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**ENVIRONMENTAL ENGINEERING, INC.**  
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January 16, 2013

Ms. Karel Detterman  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Subject: Site Location: 6501 Shattuck Avenue, Oakland, CA  
**Fuel Leak Case No. RO0003066**

Dear Ms. Detterman:

SOMA's "Fourth Quarter 2012 Groundwater Monitoring Report" for the subject site 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. Please do not hesitate to call me at (925) 734-6400, if you have questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Mansour Sepehr", written over a horizontal line.

Mansour Sepehr, Ph.D., PE  
Principal Hydrogeologist



cc: Mr. Athan Magganas w/report enclosure

**Fourth Quarter 2012  
Groundwater Monitoring Report**

**6501 Shattuck Avenue  
Oakland, California**

**January 16, 2013**

**Project 5031**

**Prepared for**

**Bruder LLC  
2550 Appian Way, Suite 201  
Pinole, California, 94564**



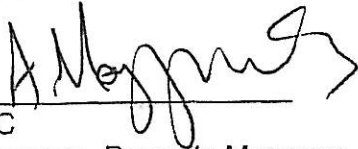
ENVIRONMENTAL ENGINEERING, INC.

6620 Owens Drive Suite A Pleasanton CA 94588 Ph: 925.734.6400 F: 925.734-6401 [www.somaenv.com](http://www.somaenv.com)

PERJURY STATEMENT

Site Location: 6501 Shattuck Avenue, Oakland, California  
Fourth Quarter 2012 Groundwater Monitoring Report

"I declare under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge".



1/15/2013

Bruder LLC  
Athan Magganis, Property Manager  
2550 Appian Way, Suite 201  
Pinole, California 94564

## CERTIFICATION

SOMA Environmental Engineering, Inc. has prepared this document for Bruder LLC, at the request of Bruder LLC property owner Mr. Athan Magganas, for the property located at 6501 Shattuck Avenue in Oakland, California to comply with requirements of the Alameda County Environmental Health Department (ACEH) for the Fourth Quarter 2012 groundwater monitoring event.



Mansour Sepehr, PhD, PE  
Principal Hydrogeologist



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- Appendix C Laboratory Report and Chain of Custody Form

# 1. INTRODUCTION

SOMA Environmental Engineering, Inc. (SOMA) has prepared this report on behalf of Bruder LLC property owner, Mr. Athan Magganas, for the site located at 6501 Shattuck Ave., Oakland, California. The site is located at the northwest quadrant of the intersection of Shattuck Avenue and 65th Street near the common municipal limits of Oakland and Berkeley, approximately 3.25 miles north-northeast of the downtown Oakland commercial district. Former underground storage tank (UST) locations and site features are shown in Figure 2.

This report summarizes results of the Fourth Quarter 2012 groundwater monitoring event conducted at the site on December 20, 2012. It includes physical and chemical properties and biodegradation parameters measured in the field for each groundwater sample and laboratory analytical results for groundwater samples.

## 1.1 Previous Activities

According to the Phase I Environmental Site Assessment Report dated January 26, 2007, prepared for the site by RGA Environmental, the site was redeveloped from a single-family residential property to a service station in 1933. The total period of operation of the service station could not be precisely determined from available historical sources, but based on the City Directory Abstract, the service station appears to have been converted to a repair shop and used car sales facility during the mid-1980s. The facility has operated as East Bay Smog Center and Auto Repair since 2000.

In September 2009, Controlled Environmental Services (CES) obtained permits for removal of six steel USTs located at the subject site. According to the report prepared by CES, dated October 23, 2009, two 1,000-gallon gasoline USTs, three 2,000-gallon gasoline USTs, and one 500-gallon waste oil UST were removed.

In June 2011, SOMA advanced six soil borings, B-4 through B-9, and collected soil and groundwater samples for analysis of TPHs and VOCs. Based on results of soil and groundwater investigation conducted in the vicinity of the former USTs, it was determined that petroleum-hydrocarbon contamination still exists in soil and groundwater beneath the site.

In October 2011, remedial excavation was conducted at the site. A total of 770 tons of PHC-impacted soils were excavated and disposed of off-site at Potrero Hills Landfill. The excavated area was backfilled and compacted with pre-tested clayey backfill material. Confirmation soil sampling indicated that all shallow

residual PHC soil contamination has been removed from the area in the vicinity of former USTs.

## **1.2 Summary of Field Activities and Laboratory Analysis**

### **1.2.1 Field Activities**

On December 20, 2012, three monitoring wells (MW-1, MW-2, and MW-3) were measured for depth to groundwater. Additional field measurements and groundwater samples were collected from all three wells. Properties measured in the field were Dissolved oxygen (DO), pH, temperature, electrical conductivity (EC), turbidity, and oxidation and reduction potential (ORP). This monitoring event was conducted in accordance with procedures and guidelines of Alameda County Environmental Health Department (ACEHD).

To evaluate the state of biodegradation processes in the subsurface, biodegradation parameters such as dissolved oxygen (DO), turbidity, and oxidation reduction potential (ORP) were measured.

Figure 2 shows well locations. Appendix A details groundwater monitoring procedures followed during this event.

Purged groundwater was temporarily stored on-site in a 55-gallon drum.

### **1.2.2 Laboratory Analysis**

Curtis and Tompkins Laboratories, a California state-certified laboratory, analyzed groundwater samples for the following: TPH-g, TPH as diesel (TPH-d), and TPH as motor Oil (TPH-mo); Full list of VOCs by EPA Method 8260 (including BTEX (benzene, toluene, ethylbenzene, and total xylenes), and MtBE). TPH-g, TPH-d, and TPH-mo were analyzed using EPA Method 8015B.

## **2. RESULTS**

Results of field measurements and laboratory analyses for the groundwater monitoring event conducted on December 20, 2012 follow below.

### **2.1 Field Measurements**

Monitoring wells MW-1 through MW-3 were measured for depth to groundwater (Table 1). Depths ranged from 2.94 feet in MW-1 to 6.61 feet in MW-2. Groundwater elevations ranged from 123.71 feet in MW-2 to 126.79 feet in MW-3.



Figure 3 displays the groundwater elevation contour map. The groundwater flow direction is northwesterly at a gradient of approximately 0.087 feet/feet. Since the previous monitoring event (September 2012), Groundwater flow direction has shifted from westerly to northwesterly and the gradient has increased. Appendix B shows field measurements, biodegradation parameter measurements and gradient calculations.

The more positive the redox potential of an electron acceptor, the more energetically favorable is the reaction utilizing that electron acceptor. The most energetically preferred electron acceptor for redox reactions is DO. Negative redox potentials indicate that contaminants in the groundwater are conducive to anaerobic biodegradation. Positive redox potentials are more energetically favorable in utilizing electron acceptors during chemical reactions. This promotes the removal of organic mass from the contaminated groundwater by indigenous bacteria in the subsurface during the release of the transfer of electrons. Evaluating the distribution of electron acceptors can provide evidence of where, and to what extent, hydrocarbon biodegradation is occurring.

Once stabilization of the existing aquifer was achieved, upon terminating the purge cycle at each well, DO and ORP readings were as follows: DO ranged from 0.42 mg/L in MW-2 to 0.66 mg/L in MW-1. ORP showed positive redox potentials in MW-1 and MW-3 and negative redox potential in MW-2.

