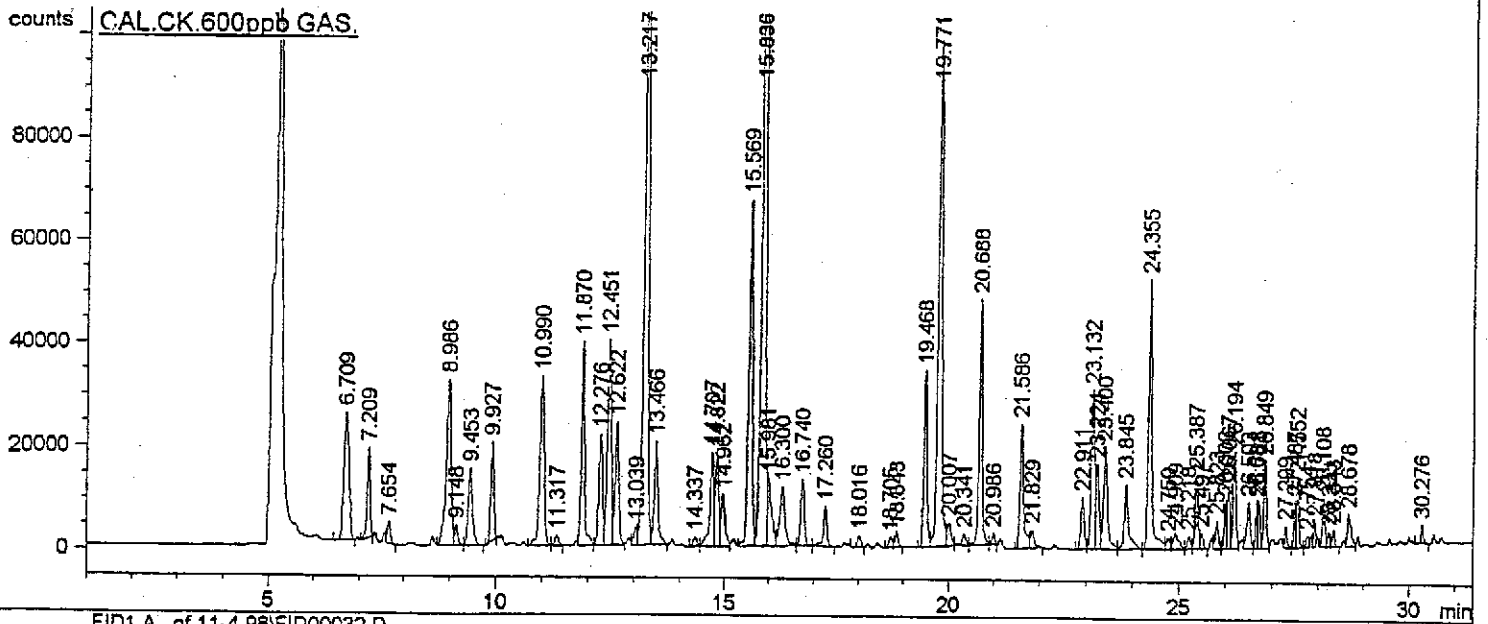
**EPA METHOD 8020-BTEX/EPA METHOD 8015-Gasoline Range Hydrocarbons (C4-C12)
(Purge & Trap)**

