ENVIRONMENTAL ENGINEERING, INC
2680 Bishop Drive • Suite 203 • San Ramon, CA 94583
TEL (925) 244-6600 • FAX (925) 244-6601

August 27, 2004

Mr. Don Hwang
Alameda County
Department of Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Fuel Leak Case No. RO0000317-5725 Thornhill Drive, Oakland, CA

Dear Don:

Enclosed for your review is a copy of SOMA's "Third Quarter 2004 Groundwater Monitoring Report" for the subject property.

Thank you for your time in reviewing our report. If you have any questions or comments, please call me at (925) 244-6600.

Sincerely,

Mansour Sepehr, Ph.D.,PE
Principal Hydrogeologist

Enclosure

cc: Mr. Mo Mashhoon

R0317

ENVIRONMENTAL ENGINEERING, INC.
2680 Bishop Drive, Suite 203, San Ramon, CA 94583
TEL (925) 244-6600 * FAX (925) 244-6601

Third Quarter 2004

Groundwater Monitoring Report

Mash Petroleum Inc.

5725 Thornhill Drive

Oakland, California

August 27, 2004

Project 2831

Prepared for

Mr. Mo Mashhoon

1721 Jefferson Street

Oakland, California 94612

Prepared by

SOMA Environmental Engineering, Inc.

2680 Bishop Drive, Suite 203

San Ramon, California 94583

Certification

This report has been prepared by SOMA Environmental Engineering, Inc. on behalf of Mr. Mo Mashhoon, the property owner of 5725 Thornhill Drive, Oakland, California, to comply with the Alameda County Health Care Services Agency's and California Regional Water Quality Control Board's requirements for the Third Quarter 2004 groundwater monitoring event.

Mansour Sepehr, Ph.D., P.E.

Principal Hydrogeologist

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1.0 INTRODUCTION

This report has been prepared by SOMA Environmental Engineering, Inc. (SOMA) on behalf of Mr. Mo Mashhoon, the property owner of 5725 Thornhill Drive, Oakland, California (the "Site"), as shown in Figure 1. The Site is currently an active ARCO station, which is located in an area consisting primarily of commercial and residential land uses.

This report summarizes the results of the Third Quarter 2004 groundwater monitoring event conducted at the Site on July 27, 2004. Also included in this report are the physical and chemical properties measured in the field for each groundwater sample. The physical and chemical properties consisted of measurements of pH, temperature, and electrical conductivity (EC). Also included in this report are the results of the laboratory analyses for each groundwater sample, which were analyzed for:

- Total petroleum hydrocarbons as gasoline (TPH-g)
- Benzene, toluene, ethylbenzene, total xylenes (collectively referred to as BTEX)
- Methyl tertiary Butyl Ether (MtBE)
- Total petroleum hydrocarbons as diesel (TPH-d)
- Total petroleum hydrocarbons as motor oil (TPH-mo)
- Gasoline oxygenates, which consisted of tert-Butyl-Alcohol (TBA), Isopropyl Ether (DIPE), Ethyl tertiary Butyl Ether (ETBE), Methyl tert-Amyl Ether (TAME), and Ethanol, and
- Lead scavengers, which consisted of 1,2 Dichloroethane (1,2-DCA) and 1,2-Dibromoethane (EDB)

1.1 Previous Activities

In November 1998, Penn Environmental removed a 550-gallon steel underground waste oil tank (WOT) from the Site. Soil samples collected from the WOT excavation contained up to 1,100,000 µg/Kg of TPH-g, 2,700,000 µg/Kg of TPH-d, and 4,200,000 µg/Kg of TPH-Mo.

On February 4, 1999, Penn Environmental over-excavated the contaminated soil surrounding the former WOT. Aqua Science Engineers, Inc., (ASE) collected confirmation soil samples from two sidewalls of the excavation. The only compound detected in one of these two soil samples was MtBE at 40 µg/Kg.

In July 1999, ASE drilled borehole BH-A in the vicinity of the former WOT. The only compounds that were detected at concentrations above the California Department of Health Services' (DHS) maximum contaminant levels (MCLs) for

drinking water were MtBE and cadmium. On September 6, 2000, ASE drilled soil boreholes BH-B and BH-C. On October 23, 2000, ASE drilled soil boreholes BH-D and BH-E. ASE also collected water samples from Temescal Creek. No hydrocarbons were detected in the water sample collected from Temescal Creek. Figure 2 shows the locations of the borings. Historical groundwater and soil analytical data is shown in Appendix A.

On March 1 and 2, 2004, nine temporary well boreholes, HP-1 through HP-7, HP-9 and HP-10 were advanced by Gregg Drilling & Testing (Gregg). Due to the excessive traffic hazards and the disruption of local traffic flow posed by advancing HP-8 in the middle of the street, this borehole was not drilled. Groundwater samples were collected following the completion of each temporary well borehole. The locations of the boreholes are shown in Figure 2.

During the Site's investigation activities, Gregg decommissioned the three existing on-site monitoring wells, MW-1, MW-2 and MW-3, under the supervision of SOMA. On March 12, 2004, Woodward Drilling installed three new monitoring wells SOMA-1, SOMA-2 and SOMA-3. On March 19, 2004, licensed surveyors from Kier & Wright surveyed the casing elevations of the monitoring wells and water level elevations along Temescal Creek. Kier & Wright performed a horizontal and vertical survey on the wells in accordance with the requirements set forth by the State for the GeoTracker database. On April 7, 2004, Gregg developed the recently installed monitoring wells. Figure 2 shows the locations of the monitoring wells.

2.0 FIELD ACTIVITIES

On July 27, 2004, SOMA's field crew conducted a groundwater monitoring event in accordance with the procedures and guidelines of the California Regional Water Quality Control Board (CRWQCB) and the Alameda County Health Care Services (ACHCS). During this groundwater monitoring event three on-site wells (SOMA-1, SOMA-2, and SOMA-3) were monitored.

The depth to groundwater in each monitoring well was measured from the top of the casing to the nearest 0.01 foot using an electric sounder. The top of the casing elevation data and the depth to groundwater in each monitoring well were used to calculate the groundwater elevation. The top of casing elevation was based on an elevation datum of 37 feet NAVD88.

Prior to the collection of samples, each well was purged using a battery operated 2-inch diameter pump (Model ES-60 DC). In order to ensure that the final samples were in equilibrium with (and representative of) the surrounding groundwater, during purging, several samples were taken for field measurements of pH, temperature and EC. The field parameters were measured

using a Hanna pH, conductivity, and temperature meter. The equipment was calibrated at the Site using standard solutions and procedures provided by the manufacturer.

Appendix B details the field measurements taken during the monitoring event.

The purging of the wells continued until the parameters for pH, temperature and EC stabilized or three casing volumes were purged. A disposable polyethylene bailer was used to collect sufficient samples from each well for laboratory analyses. The groundwater sample was transferred to five 40-mL VOA vials and preserved with hydrochloric acid. The vials were then sealed to prevent the development of air bubbles within the headspace. The groundwater sample collected from each well was also transferred into a 1-liter amber non-preserved glass container. After the groundwater samples were collected they were placed on ice in an ice chest and maintained at 4^{0}C. A chain of custody (COC) form was written for all the samples. After the sampling was complete, on July 27, 2004, SOMA's field crew delivered the groundwater samples along with the COC form to Curtis & Tompkins, Ltd., in Berkeley, California.

3.0 LABORATORY ANALYSIS

Curtis & Tompkins, Ltd., a state certified laboratory, analyzed the groundwater samples for TPH-g, BTEX, TPH-d, TPH-mo, ethanol, gasoline oxygenates, and lead scavengers. TPH-g was prepared using EPA Method 5030B and measured using EPA Method 8015B. BTEX was prepared using EPA Method 5030B and measured using EPA Method 8021B. TPH-d and TPH-mo were prepared using EPA Method 3520C and measured using EPA Method 8015B. Lead scavengers and gasoline oxygenates, which included MtBE, were prepared using EPA method 5030B and measured using EPA Method 8260B.

4.0 RESULTS

The following sections provide the results of the field measurements and laboratory analyses for the July 27, 2004 groundwater monitoring event.

4.1 Field Measurements

Table 1 presents the calculated groundwater elevations in each monitoring well. As shown in Table 1, the groundwater elevations ranged from 567.58 feet in monitoring well SOMA-2 to 570.26 feet in monitoring well SOMA-1. Based on the data measured in the Third Quarter 2004, the groundwater flows south to

southwesterly across the Site, at a gradient of 0.046 feet/feet, as displayed in Figure 3.

4.2 Laboratory Analyses

Table 1 presents the results of the laboratory analyses for hydrocarbons, BTEX, and MtBE for the groundwater samples collected during this monitoring event.

As shown in Table 1, the main constituents of concern appear to be TPH-g, TPH-d, and MtBE. TPH-mo was below the laboratory reporting limit in all of the groundwater samples. All BTEX concentrations were below the laboratory reporting limit for wells SOMA-1 and SOMA-3. In SOMA-2, all BTEX constituents were at low levels. The highest TPH-g, TPH-d, and MtBE concentrations were detected in well SOMA-2. Based on the groundwater elevation data, SOMA-2 appears to be the most downgradient well from the UST cavity and pump islands.

Figures 4 through 7 display the contour maps of TPH-g, TPH-d, benzene, and MtBE in the groundwater.

Table 2 shows the analytical results for gasoline oxygenates and lead scavengers. As shown in Table 2, with the exception of a trace concentration of TAME in SOMA-2, all gasoline oxygenate and lead scavenger constituents were below the laboratory reporting limit in the groundwater samples collected during this monitoring event.

Appendix C contains the laboratory report and COC form from the Third Quarter 2004 monitoring event.

5.0 CONCLUSIONS & RECOMMENDATIONS

The findings of the Third Quarter 2004 groundwater monitoring event can be summarized as follows:

- This was the second time SOMA monitored the Site. The groundwater appears to flow south to southwesterly across the Site. Further monitoring events will determine if the flow pattern is consistent.

- The most impacted well appears to be SOMA-2, which is the most downgradient well. Based on previous site investigations, both hydrocarbon and MtBE plumes have migrated southwesterly off-site with the flow of groundwater.

- Due to the close proximity of Temescal Creek in relation to the Site, SOMA recommends the installation of additional off-site wells. This will aid in determining the extent of the off-site contamination and possible impact on Temescal Creek.

6.0 REPORT LIMITATIONS

This report is the summary of work done by SOMA, including observations and descriptions of the Site's conditions. It includes the analytical results produced by Curtis & Tompkins Laboratories for the current groundwater monitoring event. The number and location of the wells were selected to provide the required information, but may not be completely representative of the entire site's conditions. All conclusions and recommendations are based on the results of the laboratory analysis. Conclusions beyond those specifically stated in this document should not be inferred from this report.