## **2.2 Laboratory Analysis**

Groundwater analytical data for this monitoring event is shown in Table 1. Appendix C includes the laboratory report and chain of custody form.

TPH-g was detected in MW-2 at 76 µg/L and was below laboratory-reporting limits in MW-1 and MW-3. Figure 4 shows a map of TPH-g concentrations in groundwater. Since the previous monitoring event (September 2012), TPH-g has increased from below laboratory-reporting limit to 76 µg/L.

During analytical testing of TPH-g, groundwater sample from MW-2 exhibited chromatographic pattern that did not resemble standard. Refer to the laboratory report in Appendix C for further clarification of gasoline testing and results.

1,2-DCA was detected in MW-1 at a low level of 0.9 µg/L and was below laboratory-reporting limits in MW-2 and MW-3. Figure 4 shows a map of 1,2-DCA concentrations in groundwater. Since the previous monitoring event (September 2012), 1,2-DCA has decreased from 1.3 µg/L to 0.9 µg/L.

TPH-d, TPH-mo, and all other VOCs were below laboratory reporting-limit in MW-1, MW-2, and MW-3, similar to the previous monitoring event (September 2012).

### **3. CONCLUSIONS AND RECOMMENDATIONS**

Conclusions and recommendations based on results of Fourth Quarter 2012 groundwater monitoring are summarized below.

- In general, the groundwater flow direction is northwesterly at a gradient of 0.087 feet/feet.
- TPH-g has increased in MW-2 from below laboratory-reporting limit to 76 µg/L and 1,2-DCA has decreased in MW-1 from 1.3 µg/L to 0.9 µg/L, since the previous monitoring event (September 2012).
- Other contaminant concentrations were below laboratory reporting-limits in all monitoring wells.
- SOMA recommends conducting two more rounds of groundwater monitoring in order to complete four quarterly groundwater monitoring events at the site as previously recommended in the Remedial excavation report dated January 9, 2012.

### **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 Curtis and Tompkins, Laboratories for the current groundwater monitoring event. Quantities 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 services were provided in accordance with generally accepted environmental engineering and consulting practices at the time of this sampling.

# Figures

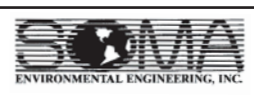


**SITE:**  
6501 Shattuck Ave,  
Oakland, CA



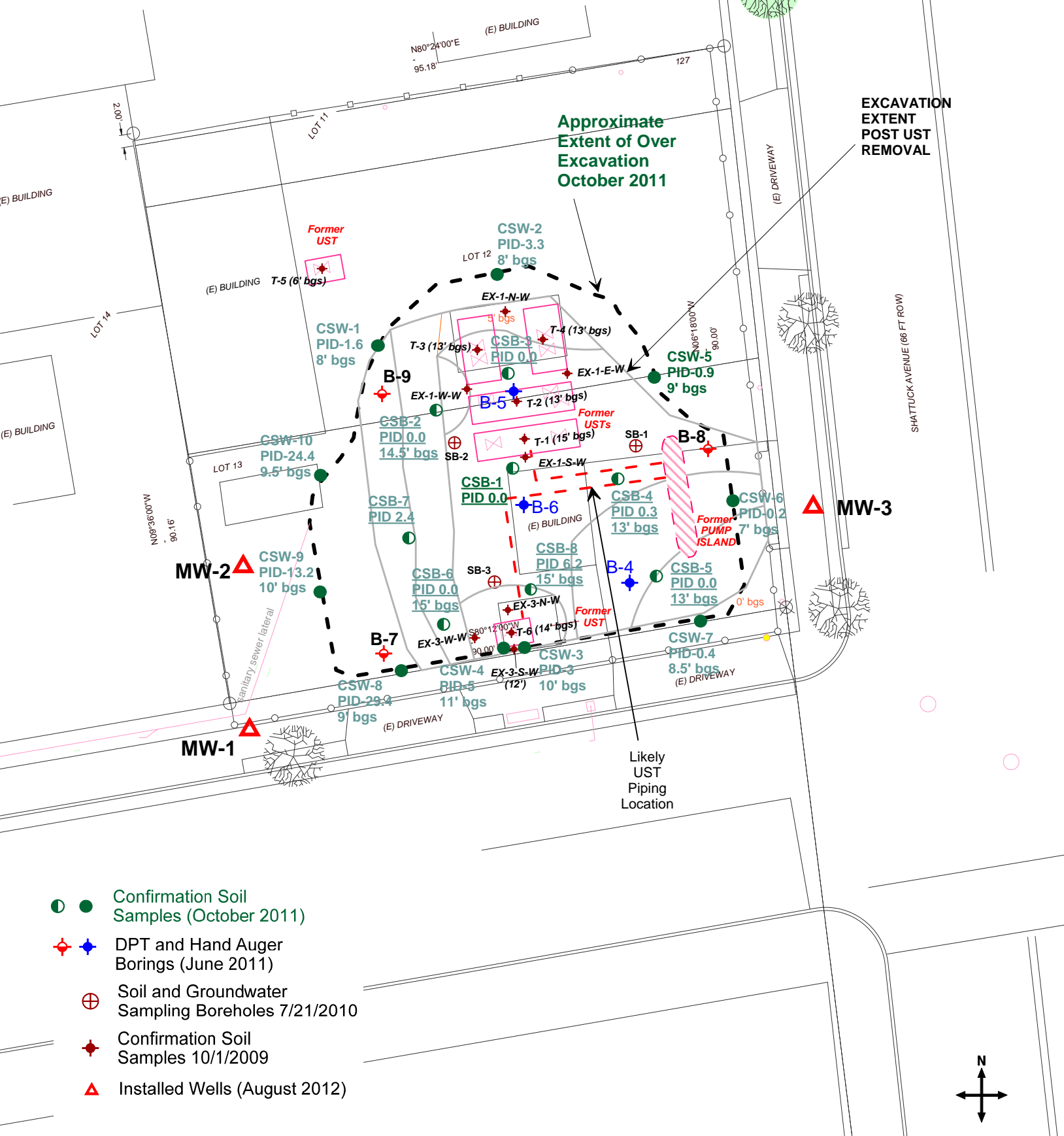
approximate scale in feet  
0 50 100

Figure 1: Site vicinity map.