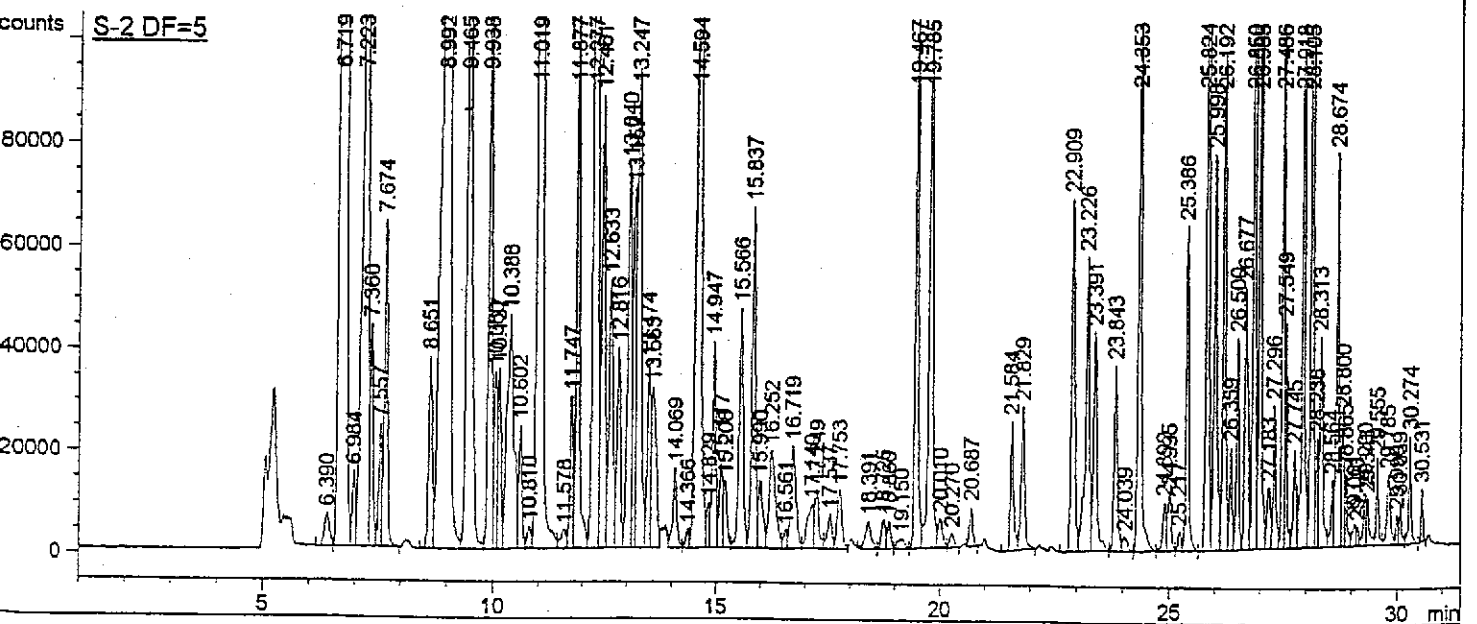
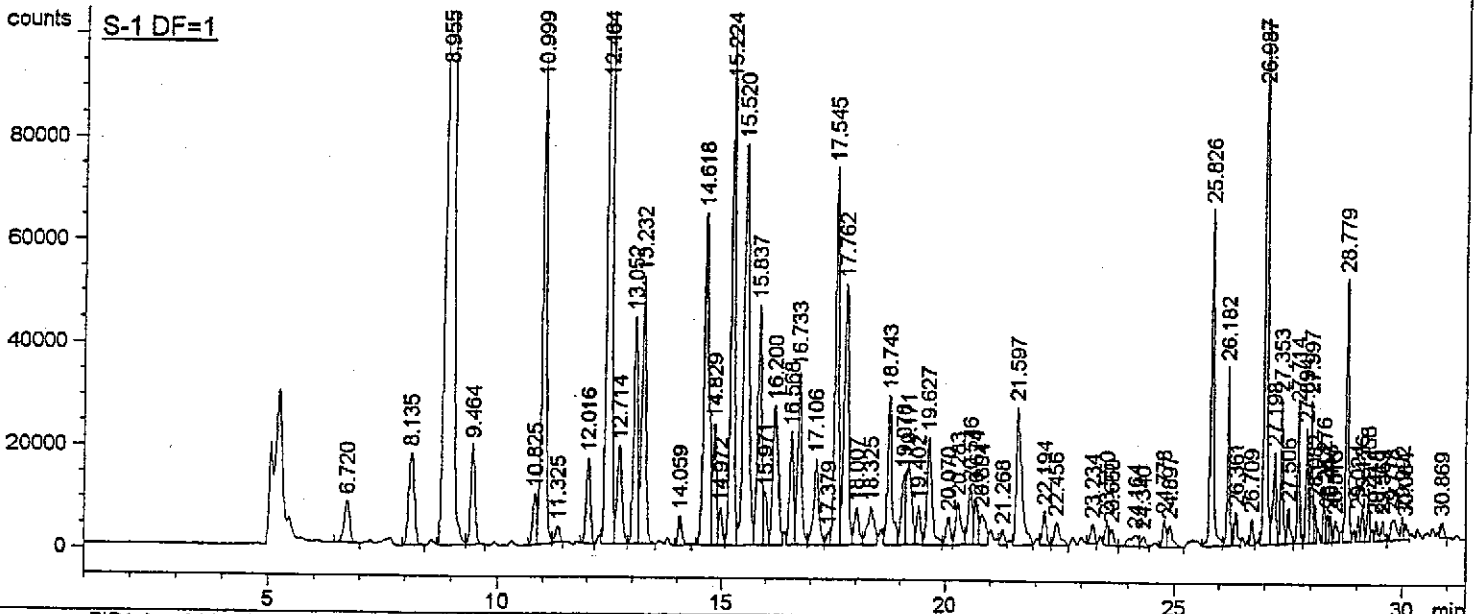
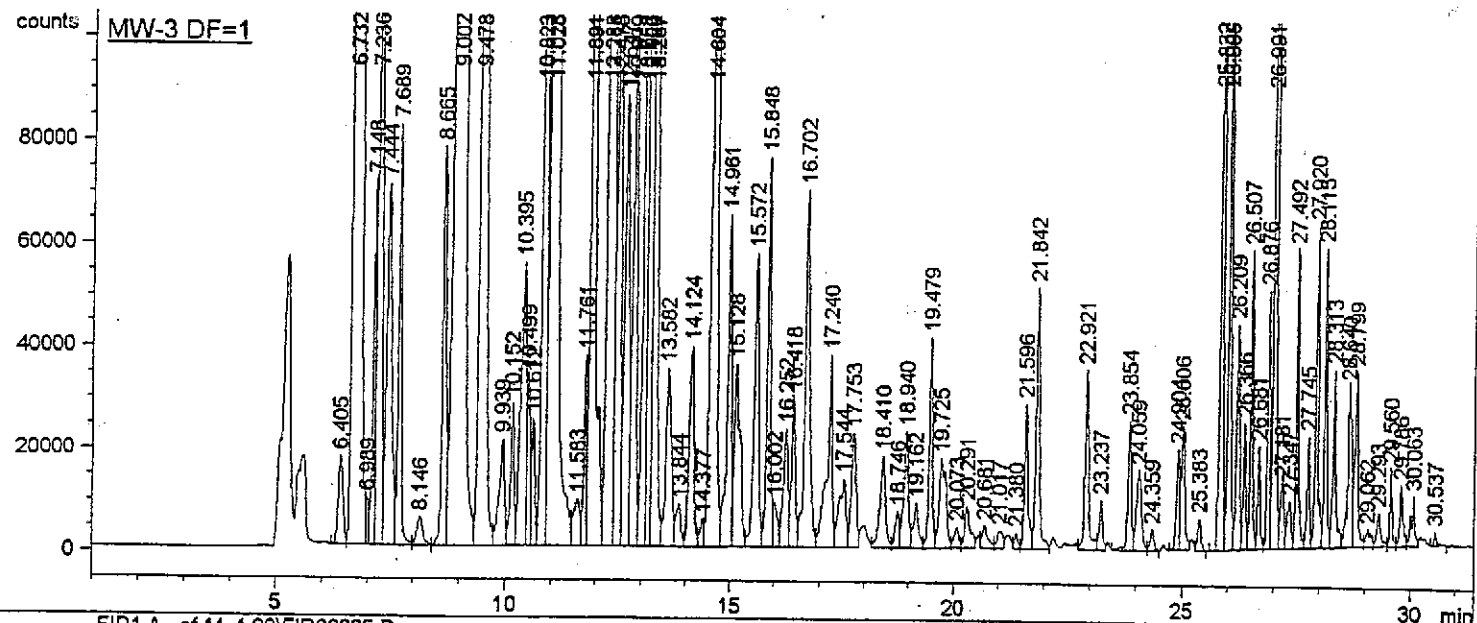
Concentration, ug/L											
Client Sample No.:	MW-5	MW-8	MW-3	S-1	S-2						Method Detection Limit, ug/L
Sierra Sample No.:	17151	17152	17153	17154	17155						
COMPOUNDS:											
Benzene	ND	ND	220	ND	170						0.5
Toluene	ND	ND	16	9.5	70			ND			0.5
Ethylbenzene	ND	ND	13	1.6	170						0.5
Total Xylenes	ND	ND	13.7	9.1	230						0.5
MTBE	ND	ND	180	100	490						5.0
Gasoline	ND	ND	4900	1000	14000						50
Dilution Factor	1	1	1	1	5						QC Limits
% Surrogate Recovery: 4-Bromofluorobenzene	105	110	120	120	110						70-125

