ENVIRONMENTAL ENGINEERING, INC
6620 Owens Drive, Suite A • Pleasanton, CA 94588-3334
TEL (925) 734-6400 • FAX (925) 734-6401

July 5, 2007

Mr. Steven Plunkett
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 Mr. Plunkett:

SOMA's "Second Quarter 2007 Groundwater Monitoring Report" for the subject property has been uploaded to the State's GeoTracker database and Alameda County's FTP site for your review.

Thank you for your time in reviewing our report. If you have any questions or comments, please call me at (925) 734-6400.

Sincerely,

Mansour Sepehr, Ph.D.,PE
Principal Hydrogeologist

cc: Mr. Mo Mashhoon w/report enclosure

# Second Quarter 2007
# Groundwater Monitoring Report

## Mash Petroleum Inc.
## 5725 Thornhill Drive
## Oakland, California

**July 5, 2007**

**Project 2831**

**Prepared for**
**Mr. Mo Mashhoon**
**1721 Jefferson Street**
**Oakland, California 94612**

SOMA ENVIRONMENTAL ENGINEERING, INC.
6620 Owens Drive Suite A Pleasanton CA 94588 Ph: 925.734.6400 F: 925.734-6401 www.somaenv.com

## CERTIFICATION

SOMA Environmental Engineering, Inc. has prepared this report on behalf of Mr. Mo Mashhoon, property owner of 5725 Thornhill Drive, Oakland, California, to comply with requirements of the Alameda County Health Care Services and California Regional Water Quality Control Board for the Second Quarter 2007 groundwater monitoring event.

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

# TABLE OF CONTENTS

## LIST OF TABLES



## LIST OF FIGURES



## LIST OF APPENDICES

# 1.0 INTRODUCTION

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

This report summarizes results of the Second Quarter 2007 groundwater monitoring event conducted at the Site on June 14, 2007, and includes field measurement results of physical and chemical properties of the groundwater at the time of sampling and laboratory analytical results for the groundwater samples.

Groundwater monitoring activities for this quarter were performed in accordance with general guidelines of the California Regional Water Quality Control Board (CRWQCB) and the Alameda County Health Care Services (ACHCS). Appendix A details groundwater monitoring procedures used during this monitoring event.

## 1.1 Previous Activities

November 1998L Penn Environmental (Penn) 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 total petroleum hydrocarbons as gasoline (TPH-g), 2,700,000 µg/kg of total petroleum hydrocarbons as diesel (TPH-d), and 4,200,000 µg/kg of total petroleum hydrocarbons as motor oil (TPH-mo).

February 4, 1999: Penn 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 methyl tertiary-butyl ether (MtBE) at 40 µg/kg.

July 1999: ASE drilled borehole BH-A in the vicinity of the former WOT.

September 6, 2000: ASE drilled soil boreholes BH-B and BH-C.

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 locations of the borings.

March 2004: On March 1 and 2, SOMA oversaw advancement of nine temporary well boreholes (HP-1 through HP-7, HP-9 and HP-10) by Gregg Drilling & Testing (Gregg). Proposed hydropunch HP-8, which was to be installed in the street, was not drilled due to traffic hazards. Three on-site wells were decommissioned and

three additional wells (SOMA-1 to SOMA-3) were installed. Locations of boreholes and wells are shown in Figure 2.

Results of the March 2004 investigation and details of well installations are presented in SOMA's report entitled "Soil and Groundwater Investigation and Monitoring Well Installation Report at 5725 Thornhill Drive, Oakland, California," dated April 16, 2004.

April 25, 2005: SOMA conducted a sensitive receptor survey to identify any water bodies or domestic, irrigation or water supply wells within a quarter-mile radius of the Site. Based on State Department of Water Resources and Alameda County Public Works Agency records, no drinking water, domestic or irrigation wells were within a quarter-mile radius of the Site.

May 2005: CPT/MIP boreholes (CPT-1 through CPT-5 and CPT-7 through CPT-11) were advanced under SOMA's supervision. CPT-6 could not be drilled due to physical constraints and obstruction of local traffic. Ten boreholes, designated GS-1 through GS-5 and GS-7 through GS-11, were advanced at their corresponding CPT borehole locations. Monitoring well SOMA-4 was also installed. Figure 2 shows locations of CPT boreholes and SOMA-4.

Results of the May 2005 site investigation and well installation are presented in SOMA's report entitled "Additional Soil and Groundwater Investigation and Monitoring Well Installation Report at 5725 Thornhill Drive, Oakland, California," dated June 13, 2005.

# 2. RESULTS

Following are results of field measurements and laboratory analyses for the June 14, 2007 groundwater monitoring event.

## 2.1 Field Measurements

As shown in Table 1, depth to groundwater ranged from 5.96 feet in SOMA-1 to 8.03 feet in SOMA-4. Corresponding groundwater elevations ranged from 564.62 feet in SOMA-4 to 570.51 feet in SOMA-1. The contour map of the groundwater elevations is presented in Figure 3. Groundwater flows southwesterly across the Site, with an average gradient of 0.030 feet/feet. Since the previous monitoring event (First Quarter 2007), the flow direction has remained southwesterly; however, the gradient has slightly increased.

Field notes in Appendix B show detailed measurements of physical and chemical parameters of the groundwater for each well during this monitoring event.

## 2.2 Laboratory Analyses

Table 1 presents the laboratory analysis results for TPH-g, TPH-d and TPH-mo; benzene, toluene, ethylbenzene, total xylenes (BTEX); and MtBE. Table 2 presents results of the gasoline oxygenates and lead scavengers analysis.

TPH-g was below the laboratory-reporting limit in wells SOMA-1 and SOMA-3. It was detected in SOMA-2 and SOMA-4 at 988 µg/L and 2,600 µg/L, respectively. Figure 4 displays the contour map of TPH-g concentrations in the groundwater. TPH-g appears to have originated at the pump islands, as observed by the TPH-g concentration in SOMA-2, and has migrated to off-site well SOMA-4. The southwesterly migration can be attributed to the groundwater flow direction across the Site.

TPH-d was below the laboratory-reporting limit in well SOMA-1. Detectable TPH-d concentrations ranged from 407 µg/L in SOMA-4 to 569 µg/L in SOMA-3. During analytical testing for TPH-d results, several variations were observed that included, but were not limited to, the presence of unidentified hydrocarbons and irregular chromatographic patterns in reference to the standard diesel patterns. Refer to the laboratory report in Appendix C for further clarification of diesel testing and results.

Figure 5 displays the contour map of TPH-d concentrations in the groundwater. Due to the southwesterly groundwater flow direction from the pump islands, TPH-d has migrated off-site to well SOMA-4. Since the previous monitoring event, TPH-d appears to have slightly decreased in SOMA-2 and SOMA-4.

TPH-mo was below the laboratory-reporting limit throughout the Site.

The following BTEX analytes were observed during this monitoring event:

- All BTEX analytes were below the laboratory-reporting limit in SOMA-1 and SOMA-3.
- In SOMA-2 and SOMA-4, benzene and toluene were below the laboratory-reporting limit, and ethylbenzene and total xylenes were at low levels.

MtBE was detected at trace concentrations in all groundwater samples collected during this monitoring event. Detectable MtBE concentrations ranged from 1.91 µg/L in well SOMA-1 to 28.9 µg/L in SOMA-2. Due to the minimal concentrations detected, no iso-concentration figure was drawn for MtBE.

As shown in Table 2, all gasoline oxygenates and lead scavengers, which include isopropyl ether (DIPE), ethyl tertiary-butyl ether (EtBE), tertiary-amyl methyl ether (TAME), 1,2-dichloroethane (1,2-DCA), 1,2-dibromoethane (EDB), and ethanol, were below the laboratory reporting limit in all of the groundwater samples collected during the Second Quarter 2007 monitoring event. Tertiary-butyl alcohol (TBA) was detected in wells SOMA-2 and SOMA-4 at 35.6

µg/L and 87.9 µg/L, respectively; and below the laboratory-reporting limit in SOMA-1 and SOMA-3. Due to the minimal concentrations detected, no iso-concentration figure was drawn for TBA.

Appendix C contains the laboratory report and chain-of-custody (COC) form from this monitoring event.

## 3. CONCLUSIONS AND RECOMMENDATIONS

Findings of the Second Quarter 2007 groundwater monitoring event are summarized as follows:

- The groundwater flow direction has remained southwesterly across the Site.
- Based on previous site investigations and results of quarterly monitoring events, both the hydrocarbon and MtBE plumes have migrated off-site, southwesterly, with the flow of groundwater.
- Based on the recent workplan submitted to the ACHCS, SOMA plans to conduct an additional investigation around the utility lines to investigate the extent of the MtBE plume in the sewer line trench backfill material.

## 4. REPORT LIMITATIONS

This report is the summary of work done by SOMA, including observations and descriptions of Site conditions. It includes analytical results produced by Pacific Analytical Laboratory in Alameda, for the current groundwater-monitoring event. Numbers and locations of wells were selected to provide the required information, but may not be completely representative of entire site conditions. All conclusions and recommendations are based on results of laboratory analysis. Conclusions beyond those specifically stated in this document should not be inferred from this report.

SOMA warrants that the services were provided 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 | Top of Casing Elevation (feet) | Depth to Groundwater (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** | 4/22/2004 | 576.47 | 5.75 | 570.72 | 63 | <50 | <300 | <0.5 | <0.5 | <0.5 | <0.5 | 7.7 |
| | 7/27/2004 | 576.47 | 6.21 | 570.26 | <50 | <50 | <300 | <0.5 | <0.5 | <0.5 | <0.5 | 9.1 |
| | 10/28/2004 | 576.47 | 5.76 | 570.71 | <50 | <1.0 | <1.0 | <0.5 | <0.5 | <0.5 | <1.0 | 6.4 |
| | 1/11/2005 | 576.47 | 3.73 | 572.74 | <50 | 200 HY | 900 | <0.5 | <0.5 | <0.5 | <0.5 | 4.7 |
| | 4/12/2005 | 576.47 | 4.72 | 571.75 | <200 | <50 | <300 | <0.5 | <0.5 | <0.5 | <1.0 | 7.49 |
| | 7/19/2005 | 576.47 | 5.87 | 570.60 | <200 | <50 | <300 | <0.5 | <2.0 | <0.5 | <1.0 | 4.94 |
| | 10/18/2005 | 576.47 | 6.12 | 570.35 | <50 | <50 | <300 | <0.5 | <2.0 | <0.5 | <1.0 | 5.33 |
| | 2/6/2006 | 576.47 | 5.10 | 571.37 | <50 | 920LY | <300 | <0.5 | <2.0 | <0.5 | <1.0 | 2.74 |
| | 4/26/2006 | 576.47 | 4.71 | 571.76 | <50 | <50 [1] | <250 [1] | <0.5 | <2.0 | <0.5 | <1.0 | 5.28 |
| | 8/3/2006 | 576.47 | 5.96 | 570.51 | <50 | <50 | <250 | <0.5 | <2.0 | <0.5 | <1.0 | 4.52 |
| | 10/30/2006 | 576.47 | 6.22 | 570.25 | <50 | <50 | <250 | <0.5 | <2.0 | <0.5 | <1.0 | 3.38 |
| | 1/8/2007 | 576.47 | 6.19 | 570.28 | <50 | <50 [4] | <250 [4] | <0.5 | <2.0 | <0.5 | <2.0 | 3.07 |
| | **6/14/2007** | **576.47** | **5.96** | **570.51** | **<50** | **<50** [4] | **<250** [4] | **<0.5** | **<2.0** | **<0.5** | **<2.0** | **1.91** |