2996 SHATTUCK AVENUE-  
groundwater flow predominantly  
westerly, DTW 2.3-8.5' bgs

6407 TELEGRAPH-  
groundwater flow southwest,  
DTW 5-8' bgs



- Confirmation Soil Samples (October 2011)
- ✦ ✦ DPT and Hand Auger Borings (June 2011)
- ⊕ Soil and Groundwater Sampling Boreholes 7/21/2010
- ✦ Confirmation Soil Samples 10/1/2009
- ▲ Installed Wells (August 2012)

approximate scale in feet

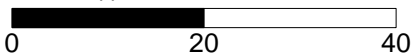


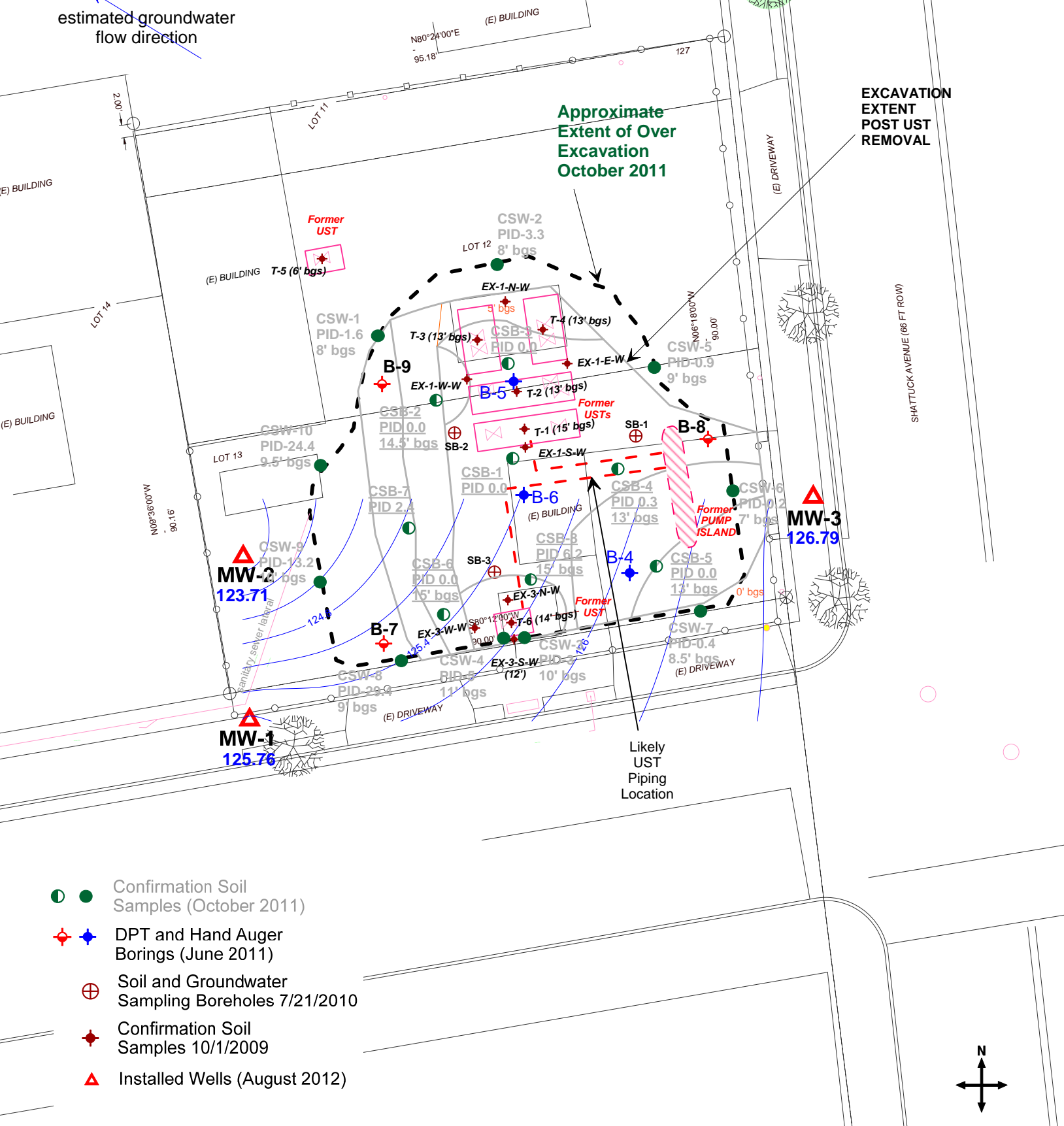
Figure 2: Site map showing excavation extent, locations of former USTs, soil borings and groundwater monitoring wells



2996 SHATTUCK AVENUE-  
groundwater flow predominantly  
westerly, DTW 2.3-8.5' bgs

6407 TELEGRAPH-  
groundwater flow southwest,  
DTW 5-8' bgs

estimated groundwater  
flow direction



2996 SHATTUCK AVENUE-  
groundwater flow predominantly  
westerly, DTW 2.3-8.5' bgs

6407 TELEGRAPH-  
groundwater flow southwest,  
DTW 5-8' bgs

estimated groundwater  
flow direction

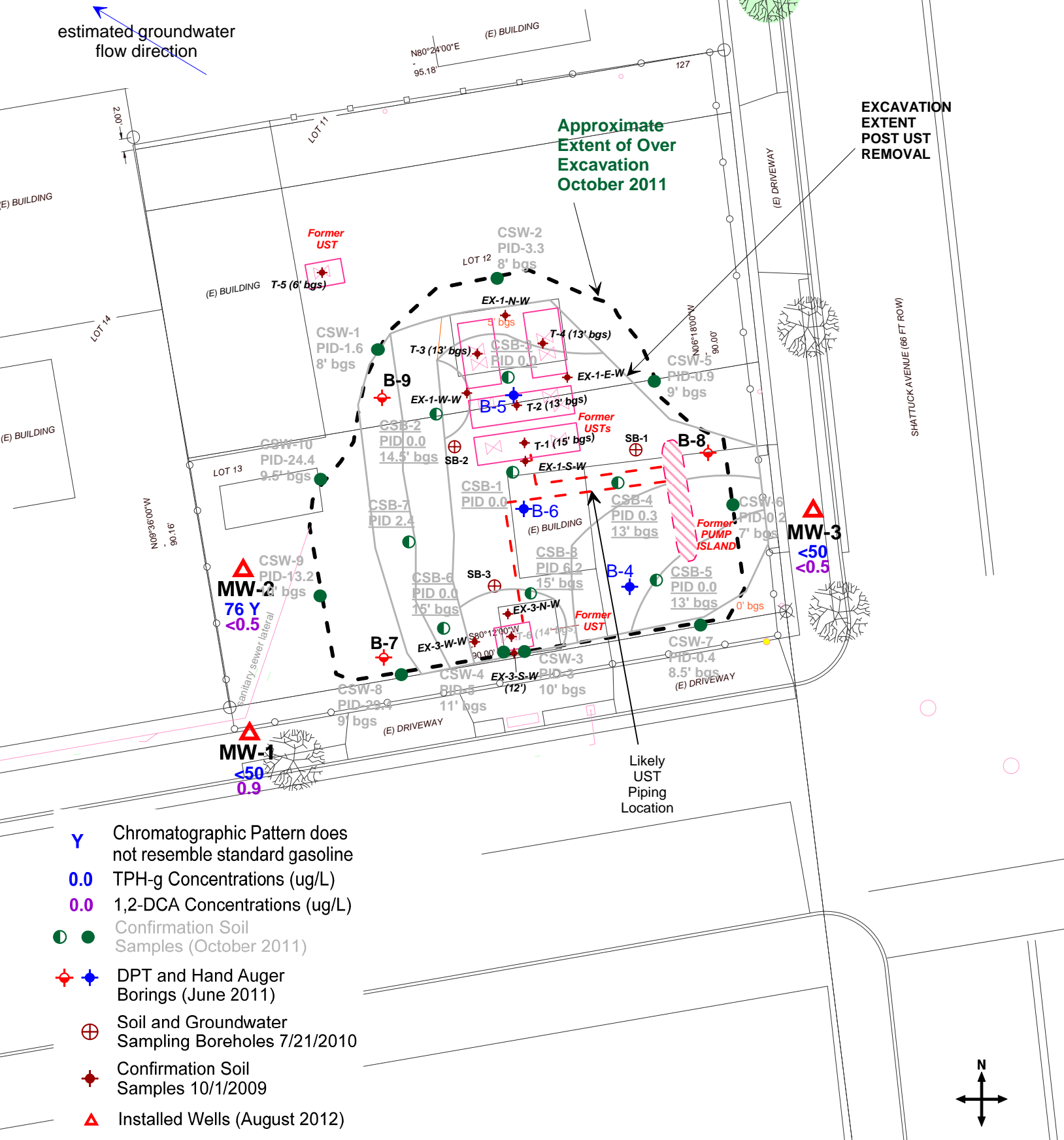


Figure 4: Map showing TPH-g and 1,2-DCA concentrations in groundwater, December 20, 2012