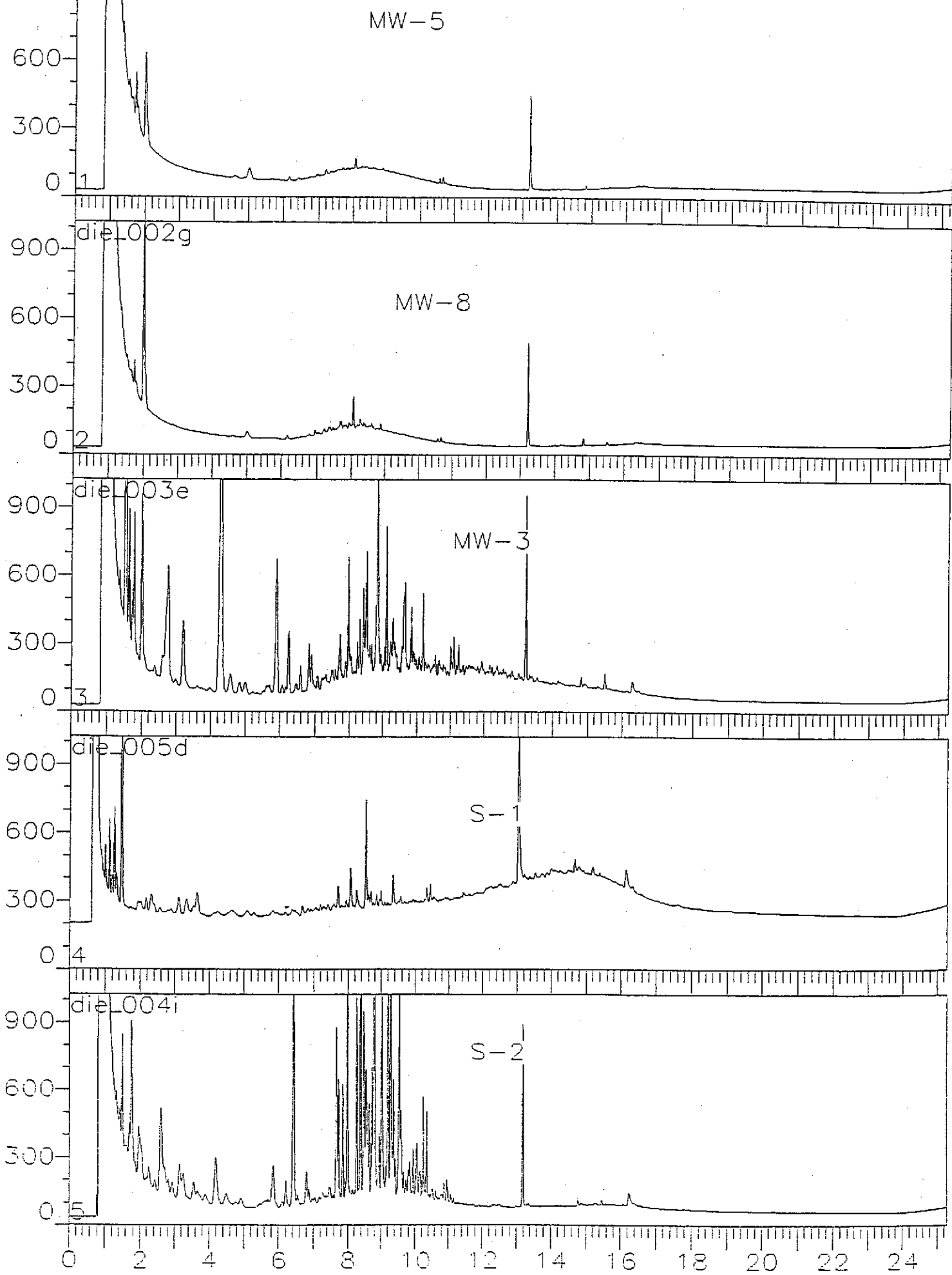
Quality Assurance/Quality Control Data							
QC Sample ID: 9811-034-17151							
Compounds	LCS % Rec.	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits	
Benzene	93	93	95	39-150	2.9	0-30	
Toluene	95	94	96	46-148	1.8	0-30	
Ethylbenzene	97	98	99	32-160	1.0	0-30	
Gasoline	105	98	99	50-150	0.8	0-30	

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor







* PLEASE PROVIDE CHAIN OF CUSTODY
 AND CHECK IN SHEET

CHAIN OF CUSTODY

JOB NAME: USA-DALLAS LAB: SLEDDA
 PROJECT MANAGER: VERN BENNETT SAMPLES COLLECTED BY: CHRIS LAPOSE

COMP.	GRAB	SAMPLE LOCATION	DATE	TIME	SAMPLE TYPE			SAMPLE NO.	TYPE CONTAINER(S)	ANALYSIS REQUIRED
					SOIL	AIR	WATER			
151	X	MONROE WELL	11/2/98	1315			X	MW-5	12 Poly	DO, NITRATE, TOTAL ALKALINITY,
152	X	}	}	1327			X	MW-8	}	AMMONIA AS (N), TKN, PHOSPHATE,
153	X			1416			X	MW-3		CO ₂ , SULFATE, REDOX POTENTIAL
154	X			1458			X	S-1		
155	X			1509			X	S-2		

PRINT NAME AFTER SIGNATURE

RELINQUISHED BY: <u>Chris LaPose</u>	RECEIVED BY:	DATE/TIME
RELINQUISHED BY:	RECEIVED BY: <u>[Signature]</u>	DATE/TIME 11-3-98 11:00
RELINQUISHED BY:	RECEIVED BY:	DATE/TIME
RECEIVED FOR LABORATORY BY:		DATE/TIME

METHOD OF SHIPMENT.

DISPOSITION:

- STORAGE REFRIGERATOR FREEZER
 24 HOURS 3 DAYS 1 WEEK 2 WEEKS

SECURED	
<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

NOTE: PLEASE HAVE EACH DATA SHEET SIGNED BY CHEMIST.

* PLEASE PROVIDE CHROMATOGRAMS
 AND CHECK IN SHEET

CHAIN OF CUSTODY

JOB NAME: USA - OAKLAND

LAB: SIERRA

PROJECT MANAGER: VERN BENNETT

SAMPLES COLLECTED BY: CHRIS LAPOSE

COMP	GRAB	SAMPLE LOCATION	DATE	TIME	SAMPLE TYPE			SAMPLE NO.	TYPE CONTAINER(S)	ANALYSIS REQUIRED
					SOIL	AIR	WATER			
151	X	MONITOR WELL	11/2/98	1315			X	MW-5	12 AMBER	PH-D
152	X	}	}	1327			X	MW-8	}	}
153	X			1416			X	MW-3		
154	X			1458			X	S-1		
155	X			1509			X	S-2		

PRINT NAME AFTER SIGNATURE

RELINQUISHED BY: <u>Chris LaPose</u>	RECEIVED BY:	DATE/TIME
RELINQUISHED BY:	RECEIVED BY: <u>[Signature]</u>	DATE/TIME
RELINQUISHED BY:	RECEIVED BY:	11-3-98 11:00 DATE/TIME
RECEIVED FOR LABORATORY BY:		DATE/TIME

METHOD OF SHIPMENT:

DISPOSITION:

STORAGE REFRIGERATOR FREEZER
 TURN AROUND TIME
 24 HOURS 3 DAYS 1 WEEK WEEKS

SECURED	
<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

NOTE: PLEASE HAVE EACH DATA SHEET SIGNED BY CHEMIST.

* PLEASE PROVIDE CHROMATOGRAMS
 AND CHECK IN SHEET

CHAIN OF CUSTODY

JOB NAME: USA Oakland

LAB: SIERRA

PROJECT MANAGER: VERN BENNETT

SAMPLES COLLECTED BY: CHRIS W. POSE

COMP.	GRAB	SAMPLE LOCATION	DATE	TIME	SAMPLE TYPE			SAMPLE NO.	TYPE CONTAINER(S)	ANALYSIS REQUIRED
					SOIL	AIR	WATER			
1151	X	MONITOR WELL	11/2/98	1315			X	MW-5	3xVol(H ₂)	PAH-6 + PTEX, MTBE
1152	X	}	}	1327			X	MW-8	}	}
1153	X			1410			X	MW-3		
1154	X			1458			X	S-1		
1155	X			1509			X	S-2		

PRINT NAME AFTER SIGNATURE

RELINQUISHED BY: <u>Chris W. Pose</u>	RECEIVED BY:	DATE/TIME
RELINQUISHED BY:	RECEIVED BY: <u>[Signature]</u>	DATE/TIME 11-3-98 1100
RELINQUISHED BY:	RECEIVED BY:	DATE/TIME
RECEIVED FOR LABORATORY BY:		DATE/TIME

METHOD OF SHIPMENT

DISPOSITION:

- STORAGE REFRIGERATOR FREEZER
 TURN AROUND TIME
 24 HOURS 3 DAYS 1 WEEK 2 WEEKS

SECURED	
<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

NOTE: PLEASE HAVE EACH DATA SHEET SIGNED BY CHEMIST.