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

| Monitoring Well | Date | Top of Casing Elevation (feet) | Depth to Groundwater (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-2** | 4/22/2004 | 575.50 | 7.40 | 568.10 | 1,900 | 690 LY | <300 | <0.5 | <0.5 | 5.2 | 9.9 | 1,900 |
| | 7/27/2004 | 575.50 | 7.92 | 567.58 | 1,500 | 710 LY | <300 | 8.9 C | <0.5 | 1.5 C | 2.9 C | 740 |
| | 10/28/2004 | 575.50 | 7.62 | 567.88 | 955 | 790 LY | <1.0 | <2.5 | <2.5 | <2.5 | < 5 | 785 |
| | 1/11/2005 | 575.50 | 5.70 | 569.80 | 3,700 | 2100 LY | 380 | 3.7 | <2.0 | 3.5 | 102 | 310 |
| | 4/12/2005 | 575.50 | 6.28 | 569.22 | 5,960 | 1200 LY | <300 | 1.19 | <0.5 | 20.6 | 25 | 241 |
| | 7/19/2005 | 575.50 | 7.42 | 568.08 | 2,480 | 800 LY | <300 | 1.09 | <2.0 | 2.65 | 0.73 | 162 |
| | 10/18/2005 | 575.50 | 7.70 | 567.80 | 2,710 | 1,100 LY | <300 | 1.41 | <2.0 | 2.24 | 0.64 | 130 |
| | 2/6/2006 | 575.50 | 6.71 | 568.79 | 2,730 | 66Y | <300 | 0.68 | <2.0 | 0.71 | 6.33 | 49 |
| | 4/26/2006 | 575.50 | 6.32 | 569.18 | 6,490 | 1,580 [1,2,3] | <250 [1] | <0.5 | <2.0 | 15.3 | 8.49 | 38.5 |
| | 8/3/2006 | 575.50 | 7.39 | 568.11 | 3,580 | 286 [1,3] | <250 | 0.8 | 0.7 | 2.65 | 0.7 | 44.8 |
| | 10/30/2006 | 575.50 | 7.60 | 567.90 | 1,680 | 608 [2,3] | 448 | <0.5 | <2.0 | 3.78 | <1.0 | 51.4 |
| | 1/8/2007 | 575.50 | 7.18 | 568.32 | 1,720 | 1010 [3,Y] | <250 | <0.5 | <2.0 | 2.75 | <2.0 | 33.3 |
| | **6/14/2007** | **575.50** | **7.39** | **568.11** | **988** | **427** [3,4,Y] | **<250** [4] | **<0.5** | **<2.0** | **4.80** | **2.46** | **28.9** |
| | | | | | | | | | | | | |
| **SOMA-3** | 4/22/2004 | 575.92 | 7.14 | 568.78 | 190 | 120 Y | <300 | <0.5 | <0.5 | <0.5 | <0.5 | 5.1 |
| | 7/27/2004 | 575.92 | 7.95 | 567.97 | 130 | 120 LY | <300 | <0.5 | <0.5 | <0.5 | <0.5 | 9.1 |
| | 10/28/2004 | 575.92 | 7.60 | 568.32 | 57 | 280 LY | <1.0 | <0.5 | <0.5 | <0.5 | <2 | 11.3 |

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

| Monitoring Well | Date | Top of Casing Elevation (feet) | Depth to Groundwater (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-3** cont | 1/11/2005 | 572.92 | 5.45 | 567.47 | 140 | 210 Y | <300 | <0.5 | <0.5 | <0.5 | <0.5 | 5.8 |
| | 4/12/2005 | 572.92 | 6.02 | 566.90 | <200 | <50 | <300 | <0.5 | <0.5 | <0.5 | <1.0 | 4.53 |
| | 7/19/2005 | 572.92 | 7.49 | 565.43 | <200 | 120 Y | <300 | <0.5 | <2.0 | <0.5 | <1.0 | 4.69 |
| | 10/18/2005 | 572.92 | 7.63 | 565.29 | 50.1 | 120 Y | <300 | <0.5 | <2.0 | <0.5 | <1.0 | 8.63 |
| | 2/6/2006 | 572.92 | 7.20 | 565.72 | 1,010 | 220Y | <300 | <0.5 | <2.0 | <0.5 | 2.06 | 32 |
| | 4/26/2006 | 572.92 | 6.13 | 566.79 | 121 | 123 [1,2,3] | <250 [1] | <0.5 | <2.0 | <0.5 | <1.0 | 5.49 |
| | 8/3/2006 | 572.92 | 7.35 | 565.57 | <50 | 60 [1,2] | <250 | <0.5 | <0.5 | <0.5 | <1.0 | 8.05 |
| | 10/30/2006 | 572.92 | 7.64 | 565.28 | <50 | 199 [2,3] | <250 | <0.5 | <2.0 | <0.5 | <1.0 | 7.37 |
| | 1/8/2007 | 572.92 | 7.82 | 565.10 | <50 | 181 [3,Y] | <250 | <0.5 | <2.0 | <0.5 | <2.0 | 8.65 |
| | **6/14/2007** | **572.92** | **7.31** | **565.61** | **<50** | **569** [3,Y] | **<250** | **<0.5** | **<2.0** | **<0.5** | **<2.0** | **5.57** |
| | | | | | | | | | | | | |
| **SOMA-4** | 7/19/2005 | 572.65 | 8.10 | 564.55 | 3,350 | 1,200 LY | <300 | <1.0 | <4.0 | <1.0 | <2.0 | 455 |
| | 10/18/2005 | 572.65 | 8.15 | 564.50 | 1,580 | 1,200 LY | <300 | <2.15 | <8.6 | <2.15 | <4.3 | 425 |
| | 2/6/2006 | 572.65 | 7.68 | 564.97 | 1,940 | 830LY | <300 | <2.15 | <8.60 | <2.15 | <4.3 | 409 |
| | 4/26/2006 | 572.65 | 7.61 | 565.04 | 3,930 | 1,080 [1,2,3] | <250 [1] | <0.5 | <2.0 | <0.5 | <1.0 | 231 |
| | 8/3/2006 | 572.65 | 8.08 | 564.57 | 4,340 | 357 [1,3] | <250 | <0.5 | 0.52 | <0.5 | 0.52 | 34.2 |
| | 10/30/2006 | 572.65 | 8.11 | 564.54 | 4,320 | 1070 [2,3] | <250 | <0.5 | <2.0 | 3.34 | 0.54 | 37.4 |
| | 1/8/2007 | 572.65 | 7.86 | 564.79 | 2,280 | 977 [3,Y] | <250 | <0.5 | <2.0 | <0.5 | <2.0 | 36 |
| | **6/14/2007** | **572.65** | **8.03** | **564.62** | **2,600** | **407** [3,4,Y] | **<250** [4] | **<0.5** | **<2.0** | **4.39** | **2.69** | **10.3** |

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

| Monitoring Well | Date | Top of Casing Elevation (feet) | Depth to Groundwater (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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

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

1 To reduce matrix interference , the sample extract has undergone silica-gel clean-up, method 3630, which is specific to polar compound contamination, diesel 2Q06.
2 The sample chromatographic pattern does not resemble fuel standard used for quantitation, diesel 2Q06 to 4Q06.
3 Unidentified hydrocarbons C9-C16, diesel 2Q06 to 2Q07.
4 Surrogate recovery for this sample is outside of established control limits due to sample matrix effect, diesel & motor oil 1Q07, 2Q07.

The Second Quarter 2004 was the first time SOMA monitored the site. Wells SOMA-1 to SOMA-3 were monitored at that time.
Well SOMA-4 was installed on May 27, 2005. The Third Quarter 2005 was the first time SOMA monitored this well.

# 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** | 4/22/2004 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1000 |
| | 7/27/2004 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1000 |
| | 10/28/2004 | <2.5 | <0.5 | <0.5 | <2 | <0.5 | <0.5 | <1.0 |
| | 1/11/2005 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1,000 |
| | 4/12/2005 | <2.5 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 7/19/2005 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 10/18/2005 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 2/1/2006 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 4/26/2006 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 8/3/2006 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 10/30/2006 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 1/8/2007 | <2.0 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | **6/14/2007** | **<2.0** | **<0.5** | **<0.5** | **<2.0** | **<0.5** | **<0.5** | **<1000** |
| **SOMA-2** | 4/22/2004 | <100 | <5.0 | <5.0 | 19.0 | <5.0 | <5.0 | <10000 |
| | 7/27/2004 | <33 | <1.7 | <1.7 | 9.8 | <1.7 | <1.7 | <3300 |
| | 10/28/2004 | 36.3 | <2.5 | <2.5 | 12.85 | <0.5 | <0.5 | <1.0 |
| | 1/11/2005 | 67 | <2.0 | <2.0 | 6.7 | <2.0 | <2.0 | <4,000 |
| | 4/12/2005 | 71 | <0.5 | <0.5 | 3.29 | <0.5 | <0.5 | <1000 |
| | 7/19/2005 | 74.2 | <0.5 | <0.5 | 2.82 | <0.5 | <0.5 | <1000 |
| | 10/18/2005 | 81.7 | <0.5 | <0.5 | 2.61 | <0.5 | <0.5 | <1000 |
| | 2/1/2006 | 37.8 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 4/26/2006 | 36.1 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 8/3/2006 | 32.4 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 10/30/2006 | 20.7 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 1/8/2007 | 22.2 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | **6/14/2007** | **35.6** | **<0.5** | **<0.5** | **<2.0** | **<0.5** | **<0.5** | **<1000** |