# Tables



**Table 1**  
**Groundwater Analytical Results**  
**6501 Shattuck Ave, Oakland, CA**

Monitoring Well	Date	Top of Casing Elevation (Ft.)	Depth to Groundwater (Ft.)	Groundwater Elevation	TPH-g µg/L	TPH-d µg/L	TPH-mo µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MtBE µg/L	1,2-DCA µg/L	EDB µg/L
MW-1	9/11/2012	128.70	6.14	122.56	<50	<52	<310	<0.5	<0.5	<0.5	<0.5	<0.5	1.30	<0.5
	12/20/2012	128.70	2.94	125.76	<50	<51	<310	<0.5	<0.5	<0.5	<0.5	<0.5	0.90	<0.5
MW-2	9/11/2012	130.32	7.81	122.51	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	12/20/2012	130.32	6.61	123.71	76 <sup>y</sup>	<51	<310	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-3	9/11/2012	131.34	7.89	123.45	<50	<53	<320	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	12/20/2012	131.34	4.55	126.79	<50	<51	<310	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Note:

< : Below Laboratory Reporting Limit (Method Detection Limit)

All other VOCs were below laboratory-reporting limits in groundwater samples

# Appendix A

## Standard Operating Procedures for Conducting Groundwater Monitoring Activities

# Standard Operating Procedures for Conducting Groundwater Monitoring Activities

## Water Level Measurements

Prior to measurement of groundwater depth at each well, equalization with the surrounding aquifer must be achieved. Initially, the well cap is removed and the pressure is allowed to dissipate, creating a more stable water table level within the well. After about 10-15 minutes, once the water level in the well stabilizes, the depth to groundwater is measured from the top of the casing to the nearest 0.01 foot using an electric sounder.

## Purging and Field Measurements

Prior to sample collection, each well is purged using a battery-operated, 2-inch-diameter pump (Model ES-60 DC). During purging, groundwater is measured for parameters such as dissolved oxygen (DO), pH, temperature, electrical conductivity (EC), and oxygen-reduction potential (ORP) using a Hanna HI-9828 multi-parameter instrument. Turbidity is measured using a Hanna HI-98703 portable turbidimeter. The equipment is calibrated at the Site using standard solutions and procedures provided by the manufacturer.

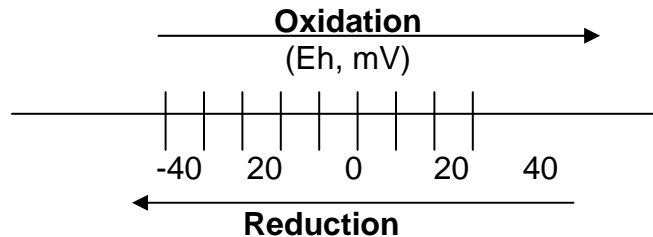
The pH of groundwater has an effect on the activity of microbial populations in the groundwater. The groundwater temperature affects the metabolic activity of bacteria. The groundwater EC is directly related to the concentration of total dissolved solids (TDS) in solution.

There is a strong correlation between the turbidity level and the biological oxygen demand of natural water bodies. The main purpose for checking the turbidity level is to provide a general overview of the extent of the suspended solids in the groundwater.

ORP is the measure of the potential for an oxidation or reduction process to occur. In the oxidation process, a molecule or ion loses one or several electrons. In the reduction process, a molecule or ion gains one or several electrons. The unit of the redox potential is the volt or millivolt. The most important redox reaction in petroleum-contaminated groundwater is the oxidation of petroleum hydrocarbons in the presence of bacteria and free molecular oxygen. Because the solubility of O<sub>2</sub> in water is low (9 mg/L at 25 °C and 11 mg/L at 5 °C), and because the rate of O<sub>2</sub> replenishment in subsurface environments is limited, DO can be entirely consumed when the oxidation of only a small amount of petroleum hydrocarbons occurs.

Oxidation of petroleum hydrocarbons can still occur when all the dissolved O<sub>2</sub> in the groundwater is consumed; however, the oxidizing agents (i.e., the constituents that undergo reduction) now become NO<sub>3</sub><sup>-</sup>, MnO<sub>2</sub>, Fe (OH)<sub>3</sub>, SO<sub>4</sub><sup>2-</sup>

and others (Freeze and Cherry, 1979). As these oxidizing agents are consumed, the groundwater environment becomes more and more reduced. If the process advances far enough, the environment may become so strongly reduced that the petroleum hydrocarbons undergo anaerobic degradation, resulting in the production of methane and carbon dioxide. The concept of oxidation and reduction in terms of changes in oxidation states is illustrated below.



Purging of wells continues until the parameters for DO, pH, temperature, EC, turbidity, and redox stabilize, or three casing volumes are purged.

Once stabilization occurs, the groundwater samples are also tested on-site for ferrous iron ( $\text{Fe}^{+2}$ ), nitrate ( $\text{NO}_3^-$ ), and sulfate ( $\text{SO}_4^{-2}$ ) concentrations.

$\text{Fe}^{+2}$ ,  $\text{NO}_3^-$ , and  $\text{SO}_4^{-2}$  are measured colorimetrically using the Hach Colorimeter Model 890, a microprocessor-controlled photometer suitable for colorimetric testing in the laboratory or the field. The required reagents for each specific test are provided in AccuVac ampuls.

## Sampling

For sampling purposes, after purging a disposable polyethylene bailer is used to collect sufficient samples from each monitoring well for laboratory analyses. Groundwater samples are transferred into 40-mL VOA vials and preserved with hydrochloric acid. The vials are sealed to prevent air bubbles from developing within the headspace. For TPH-d analysis, groundwater samples are collected using 1-L or 500-mL, amber, nonpreserved glass containers. Samples are placed in an ice-filled cooler and maintained at 4°C. A chain of custody form for all samples is prepared to accompany the samples, which are promptly delivered to a California state-certified analytical laboratory.