SOMA warrants that the services provided were done in accordance with the generally accepted practices in the environmental engineering and consulting field at the time of this sampling.

Tables

Table 1
SOMA Historical Groundwater Elevation Data & Analytical Results (Hydrocarbons, BTEX, & MtBE)
5725 Thornhill Drive,Oakland California

Monitoring Well	Date	Casing Elevation (feet)	Groundwater Elevation (feet)	TPH-g (µg/L)	TPH-d (µg/L)	TPH-mo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Total Xylenes (µg/L)	MtBE* 8260B (µg/L)
SOMA-1	Apr-04	576.47	570.72	63	<50	<300	<0.5	<0.5	<0.5	<0.5	7.7
	Jul-04	**576.47**	**570.26**	**<50**	**<50**	**<300**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**9.1**
SOMA-2	Apr-04	575.50	568.10	1,900	690 LY	<300	<0.5	<0.5	5.2	9.9	1,900
	Jul-04	**575.50**	**567.58**	**1,500**	**710 LY**	**<300**	**8.9 C**	**<0.5**	**1.5 C**	**2.9 C**	**740**
SOMA-3	Apr-04	575.92	568.78	190	120 Y	<300	<0.5	<0.5	<0.5	<0.5	5.1
	Jul-04	**575.92**	**567.97**	**130**	**120 LY**	**<300**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**9.1**

Notes:
<: not detected at or above laboratory reporting limits.
C: Presence confirmed, but RPD between columns exceeds 40%.
L: Lighter hydrocarbons contributed to the quantitation.
Y: Sample exhibits chromatographic pattern which did not resemble standard.

Table 2
Groundwater Analytical Results
Gasoline Oxygenates & Lead Scavengers
5725 Thornhill Drive,Oakland California

Monitoring Well	Date	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)
SOMA-1	Apr-04	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<1000
	Jul-04	**<10**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<1000**
SOMA-2	Apr-04	<100	<5.0	<5.0	19.0	<5.0	<5.0	<10000
	Jul-04	**<33**	**<1.7**	**<1.7**	**9.8**	**<1.7**	**<1.7**	**<3300**
SOMA-3	Apr-04	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<1000
	Jul-04	**<10**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<1000**

Notes:
<: Not detected above the laboratory reporting limit.

Gasoline Oxygenates:
TBA: tertiary butyl alcohol
DIPE: Isopropyl ether
ETBE: Ethyl tertiary butyl ether
TAME: Methyl tertiary amyl ether
Ethanol

Lead Scavengers:
1,2-Dichloroethane
EDB: 1,2-Dibromoethane

Figures

Figure 1: Site vicinity map.

SOMA ENVIRONMENTAL ENGINEERING, INC

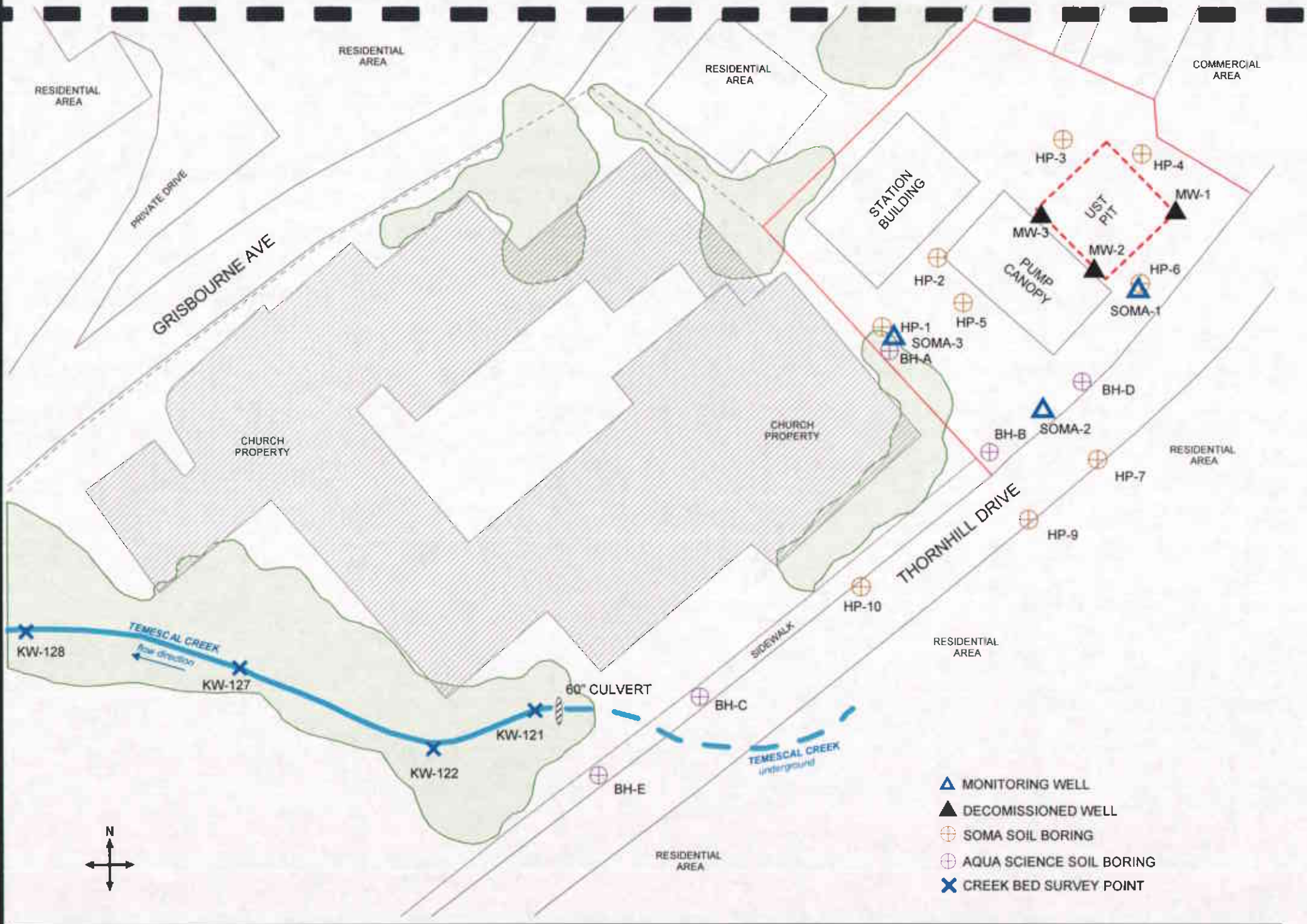


Figure 2: Site map showing locations of monitoring wells, soil borings, creekbed survey points, decomissioned UST backfill wells, and previously drilled soil borings.

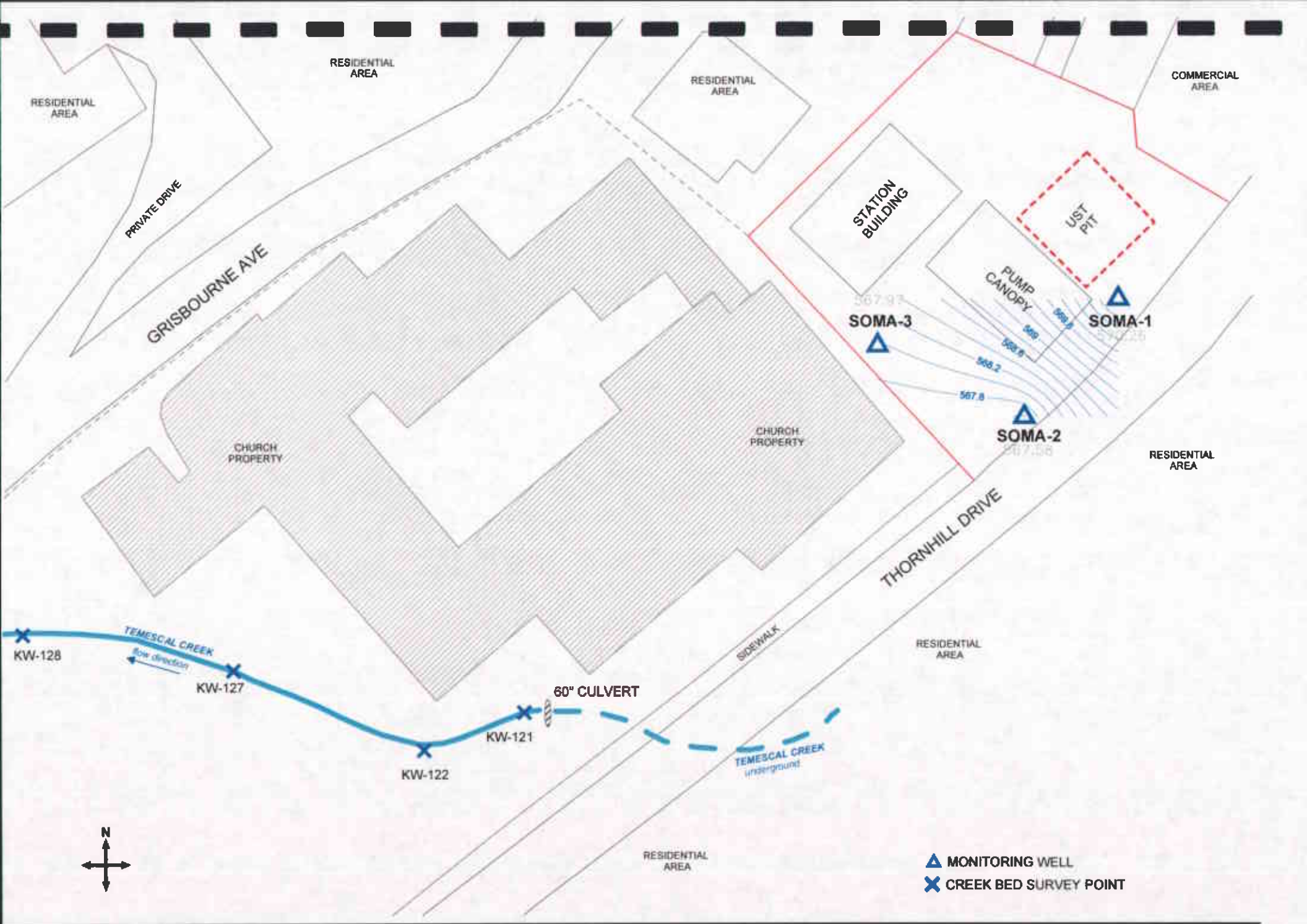


Figure 3: Groundwater elevation contour map in feet. July 2004.