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

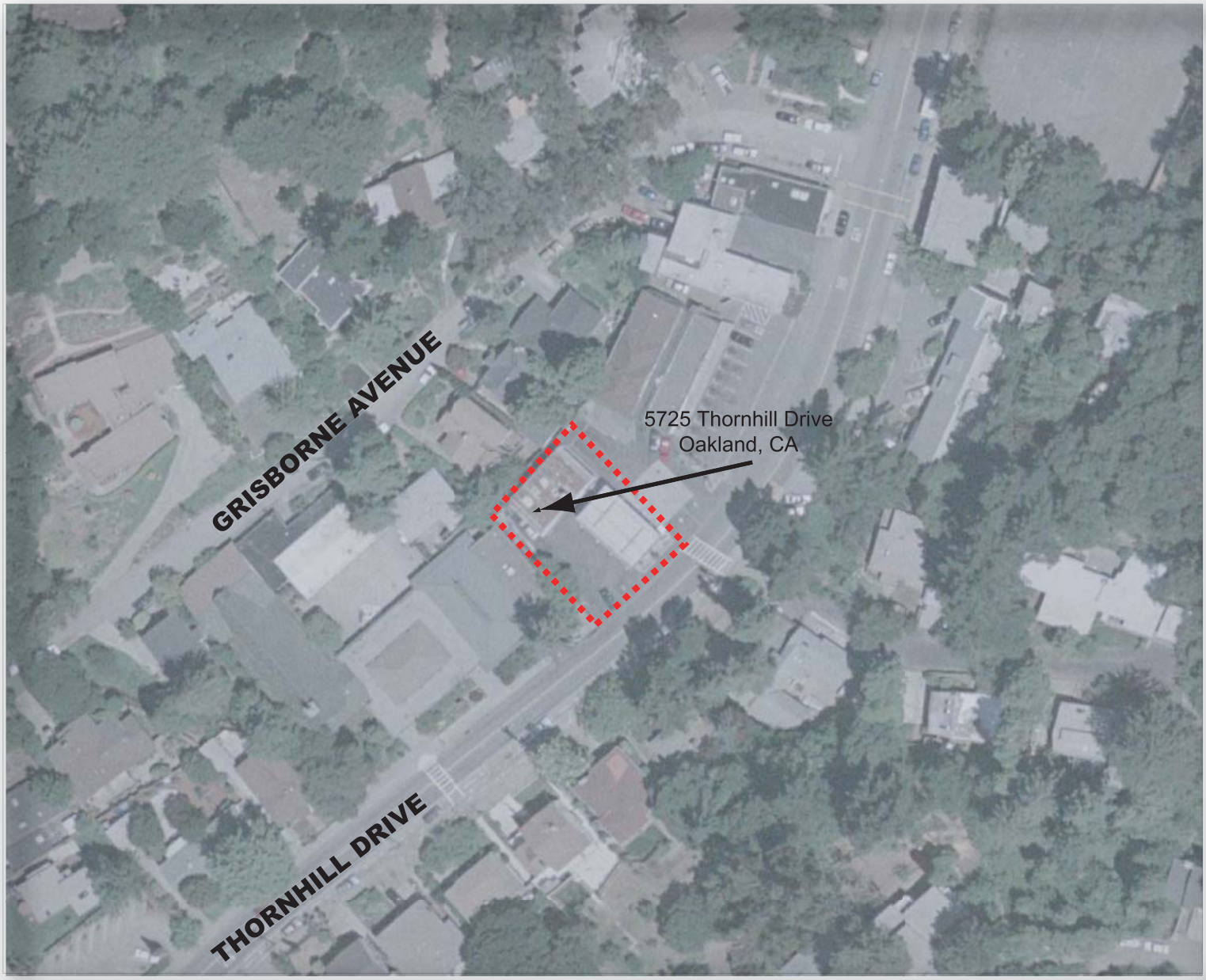
| Monitoring Well | Date | TBA (µg/L) | DIPE (µg/L) | ETBE (µg/L) | TAME (µg/L) | 1,2-DCA (µg/L) | EDB (µg/L) | Ethanol (µg/L) |
|---|---|---|---|---|---|---|---|---|
| **SOMA-3** | 4/22/2004 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1000 |
| | 7/27/2004 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1000 |
| | 10/28/2004 | <2.5 | <0.5 | <0.5 | <2 | <0.5 | <0.5 | <1.0 |
| | 1/11/2005 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1,000 |
| | 4/12/2005 | <2.5 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 7/19/2005 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 10/18/2005 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 2/1/2006 | 40.9 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 4/26/2006 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 8/3/2006 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 10/30/2006 | <10 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 1/8/2007 | <2.0 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | **6/14/2007** | **<2.0** | **<0.5** | **<0.5** | **<2.0** | **<0.5** | **<0.5** | **<1000** |
| **SOMA-4** | 7/19/2005 | 84.1 | <1.0 | <1.0 | 4.4 | <1.0 | <1.0 | <1000 |
| | 10/18/2005 | 314 | <2.15 | <2.15 | <8.6 | <2.15 | <2.15 | <4300 |
| | 2/1/2006 | 417 | <2.15 | <2.15 | <8.6 | <2.15 | <2.15 | <4300 |
| | 4/26/2006 | 357 | 0.59 | <0.5 | 2.1 | <0.5 | <0.5 | <1000 |
| | 8/3/2006 | 216 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 10/30/2006 | 269 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | 1/8/2007 | 233 | <0.5 | <0.5 | <2.0 | <0.5 | <0.5 | <1000 |
| | **6/14/2007** | **87.9** | **<0.5** | **<0.5** | **<2.0** | **<0.5** | **<0.5** | **<1000** |

Notes:
<: Not detected above the laboratory reporting limit.
The Second Quarter 2004 was the first time SOMA monitored the site.
Wells SOMA-1 to SOMA-3 were monitored at that time.
Well SOMA-4 was installed on May 27, 2005. The Third Quarter 2005 was the first time SOMA monitored this well.

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

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

# Figures




N

approximate scale in feet

0 100 200

Figure 1: Site vicinity map.

SOMA ENVIRONMENTAL ENGINEERING, INC.

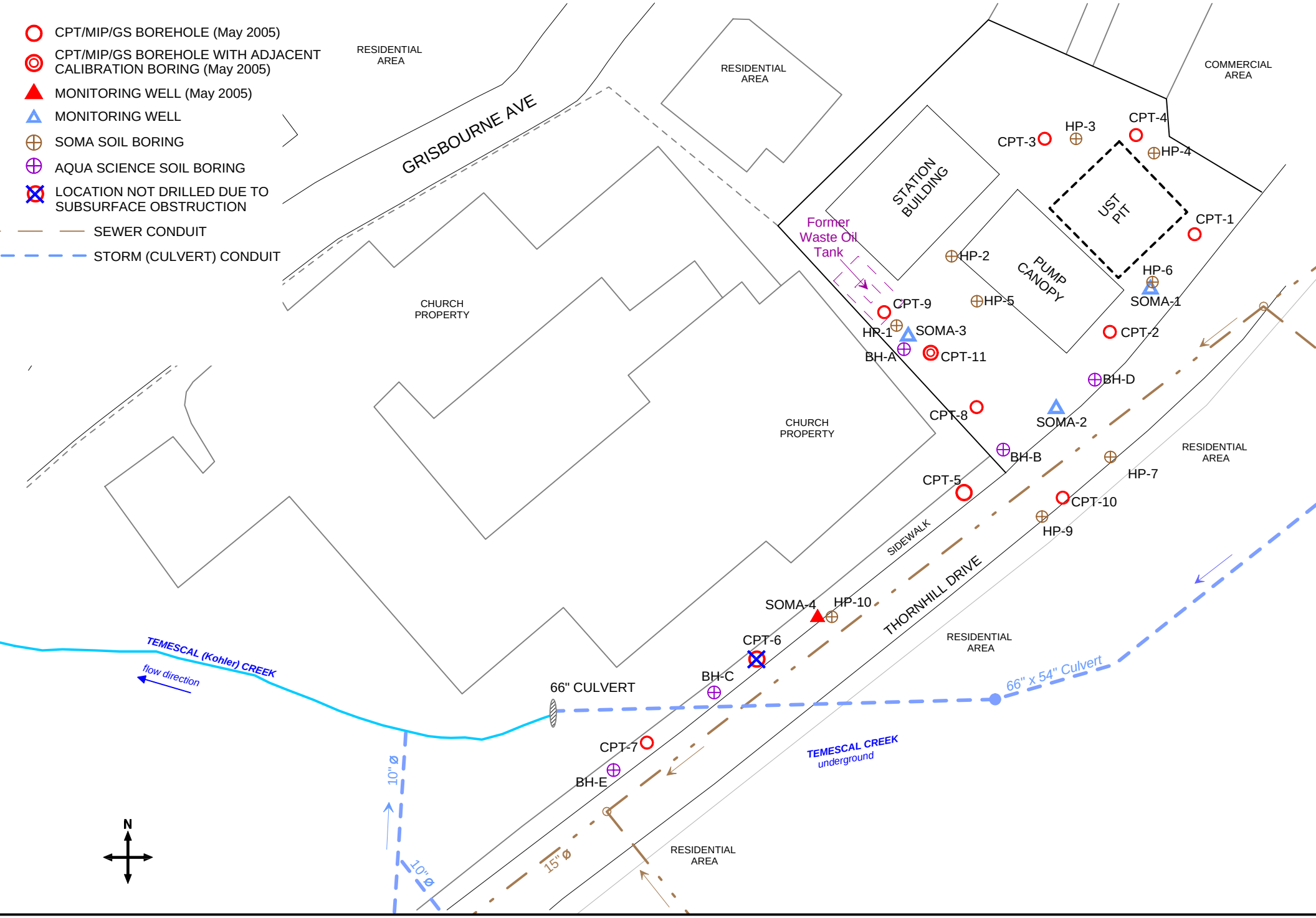
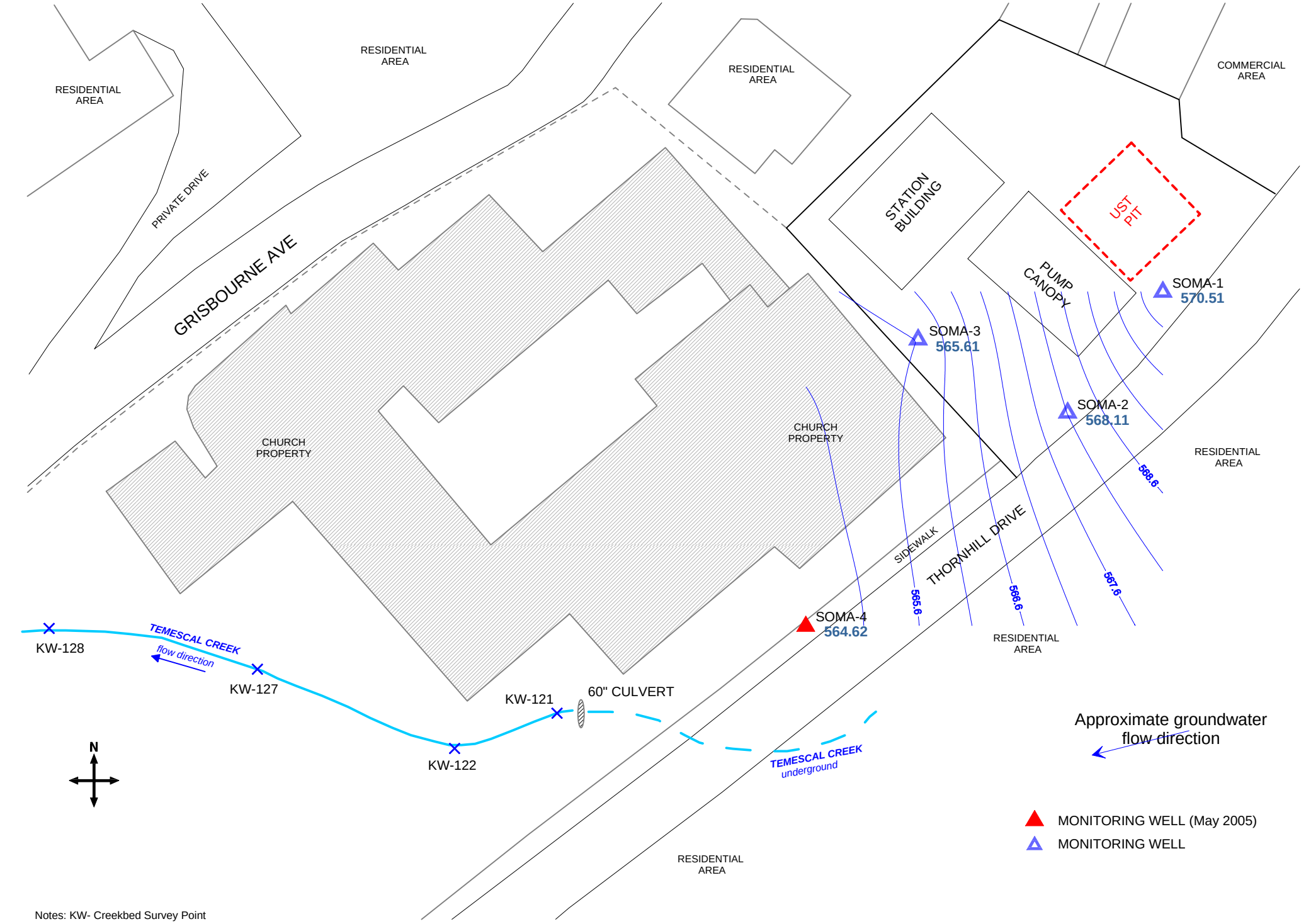