APPENDIX E

HYDRO DATA & GROUNDWATER SAMPLE DATA

DATE: 6/10/99

PROJECT: USA-OAKLAND

EVENT: Bio Sampling SAMPLER: CL

NO.	WELL OR LOCATION	DATE			TIME		MEASUREMENT PROB/HTG	CODE	COMMENTS
		NO.	DA.	YR.	HR.	MIN.			
1	MW-4	6	10	99			14.81	SWL	
2	MW-5						14.60		
3	MW-6						16.92		
4	MW-7						14.23		
5	MW-8						14.98		
6	MW-3						15.24		
7	S-1						14.35		
8	S-2						16.48	v	
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

CODE

- *SWL - Static water level (feet)
- *IWL - Instant Water Level; Non Static (feet)
- *OIL - Oil Level (feet)
- *OWI - Oil/Water Interface (feet)
- *MTD - Measured Total Depth (feet)
- FLO - Flow Rate (Gallons/Minutes)
- CUM - Cumulative (Gallons)

- HRS - Total (Hours)
- PSI - Pressure (psi)
- VAC - Vacuum
- pH - 1 to 14
- Ec - Conductivity
- TMP - Temperature
- TRB - Turbidity

* All levels are depth from inner casing - describe any other reference points in comments column

Note in comments column if well is not properly labeled, locked, or able to be locked. Describe corrective action.

Note flooding of vault box, odor, access problems.



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name UCA - OAKLAND Job # 5090.09 Well # MW-5

Date 6/10/99 Sample ID MW-5

Sampling Team CE

Purpose of Sampling: Initial Quarterly Verification Other: _____

Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		14.60	37.60	23.00	1.65	LC
After Development/ Purging	0940	35.42				
At Time of Sampling	1035	18.87				

Three Casing Volumes LC Gals
Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailer Sandpiper Other: _____

Method: 2" ReaFlo Description _____

Decontamination Method: TSP/Raise Description _____

Water Containment: Drums Baker Tank Treatment System Other: _____

Labeled: _____

Start Time	Volume Water Extracted	Temperature °F (C)	EC (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
0915	0	21.5	28.9	10.99	
0923	15	21.8	25.1	11.13	
0931	30	22.0	24.6	11.21	
	45				

SAMPLE INFORMATION

Lab: SIERDA

Sampling Containers/No. of Containers: _____ Preservation: _____
 1 Liter Amber Ice Other _____
 40 ml VOA Ice Other _____
 Other 12 200ml BOD Ice Other 12 200ml

Device: Bailer, Disposable Other _____

Pertinent Field Observations: Day After 36 hrs Purged

Deviations From Standard Sampling Protocol: _____



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA-DAKLAND Job # 5090.09 Well # MW-3
 Date 6/10/99 Sample ID MW-3
 Sampling Team ce
 Purpose of Sampling: Initial Quarterly Verification Other: BO SAMPLING
 Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		15.24	47.75	32.51	.65	21
After Development/ Purging	1024	39.87				
At Time of Sampling	1126	20.43				

Three Casing Volumes 63 Gals
 Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailor Sandpiper Other: _____
 Method: 2" 20' Ho Description _____
 Decontamination Method: 19P/20' Ho Description _____
 Water Containment: Drums Baker Tank Treatment System Other: _____
 Labeled: _____

Start Time	Volume Water Extracted	Temperature °F/C	EC (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
0952	0	21.8	-8.1	7.14	
1002	21	21.5	0.9	6.96	
1012	42	21.0	1.3	6.91	
1022	63	21.1	2.0	6.92	

SAMPLE INFORMATION

Lab: SERRA

Sampling Containers/No. of Containers: 1 1 Liter Amber (Pt-D)
5 40 ml VOA 19-G + 15-EX, 15-EX
 Other _____

Preservation: Ice Other _____
 Ice Other _____
 Ice Other _____

Device: Bailor, Disposable Other _____

Pertinent Field Observations: _____

Deviations From Standard Sampling Protocol: _____

WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA-DANLIND Job # 509009 Well # S-1
 Date 6/10/99 Sample ID S-1
 Sampling Team CE
 Purpose of Sampling: Initial Quarterly Verification Other: BW
 Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		14.35	40.80	26.45	.36	9.5
After Development/Purging	1100	37.63				
At Time of Sampling	1411	18.21				

Three Casing Volumes 28.5 Gals
 Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailer Sandpiper Other: _____
 Method: 2" Reel Description _____
 Decontamination Method: TSP / RINSE Description _____
 Water Containment: Drums Baker Tank Treatment System Other: _____
 Labeled: _____

Start Time	Volume Water Extracted	Temperature °F/°C	^{u/v} -EC (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
1043	0	20.9	-4.3	7.04	
1048	9.5	21.1	-3.0	6.99	
1053	19	20.9	-2.4	7.00	
1058	28.5	20.8	-1.9	7.00	

SAMPLE INFORMATION

Lab: SERRA

Sampling Containers/No. of Containers: 1 2L = D
 1 Liter Amber 1 2L = D + 3 2L = M, M, B, F
 40 ml VOA 1 2L = D + 3 2L = M, M, B, F
 Other _____

Preservation: Ice Other Ice
 Ice Other _____

Device: Bailer, Disposable Other _____
 Pertinent Field Observations: _____

 Deviations From Standard Sampling Protocol: _____



WELL DEVELOPMENT/SAMPLING DOCUMENTATION FORM

Project Name USA-DUKLAND Job # 5090.09 Well # S-2
 Date 6/10/99 Sample ID 52
 Sampling Team CL
 Purpose of Sampling: Initial Quarterly Verification Other: BO
 Weather Conditions _____

GROUNDWATER LEVEL/CASING VOLUME

Description	Time	Depth (TOC to GW)	Total Depth	Feet of Water	Conversion Factor (ft to gals)	Casing Volume (gallons)
Initial		16.48	42.85	26.37	.36	9.5
After Development/ Purging	1138	38.19				
At Time of Sampling	1418	20.17				

Three Casing Volumes 28.5 Gals
 Ten Casing Volumes _____ Gals

WELL DEVELOPMENT/PURGING

Equipment: Submersible Pump Bailer Sandpiper Other: _____
 Method: 2" Rod PU Description _____
 Decontamination Method: TSP RINSE Description _____
 Water Containment: Drums Baker Tank Treatment System Other: _____
 Labeled: _____