# Appendix B

Tables of elevations and coordinates on wells, Field Measurements of Physical, Chemical and Biodegradation Parameters of the Groundwater Samples and Groundwater Gradient Calculations





ENVIRONMENTAL ENGINEERING, INC

Well No.: MW-1  
 Casing Diameter: 2 inch  
 Depth of Well: 24.29 ft  
 Top of Casing Elevation: 128.70 ft  
 Depth to Groundwater: 2.94 ft  
 Groundwater Elevation: 125.76 ft  
 Water Column Height: 21.35 ft  
 Purged Volume: 9 gallons

Project No.: 5031  
 Address: 6501 Shattuck Avenue  
 Oakland, CA  
 Date: December 20, 2012  
 Sampler: Lizzie Hightower

Purging Method: Bailer

Pump  Geotech

Sampling Method: Bailer

Pump  Geotech

Color: No

Yes  Describe

Sheen: No

Yes  Describe

Odor: No

Yes  Describe

Field Measurements:

Time	Volume (gallons)	D.O. mg/L	pH	Temp °C	E.C. (µS/cm)	Turb. NTU	ORP
12:33	Started purging well						
12:39	1	2.78	6.89	18.37	726	13.5	+398.2
12:45	3	1.42	6.87	18.14	717	9.29	+456.3
12:51	5	0.96	6.93	18.28	790	10.1	+445.0
12:57	7	0.78	6.95	18.32	867	11.1	+412.9
13:03	9	0.66	6.97	18.38	864	11.0	+392.8
13:08	Sampled						

Notes:



ENVIRONMENTAL ENGINEERING, INC

Well No.: MW-2  
 Casing Diameter: 2 inch  
 Depth of Well: 24.64 ft  
 Top of Casing Elevation: 130.32 ft  
 Depth to Groundwater: 6.61 ft  
 Groundwater Elevation: 123.71 ft  
 Water Column Height: 18.03 ft  
 Purged Volume: 7 gallons

Project No.: 5031  
 Address: 6501 Shattuck Avenue  
 Oakland, CA  
 Date: December 20, 2012  
 Sampler: Lizzie Hightower

Purging Method: Bailer  Pump  Geotch  
 Sampling Method: Bailer  Pump  Geotch  
 Color: No  Yes  Describe Cloudy  
 Sheen: No  Yes  Describe  
 Odor: No  Yes  Describe

Field Measurements:

Time	Volume (gallons)	D.O. mg/L	pH	Temp °C	E.C. (µS/cm)	Turb. NTU	ORP
11:38	Started purging well						
11:44	1	0.97	7.17	17.28	855	46.4	-10.4
11:50	2	0.55	7.15	17.29	856	34.2	-25.6
11:56	5	0.46	7.15	17.33	853	17.8	-31.9
12:02	7	0.42	7.15	17.35	849	20.8	-30.5
12:07	Sampled						

Notes:





ENVIRONMENTAL ENGINEERING, INC

Well No.: MW-3  
 Casing Diameter: 2 inch  
 Depth of Well: 24.80 ft  
 Top of Casing Elevation: 131.34 ft  
 Depth to Groundwater: 4.55 ft  
 Groundwater Elevation: 126.79 ft  
 Water Column Height: 20.25 ft  
 Purged Volume: 6 gallons

Project No.: 5031  
 Address: 6501 Shattuck Avenue  
 Oakland, CA  
 Date: December 20, 2012  
 Sampler: Lizzie Hightower

Purging Method: Bailer  Pump  Geotech  
 Sampling Method: Bailer  Pump  Geotech  
 Color: No  Yes  Describe Cloudy  
 Sheen: No  Yes  Describe  
 Odor: No  Yes  Describe

Field Measurements:

Time	Volume (gallons)	D.O. (mg/L)	pH	Temp (°C)	E.C. (µS/cm)	Turb. NTU	ORP
10:15	Started purging well						
10:21	1	2.24	7.08	18.62	634	261	+192.4
10:27	2	1.55	7.01	18.62	580	47.2	+181.3
10:33	3	0.81	6.90	18.63	561	40.7	+174.2
10:39	4	0.67	6.98	18.63	583	66.3	+172.2
10:45	5	0.57	7.00	18.63	588	153	+174.2
10:51	6	0.52	6.99	18.62	565	272	+175.3
10:56	Sampled						

Notes:

# EPA On-line Tools for Site Assessment Calculation

## Hydraulic Gradient -- Magnitude and Direction

Gradient Calculation from fitting a plane to as many as thirty points

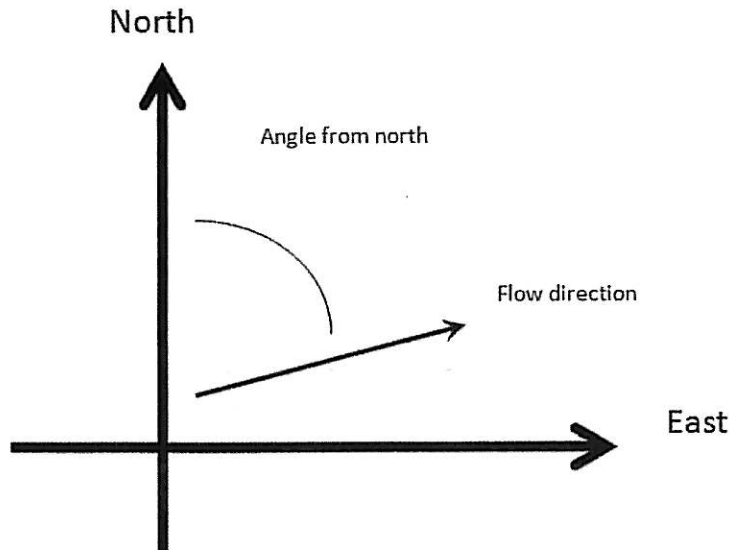
$$\begin{aligned}
 a x_1 + b y_1 + c &= h_1 \\
 a x_2 + b y_2 + c &= h_2 \\
 a x_3 + b y_3 + c &= h_3 \\
 &\dots \\
 a x_{30} + b y_{30} + c &= h_{30}
 \end{aligned}$$

where  $(x_i, y_i)$  are the coordinates of the well and  $h_i$  is the head

$i = 1, 2, 3, \dots, 30$

The coefficients a, b, and c are calculated by a least-squares fitting of the the data to a plane

The gradient is calculated from the square root of  $(a^2 + b^2)$  and the angle from the arctangent of a/b or b/a depending on the quadrant



### Inputs

Example Data Set 1 Example Data Set 2 Calculate Clear

Save Data Recall Data Go Back

Site Name

Date  Current Date

Calculation basis

Coordinates

I.D.	x-coordinate	y-coordinate	head	ft
1) MW-1	6775.300744	4740.653962	125.76	
2) MW-2	6774.282756	4766.867171	123.71	
3) MW-3	6865.138245	4776.029069	126.79	
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				

15)			
16)			
17)			
18)			
19)			
20)			
21)			
22)			
23)			
24)			
25)			
26)			
27)			
28)			
29)			
30)			

**Results**

Number of Points Used in Calculation	3
Max. Difference Between Head Values	0.9388
Gradient Magnitude (i)	0.08717
Flow direction as degrees from North (positive y axis)	331.5
Coefficient of Determination (R <sup>2</sup> )	1.00

WQMS

Last updated on 1/16/2013

# Appendix C

## Laboratory Report and Chain of Custody Form



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 242117  
ANALYTICAL REPORT

SOMA Environmental Engineering Inc. 6620 Owens Dr. Pleasanton, CA 94588	Project : 5031 Location : 6501 Shattuck Ave., Oakland Level : II
---	--

<u>Sample ID</u>	<u>Lab ID</u>
MW-1	242117-001
MW-2	242117-002
MW-3	242117-003

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 signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: *Desiree N. Tetrault*  
Desiree N. Tetrault  
Project Manager  
(510) 486-0900

Date: 01/02/2013

NELAP # 01107CA

**CASE NARRATIVE**

Laboratory number: 242117  
Client: SOMA Environmental Engineering Inc.  
Project: 5031  
Location: 6501 Shattuck Ave., Oakland  
Request Date: 12/21/12  
Samples Received: 12/21/12

This data package contains sample and QC results for three water samples, requested for the above referenced project on 12/21/12. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B):**

No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

No analytical problems were encountered.



COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 242117 Date Received 12/21/12 Number of coolers 1
Client SOMA Project 6501 Shestak
Date Opened 12/21/12 By (print) [Signature] (sign) [Signature]
Date Logged in 12/26/12 By (print) [Signature] (sign) [Signature]

1. Did cooler come with a shipping slip (airbill, etc) YES NO
Shipping info

2A. Were custody seals present? ... YES (circle) on cooler on samples NO
How many Name Date

2B. Were custody seals intact upon arrival? YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe)

- Bubble Wrap, Cloth material, Foam blocks, Cardboard, Bags, Styrofoam, None, Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C

Type of ice used: Wet Blue/Gel None Temp(°C)

Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO

If YES, what time were they transferred to freezer?

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES NO

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO N/A

16. Did you check preservatives for all bottles for each sample? YES NO N/A

17. Did you document your preservative check? YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? YES NO N/A

21. Was the client contacted concerning this sample delivery? YES NO

If YES, Who was called? By Date:

COMMENTS

Blank lines for handwritten comments.





## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	242117	Location:	6501 Shattuck Ave., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5031	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC671309	Batch#:	194141
Matrix:	Water	Analyzed:	12/26/12
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	905.3	91	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	103	75-124

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	242117	Location:	6501 Shattuck Ave., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5031	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	194141
MSS Lab ID:	242102-002	Sampled:	12/20/12
Matrix:	Water	Received:	12/21/12
Units:	ug/L	Analyzed:	12/26/12
Diln Fac:	1.000		

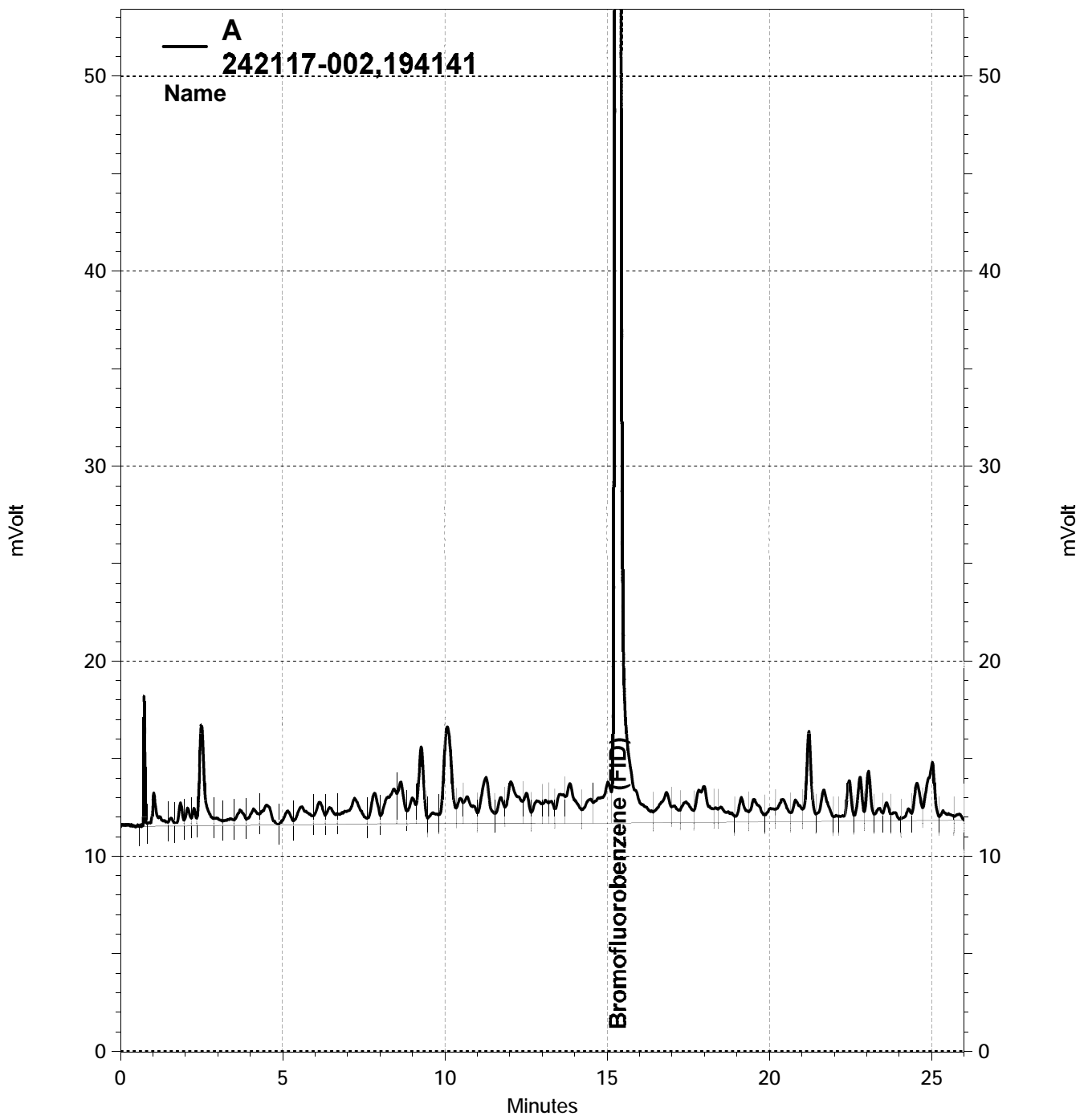
Type: MS Lab ID: QC671311

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	35.09	2,000	1,980	97	71-120
Surrogate	%REC	Limits			
Bromofluorobenzene (FID)	103	75-124			