Figure 2: Site map showing locations of monitoring wells, soil borings, decomissioned wells, and CPT/MIP/GS boreholes.

SOMA ENVIRONMENTAL ENGINEERING, INC. SAN RAMON CA (925) 244 6600




Notes: KW- Creekbed Survey Point

approximate scale in feet

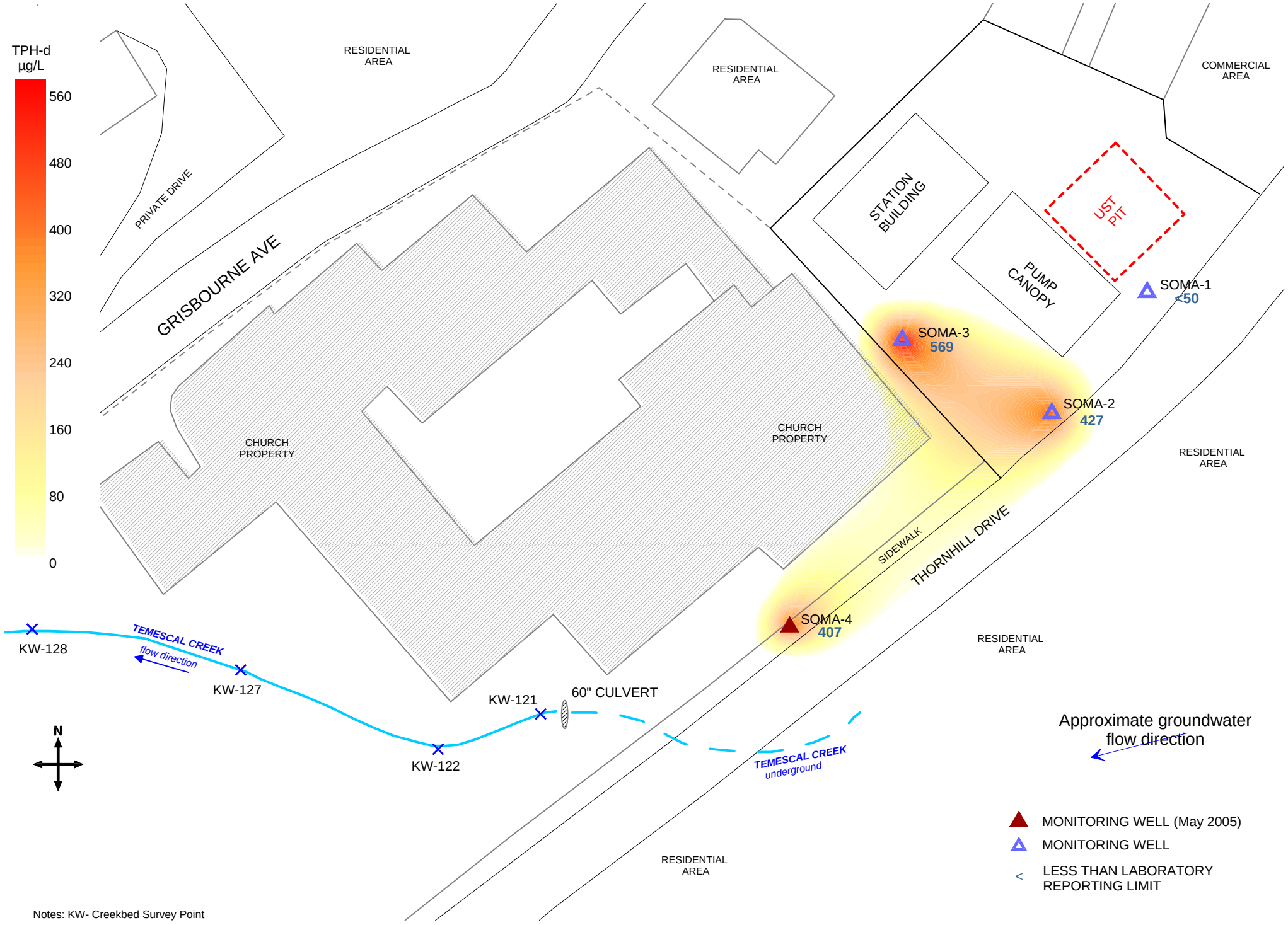
0 25 50

Figure 3: Groundwater elevation contour map in feet. June 14, 2007.

SOMA ENVIRONMENTAL ENGINEERING, INC. SAN RAMON CA (925) 244 6600


Figure 4: Contour map of TPH-g concentrations in groundwater. June 14, 2007.

SOMA ENVIRONMENTAL ENGINEERING, INC. SAN RAMON CA (925) 244 6600




Notes: KW- Creekbed Survey Point

approximate scale in feet

0 25 50

Figure 5: Contour map of TPH-d concentrations in groundwater.
June 14, 2007.

SOMA ENVIRONMENTAL ENGINEERING, INC.
SAN RAMON CA (925) 244 6600

# APPENDIX A

SOMA's Groundwater Monitoring Procedures

## Field Activities

On June 14, 2007, a total of three on-site monitoring wells (SOMA-1 to SOMA-3), and one off-site well SOMA-4 were measured for depth to groundwater. On June 14, 2007, additional field measurements and grab groundwater samples were collected from all of the monitoring wells. This monitoring event was conducted in accordance with the procedures and guidelines of the California Regional Water Quality Control Board and the Alameda County Health Care Services.

Prior to measurement of the groundwater depth at each well, equalization with the surrounding aquifer was achieved. The well cap was removed each well, and the pressure in each well was then allowed to dissipate. This allowed for a more stable water table level within the well. After a few minutes, and once the water level in the well stabilized, 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. Appendix B shows the survey datum.

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 three 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 one 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 June 14, 2007, SOMA's field crew delivered the groundwater samples along with the COC form to Pacific Analytical Laboratory in Alameda, California.

## Laboratory Analysis

Pacific Analytical Laboratory, a state certified laboratory, analyzed the groundwater samples for TPH-g, TPH-d, TPH-mo, BTEX, MtBE, gasoline oxygenates, and lead scavengers.

TPH-g, BTEX, MtBE, gasoline oxygenates, and lead scavengers measurements were prepared using EPA Method 5030B and analyzed using EPA Method 8260B. Samples for TPH-d and TPH-mo measurements were analyzed using EPA Method 8015B modified.

# Appendix B

Table of Elevations & Coordinates on Monitoring Wells

and

Field Measurements of the Physical and Chemical

Properties of the Groundwater Samples

Collected During the Second Quarter 2007

DATE: 4/28/04
JOB# A04549

# TABLE OF ELEVATIONS & COORDINATES ON MONITORING WELLS

SOMA ENVIRONMENTAL, PROJECT # 2830
5725 THORNHILL DRIVE, OAKLAND

| WELL ID # | NORTHING (FT.) / LATITUDE (D.M.S.) | EASTING (FT.) / LONGITUDE (D.M.S.) | ELEVATION (FT.) | DESCRIPTION |
|---|---|---|---|---|
| SOMA-1 | 2130799.64 | 6067141.82 | 576.47 | TOP PIPE , BLACK MARK N. SIDE (FELT TIP) (LOCKED AND TIGHT) |
| | N 37°50'03.73174" | W 122°12'44.98565" | 576.72 | RIM |
| | | | 576.70 | CONC. |
| | | | | |
| SOMA-2 | 2130764.55 | 6067114.08 | 575.50 | TOP PIPE , BLACK MARK N. SIDE (FELT TIP) (LOCKED AND TIGHT) |
| | N 37°50'03.37985" | W 122°12'45.32339" | 575.74 | RIM |
| | | | 575.75 | CONC. |
| | | | | |
| | | | | |
| SOMA-3 | 2130785.85 | 6067071.01 | 575.92 | TOP PIPE , BLACK MARK N. SIDE (FELT TIP) (LOCKED AND TIGHT) |
| | N 37°50'03.58261" | W 122°12'45.86506" | 576.31 | RIM |
| | | | 576.30 | CONC. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## ADDITIONAL POINTS

| PT# | NORTHING (FT.) | EASTING (FT.) | ELEVATION (FT.) | DESCRIPTION |
|---|---|---|---|---|
| 108 | 2130820.55 | 6067045.27 | N/A | BL< |
| 109 | 2130800.14 | 6067066.40 | N/A | BL< |
| 110 | 2130830.97 | 6067096.14 | N/A | BL< |
| 104 | 2130818.02 | 6067033.92 | N/A | BLOCK WALL 8" <PT |
| 105 | 2130808.04 | 6067041.66 | N/A | BLOCK WALL 8" END |
| 106 | 2130821.74 | 6067037.78 | N/A | BLOCK WALL 8" END |
| 107 | 2130821.83 | 6067037.75 | N/A | FNC-WD B-C CL |
| 111 | 2130872.58 | 6067087.64 | N/A | FNC-WD END CL |
| 112 | 2130837.52 | 6067194.12 | N/A | FOGL |
| 113 | 2130793.20 | 6067156.45 | N/A | FOGL |
| 114 | 2130759.63 | 6067123.75 | N/A | FOGL |
| 115 | 2130740.79 | 6067101.26 | N/A | FOGL END |
| 117 | 2130628.30 | 6066947.69 | N/A | TC |
| 116 | 2130738.69 | 6067095.34 | N/A | TC END |
| 128 | 2130693.29 | 6066817.93 | 558.29 | C/L CREEK +0.4' TO TOP OF WATER |
| 127 | 2130685.30 | 6066880.75 | 559.78 | C/L CREEK +0.4' TO TOP OF WATER |
| 122 | 2130664.83 | 6066937.67 | 562.81 | C/L CREEK +0.4' TO TOP OF WATER |
| 121 | 2130676.03 | 6066966.79 | 563.15 | C/L 60" CULVERT +0.5' TO TOP OF WATER |