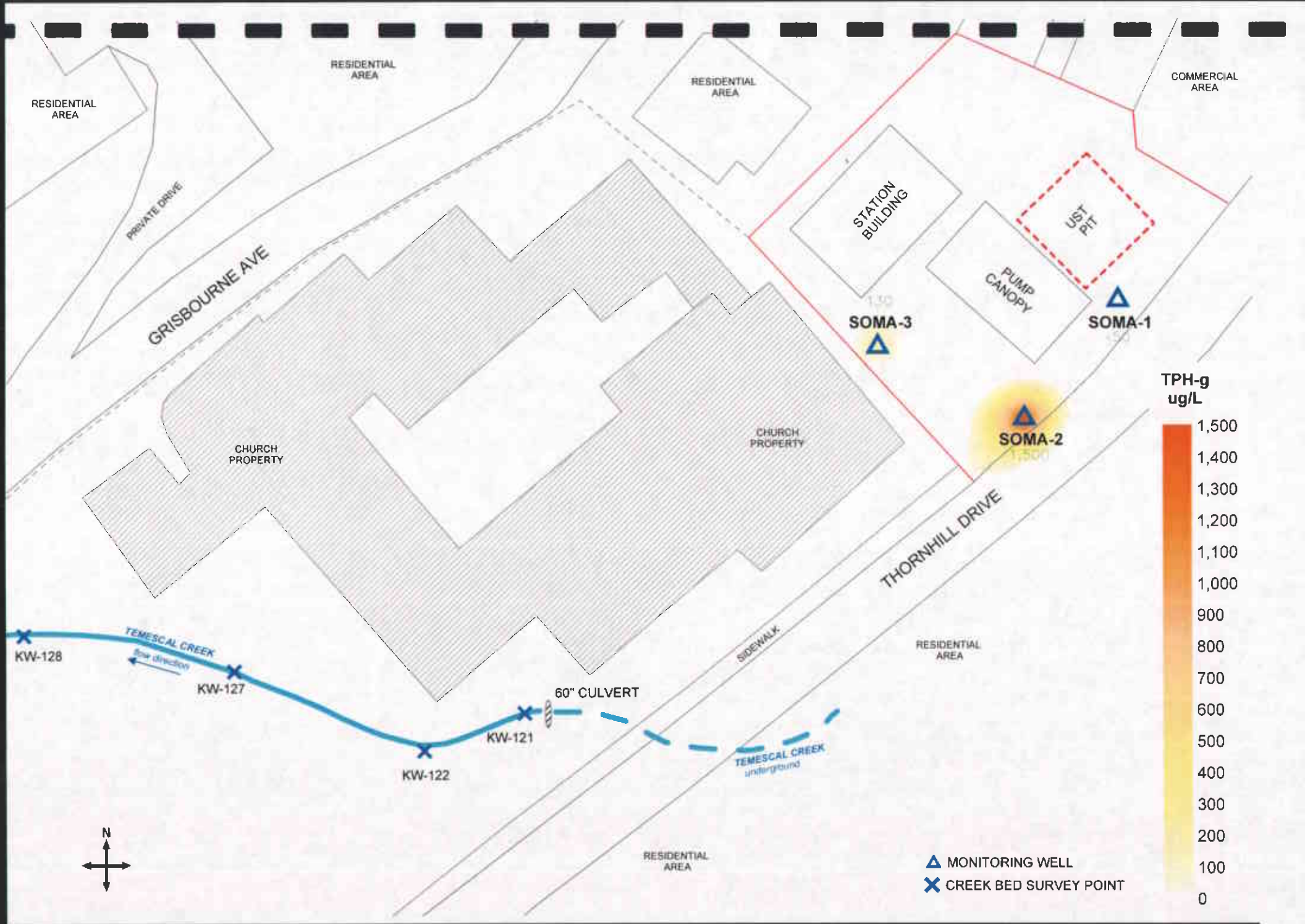


Figure 4: Contour Map of TPH-g concentrations in groundwater. July 2004.

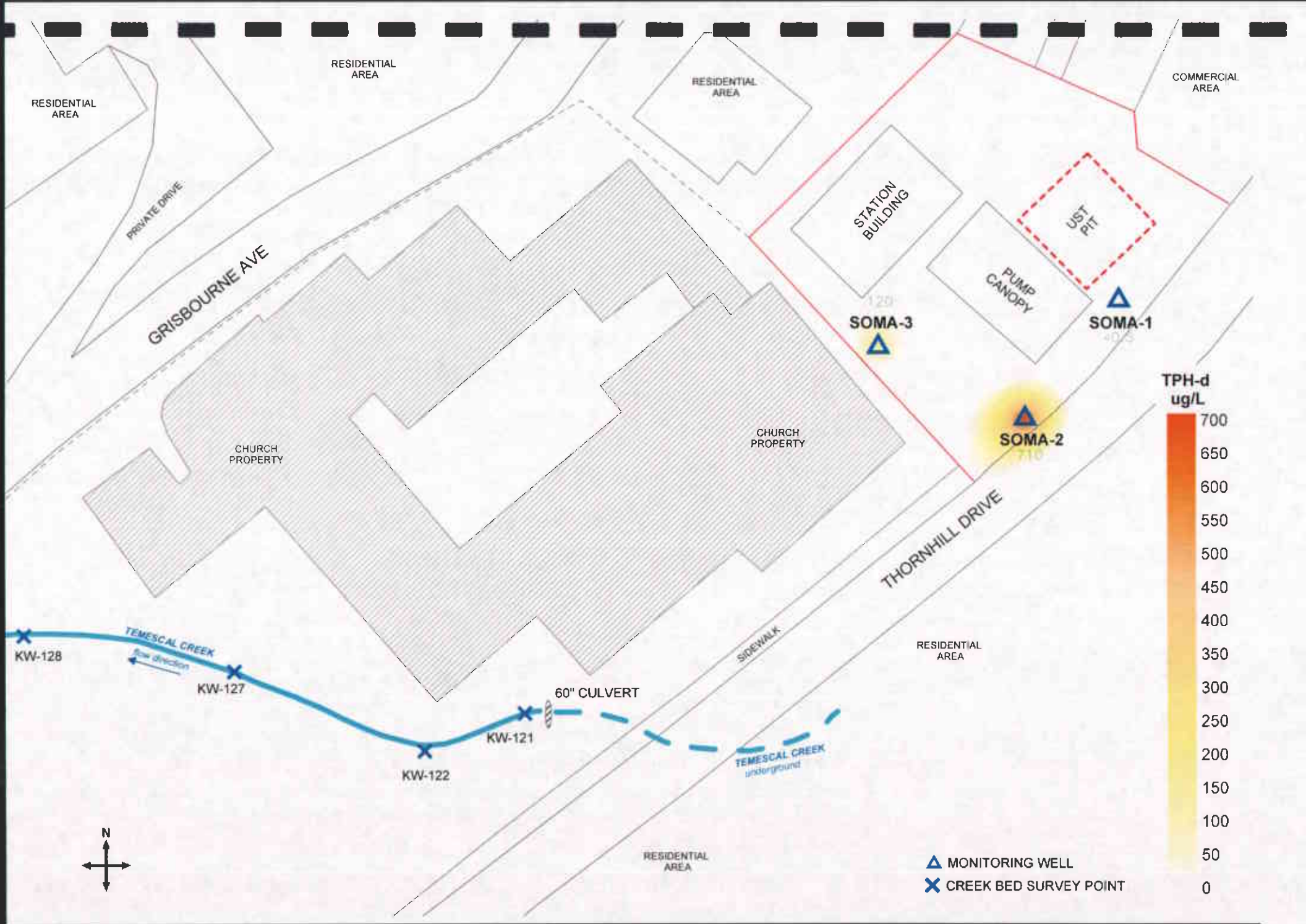


Figure 5: Contour Map of TPH-d concentrations in groundwater. July 2004.

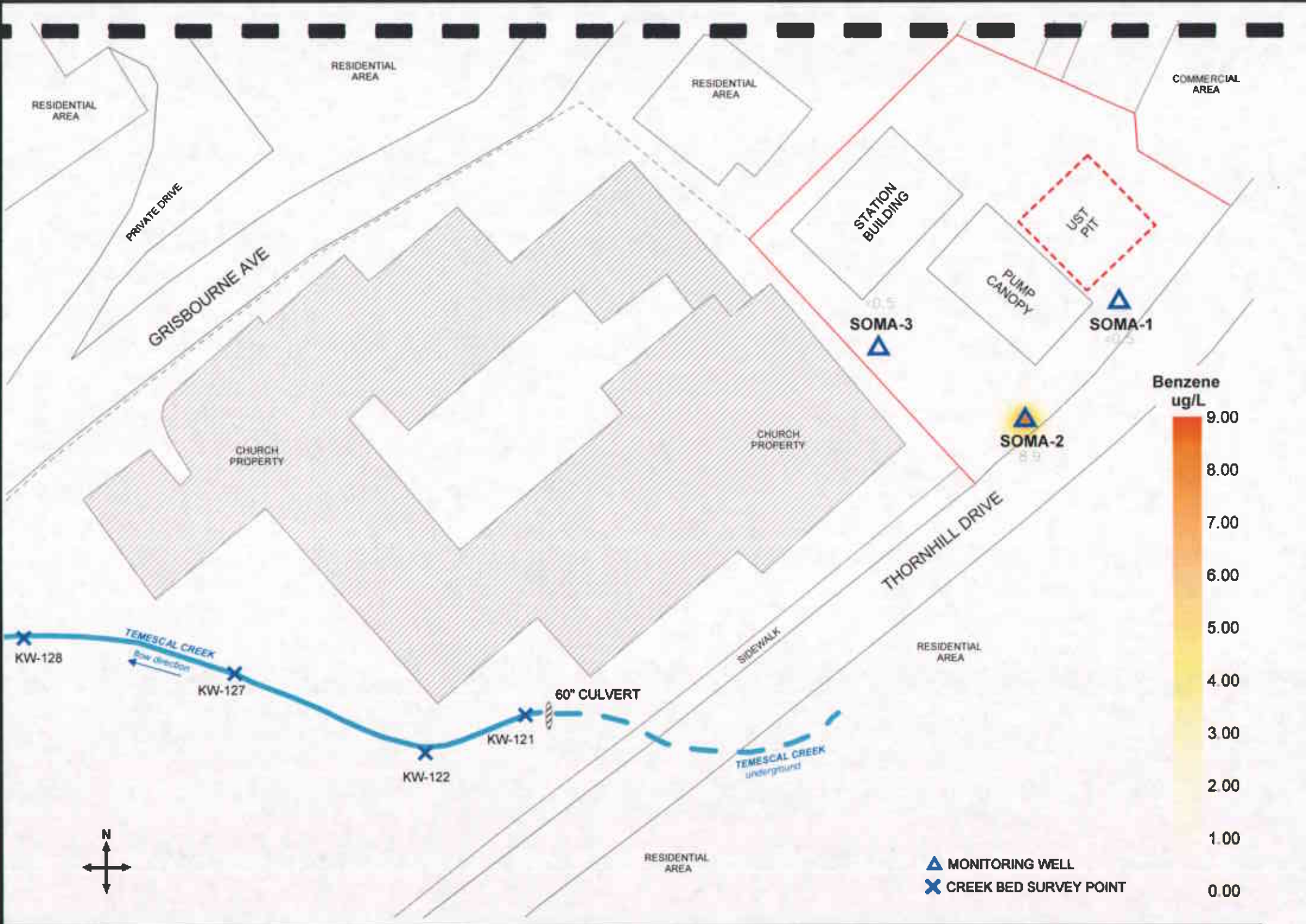


Figure 6: Contour map of Benzene concentrations in groundwater. July 2004.