Start Time	Volume Water Extracted	Temperature °F (°C)	EC (umhos)	pH	Observations (Color, Turbidity, Oils, Odor)
1112	0	21.2	6.3	7.06	
1122	9.5	21.0	7.9	6.91	
1132	19.5	21.0	8.7	6.91	

SAMPLE INFORMATION

Lab: S 1622A

Sampling Containers/No. of Containers: 1 PRAD
 1 Liter Amber 40 ml VOA Other: BSU

Preservation: Ice Other: None
 Ice Other: _____
 Ice Other: _____

Device: Bailer, Disposable Other _____

Pertinent Field Observations: Dry 1622A has Purged

Deviations From Standard Sampling Protocol: _____

APPENDIX F

GROUNDWATER ANALYTICAL RESULTS

June 10, 1999



SIERRA
ANALYTICAL

JUN 7 5 1999

Date: 6/16/99

GHH Engineering, Inc.
8084 Old Auburn Road, Suite E
Citrus Heights, CA 95610
Attention: Mr. Vern Bennett

Client Project Number: USA-Oakland/5090.10
Date Sampled: 6/10/99
Date Samples Received: 6/11/99
Sierra Project No.: 9906-217

Attached are the results of the chemo-physical analysis of the sample(s) from the project identified above.

The samples were received by Sierra Laboratories, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analysis were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report. If you require additional retaining time, please advise us.

Richard K. Forsyth
Laboratory Director

Reviewed

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

26052 MERIT CIRCLE SUITE 105, LAGUNA HILLS, CALIFORNIA 92653
TELEPHONE: (949) 348-9389 FAX: (949) 348-9115
E-MAIL: SIERRALABS@EARTHLINK.NET

GHH Engineers, Inc. 8084 Old Auburn Road, Suite E Citrus Heights, CA 95610		Date Sampled: 6/10/99 Date Received: 6/11/99 Date Prepared: 6/11/99 Date Analyzed: 6/11/99 Analyst: RF
Sierra Project No.:	9906-217	Report Date: 6/16/99
Client Project ID:	USA-Oakland/5090.10	
Sample Matrix:	Water	

INDIVIDUAL INORGANIC ANALYSIS

Client Sample No.		MW-5	S-2		Method No.	Detection Limit
Sierra Sample No.		12336	12337			
TEST PARAMETERS	UNITS					
Dissolved Oxygen	mg/l	3.36	2.52		EPA 360.1	0.1
pH	Units	6.7	6.9		EPA 150.1	0.1
Redox Potential	Eh	94	101		SM 2580	1
Carbon Dioxide	mg/l	84.0	72.0		SM 4500 CO ₂	0.10
Specific Conductance	µmhos/cm	2780	1160		EPA 120.1	0.1
T.D.S.	mg/l	1980	790		EPA 160.1	1.0
Alkalinity, Total						
Bicarbonate	mg/l	640	180		EPA 310.1	0.4
Nitrate (as N)	mg/l	6.9	1.90		EPA 353.3	0.05
Ammonia (as N)	mg/l	0.75	0.64		EPA 350.2	0.10
T.K.N.	mg/l	0.82	0.70		EPA 351.2	0.05
Phosphate (as P)	mg/l	0.10	0.11		EPA 365.2	0.01
Sulfate (as SO ₄)	mg/l	38.0	22.0		EPA 375.4	0.50

ND means Not Detected.

GHH Engineering, Inc.
 8084 Old Auburn Road, Suite E
 Citrus Heights, CA 95610

Date Sampled: 6/10/99
 Date Received: 6/11/99
 Date Extracted: 6/14/99
 Date Analyzed: 6/15/99
 Analyst: LT
 Report Date: 6/16/99

Sierra Project No.: 9906-217
 Client Project ID: USA-Oakland / 5090.10
 Sample Matrix: Water

TOTAL PETROLEUM HYDROCARBONS

EPA 8015B MODIFIED - Diesel Range Hydrocarbons (C10-C23)

SIERRA Sample No.	Client Sample No.	Concentration (mg/l)	Dilution Factor	% Surrogate Recover	MDL (mg/l)
12337	S-2	ND	1	74	0.05
12338	S-1	0.15	1	51	0.05
12339	MW-3	0.31	1	71	0.05

Quality Assurance/Quality Control Data

QC Sample ID: 9906-115

Compound	LCS % Rec.	QC Limits	Spike % Rec.	Spike Du % Rec.	QC Limits	RPD	QC Limits
TPH as Diesel	100	50-120	80	85	50-150	5	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor

GHH Engineers, Inc.
8084 Old Auburn Road, Suite E
Citrus Heights, CA 95610

Date Sampled: 6/10/99
Date Received: 6/11/99
Date Prepared: 6/11/99
Date Analyzed: 6/11/99
Analyst: SM

Sierra Project No.: 9906-217
Client Project ID: USA-Oakland / 5090.10
Sample Matrix: Water

Report Date: 6/15/99

EPA METHOD 8020-BTEX/
EPA METHOD 8015 MODIFIED-GASOLINE RANGE HYDROCARBONS (C4-C12)
(PURGE AND TRAP)

Client Sample No.:	Concentration, ug/L			Method Detection Limit, ug/L
	S-2	S-1	MW-3	
Sierra Sample No.:	12337	12338	12339	
COMPOUNDS:				
Benzene	650	0.99	ND	0.5
Toluene	230	ND	ND	0.5
Ethylbenzene	ND	ND	ND	0.5
Total Xylenes	750	2.4	1.1	0.5
Gasoline	17000	660	1000	50
Dilution Factor	50	1	1	QC Limits
% Surrogate Recovery 4-Bromofluorobenzene	110	120	120	70-125

Quality Assurance/Quality Control Data							
QC Sample ID: 9906-115-11721							
Compounds	LCS % Rec.	QC Limits	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits
Benzene	95	80-120	89	96	39-150	7.31	0-30
Toluene	95	80-120	89	96	46-148	7.29	0-30
Ethylbenzene	99	80-120	91	98	32-160	7.17	0-30
Gasoline	100	80-120	93	94	50-150	0.9	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor

GHH Engineering, Inc.
8084 Old Auburn Road, Suite E
Citrus Heights, CA 95610

Sierra Project No.: 9906-217
Client Project ID: USA - Oakland / 5090.10
Sample Matrix: Water

Date Sampled: 6/10/99
Date Received: 6/11/99
Date Prepared: 6/15/99
Date Analyzed: 6/15/99
Analyst: WH
Report Date: 6/16/99