**Kier & Wright Engineers Surveyors, Inc.**
1233 Quarry Lane, Suite 145, Pleasanton, CA 94566
Phone (925) 249-6555,
Fax (925) 249-6563

PRINTED: 6/9/2005
11:27 AM

DATE: 4/28/04
JOB# A04549

# TABLE OF ELEVATIONS & COORDINATES ON MONITORING WELLS

SOMA ENVIRONMENTAL, PROJECT # 2830
5725 THORNHILL DRIVE, OAKLAND

**BENCH MARK:** NGS Bench mark No.PID# HT2487
DESCRIPTION FROM NGS DATA SHEET:
DESCRIBED BY EAST BAY MUNICIPAL UTILITIES DISTRICT 1947 (SPH) THE AZIMUTH MARK IS AN EBMUD TRIANGULATION STATION DISC SET 1 FOOT BELOW THE SURFACE AND COVERED BY AN 8 INCH IRON CASTING WITH A REMOVABLE LID MARKED CITY MONUMENT. IT IS IN THE SIDEWALK IN FRONT OF A SAFEWAY STORE AT THE INTERSECTION OF GRAND AND WILDWOOD AVENUES. IT IS 1.5 FEET SOUTHEAST OF THE SOUTHEAST CURB OF WILDWOOD AVE., 6.2 FEET OF EAST CURB OF GRAND AVE. AND 10.4 FEET NORTHEAST OF POWERPOLE. THE MARK IS STAMPED LINDA AZIMUTH MARK 1947.

Elevation =37. FEET NAVD88 Datum
BY VERTCON

**HORIZONTAL CONTROL:**

**PID - AA5496**
NORTHING =1,988,577.07 , EASTING = 6,077,862.13 FEET; EPOCH DATE = 1991.35

**PID - HT2541**
NORTHING = 2,130,331.28 , EASTING = 6,062,624.49 FEET; EPOCH DATE = 1991.35

Coordinate values are based on the California Coordinate System, Zone III NAD 83 Datum.

**Kier & Wright Engineers Surveyors, Inc.**
1233 Quarry Lane, Suite 145, Pleasanton, CA 94566
Phone (925) 249-6555,
Fax (925) 249-6563

DATE: 8/17/05
Job No. 205048

DATE OF SURVEY 8/12/05
INSTRUMENT LEICA TCA 1100L

# TABLE OF ELEVATIONS & COORDINATES ON MONITORING WELLS

SOMA ENVIRONMENTAL, PROJECT # 2830
5725 THORNHILL DRIVE, OAKLAND

| WELL ID # | NORTHING (FT.) / LATITUDE (D.M.S.) | EASTING (FT.) / LONGITUDE (D.M.S.) | ELEVATION (FT.) | DESCRIPTION |
|---|---|---|---|---|
| SOMA-4 | 2130703.437 | 6067044.632 | 572.65 | TOP PIPE , BLACK MARK N. SIDE (FELT TIP) |
| | N 37°50'02.76318" | W 122°12'46.17502" | 573.03 | RIM |
| | | | 573.03 | CONC. |
| DECIMAL DEGREES | N 37°.83410088 | W 121°.21282639" | | |
| | | | | |
| LOCAL CONTROL | | | | |
| SOMA-2 | 2130764.55 | 6067114.08 | 575.50 | TOP PIPE |
| | N 37°50'03.37985" | W 122°12'45.32339" | | |
| SOMA-3 | 2130785.85 | 6067071.01 | 575.92 | TOP PIPE |
| | N 37°50'03.58261" | W 122°12'45.86506" | | |

**BENCH MARK:** NGS Bench mark No.PID# HT2487
DESCRIPTION FROM NGS DATA SHEET:
DESCRIBED BY EAST BAY MUNICIPAL UTILITIES DISTRICT 1947 (SPH) THE AZIMUTH MARK IS AN EBMUD TRIANGULATION STATION DISC SET 1 FOOT BELOW THE SURFACE AND COVERED BY AN 8 INCH IRON CASTING WITH A REMOVABLE LID MARKED CITY MONUMENT. IT IS IN THE SIDEWALK IN FRONT OF A SAFEWAY STORE AT THE INTERSECTION OF GRAND AND WILDWOOD AVENUES. IT IS 1.5 FEET SOUTHEAST OF THE SOUTHEAST CURB OF WILDWOOD AVE., 6.2 FEET OF EAST CURB OF GRAND AVE. AND 10.4 FEET NORTHEAST OF POWERPOLE. THE MARK IS STAMPED LINDA AZIMUTH MARK 1947.

Elevation =37. FEET NAVD88 Datum
BY VERTCON

**ALIQUOT ASSOCIATES**
**1390 MAIN STREET STE 310**
**WALNUT CREEK, CA. 94596**
**925-476-2300**

DATE: 8/17/05
Job No. 205048

DATE OF SURVEY 8/12/05
INSTRUMENT LEICA TCA 1100L

# TABLE OF ELEVATIONS & COORDINATES ON MONITORING WELLS

SOMA ENVIRONMENTAL, PROJECT # 2830
5725 THORNHILL DRIVE, OAKLAND

**HORIZONTAL CONTROL:**

**PID - AA5496**
NORTHING =1,988,577.07 , EASTING = 6,077,862.13 FEET; EPOCH DATE = 1991.35

**PID - HT2541**
NORTHING = 2,130,331.28 , EASTING = 6,062,624.49 FEET; EPOCH DATE = 1991.35

Coordinate values are based on the California Coordinate System, Zone III NAD 83 Datum.

**NOTE**

THE VALUES FOR SOMA-4 ARE DERIVED FROM LOCAL CONTROL BASED UPON CONTROL VALUE USED FROM THE PREVIOUS SITE SURVEY AS PROVIDED BY KIER AND WRIGHT


**ALIQUOT ASSOCIATES**
**1390 MAIN STREET STE 310**
**WALNUT CREEK, CA. 94596**
**925-476-2300**

ENVIRONMENTAL ENGINEERING, INC

| | | | |
|---|---|---|---|
| **Well No.:** | SOMA-1 | **Project No.:** | 2831 |
| **Casing Diameter:** | 2 inches | **Address:** | 5725 Thornhill Drive |
| **Depth of Well:** | 27.85 feet | | Oakland CA |
| **Top of Casing Elevation:** | 576.47 feet | **Date:** | June 14, 2007 |
| **Depth to Groundwater:** | 5.96 feet | **Sampler:** | Tony Perini |
| **Groundwater Elevation:** | 570.51 feet | | |
| **Water Column Height:** | 21.89 feet | | |
| **Purged Volume:** | 12 gallons | | |

**Purging Method:** **Bailer** ☐ **Pump** ☑

**Sampling Method:** **Bailer** ☑ **Pump** ☐

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

**Sheen:** **No** ☑ **Yes** ☐ **Describe:** _____

**Odor:** **No** ☑ **Yes** ☐ **Describe:** _____

**Field Measurements:**

| Time | Vol (gallons) | pH | Temp ($^0$C) | E.C. (µs/cm) |
|---|---|---|---|---|
| 1035 Am | Starts purging well | | | |
| 1038 Am | 4 | 7.31 | 20.70 | 462 |
| 1042 Am | 8 | 7.01 | 19.70 | 494 |
| 1045 Am | 12 | 7.01 | 18.50 | 494 |
| 1048 Am | sampled | | | |
| | | | | |

ENVIRONMENTAL ENGINEERING, INC

| | | | |
|---|---|---|---|
| **Well No.:** | SOMA-2 | **Project No.:** | 2831 |
| **Casing Diameter:** | 2 inches | **Address:** | 5725 Thornhill Drive |
| **Depth of Well:** | 28.00 feet | | Oakland CA |
| **Top of Casing Elevation:** | 575.50 feet | **Date:** | June 14, 2007 |
| **Depth to Groundwater:** | 7.39 feet | **Sampler:** | Tony Perini |
| **Groundwater Elevation:** | 568.11 feet | | |
| **Water Column Height:** | 20.61 feet | | |
| **Purged Volume:** | 10 gallons | | |

| | | | | |
|---|---|---|---|---|
| **Purging Method:** | **Bailer** ☐ | **Pump** ☑ | | |
| **Sampling Method:** | **Bailer** ☑ | **Pump** ☐ | | |
| **Color:** | **No** ☐ | **Yes** ☑ | **Describe:** | cloudy |
| **Sheen:** | **No** ☑ | **Yes** ☐ | **Describe:** | |
| **Odor:** | **No** ☑ | **Yes** ☐ | **Describe:** | |

**Field Measurements:**

| Time | Vol (gallons) | pH | Temp ($^0$C) | E.C. (µs/cm) |
|---|---|---|---|---|
| 1006 AM | Starts purging well | | | |
| 1008 AM | 2 | 7.19 | 21.0 | 663 |
| 1012 AM | 7 | 7.21 | 19.40 | 652 |
| 1015 AM | 10 | 7.18 | 19.40 | 645 |
| 1018 AM | sampled | | | |
| | | | | |

ENVIRONMENTAL ENGINEERING, INC

| | | | |
|---|---|---|---|
| **Well No.:** | SOMA 3 | **Project No.:** | 2831 |
| **Casing Diameter:** | 2 inches | **Address:** | 5725 Thornhill Drive |
| **Depth of Well:** | 27.77 feet | | Oakland CA |
| **Top of Casing Elevation:** | 572.92 feet | **Date:** | June 14, 2007 |
| **Depth to Groundwater:** | 7.31 feet | **Sampler:** | Tony Perini |
| **Groundwater Elevation:** | 565.61 feet | | |
| **Water Column Height:** | 20.46 feet | | |
| **Purged Volume:** | 12 gallons | | |

| | | | | | |
|---|---|---|---|---|---|
| **Purging Method:** | **Bailer** ☐ | | **Pump** ☑ | | |
| **Sampling Method:** | **Bailer** ☑ | | **Pump** ☐ | | |
| **Color:** | **No** ☐ | | **Yes** ☑ | **Describe:** | cloudy |
| **Sheen:** | **No** ☑ | | **Yes** ☐ | **Describe:** | |
| **Odor:** | **No** ☑ | | **Yes** ☐ | **Describe:** | |

**Field Measurements:**

| Time | Vol (gallons) | pH | Temp ($^0$C) | E.C. (µs/cm) |
|---|---|---|---|---|
| 1108 AM | starts purging well | | | |
| 1112 AM | 4 | 7.94 | 21.40 | 827 |
| 1116 AM | 8 | 7.54 | 20.80 | 717 |
| 1120 AM | 12 | 7.25 | 18.10 | 694 |
| 1123 AM | samples | | | |
| | | | | |