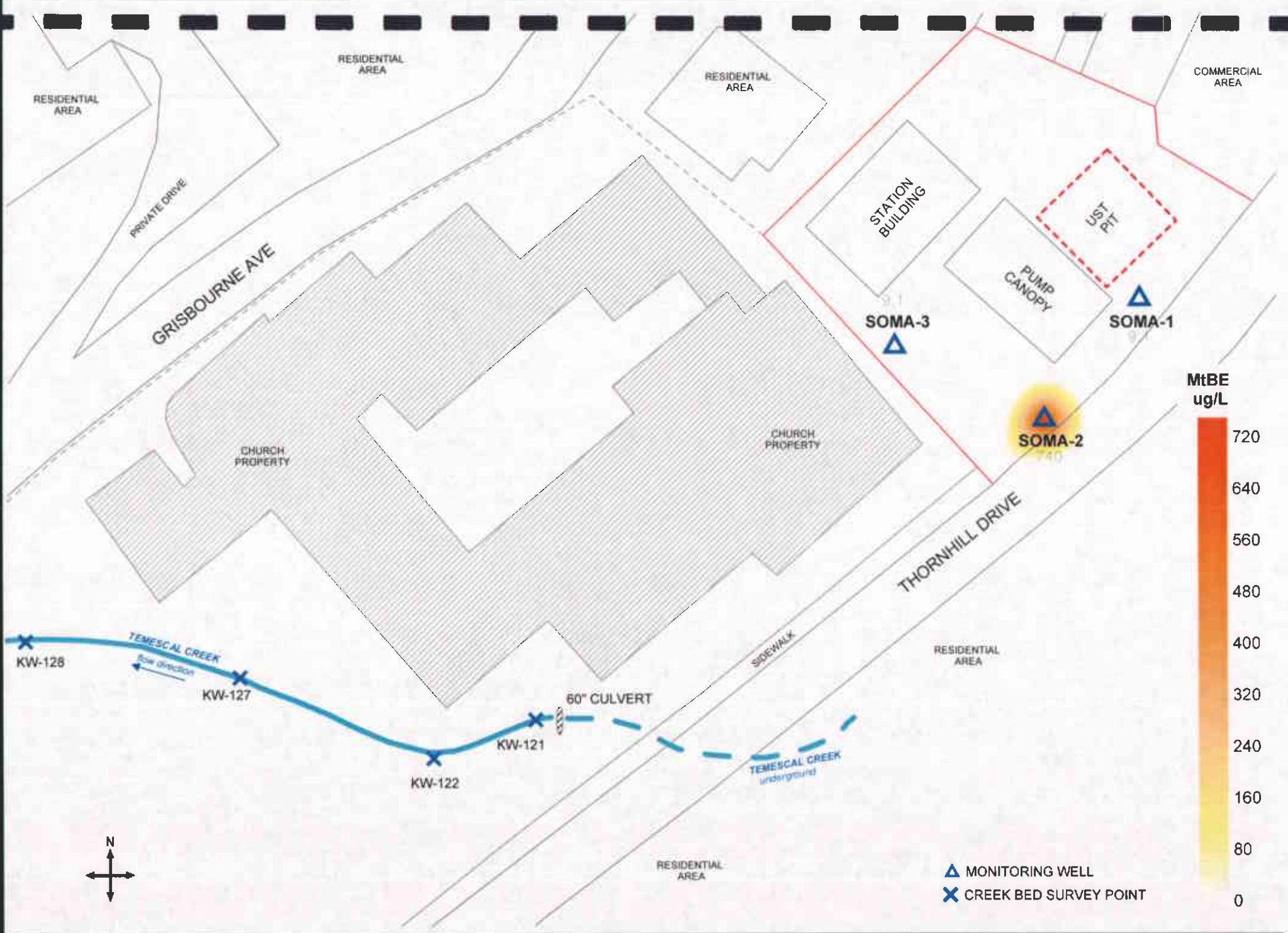


Figure 7: Contour Map of MtBE concentrations in groundwater, July 2004.

APPENDIX A

Historical Groundwater and

Soil Analytical Results

KIFF ANALYTICAL LLC

Report Number : 17696
Date : 09/18/2000

Project Name : **THORNHILL**
Project Number :

Sample : **BH-B** Matrix : Water Lab Number : 17696-01
Sample Date :09/06/2000

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	44	5.0	ug/L	EPA 8260B	09/15/2000
Toluene	< 5.0	5.0	ug/L	EPA 8260B	09/15/2000
Ethylbenzene	360	5.0	ug/L	EPA 8260B	09/15/2000
Total Xylenes	**49**	5.0	ug/L	EPA 8260B	09/15/2000
Methyl-t-butyl ether	4300	50	ug/L	EPA 8260B	09/15/2000
TPH as Gasoline	12000	500	ug/L	EPA 8260B	09/15/2000
TPH as Diesel	**11000**	50	ug/L	M EPA 8015	09/14/2000
TPH as Motor Oil	**420**	100	ug/L	M EPA 8015	09/14/2000
Toluene - d8 (Surr)	99.5		% Recovery	EPA 8260B	09/15/2000
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	09/15/2000

Sample : **BH-C** Matrix : Water Lab Number : 17696-02
Sample Date :09/06/2000

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 20**	20	ug/L	EPA 8260B	09/14/2000
Toluene	**< 20**	20	ug/L	EPA 8260B	09/14/2000
Ethylbenzene	**< 20**	20	ug/L	EPA 8260B	09/14/2000
Total Xylenes	**< 20**	20	ug/L	EPA 8260B	09/14/2000
Methyl-t-butyl ether	**5300**	200	ug/L	EPA 8260B	09/14/2000
TPH as Gasoline	**7300**	2000	ug/L	EPA 8260B	09/14/2000
TPH as Diesel	**25000**	50	ug/L	M EPA 8015	09/14/2000
TPH as Motor Oil	**620**	100	ug/L	M EPA 8015	09/14/2000
Toluene - d8 (Surr)	99.2		% Recovery	EPA 8260B	09/14/2000
4-Bromofluorobenzene (Surr)	94.4		% Recovery	EPA 8260B	09/14/2000

Approved By: Joel Kiff

TABLE ONE
Summary of Chemical Analysis of SOIL Samples
All results are in parts per million

Boring	Depth (feet bgs)	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE
BH-B	8	**240**	**370**	< 200	**0.043**	< 0.02	**0.13**	< 0.02	< 0.02
BH-C	8	< 1.0	< 1.0	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
PRG		NE	NE	NE	0.67	520	230	210	NE

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in bold.

PRG is the United States Environmental Protection Agency (US EPA) Region IX Preliminary Remediation Goal (PRG) for residential soil.

TABLE TWO
Summary of Chemical Analysis of GROUNDWATER Samples
All results are in parts per billion

Boring	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE	Dissolved Cadmium
BH-B	**12,000**	**11,000**	**420**	**44**	< 5.0	**360**	**49**	**4,300**	< 2
BH-C	**7,300**	**25,000**	**620**	< 20	< 20	< 20	< 20	**5,300**	< 2
DHS MCL	NE	NE	NE	1	150	700	1,750	13	5

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in bold.

DHS MCL is the California Department of Health Services maximum contaminant level for drinking water.

NE = DHS MCLs are not established.

Appendix B

Field measurements of physical and chemical properties
of groundwater samples collected during the
Third Quarter 2004

ENVIRONMENTAL ENGINEERING, INC

Well No.:	SOMA-1	**Project No.:**	2831
Casing Diameter:	2 inches	**Address:**	5725 Thornhill Drive
Depth of Well:	28.00 feet		Oakland, CA
Top of Casing Elevation:	576.47 feet	**Date:**	July 27, 2004
Depth to Groundwater:	6.21 feet	**Sampler:**	Elena Manzo
Groundwater Elevation:	570.26 feet		Mehran Nowroozi
Water Column Height:	21.79 feet		
Purged Volume:	10.00 gallons		

Purging Method:	**Bailer** ☐	**Pump** ☑			
Sampling Method:	**Bailer** ☑	**Pump** ☐			
Color:	**No** ☐	**Yes** ☑	**Describe:**	Brownish	
Sheen:	**No** ☑	**Yes** ☐	**Describe:**		
Odor:	**No** ☑	**Yes** ☐	**Describe:**		

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
9:41 am	1.0	6.89	19.3	618
9:43 am	4.0	6.80	19.5	541
9:45 am	8.0	6.82	19.3	550
9:47 am	10.0	6.85	19.2	551
9:50 am	samples			

ENVIRONMENTAL ENGINEERING, INC

Well No.:	SOMA-2	**Project No.:**	2831
Casing Diameter:	2 inches	**Address:**	5725 Thornhill Drive
Depth of Well:	28.10 feet		Oakland, CA
Top of Casing Elevation:	575.50 feet	**Date:**	July 27, 2004
Depth to Groundwater:	7.92 feet	**Sampler:**	Elena Manzo
Groundwater Elevation:	567.58 feet		Mehran Nowroozi
Water Column Height:	20.18 feet		
Purged Volume:	10.00 gallons		

Purging Method: Bailer ☐ Pump ☑

Sampling Method: Bailer ☑ Pump ☐

Color: No ☐ Yes ☑ **Describe:** grayish

Sheen: No ☑ Yes ☐ **Describe:**

Odor: No ☑ Yes ☐ **Describe:**

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
10:10am	1.0	7.37	19.1	817
10:12am	4.0	7.19	19.1	701
10:15am	8.0	7.14	19.2	710
10:17am	10.0	7.14	19.1	719
10:20am	samples			