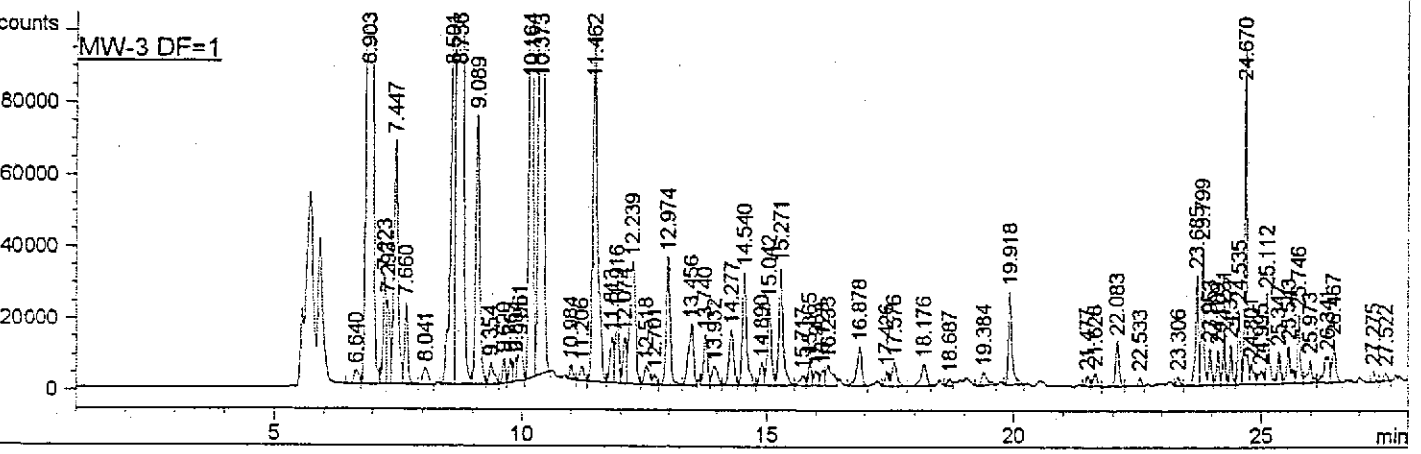
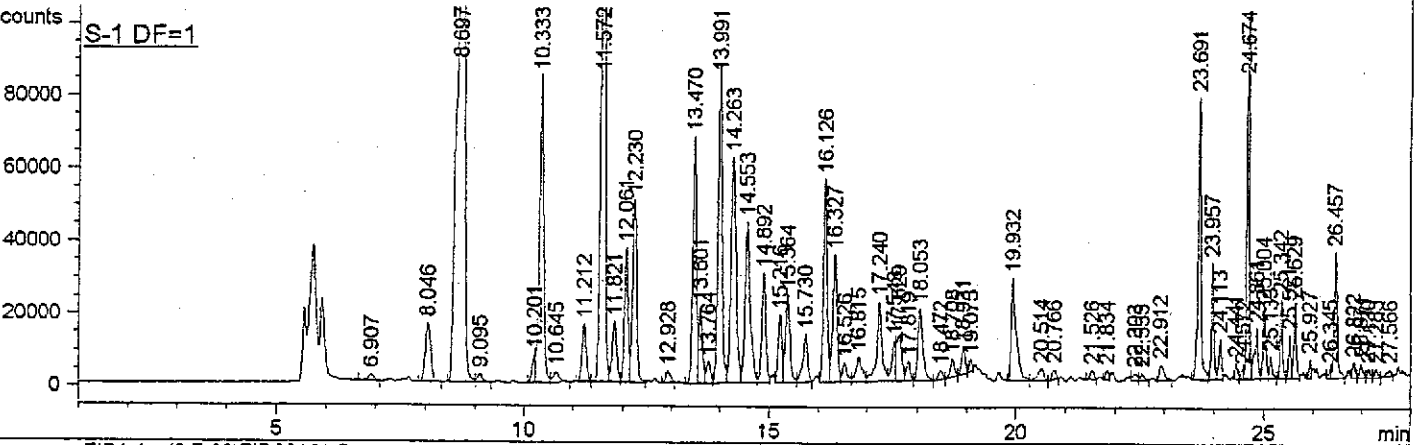
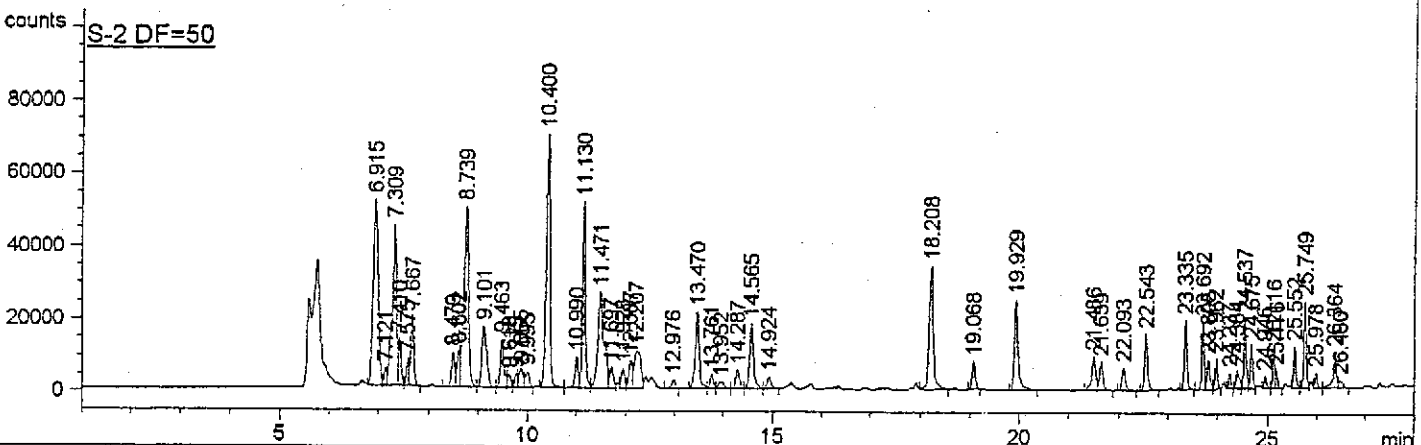
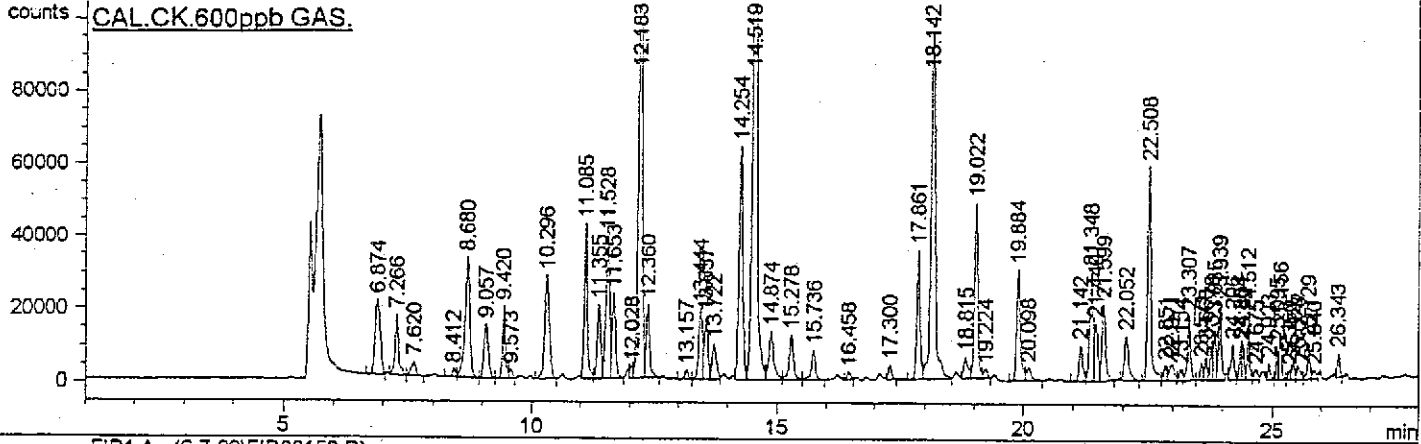
VOLATILE ORGANICS (GC/MS)
EPA METHOD 8260B