ENVIRONMENTAL ENGINEERING, INC

| | | | |
|---|---|---|---|
| **Well No.:** | SOMA-4 | **Project No.:** | 2831 |
| **Casing Diameter:** | 2 inches | **Address:** | 5725 Thornhill Drive |
| **Depth of Well:** | 19.70 feet | | Oakland CA |
| **Top of Casing Elevation:** | 572.65 feet | **Date:** | June 14, 2007 |
| **Depth to Groundwater:** | 8.03 feet | **Sampler:** | Tony Perini |
| **Groundwater Elevation:** | 564.62 feet | | |
| **Water Column Height:** | 11.67 feet | | |
| **Purged Volume:** | 7 gallons | | |

| | | | | | |
|---|---|---|---|---|---|
| **Purging Method:** | **Bailer** ☐ | | **Pump** ☑ | | |
| **Sampling Method:** | **Bailer** ☑ | | **Pump** ☐ | | |
| **Color:** | **No** ☐ | | **Yes** ☑ | **Describe:** | cloudy |
| **Sheen:** | **No** ☑ | | **Yes** ☐ | **Describe:** | |
| **Odor:** | **No** ☑ | | **Yes** ☐ | **Describe:** | |

**Field Measurements:**

| Time | Vol (gallons) | pH | Temp ($^0$C) | E.C. (µs/cm) |
|---|---|---|---|---|
| 938 Am | Starts Purging well | | | |
| 940 Am | 2 | 6.82 | 22.90 | 687 |
| 942 Am | 5 | 6.94 | 18.10 | 614 |
| 944 Am | 7 | 6.93 | 17.90 | 609 |
| 947 Am | samples | | | |
| | | | | |

# Appendix C

Chain of Custody Form and Laboratory Report

for the

Second Quarter 2007 Monitoring Event

# CHAIN OF CUSTODY FORM

Page 1 of 1

**PAL** Pacific Analytical Laboratory
851 West Midway Ave., Suite 201B
Alameda, CA 94501
510-864-0364 Telephone
510-864-0365 Fax

PAL Login# 7060006

| Project No: 2831 | Sampler: Tony PERINI |
|---|---|
| Project Name: 5725 Thornhill Drive Oakland, CA | Report To: Tony Perini |
| | Company: SOMA Environmental Engineering, Inc. |
| Turnaround Time: Standard | Tel: 925-734-6400 Fax: 925-734-6401 |

| Lab No. | Sample ID | Sampling Date/Time: Date | Time | Matrix: Soil | Water | Waste | # of Containers | Preservatives: HCL | $H_2So4$ | NONE | ICE | Field Notes | Analyses/Method: TPHg, BTEX, MtBE 8260B | Gas Ox – Lead Scavenge | Ethanol | TPH-d , TPH-mo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SOMA-1 | 6/14/07 | 1048AM | | X | | 1 L Amber 3 VOAs | X | | X | X | Grab Sample | X | X | X | X |
| | SOMA-2 | ↓ | 1018AM | | X | | 1 L Amber 3 VOAs | X | | X | X | Grab Sample | X | X | X | X |
| | SOMA-3 | | 1123 AM | | X | | 1 L Amber 3 VOAs | X | | X | X | Grab Sample | X | X | X | X |
| | SOMA-4 | ↓ | 947 AM | | X | | 1 L Amber 3 VOAs | X | | X | X | Grab Sample | X | X | X | X |

| Sampler Remarks: | Relinquished by: | Date/Time: | Received by: | Date/Time: |
|---|---|---|---|---|
| | Tony Perini | 110 PM 6/14/07 | Eskender Solomon | June 14 07 315 |

PAL
Pacific Analytical Laboratory
851 West Midway Ave. Suite 201
Alameda, CA 94501
Phone (510) 864-0364

27 June 2007

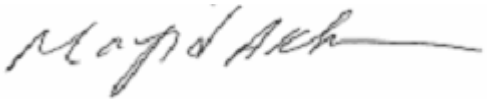
Mansour Sepehr
SOMA Environmental Engineering Inc.
6620 Owens Drive, Suite A
Pleasanton, CA 94588

RE: 5725 Thornhill Dr., Oakland

Work Order Number: 7060006

This Laboratory report has been reviewed for technical correctness and completeness. This entire report was reviewed and approved by the Laboratory Director or the Director's designee, as verified by the following signature.

Sincerely,



Maiid Akhavan
Laboratory Director

| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| SOMA-1 | 7060006-01 | Water | 14-Jun-07 10:48 | 14-Jun-07 13:27 |
| SOMA-2 | 7060006-02 | Water | 14-Jun-07 10:18 | 14-Jun-07 13:27 |
| SOMA-3 | 7060006-03 | Water | 14-Jun-07 11:23 | 14-Jun-07 13:27 |
| SOMA-4 | 7060006-04 | Water | 14-Jun-07 09:47 | 14-Jun-07 13:27 |

| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## Extractable Petroleum Hydrocarbons by 8015 DRO

## Pacific Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **SOMA-1 (7060006-01) Water Sampled: 14-Jun-07 10:48 Received: 14-Jun-07 13:27** | | | | | | | | | |
| Diesel (C10-C24) | ND | 50.0 | ug/l | 1 | BF71901 | 14-Jun-07 | 24-Jun-07 | EPA 8015M | |
| Motor Oil (C24-C36) | ND | 250 | " | " | " | " | " | " | |
| *Surrogate: Pentacosane* | | *16.5 %* | *50.4-137* | | *"* | *"* | *"* | *"* | *S-04* |
| **SOMA-2 (7060006-02) Water Sampled: 14-Jun-07 10:18 Received: 14-Jun-07 13:27** | | | | | | | | | |
| **Diesel (C10-C24)** | **427** | 50.0 | ug/l | 1 | BF71901 | 14-Jun-07 | 24-Jun-07 | EPA 8015M | D-06, D-30 |
| Motor Oil (C24-C36) | ND | 250 | " | " | " | " | " | " | |
| *Surrogate: Pentacosane* | | *47.0 %* | *50.4-137* | | *"* | *"* | *"* | *"* | *S-04* |
| **SOMA-3 (7060006-03) Water Sampled: 14-Jun-07 11:23 Received: 14-Jun-07 13:27** | | | | | | | | | |
| **Diesel (C10-C24)** | **569** | 50.0 | ug/l | 1 | BF71901 | 14-Jun-07 | 24-Jun-07 | EPA 8015M | D-06, D-30 |
| Motor Oil (C24-C36) | ND | 250 | " | " | " | " | " | " | |
| *Surrogate: Pentacosane* | | *88.2 %* | *50.4-137* | | *"* | *"* | *"* | *"* | |
| **SOMA-4 (7060006-04) Water Sampled: 14-Jun-07 09:47 Received: 14-Jun-07 13:27** | | | | | | | | | |
| **Diesel (C10-C24)** | **407** | 50.0 | ug/l | 1 | BF71901 | 14-Jun-07 | 24-Jun-07 | EPA 8015M | D-06, D-30 |
| Motor Oil (C24-C36) | ND | 250 | " | " | " | " | " | " | |
| *Surrogate: Pentacosane* | | *43.4 %* | *50.4-137* | | *"* | *"* | *"* | *"* | *S-04* |

| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## Volatile Organic Compounds by EPA Method 8260B

## Pacific Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **SOMA-1 (7060006-01) Water Sampled: 14-Jun-07 10:48 Received: 14-Jun-07 13:27** | | | | | | | | | |
| Gasoline (C6-C12) | ND | 50.0 | ug/l | 1 | BF72001 | 14-Jun-07 | 22-Jun-07 | EPA 8260B | |
| Benzene | ND | 0.500 | " | " | " | " | " | " | |
| Ethylbenzene | ND | 0.500 | " | " | " | " | " | " | |
| m&p-Xylene | ND | 2.00 | " | " | " | " | " | " | |
| o-xylene | ND | 0.500 | " | " | " | " | " | " | |
| Toluene | ND | 2.00 | " | " | " | " | " | " | |
| **MTBE** | **1.91** | 0.500 | " | " | " | " | " | " | |
| DIPE | ND | 0.500 | " | " | " | " | " | " | |
| ETBE | ND | 0.500 | " | " | " | " | " | " | |
| TAME | ND | 2.00 | " | " | " | " | " | " | |
| TBA | ND | 2.00 | " | " | " | " | " | " | |
| 1,2-dichloroethane | ND | 0.500 | " | " | " | " | " | " | |
| 1,2-Dibromoethane (EDB) | ND | 0.500 | " | " | " | " | " | " | |
| Ethanol | ND | 1000 | " | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | | *77.2 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | | *110 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Perdeuterotoluene* | | *90.0 %* | | *70-130* | " | " | " | " | |
| **SOMA-2 (7060006-02) Water Sampled: 14-Jun-07 10:18 Received: 14-Jun-07 13:27** | | | | | | | | | |
| **Gasoline (C6-C12)** | **988** | 50.0 | ug/l | 1 | BF72001 | 14-Jun-07 | 22-Jun-07 | EPA 8260B | |
| Benzene | ND | 0.500 | " | " | " | " | " | " | |
| **Ethylbenzene** | **4.80** | 0.500 | " | " | " | " | " | " | |
| m&p-Xylene | ND | 2.00 | " | " | " | " | " | " | |
| **o-xylene** | **2.46** | 0.500 | " | " | " | " | " | " | |
| Toluene | ND | 2.00 | " | " | " | " | " | " | |
| **MTBE** | **28.9** | 0.500 | " | " | " | " | " | " | |
| DIPE | ND | 0.500 | " | " | " | " | " | " | |
| ETBE | ND | 0.500 | " | " | " | " | " | " | |
| TAME | ND | 2.00 | " | " | " | " | " | " | |
| **TBA** | **35.6** | 2.00 | " | " | " | " | " | " | |
| 1,2-dichloroethane | ND | 0.500 | " | " | " | " | " | " | |
| 1,2-Dibromoethane (EDB) | ND | 0.500 | " | " | " | " | " | " | |
| Ethanol | ND | 1000 | " | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | | *95.2 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | | *109 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Perdeuterotoluene* | | *94.6 %* | | *70-130* | " | " | " | " | |

| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## Volatile Organic Compounds by EPA Method 8260B