ENVIRONMENTAL ENGINEERING, INC

Well No.:	SOMA-3	**Project No.:**	2831
Casing Diameter:	2 inches	**Address:**	5725 Thornhill Drive
Depth of Well:	27.90 feet		Oakland, CA
Top of Casing Elevation:	575.92 feet	**Date:**	July 27, 2004
Depth to Groundwater:	7.95 feet	**Sampler:**	Elena Manzo
Groundwater Elevation:	567.97 feet		Mehran Nowroozi
Water Column Height:	19.95 feet		
Purged Volume:	13.00 gallons		

Purging Method:	**Bailer** ☐	**Pump** ☑			
Sampling Method:	**Bailer** ☑	**Pump** ☐			
Color:	**No** ☐	**Yes** ☑	**Describe:**	grayish	
Sheen:	**No** ☑	**Yes** ☑	**Describe:**	slight Rainbow	
Odor:	**No** ☑	**Yes** ☐	**Describe:**		

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
10:31 am	1.0	7.42	19.1	911
10:34 am	4.0	7.43	19.1	930
10:36 am	8.0	7.19	18.0	841
10:38 am	11.0	7.19	18.0	769
10:40 am	13.0	7.18	17.9	773
10:45 am	samples			

Appendix C

Chain of Custody Form and Laboratory Report

for the

Third Quarter 2004 Monitoring Event

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

SOMA Environmental Engineering Inc.
2680 Bishop Dr.
Suite 203
San Ramon, CA 94583

Date: 13-AUG-04
Lab Job Number: 173663
Project ID: 2831
Location: Thornhill Drive, Oakland

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

CHAIN OF CUSTODY

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

C&T LOGIN # 173663

Sampler: Manzo/Nowroozi

Project No: 2831

Report To: Tony Perini

Project Name: 5725 Thornhill Drive, Oakland

Company : SOMA Environmental

Turnaround Time: Standard

Telephone: 925-244-6600

Fax: 925-244-6601

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCL	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	Preservative: none
-1	SOMA-1	07/27/04 9:50am		X		1L-Amber, 5-VOA	X			X	X
-2	SOMA-2	07/27 10:20am		X		1L-Amber, 5-VOA	X			X	X
-3	SOMA-3	↓ 10:45am		X		1L-Amber, 5-VOA	X			X	X

Analyses

TPHg 8015	BTEX 8021 GC	Gasoline Oxygenates, Lead Scavengers 8260B	Ethanol	TPHd 8015	TPHmo 3550/8015
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X

Notes: **EDF OUTPUT REQUIRED**
Gasoline Oxygenates: DIPE, ETBE, TAME, TBA
Lead Scavengers: EDB, 1,2-DCA

Received On Ice ☑ Cold ☐ Ambient ☐ Intact

RELINQUISHED BY:

(Manzo) 07/27/04 12:15 pm DATE/TIME

DATE/TIME

DATE/TIME

RECEIVED BY:

Giovanna Curtis 7/27/04 DATE/TIME 12:15 p.m.

DATE/TIME

DATE/TIME

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831		
Matrix:	Water	Sampled:	07/27/04
Units:	ug/L	Received:	07/27/04
Diln Fac:	1.000	Analyzed:	07/27/04
Batch#:	93223		

Field ID: SOMA-1 Lab ID: 173663-001
Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	80	74-142	EPA 8015B
Bromofluorobenzene (FID)	107	80-139	EPA 8015B
Trifluorotoluene (PID)	79	55-139	EPA 8021B
Bromofluorobenzene (PID)	105	62-134	EPA 8021B

Field ID: SOMA-2 Lab ID: 173663-002
Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	1,500	50	EPA 8015B
Benzene	8.9 C	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	1.5 C	0.50	EPA 8021B
m,p-Xylenes	1.9 C	0.50	EPA 8021B
o-Xylene	1.0 C	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	107	74-142	EPA 8015B
Bromofluorobenzene (FID)	114	80-139	EPA 8015B
Trifluorotoluene (PID)	91	55-139	EPA 8021B
Bromofluorobenzene (PID)	104	62-134	EPA 8021B

C= Presence confirmed, but RPD between columns exceeds 40%
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831		
Matrix:	Water	Sampled:	07/27/04
Units:	ug/L	Received:	07/27/04
Diln Fac:	1.000	Analyzed:	07/27/04
Batch#:	93223		

Field ID: SOMA-3 Lab ID: 173663-003
Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	130	50	EPA 8015B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	81	74-142	EPA 8015B
Bromofluorobenzene (FID)	106	80-139	EPA 8015B
Trifluorotoluene (PID)	77	55-139	EPA 8021B
Bromofluorobenzene (PID)	105	62-134	EPA 8021B

Type: BLANK Lab ID: QC259116

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	78	74-142	EPA 8015B
Bromofluorobenzene (FID)	104	80-139	EPA 8015B
Trifluorotoluene (PID)	77	55-139	EPA 8021B
Bromofluorobenzene (PID)	103	62-134	EPA 8021B

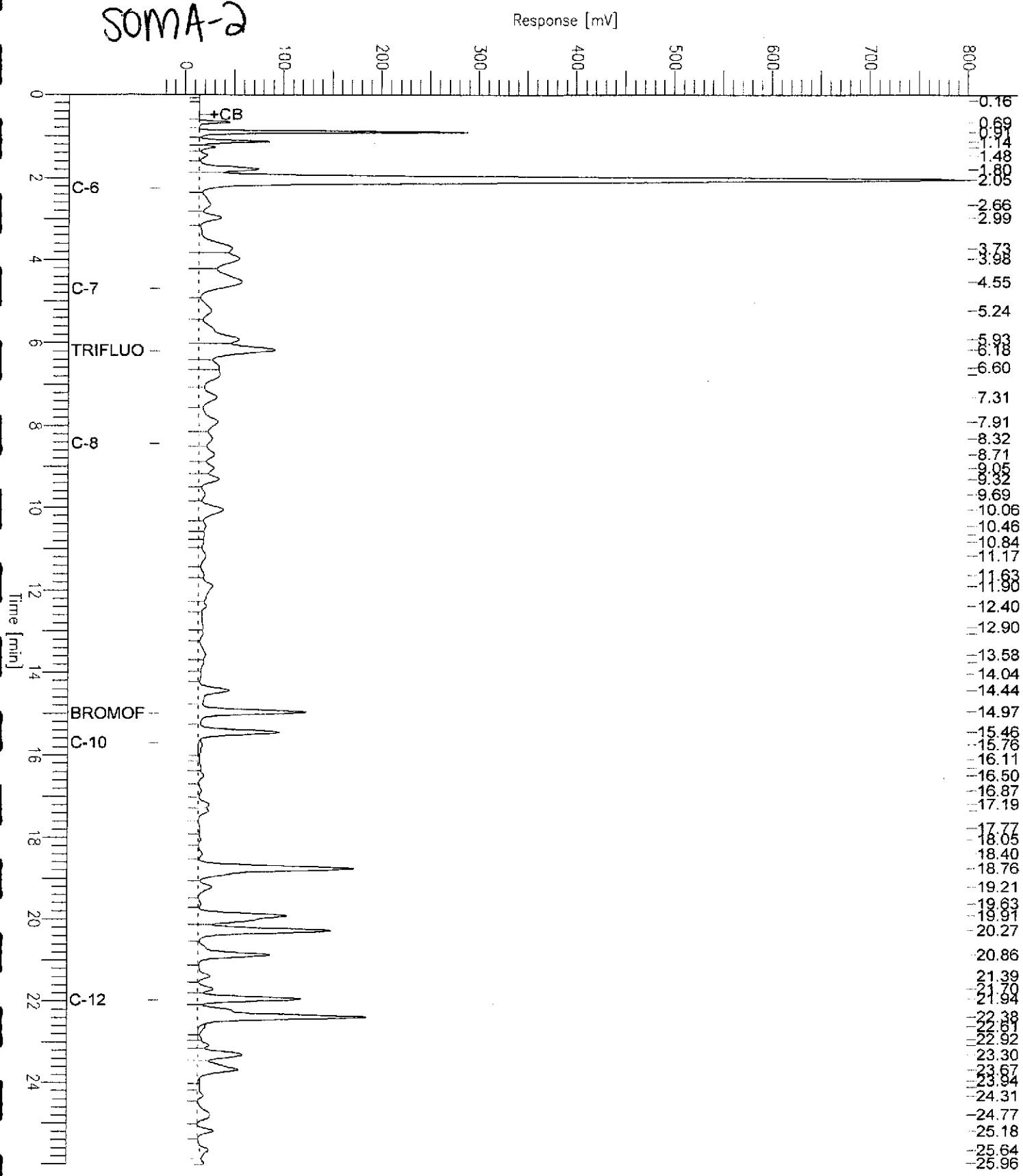
C= Presence confirmed, but RPD between columns exceeds 40%
ND= Not Detected
RL= Reporting Limit

GC07 TVH 'A' Data File RTX 502

Sample Name : 173663-002,93223
FileName : G:\GC07\DATA\209A010.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -25 mV

Sample #: a1.0 Page 1 of 1
Date : 7/27/04 08:45 PM
Time of Injection: 7/27/04 08:19 PM
Low Point : -25.07 mV High Point : 800.53 mV
Plot Scale: 825.6 mV