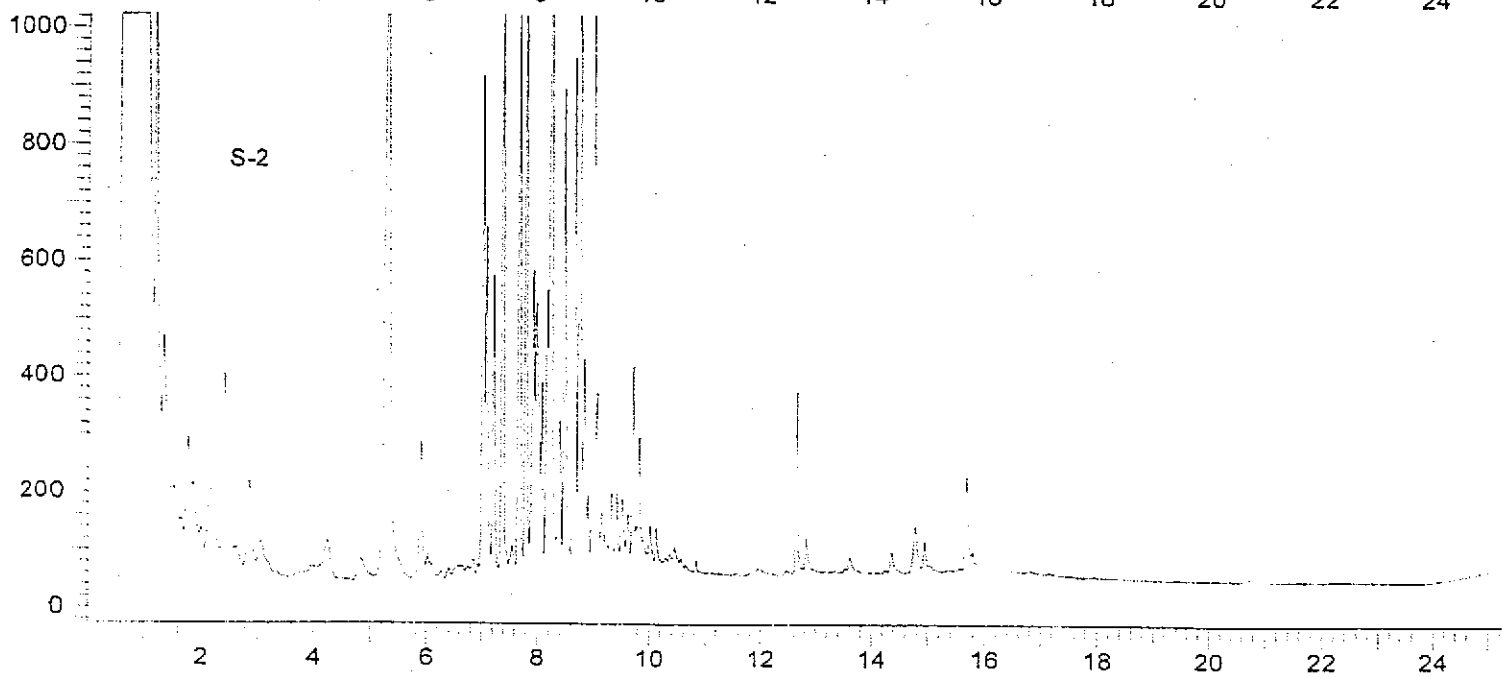
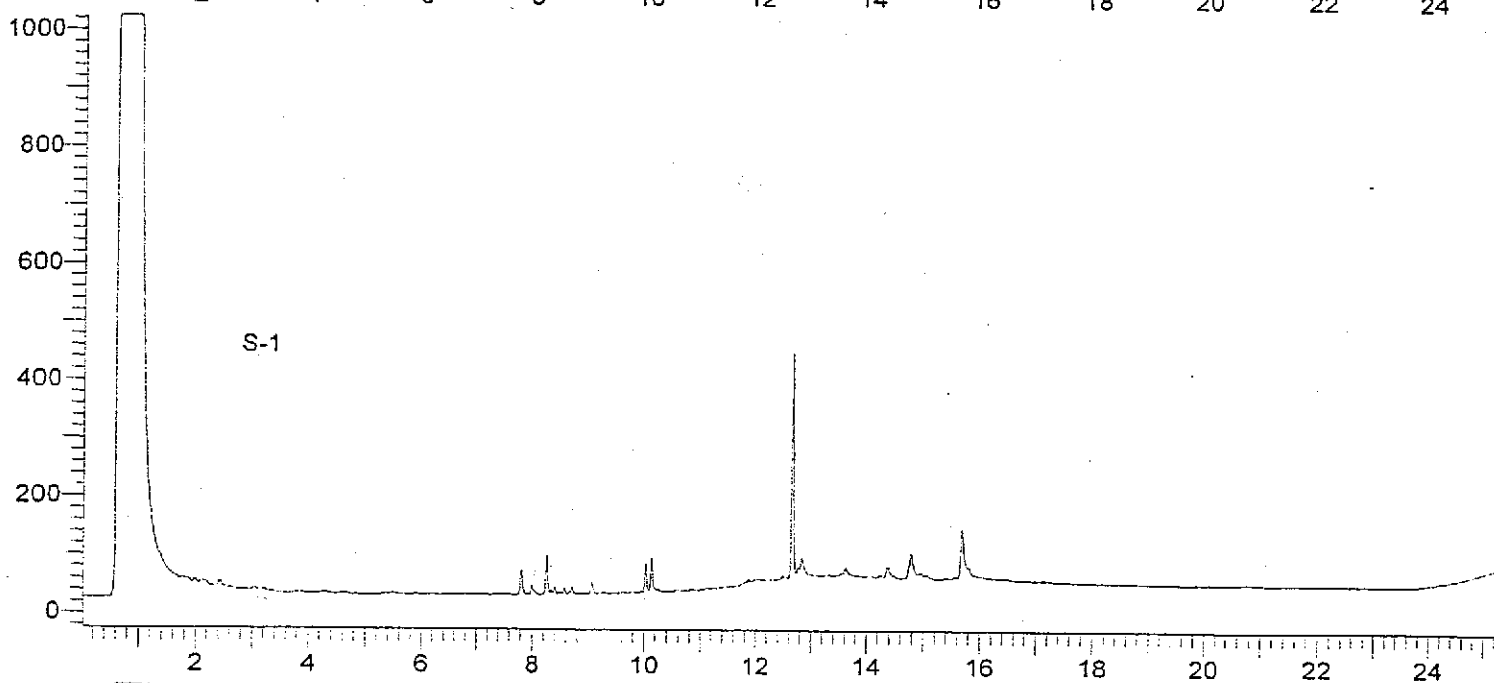
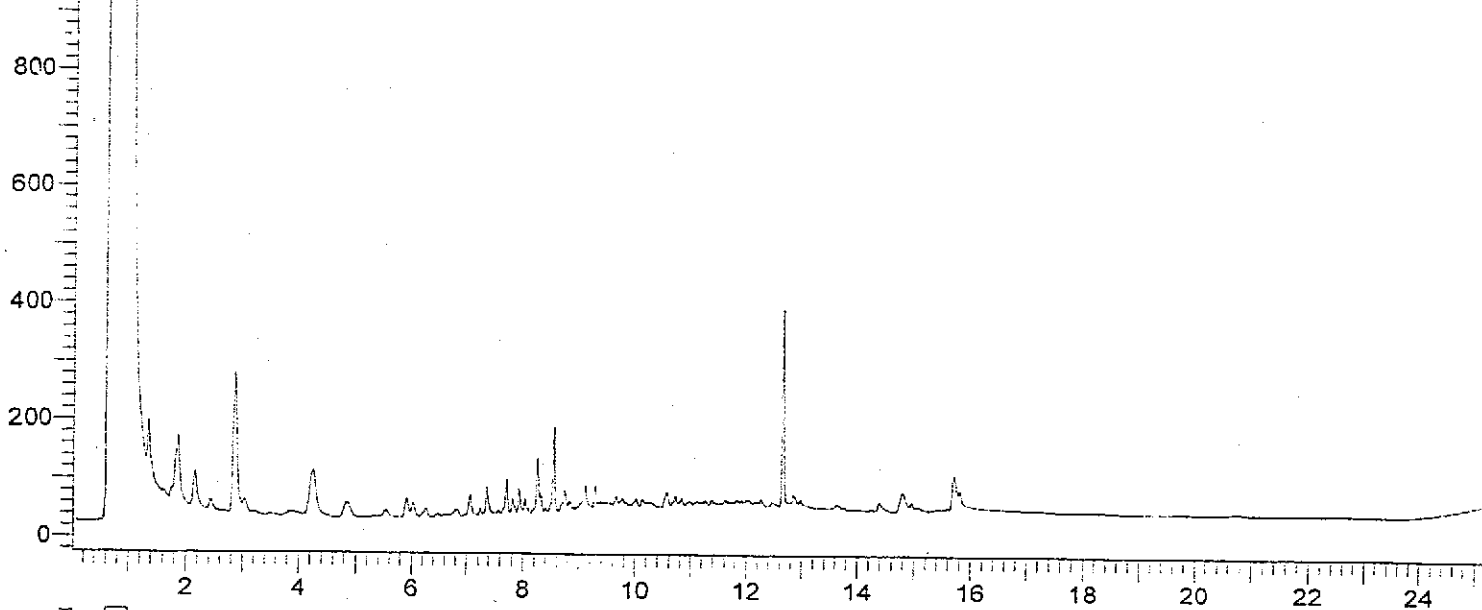
Client Sample No.:	Concentration, ug/l			Method Detection Limit, ug/l
	S-2	S-1	MW-3	
Sierra Sample No.:	12337	12338	12339	
COMPOUNDS:				
MTBE	490	80	120	5.0
Dilution Factor	1	1	1	QC Limits
%Surrogate Recoveries:				
Dibromoflouromethane	99	103	101	80-120
Toluene-d8	96	97	95	81-117
4-Bromofluorobenzene	98	92	93	74-121