## Pacific Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **SOMA-3 (7060006-03) Water Sampled: 14-Jun-07 11:23 Received: 14-Jun-07 13:27** | | | | | | | | | |
| Gasoline (C6-C12) | ND | 50.0 | ug/l | 1 | BF72001 | 14-Jun-07 | 22-Jun-07 | EPA 8260B | |
| Benzene | ND | 0.500 | " | " | " | " | " | " | |
| Ethylbenzene | ND | 0.500 | " | " | " | " | " | " | |
| m&p-Xylene | ND | 2.00 | " | " | " | " | " | " | |
| o-xylene | ND | 0.500 | " | " | " | " | " | " | |
| Toluene | ND | 2.00 | " | " | " | " | " | " | |
| **MTBE** | **5.57** | 0.500 | " | " | " | " | " | " | |
| DIPE | ND | 0.500 | " | " | " | " | " | " | |
| ETBE | ND | 0.500 | " | " | " | " | " | " | |
| TAME | ND | 2.00 | " | " | " | " | " | " | |
| TBA | ND | 2.00 | " | " | " | " | " | " | |
| 1,2-dichloroethane | ND | 0.500 | " | " | " | " | " | " | |
| 1,2-Dibromoethane (EDB) | ND | 0.500 | " | " | " | " | " | " | |
| Ethanol | ND | 1000 | " | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | | *79.4 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | | *110 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Perdeuterotoluene* | | *89.8 %* | | *70-130* | " | " | " | " | |
| **SOMA-4 (7060006-04) Water Sampled: 14-Jun-07 09:47 Received: 14-Jun-07 13:27** | | | | | | | | | |
| **Gasoline (C6-C12)** | **2600** | 50.0 | ug/l | 1 | BF72001 | 14-Jun-07 | 22-Jun-07 | EPA 8260B | |
| Benzene | ND | 0.500 | " | " | " | " | " | " | |
| **Ethylbenzene** | **4.39** | 0.500 | " | " | " | " | " | " | |
| m&p-Xylene | ND | 2.00 | " | " | " | " | " | " | |
| **o-xylene** | **2.69** | 0.500 | " | " | " | " | " | " | |
| Toluene | ND | 2.00 | " | " | " | " | " | " | |
| **MTBE** | **10.3** | 0.500 | " | " | " | " | " | " | |
| DIPE | ND | 0.500 | " | " | " | " | " | " | |
| ETBE | ND | 0.500 | " | " | " | " | " | " | |
| TAME | ND | 2.00 | " | " | " | " | " | " | |
| **TBA** | **87.9** | 2.00 | " | " | " | " | " | " | |
| 1,2-dichloroethane | ND | 0.500 | " | " | " | " | " | " | |
| 1,2-Dibromoethane (EDB) | ND | 0.500 | " | " | " | " | " | " | |
| Ethanol | ND | 1000 | " | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | | *98.6 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | | *106 %* | | *70-130* | " | " | " | " | |
| *Surrogate: Perdeuterotoluene* | | *99.4 %* | | *70-130* | " | " | " | " | |

| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## Extractable Petroleum Hydrocarbons by 8015 DRO - Quality Control

## Pacific Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch BF71901 - EPA 3510B** | | | | | | | | | | |
| **Blank (BF71901-BLK1)** | | | | Prepared & Analyzed: 24-Jun-07 | | | | | | |
| *Surrogate: Pentacosane* | *30.7* | | *ug/l* | *50.0* | | *61.4* | *50.4-137* | | | |
| Diesel (C10-C24) | ND | 50.0 | " | | | | | | | |
| Motor Oil (C24-C36) | ND | 250 | " | | | | | | | |
| **LCS (BF71901-BS1)** | | | | Prepared & Analyzed: 24-Jun-07 | | | | | | |
| *Surrogate: Pentacosane* | *37.9* | | *ug/l* | *50.0* | | *75.8* | *50.4-137* | | | |
| Diesel (C10-C24) | 752 | 50.0 | " | 1000 | | 75.2 | 70-130 | | | |
| **LCS Dup (BF71901-BSD1)** | | | | Prepared & Analyzed: 24-Jun-07 | | | | | | |
| *Surrogate: Pentacosane* | *48.1* | | *ug/l* | *50.0* | | *96.2* | *50.4-137* | | | |
| Diesel (C10-C24) | 845 | 50.0 | " | 1000 | | 84.5 | 70-130 | 11.6 | 40 | |

| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## Volatile Organic Compounds by EPA Method 8260B - Quality Control

## Pacific Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch BF72001 - EPA 5030 Water MS** | | | | | | | | | | |
| **Blank (BF72001-BLK1)** | | | | Prepared & Analyzed: 20-Jun-07 | | | | | | |
| *Surrogate: 4-Bromofluorobenzene* | *37.1* | | *ug/l* | *50.0* | | *74.2* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *55.8* | | *"* | *50.0* | | *112* | *70-130* | | | |
| *Surrogate: Perdeuterotoluene* | *43.3* | | *"* | *50.0* | | *86.6* | *70-130* | | | |
| MTBE | ND | 0.500 | " | | | | | | | |
| DIPE | ND | 0.500 | " | | | | | | | |
| ETBE | ND | 0.500 | " | | | | | | | |
| TAME | ND | 2.00 | " | | | | | | | |
| TBA | ND | 2.00 | " | | | | | | | |
| Gasoline (C6-C12) | ND | 50.0 | " | | | | | | | |
| 1,2-dichloroethane | ND | 0.500 | " | | | | | | | |
| 1,2-Dibromoethane (EDB) | ND | 0.500 | " | | | | | | | |
| Ethanol | ND | 1000 | " | | | | | | | |
| Benzene | ND | 0.500 | " | | | | | | | |
| Ethylbenzene | ND | 0.500 | " | | | | | | | |
| m&p-Xylene | ND | 2.00 | " | | | | | | | |
| o-xylene | ND | 0.500 | " | | | | | | | |
| Toluene | ND | 2.00 | " | | | | | | | |
| **LCS (BF72001-BS1)** | | | | Prepared & Analyzed: 20-Jun-07 | | | | | | |
| *Surrogate: 4-Bromofluorobenzene* | *46.1* | | *ug/l* | *50.0* | | *92.2* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *47.2* | | *"* | *50.0* | | *94.4* | *70-130* | | | |
| *Surrogate: Perdeuterotoluene* | *49.7* | | *"* | *50.0* | | *99.4* | *70-130* | | | |
| MTBE | 95.7 | 0.500 | " | 100 | | 95.7 | 70-130 | | | |
| ETBE | 93.9 | 0.500 | " | 100 | | 93.9 | 70-130 | | | |
| TAME | 91.8 | 2.00 | " | 100 | | 91.8 | 70-130 | | | |
| TBA | 540 | 2.00 | " | 500 | | 108 | 70-130 | | | |
| Gasoline (C6-C12) | 1890 | 50.0 | " | 2000 | | 94.5 | 70-130 | | | |
| Benzene | 95.9 | 0.500 | " | 100 | | 95.9 | 70-130 | | | |
| Toluene | 93.9 | 2.00 | " | 100 | | 93.9 | 70-130 | | | |

| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## Volatile Organic Compounds by EPA Method 8260B - Quality Control

## Pacific Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch BF72001 - EPA 5030 Water MS** | | | | | | | | | | |
| **LCS Dup (BF72001-BSD1)** | | | | Prepared & Analyzed: 20-Jun-07 | | | | | | |
| *Surrogate: 4-Bromofluorobenzene* | *47.9* | | *ug/l* | *50.0* | | *95.8* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *49.2* | | *"* | *50.0* | | *98.4* | *70-130* | | | |
| *Surrogate: Perdeuterotoluene* | *49.5* | | *"* | *50.0* | | *99.0* | *70-130* | | | |
| MTBE | 101 | 0.500 | " | 100 | | 101 | 70-130 | 5.39 | 20 | |
| ETBE | 90.5 | 0.500 | " | 100 | | 90.5 | 70-130 | 3.69 | 20 | |
| TAME | 98.0 | 2.00 | " | 100 | | 98.0 | 70-130 | 6.53 | 20 | |
| Gasoline (C6-C12) | 1770 | 50.0 | " | 2000 | | 88.5 | 70-130 | 6.56 | 20 | |
| TBA | 622 | 2.00 | " | 500 | | 124 | 70-130 | 14.1 | 20 | |
| Benzene | 95.7 | 0.500 | " | 100 | | 95.7 | 70-130 | 0.209 | 20 | |
| Toluene | 105 | 2.00 | " | 100 | | 105 | 70-130 | 11.2 | 20 | |

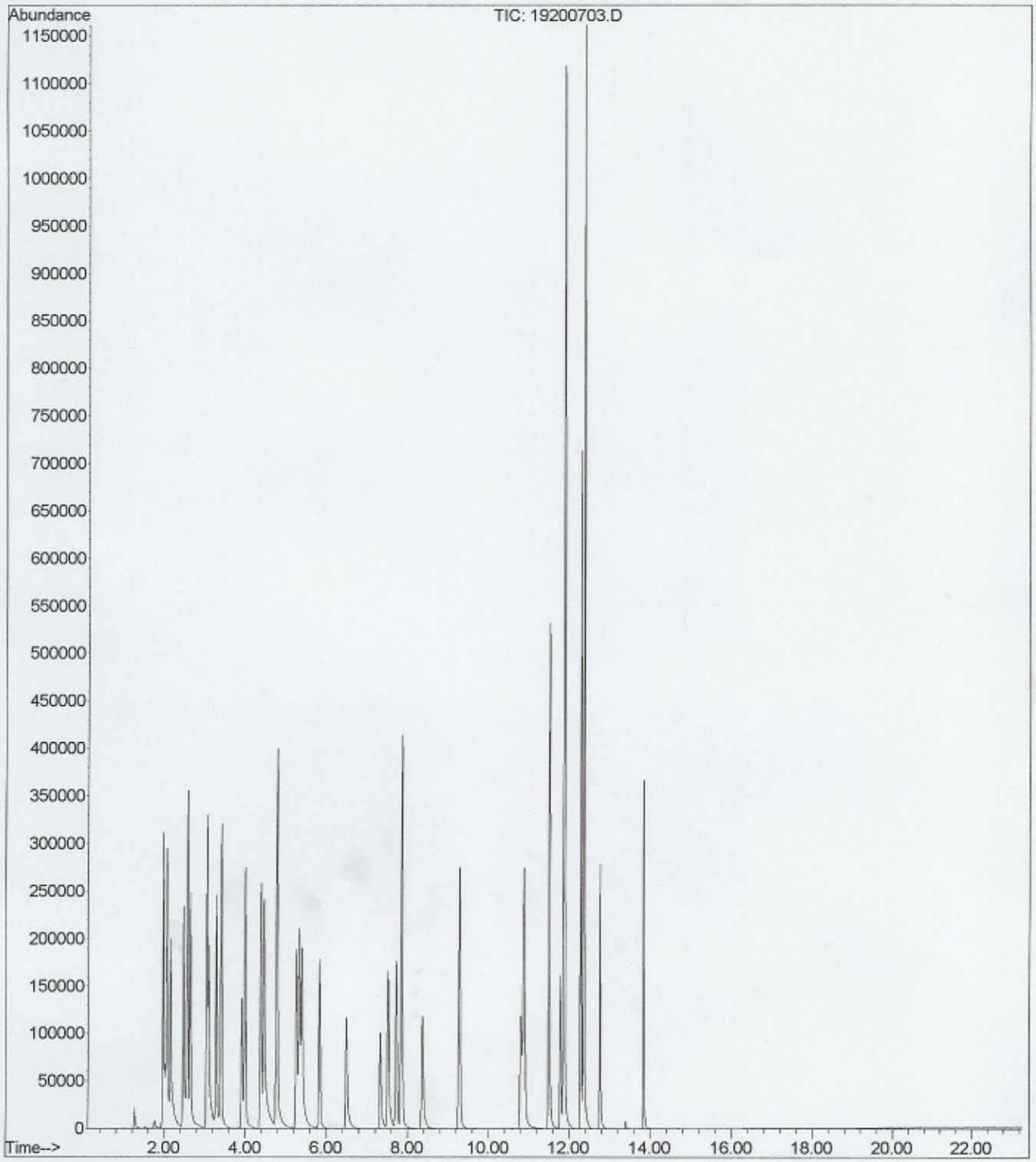
| | | |
|---|---|---|
| SOMA Environmental Engineering Inc. | Project: 5725 Thornhill Dr., Oakland | |
| 6620 Owens Drive, Suite A | Project Number: 2831 | **Reported:** |
| Pleasanton CA, 94588 | Project Manager: Mansour Sepehr | 27-Jun-07 19:34 |