SOMA-2

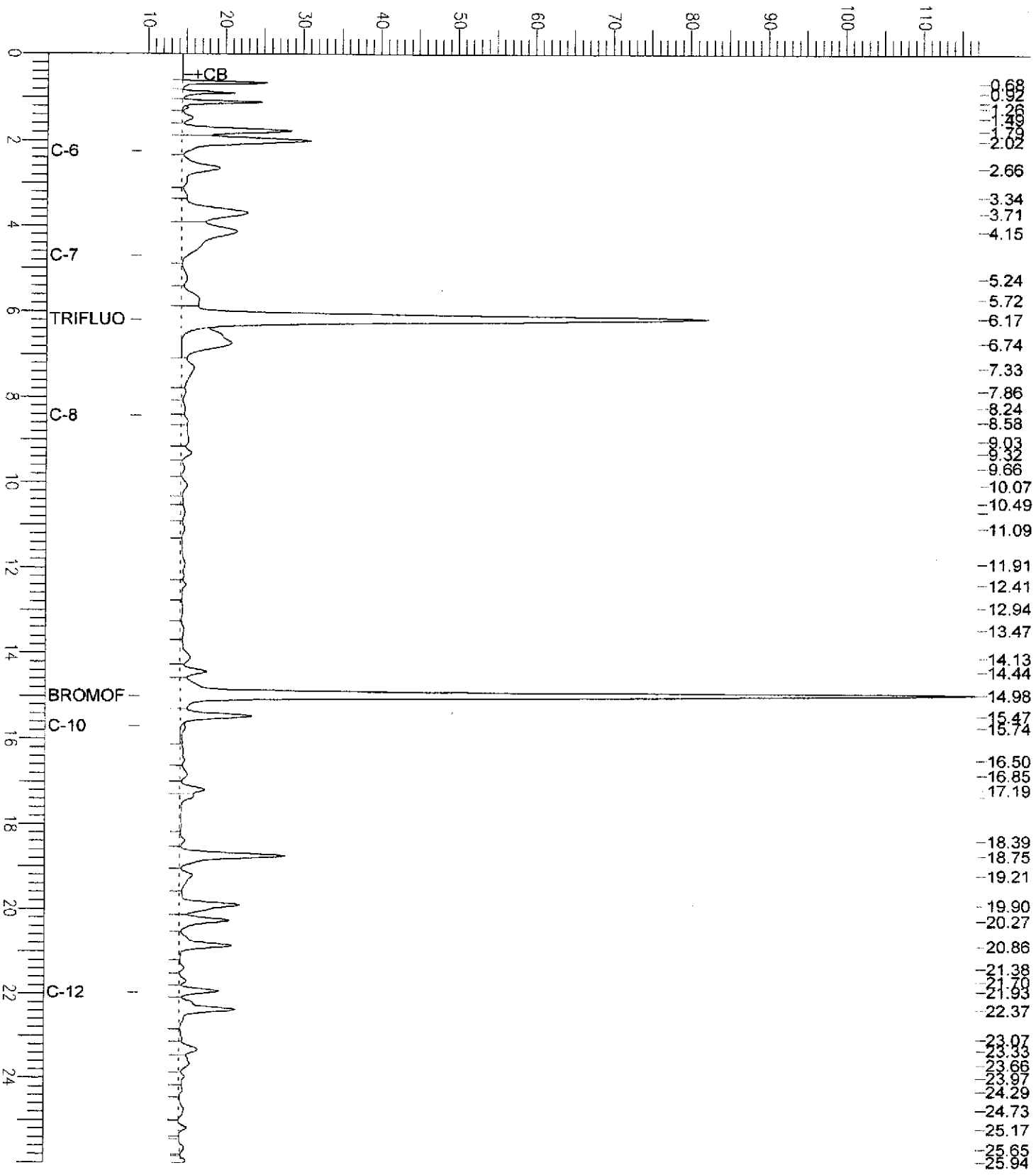


GC07 TVH 'A' Data File RTX 502

Sample Name : 173663-003,93223
FileName : G:\GC07\DATA\209A015.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: 9 mV

Sample #: a1.0 Page 1 of 1
Date : 7/27/04 11:40 PM
Time of Injection: 7/27/04 11:14 PM
Low Point : 9.26 mV High Point : 117.23 mV
Plot Scale: 108.0 mV

SOMA-3

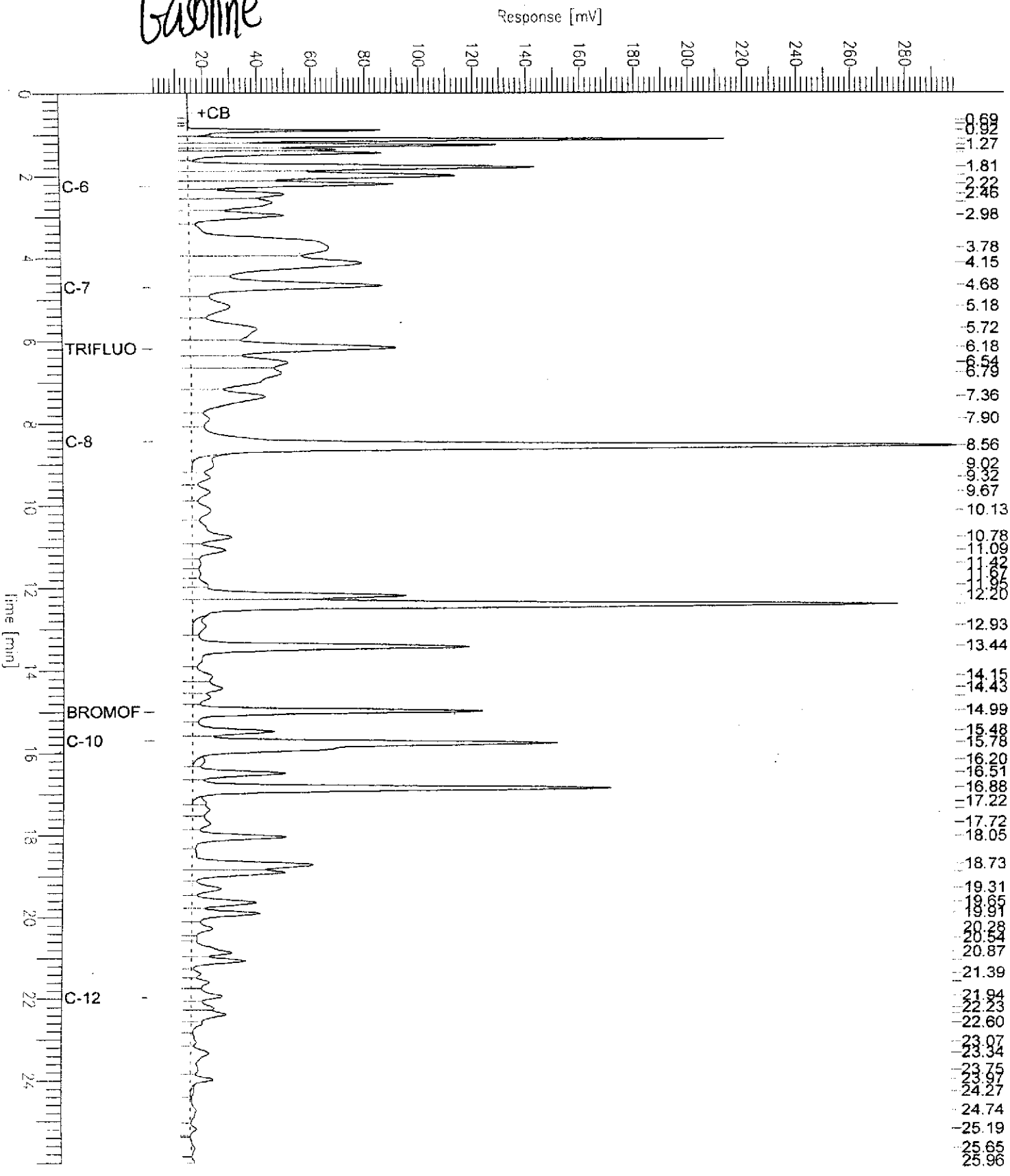


GC07 TVH 'A' Data File RTX 502

Sample Name : ccv/lcs,qc259118,93223,04ws1388,5/5000
FileName : G:\GC07\DATA\209a001.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: 0 mV

Sample #: Page 1 of 1
Date : 7/27/04 02:32 PM
Time of Injection: 7/27/04 12:30 PM
Low Point : 0.28 mV High Point : 298.74 mV
Plot Scale: 298.5 mV

Gasoline



Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC259117	Batch#:	93223
Matrix:	Water	Analyzed:	07/27/04
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Benzene	20.00	18.98	95	80-120
Toluene	20.00	19.21	96	80-120
Ethylbenzene	20.00	19.24	96	80-120
m,p-Xylenes	20.00	19.55	98	80-120
o-Xylene	20.00	19.35	97	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	80	55-139
Bromofluorobenzene (PID)	102	62-134

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC259118	Batch#:	93223
Matrix:	Water	Analyzed:	07/27/04
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,099	105	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	99	74-142
Bromofluorobenzene (FID)	111	80-139

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	93223
MSS Lab ID:	173662-002	Sampled:	07/27/04
Matrix:	Water	Received:	07/27/04
Units:	ug/L	Analyzed:	07/28/04
Diln Fac:	1.000		

Type: MS Lab ID: QC259148

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	<7.600	2,000	1,944	97	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	92	74-142
Bromofluorobenzene (FID)	110	80-139

Type: MSD Lab ID: QC259149

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,920	96	80-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	92	74-142
Bromofluorobenzene (FID)	106	80-139

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	2831	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	07/27/04
Units:	ug/L	Received:	07/27/04
Diln Fac:	1.000	Prepared:	07/29/04
Batch#:	93315	Analyzed:	07/30/04

Field ID: SOMA-1 Lab ID: 173663-001
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	82	53-142

Field ID: SOMA-2 Lab ID: 173663-002
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	710 L Y	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	81	53-142

Field ID: SOMA-3 Lab ID: 173663-003
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	120 L Y	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	76	53-142