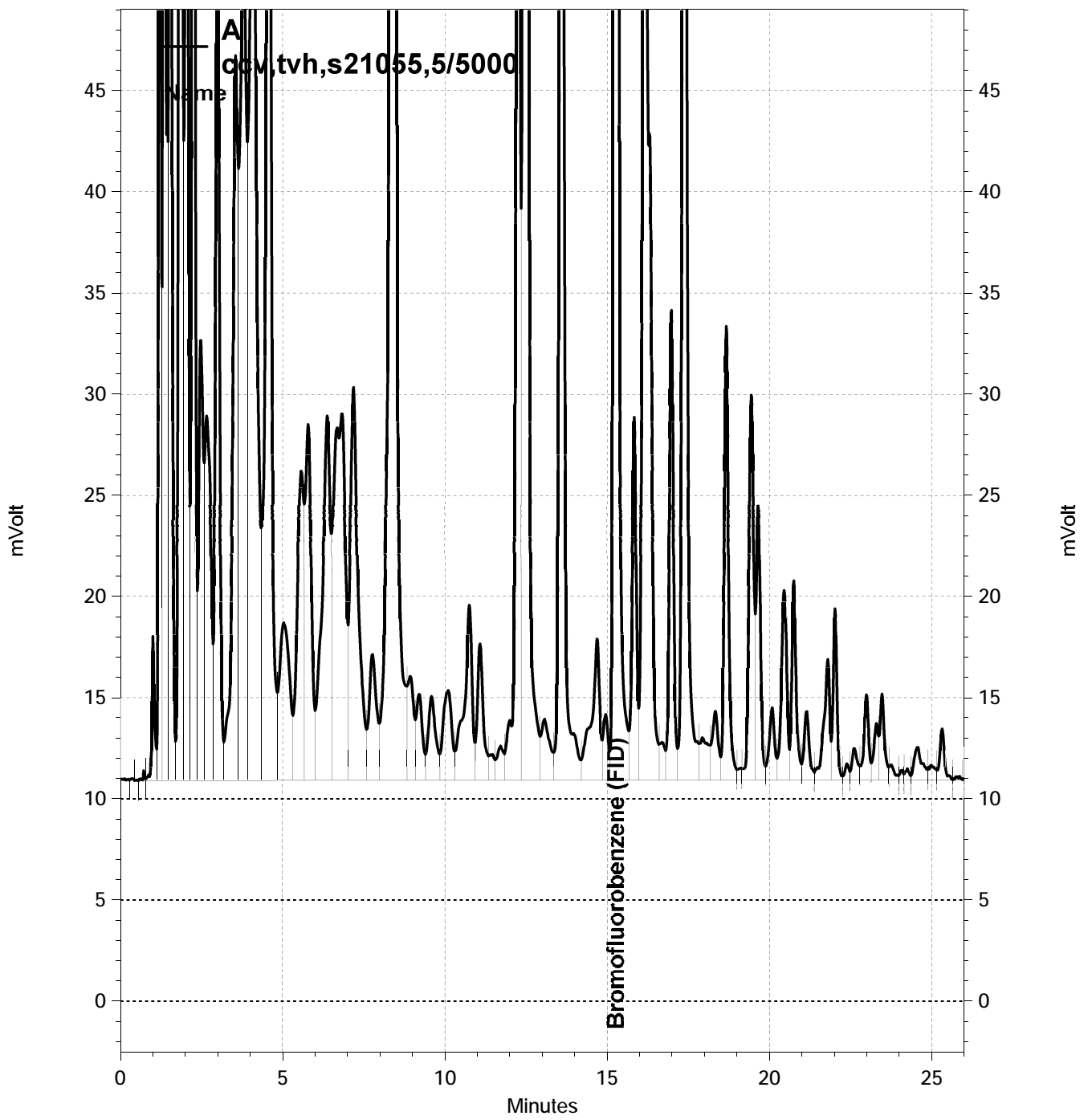
Type: MSD Lab ID: QC671312

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,977	97	71-120	0	22
Surrogate	%REC	Limits				
Bromofluorobenzene (FID)	104	75-124				

RPD= Relative Percent Difference



— \\Lims\gdrive\ezchrom\Projects\GC07\Data\361-030, A



— \\Lims\gdrive\ezchrom\Projects\GC07\Data\361-006, A



Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	242117	Location:	6501 Shattuck Ave., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	5031	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	194140
Units:	ug/L	Prepared:	12/26/12
Diln Fac:	1.000	Analyzed:	12/27/12

Type: BS Cleanup Method: EPA 3630C  
 Lab ID: QC671305

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,264	91	60-120

Surrogate	%REC	Limits
o-Terphenyl	112	61-134

Type: BSD Cleanup Method: EPA 3630C  
 Lab ID: QC671306

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,173	87	60-120	4	35

Surrogate	%REC	Limits
o-Terphenyl	107	61-134

RPD= Relative Percent Difference

### Purgeable Organics by GC/MS

Lab #: 242117	Location: 6501 Shattuck Ave., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5031	Analysis: EPA 8260B
Field ID: MW-1	Batch#: 194189
Lab ID: 242117-001	Sampled: 12/20/12
Matrix: Water	Received: 12/21/12
Units: ug/L	Analyzed: 12/28/12
Diln Fac: 1.000	

Analyte	Result	RL
Freon 12	ND	1.0
Chloromethane	ND	1.0
Vinyl Chloride	ND	0.5
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	1.0
Acetone	ND	10
Freon 113	ND	2.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	10
Carbon Disulfide	ND	0.5
MTBE	ND	0.5
trans-1,2-Dichloroethene	ND	0.5
Vinyl Acetate	ND	10
1,1-Dichloroethane	ND	0.5
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	0.5
2,2-Dichloropropane	ND	0.5
Chloroform	ND	0.5
Bromochloromethane	ND	0.5
1,1,1-Trichloroethane	ND	0.5
1,1-Dichloropropene	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	0.9	0.5
Benzene	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
Dibromomethane	ND	0.5
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	0.5
Toluene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
2-Hexanone	ND	10
1,3-Dichloropropane	ND	0.5
Tetrachloroethene	ND	0.5

ND= Not Detected  
 RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #: 242117	Location: 6501 Shattuck Ave., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5031	Analysis: EPA 8260B
Field ID: MW-1	Batch#: 194189
Lab ID: 242117-001	Sampled: 12/20/12
Matrix: Water	Received: 12/21/12
Units: ug/L	Analyzed: 12/28/12
Diln Fac: 1.000	

Analyte	Result	RL
Dibromochloromethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Chlorobenzene	ND	0.5
1,1,1,2-Tetrachloroethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Styrene	ND	0.5
Bromoform	ND	1.0
Isopropylbenzene	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,2,3-Trichloropropane	ND	0.5
Propylbenzene	ND	0.5
Bromobenzene	ND	0.5
1,3,5-Trimethylbenzene	ND	0.5
2-Chlorotoluene	ND	0.5
4-Chlorotoluene	ND	0.5
tert-Butylbenzene	ND	0.5
1,2,4-Trimethylbenzene	ND	0.5
sec-Butylbenzene	ND	0.5
para-Isopropyl Toluene	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
n-Butylbenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5
1,2-Dibromo-3-Chloropropane	ND	2.0
1,2,4-Trichlorobenzene	ND	0.5
Hexachlorobutadiene	ND	2.0
Naphthalene	ND	2.0
1,2,3-Trichlorobenzene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-127
1,2-Dichloroethane-d4	106	69-148
Toluene-d8	101	80-120
Bromofluorobenzene	104	80-121

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #: 242117	Location: 6501 Shattuck Ave., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5031	Analysis: EPA 8260B
Field ID: MW-2	Batch#: 194189
Lab ID: 242117-002	Sampled: 12/20/12
Matrix: Water	Received: 12/21/12
Units: ug/L	Analyzed: 12/28/12
Diln Fac: 1.000	