## Notes and Definitions

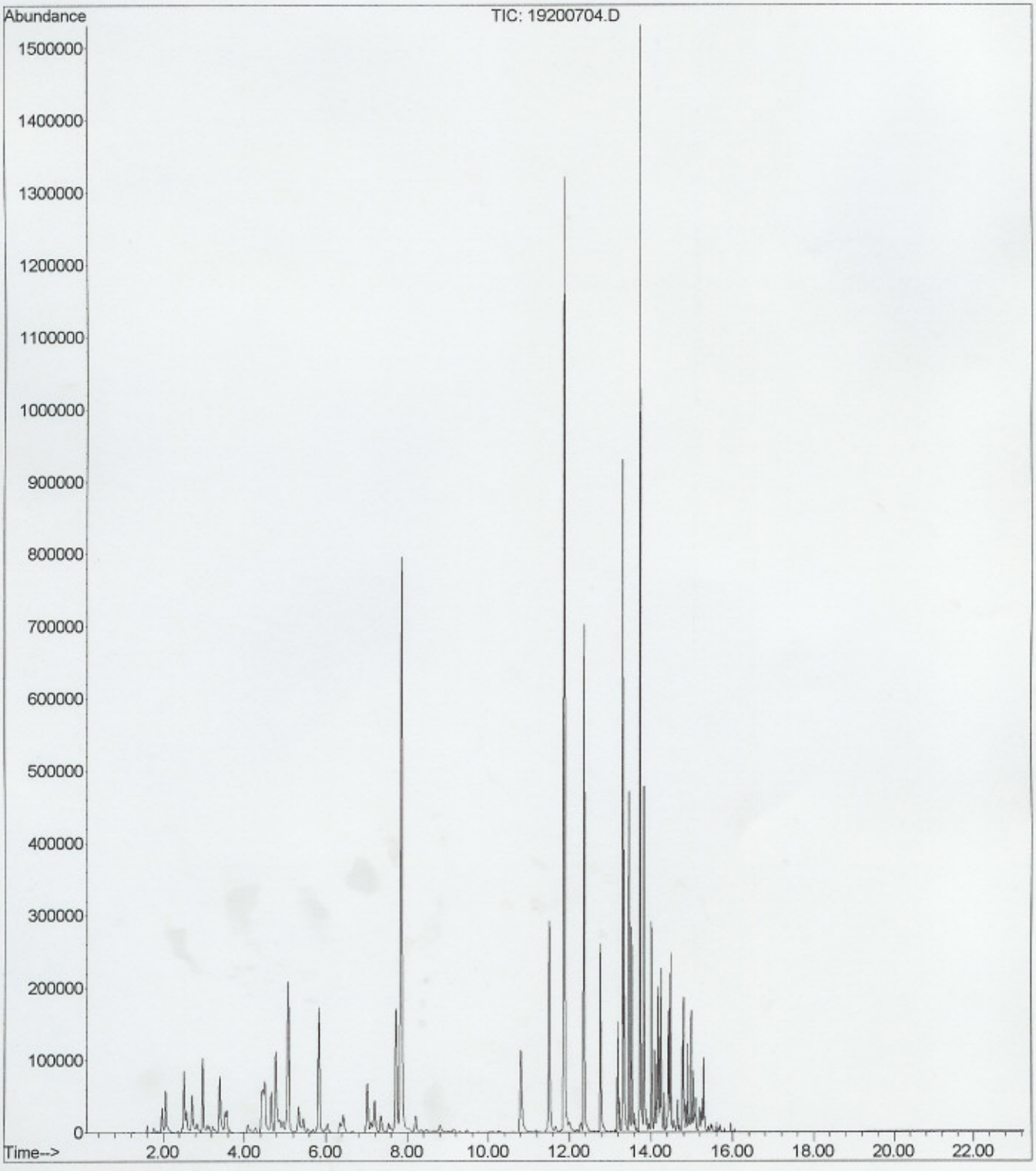
| | |
|---|---|
| S-04 | The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect. |
| D-30 | Unidentified hydrocarbons C9-C16. |
| D-06 | The sample chromatographic pattern does not resemble the fuel standard used for quantitation. |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |

File :C:\MSDChem\1\DATA\2007-Jun-19-1815.b\19200707.D
Operator : dh
Acquired : 19 Jun 2007 10:12 pm using AcqMethod OXY21506.M
Instrument : PAL GCMS
Sample Name: BF72001-BLK1
Misc Info :
Vial Number: 7

File :C:\MSDChem\1\DATA\2007-Jun-19-1815.b\19200703.D
Operator : dh
Acquired : 19 Jun 2007 8:03 pm using AcqMethod OXY21506.M
Instrument : PAL GCMS
Sample Name: BF72001-BS1@voc
Misc Info :
Vial Number: 3



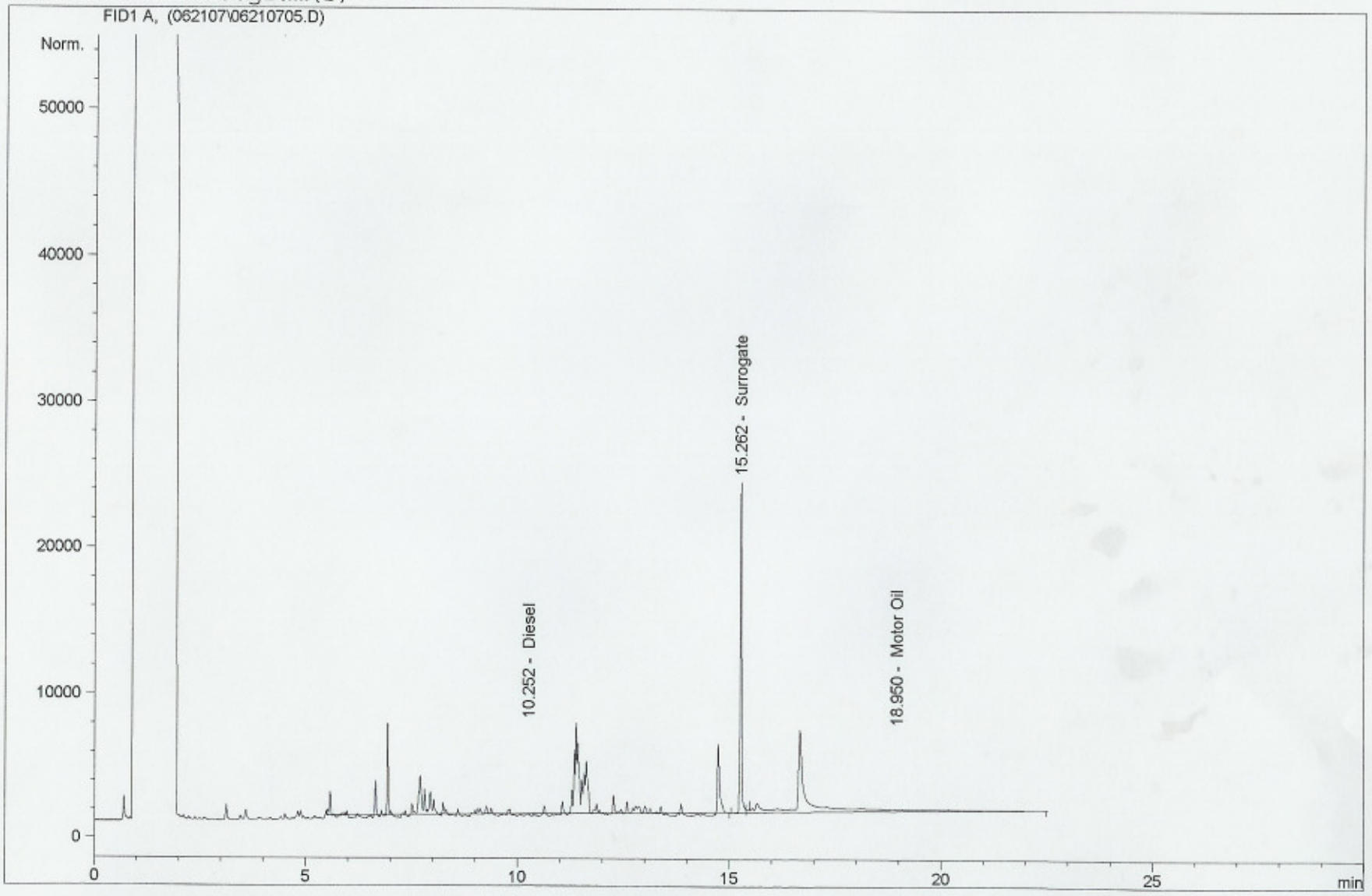
File :C:\MSDChem\1\DATA\2007-Jun-19-1815.b\19200704.D
Operator : dh
Acquired : 19 Jun 2007 8:35 pm using AcqMethod OXY21506.M
Instrument : PAL GCMS
Sample Name: BF72001-BS1@gas
Misc Info :
Vial Number: 4



Print of window 38: Current Chromatogram(s)

| | | | |
|---|---|---|---|
| Injection Date | : 6/21/07 9:12:45 PM | Seq. Line | : 4 |
| Sample Name | : BF71901-BLK1 | Vial | : 3 |
| Acq. Operator | : jz | Inj | : 1 |
| | | Inj Volume | : 2 ul |
| Method | : C:\HPCHEM\1\METHODS\GC100206.M | | |
| Last changed | : 6/2/07 3:16:12 PM by jz | | |

Current Chromatogram(s)



Print of window 38: Current Chromatogram(s)

| | | | |
|---|---|---|---|
| Injection Date | : 6/21/07 9:44:32 PM | Seq. Line | : 5 |
| Sample Name | : BF71901-BS1 | Vial | : 4 |
| Acq. Operator | : jz | Inj | : 1 |
| | | Inj Volume | : 2 ul |
| Method | : C:\HPCHEM\1\METHODS\GC100206.M | | |
| Last changed | : 6/2/07 3:16:12 PM by jz | | |

Current Chromatogram(s)