Type: BLANK Cleanup Method: EPA 3630C
Lab ID: QC259497

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	102	53-142

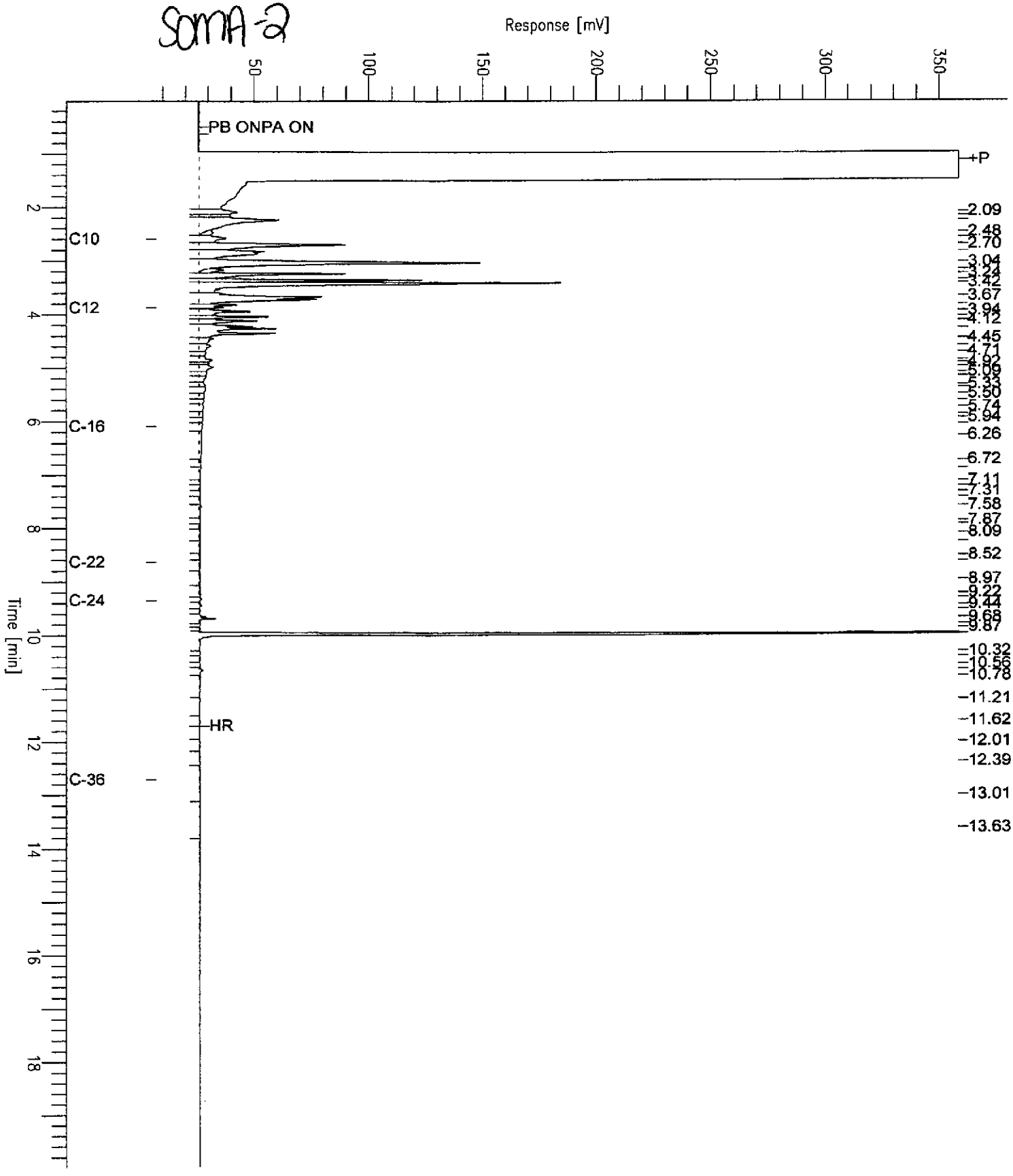
L= Lighter hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Chromatogram

Sample Name : 173663-002,93315
FileName : G:\GC15\CHB\208B158.RAW
Method : BTEH212S.MTH
Start Time : 0.01 min End Time : 19.99 min
Scale Factor: 0.0 Plot Offset: 7 mV

Sample #: 93315 Page 1 of 1
Date : 8/1/04 02:32 PM
Time of Injection: 7/30/04 05:57 PM
Low Point : 7.15 mV High Point : 358.78 mV
Plot Scale: 351.6 mV

SOMA-2

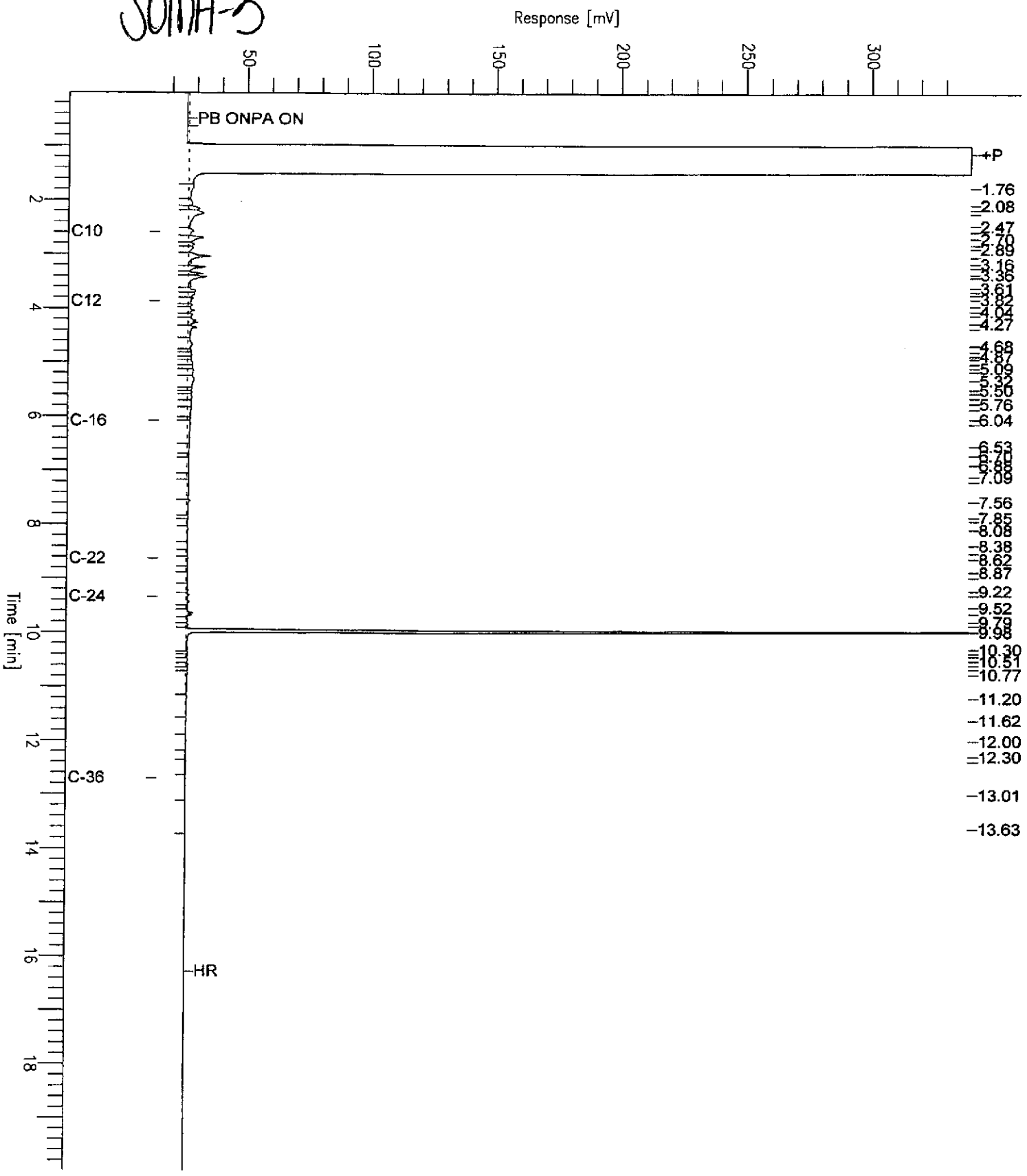


Chromatogram

Sample Name : 173663-003,93315
FileName : G:\GC15\CHB\208B159.RAW
Method : BTEH212S.MTH
Start Time : 0.01 min End Time : 19.99 min
Scale Factor: 0.0 Plot Offset: 15 mV

Sample #: 93315 Page 1 of 1
Date : 8/1/04 02:33 PM
Time of Injection: 7/30/04 06:26 PM
Low Point : 14.92 mV High Point : 339.96 mV
Plot Scale: 325.0 mV

SOMA-3



Chromatogram

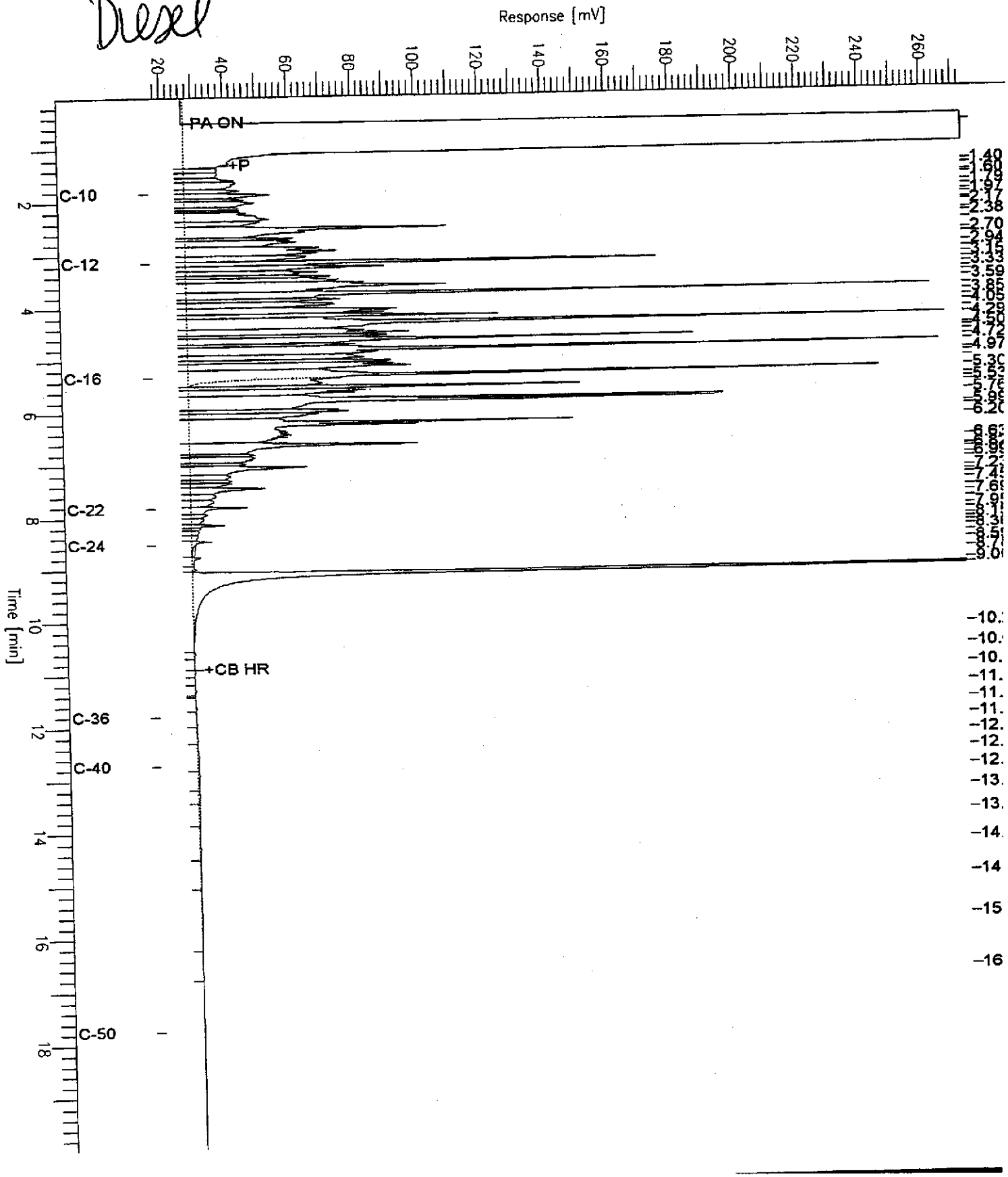
Sample Name : ccv,04ws1144,dsl
FileName : G:\GC17\CHA\211A001.RAW
Method : ATEH211.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 19.99 min
Plot Offset: 16 mV