Quality Assurance/Quality Control Data						
QC Sample ID:	9807-083-9670					
Compounds	LCS	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits
MTBE	117	112	109	37-160	3	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor







Sample Receipt / Client Notification Form

Client Name: G H H

Sierra Project Number: 9906-217

Sierra Project Manager: Bill Hudson

Date / Time Samples Received: 6-11-99 11:00

Method of Shipment: UPS

Custody Seals? N/A Intact Broken

Samples Intact?

Properly Labelled?

Appropriate Containers?

Headspace in VOA vials? None

Samples Chilled? (Cooler Temp. °C): 6.8°C

Properly Preserved? (pH) _____

Preservatives added (after receipt by Sierra): _____

* Sample Disposal Instructions: _____

** Turn Around Time Requested: Normal

Subcontractor Laboratories to be utilized: _____

Special Instructions: _____

Other Anomalies: _____

Date/Time Faxed to Client: _____

Samples Logged in by:

Printed Name: Jon Schultz

If you have any questions, please refer to the Sierra Project Number referenced above.

- * - Samples are only retained for 30 days if marked for Lab Disposal. Other charges may apply for other disposal options
- ** - Rush surcharges will be applied to Turn Around Times other than Normal, except by prior arrangement with Sierra Labs



ENGINEERING, INC.
RCE #27011 Lic. #537901

8084 OLD AUBURN ROAD
CITRUS HEIGHTS, CA 95610
(916) 723-7645
LIC. # 537901

I.D.# 02041

JOB # S090.10

P.O.#

* PLEASE PROVIDE CHROMATOGRAMS

AND CHECK IN SHEET CHAIN OF CUSTODY

JOB NAME: USA - OAKLAND

LAB: SIERRA 9906-217

PROJECT MANAGER: VERN BENNETT

SAMPLES COLLECTED BY: CHRIS W. ROSE

COMP.	GRAB	SAMPLE LOCATION	DATE	TIME	SAMPLE TYPE			SAMPLE NO.	TYPE CONTAINER(S)	ANALYSIS REQUIRED			
					SOIL	AIR	WATER						
336	X	MONROE WELL	6/10/99	1035			X	MW-5	1 Pol	DO, NITRATE, TOTAL ALKALINITY, AMMONIA AS (N), TKN, PHOSPHATE, CO ₂ , SULFATE, REDOX POTENTIAL			
	X			1418			X	S-2	1 Pol				
37	X								X		3x VOA	TPH-G + BTEX, MTBE BY 8260	
	X								X		1 Amber	TPH-D	
38	X					1411			X		S-1	3x VOA	TPH-G + BTEX, MTBE BY 8260
	X								X		1 Amber	TPH-D	
39	X					1126			X		MW-3	3x VOA	TPH-G + BTEX, MTBE BY 8260
	X								X		1 Amber	TPH-D	

PRINT NAME AFTER SIGNATURE

RELINQUISHED BY: Chris W. Rose

RECEIVED BY: Tom Schuck

DATE/TIME: 6-11-99 11:00

RELINQUISHED BY:

RECEIVED BY:

DATE/TIME:

RELINQUISHED BY:

RECEIVED BY:

DATE/TIME:

RECEIVED FOR LABORATORY BY:

RECEIVED BY:

DATE/TIME:

METHOD OF SHIPMENT:

POSITION:

- STORAGE
- REFRIGERATOR
- FREEZER
- TURN AROUND TIME:
 - 24 HOURS
 - 3 DAYS
 - 1 WEEK
 - 2 WEEKS

SECURED
 YES NO

NOTE: PLEASE HAVE EACH DATA SHEET SIGNED BY CHEMIST.

R3A / R1A4