Analyte	Result	RL
Freon 12	ND	1.0
Chloromethane	ND	1.0
Vinyl Chloride	ND	0.5
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	1.0
Acetone	ND	10
Freon 113	ND	2.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	10
Carbon Disulfide	ND	0.5
MTBE	ND	0.5
trans-1,2-Dichloroethene	ND	0.5
Vinyl Acetate	ND	10
1,1-Dichloroethane	ND	0.5
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	0.5
2,2-Dichloropropane	ND	0.5
Chloroform	ND	0.5
Bromochloromethane	ND	0.5
1,1,1-Trichloroethane	ND	0.5
1,1-Dichloropropene	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
Dibromomethane	ND	0.5
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	0.5
Toluene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
2-Hexanone	ND	10
1,3-Dichloropropane	ND	0.5
Tetrachloroethene	ND	0.5

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #: 242117	Location: 6501 Shattuck Ave., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5031	Analysis: EPA 8260B
Field ID: MW-2	Batch#: 194189
Lab ID: 242117-002	Sampled: 12/20/12
Matrix: Water	Received: 12/21/12
Units: ug/L	Analyzed: 12/28/12
Diln Fac: 1.000	

Analyte	Result	RL
Dibromochloromethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Chlorobenzene	ND	0.5
1,1,1,2-Tetrachloroethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Styrene	ND	0.5
Bromoform	ND	1.0
Isopropylbenzene	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,2,3-Trichloropropane	ND	0.5
Propylbenzene	ND	0.5
Bromobenzene	ND	0.5
1,3,5-Trimethylbenzene	ND	0.5
2-Chlorotoluene	ND	0.5
4-Chlorotoluene	ND	0.5
tert-Butylbenzene	ND	0.5
1,2,4-Trimethylbenzene	ND	0.5
sec-Butylbenzene	ND	0.5
para-Isopropyl Toluene	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
n-Butylbenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5
1,2-Dibromo-3-Chloropropane	ND	2.0
1,2,4-Trichlorobenzene	ND	0.5
Hexachlorobutadiene	ND	2.0
Naphthalene	ND	2.0
1,2,3-Trichlorobenzene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	108	80-127
1,2-Dichloroethane-d4	107	69-148
Toluene-d8	100	80-120
Bromofluorobenzene	104	80-121

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #: 242117	Location: 6501 Shattuck Ave., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5031	Analysis: EPA 8260B
Field ID: MW-3	Batch#: 194189
Lab ID: 242117-003	Sampled: 12/20/12
Matrix: Water	Received: 12/21/12
Units: ug/L	Analyzed: 12/28/12
Diln Fac: 1.000	

Analyte	Result	RL
Freon 12	ND	1.0
Chloromethane	ND	1.0
Vinyl Chloride	ND	0.5
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	1.0
Acetone	ND	10
Freon 113	ND	2.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	10
Carbon Disulfide	ND	0.5
MTBE	ND	0.5
trans-1,2-Dichloroethene	ND	0.5
Vinyl Acetate	ND	10
1,1-Dichloroethane	ND	0.5
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	0.5
2,2-Dichloropropane	ND	0.5
Chloroform	ND	0.5
Bromochloromethane	ND	0.5
1,1,1-Trichloroethane	ND	0.5
1,1-Dichloropropene	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
Dibromomethane	ND	0.5
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	0.5
Toluene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
2-Hexanone	ND	10
1,3-Dichloropropane	ND	0.5
Tetrachloroethene	ND	0.5

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #: 242117	Location: 6501 Shattuck Ave., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5031	Analysis: EPA 8260B
Field ID: MW-3	Batch#: 194189
Lab ID: 242117-003	Sampled: 12/20/12
Matrix: Water	Received: 12/21/12
Units: ug/L	Analyzed: 12/28/12
Diln Fac: 1.000	

Analyte	Result	RL
Dibromochloromethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Chlorobenzene	ND	0.5
1,1,1,2-Tetrachloroethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Styrene	ND	0.5
Bromoform	ND	1.0
Isopropylbenzene	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,2,3-Trichloropropane	ND	0.5
Propylbenzene	ND	0.5
Bromobenzene	ND	0.5
1,3,5-Trimethylbenzene	ND	0.5
2-Chlorotoluene	ND	0.5
4-Chlorotoluene	ND	0.5
tert-Butylbenzene	ND	0.5
1,2,4-Trimethylbenzene	ND	0.5
sec-Butylbenzene	ND	0.5
para-Isopropyl Toluene	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
n-Butylbenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5
1,2-Dibromo-3-Chloropropane	ND	2.0
1,2,4-Trichlorobenzene	ND	0.5
Hexachlorobutadiene	ND	2.0
Naphthalene	ND	2.0
1,2,3-Trichlorobenzene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	108	80-127
1,2-Dichloroethane-d4	107	69-148
Toluene-d8	102	80-120
Bromofluorobenzene	103	80-121

ND= Not Detected  
 RL= Reporting Limit



**Batch QC Report**

<b>Purgeable Organics by GC/MS</b>			
Lab #:	242117	Location:	6501 Shattuck Ave., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5031	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC671495	Batch#:	194189
Matrix:	Water	Analyzed:	12/28/12
Units:	ug/L		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
Freon 12	ND	1.0
Chloromethane	ND	1.0
Vinyl Chloride	ND	0.5
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	1.0
Acetone	ND	10
Freon 113	ND	2.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	10
Carbon Disulfide	ND	0.5
MTBE	ND	0.5
trans-1,2-Dichloroethene	ND	0.5
Vinyl Acetate	ND	10
1,1-Dichloroethane	ND	0.5
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	0.5
2,2-Dichloropropane	ND	0.5
Chloroform	ND	0.5
Bromochloromethane	ND	0.5
1,1,1-Trichloroethane	ND	0.5
1,1-Dichloropropene	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
Dibromomethane	ND	0.5
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	0.5
Toluene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
2-Hexanone	ND	10
1,3-Dichloropropane	ND	0.5
Tetrachloroethene	ND	0.5

ND= Not Detected

RL= Reporting Limit

**Batch QC Report**

<b>Purgeable Organics by GC/MS</b>			
Lab #:	242117	Location:	6501 Shattuck Ave., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5031	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC671495	Batch#:	194189
Matrix:	Water	Analyzed:	12/28/12
Units:	ug/L		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
Dibromochloromethane	ND	0.5
1,2-Dibromoethane	ND	0.5
Chlorobenzene	ND	0.5
1,1,1,2-Tetrachloroethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Styrene	ND	0.5
Bromoform	ND	1.0
Isopropylbenzene	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,2,3-Trichloropropane	ND	0.5
Propylbenzene	ND	0.5
Bromobenzene	ND	0.5
1,3,5-Trimethylbenzene	ND	0.5
2-Chlorotoluene	ND	0.5
4-Chlorotoluene	ND	0.5
tert-Butylbenzene	ND	0.5
1,2,4-Trimethylbenzene	ND	0.5
sec-Butylbenzene	ND	0.5
para-Isopropyl Toluene	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
n-Butylbenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5
1,2-Dibromo-3-Chloropropane	ND	2.0
1,2,4-Trichlorobenzene	ND	0.5
Hexachlorobutadiene	ND	2.0
Naphthalene	ND	2.0
1,2,3-Trichlorobenzene	ND	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	106	80-127
1,2-Dichloroethane-d4	105	69-148
Toluene-d8	101	80-120
Bromofluorobenzene	103	80-121

ND= Not Detected

RL= Reporting Limit