Sample #: 500mg/L
Date : 7/29/04 01:10 PM
Time of Injection: 7/29/04 12:13 PM
Low Point : 16.26 mV
Plot Scale: 256.8 mV

High Point : 273.05 mV

Diesel



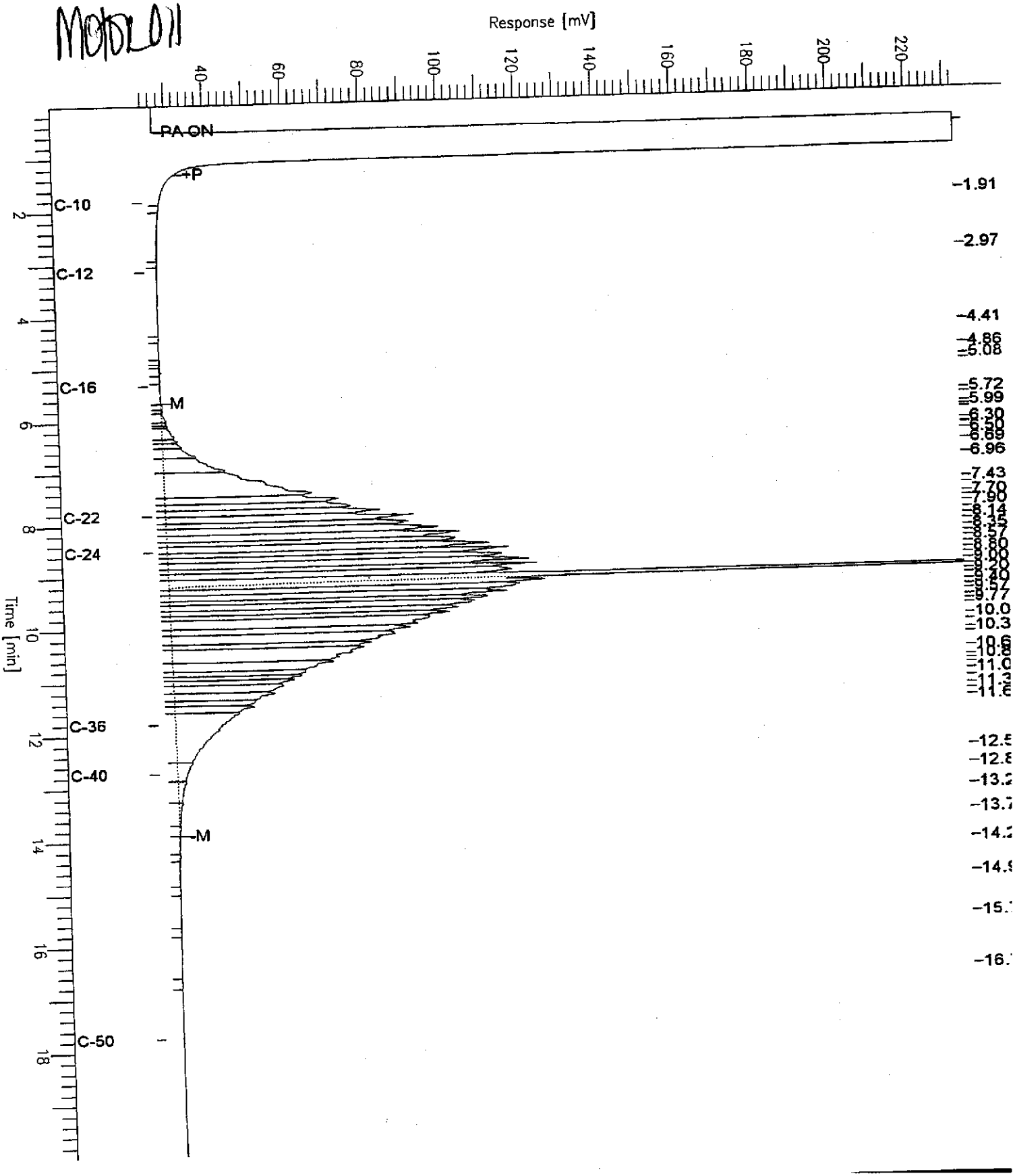
Chromatogram

mple Name : ccv,04ws1425,mo
ileName : G:\GC17\CHA\211A002.RAW
ethod : ATEH211.MTH
tart Time : 0.01 min
cale Factor: 0.0

End Time : 19.99 min
Plot Offset: 24 mV

Sample #: 500mg/L
Date : 7/29/04 01:43 PM
Time of Injection: 7/29/04 01:15 PM
Low Point : 24.00 mV
High Point : 232.71 mV
Plot Scale: 208.7 mV

Method 211



Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	2831	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	93315
Units:	ug/L	Prepared:	07/29/04
Diln Fac:	1.000	Analyzed:	08/01/04

Type: BS
Lab ID: QC259498
Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,196	88	57-128

Surrogate	%REC	Limits
Hexacosane	104	53-142

Type: BSD
Lab ID: QC259499
Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,800	72	57-128	20	38

Surrogate	%REC	Limits
Hexacosane	80	53-142

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	07/27/04
Units:	ug/L	Received:	07/27/04

Field ID:	SOMA-1	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	93249
Lab ID:	173663-001	Analyzed:	07/29/04

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	9.1	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dichloroethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethanol	ND	1,000

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-120
1,2-Dichloroethane-d4	87	80-124
Toluene-d8	99	80-120
Bromofluorobenzene	111	80-120

Field ID:	SOMA-2	Lab ID:	173663-002
Type:	SAMPLE	Analyzed:	07/29/04

Analyte	Result	RL	Diln Fac	Batch#
tert-Butyl Alcohol (TBA)	ND	33	3.333	93249
MTBE	740	2.5	5.000	93288
Isopropyl Ether (DIPE)	ND	1.7	3.333	93249
Ethyl tert-Butyl Ether (ETBE)	ND	1.7	3.333	93249
Methyl tert-Amyl Ether (TAME)	9.8	1.7	3.333	93249
1,2-Dichloroethane	ND	1.7	3.333	93249
1,2-Dibromoethane	ND	1.7	3.333	93249
Ethanol	ND	3,300	3.333	93249

Surrogate	%REC	Limits	Diln Fac	Batch#
Dibromofluoromethane	94	80-120	3.333	93249
1,2-Dichloroethane-d4	89	80-124	3.333	93249
Toluene-d8	99	80-120	3.333	93249
Bromofluorobenzene	109	80-120	3.333	93249

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	07/27/04
Units:	ug/L	Received:	07/27/04

Field ID:	SOMA-3	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	93249
Lab ID:	173663-003	Analyzed:	07/29/04

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	9.1	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dichloroethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethanol	ND	1,000

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-120
1,2-Dichloroethane-d4	89	80-124
Toluene-d8	99	80-120
Bromofluorobenzene	113	80-120

Type:	BLANK	Batch#:	93249
Lab ID:	QC259234	Analyzed:	07/28/04
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dichloroethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethanol	ND	1,000

Surrogate	%REC	Limits
Dibromofluoromethane	95	80-120
1,2-Dichloroethane-d4	89	80-124
Toluene-d8	99	80-120
Bromofluorobenzene	115	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	07/27/04
Units:	ug/L	Received:	07/27/04

Type: BLANK
Lab ID: QC259235
Diln Fac: 1.000

Batch#: 93249
Analyzed: 07/28/04

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dichloroethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethanol	ND	1,000

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-120
1,2-Dichloroethane-d4	88	80-124
Toluene-d8	99	80-120
Bromofluorobenzene	112	80-120

Type: BLANK
Lab ID: QC259399
Diln Fac: 1.000

Batch#: 93288
Analyzed: 07/29/04

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dichloroethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethanol	ND	1,000

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-120
1,2-Dichloroethane-d4	87	80-124
Toluene-d8	99	80-120
Bromofluorobenzene	111	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline Oxygenates by GC/MS

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	93249
Units:	ug/L	Analyzed:	07/28/04
Diln Fac:	1.000		

Type: BS Lab ID: QC259232

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	125.0	121.5	97	80-140
MTBE	50.00	46.93	94	76-123
Isopropyl Ether (DIPE)	25.00	23.47	94	80-124
Ethyl tert-Butyl Ether (ETBE)	25.00	24.21	97	80-120
Methyl tert-Amyl Ether (TAME)	25.00	24.61	98	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-120
1,2-Dichloroethane-d4	87	80-124
Toluene-d8	98	80-120
Bromofluorobenzene	107	80-120

Type: BSD Lab ID: QC259233

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	125.0	119.9	96	80-140	1	20
MTBE	50.00	47.82	96	76-123	2	20
Isopropyl Ether (DIPE)	25.00	23.87	95	80-124	2	20
Ethyl tert-Butyl Ether (ETBE)	25.00	24.27	97	80-120	0	20
Methyl tert-Amyl Ether (TAME)	25.00	24.66	99	80-120	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-120
1,2-Dichloroethane-d4	89	80-124
Toluene-d8	99	80-120
Bromofluorobenzene	108	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline Oxygenates by GC/MS

Lab #:	173663	Location:	Thornhill Drive, Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2831	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	93288
Units:	ug/L	Analyzed:	07/29/04
Diln Fac:	1.000		

Type: BS Lab ID: QC259397

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	125.0	131.4	105	80-140
MTBE	50.00	47.13	94	76-123
Isopropyl Ether (DIPE)	25.00	23.40	94	80-124
Ethyl tert-Butyl Ether (ETBE)	25.00	24.12	96	80-120
Methyl tert-Amyl Ether (TAME)	25.00	24.07	96	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-120
1,2-Dichloroethane-d4	88	80-124
Toluene-d8	98	80-120
Bromofluorobenzene	109	80-120

Type: BSD Lab ID: QC259398

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	125.0	136.9	110	80-140	4	20
MTBE	50.00	48.94	98	76-123	4	20
Isopropyl Ether (DIPE)	25.00	23.98	96	80-124	2	20
Ethyl tert-Butyl Ether (ETBE)	25.00	24.80	99	80-120	3	20
Methyl tert-Amyl Ether (TAME)	25.00	24.86	99	80-120	3	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-120
1,2-Dichloroethane-d4	88	80-124
Toluene-d8	99	80-120
Bromofluorobenzene	110	80-120

RPD= Relative Percent Difference