



February 7, 2007

Project No.: 015-01-022

Manwel and Samira Shuwayhat
54 Wolfe Canyon Road
Kentfield, California 94904

Subject: Preliminary Source Area Investigation Data Submittal and Rationale for Not Installing Soil Gas Probes for Fuel Leak Case No. RO0000324, Livermore Gas and Mini-Mart, 160 Holmes Street, Livermore, California

Dear Mr. and Mrs. Shuwayhat:

On your behalf, Allterra Environmental, Inc. (Allterra) has prepared this document to provide Alameda County Environmental Health – Local Oversight Program (ACEH) with preliminary soil and groundwater data from recent source area investigation activities and provide rationale for not installing soil gas probes for the property located at 160 Holmes Street in Livermore, California (Site).

Source Area Investigation Activities

The following is a brief discussion of recent Geoprobe[®] drilling activities that were conducted at the Site in order to locate and characterize the source of hydrocarbon contamination on-site. Data collected during the investigation was reviewed and evaluated with the intention of determining the locations of soil gas probes for vapor sampling to determine the feasibility of soil vapor extraction (SVE); however, soil analytical results suggest that soil vapor sampling may not be warranted at this time.

Geoprobe[®] Borings and Sample Analyses

On January 10 and 11, 2007, Allterra supervised the installation of 20 Geoprobe[®] soil borings designated GP-1 through GP-19 and GP-6A. Boring locations are presented in Figure 1. Soil and groundwater samples collected from the borings were submitted for chemical testing to McCampbell Analytical, Inc., of Pacheco, California, a state of California certified laboratory (ELAP #1644). Soil and groundwater samples collected from Geoprobe[®] borings were analyzed for total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 8015Cm and benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8021b

Soil and Groundwater Investigation Results

Subsurface Geology and Hydrogeology

Soil conditions encountered during drilling at the Site were generally consistent with previously investigations. In general, fine-grained material was encountered from the surface to approximately 28 feet below ground surface (bgs) and course-grained material was encountered

from 28 feet to total depth (approximately 32 feet bgs). Initial groundwater was encountered at approximately 28 feet bgs and static groundwater equilibrated between 20 and 24 feet bgs, suggesting confined or partially confined aquifer conditions. A more detailed discussion of subsurface geology and hydrology and boring logs will be provided in a technical report to follow.

Soil and Groundwater Analytical Data

Soil and groundwater analytical results are presented in Tables 1 and 2 respectively. A formal presentation of the soil and groundwater data will be included in a technical report to follow. A general discussion of laboratory analytical results from soil and groundwater samples is presented below:

- Soil sample data was consistent with previous investigation data. Non-detect to relatively low levels of petroleum hydrocarbons were detected in soil samples collected above the capillary-fringe (the capillary fringe is estimated to extend from approximately 24 to 28 feet bgs). The highest levels of hydrocarbons in soil were detected at 24 and 28 feet bgs, which is within the suspected capillary fringe area.
- High levels of dissolved petroleum hydrocarbons and MTBE were detected in the majority of groundwater samples. The highest levels of dissolved TPHg (210,000 micrograms per liter [$\mu\text{g/L}$]) and MTBE (1,500,000 $\mu\text{g/L}$) were detected in samples from boring GP-14.

Discussion of Results

Results from soil samples suggest that soil vapor sampling to determine the feasibility of SVE is not warranted at this time. The rationale for not collecting soil vapor samples is as follows:

- In general, it appears as though the majority of soil contamination was excavated prior to the installation of the new USTs and fuel dispensers.
- Soil analytical data from this and previous investigations show that the majority of soil contamination occurs just above the water table in the capillary fringe zone. An example from a previous investigation is soil data from boring MB-1 that indicated TPHg levels of 78 mg/kg and 110 mg/kg at depths of 22 and 26 feet bgs, respectively.
- A remedial dual-phase extraction (DPE) pilot test was conducted at well EW-1 (located adjacent to boring MB-1) and resulting soil vapors contained non-detect to trace levels of hydrocarbons. Based on these test results, we suspect that soil vapor sampling from other on-site locations would produce similar low-level results.
- The cost of installing soil gas probes for vapor sample collection may not be warranted at this time.

Recommendations:

Based on the preliminary results of source area investigation work, Allterra recommends the following:

- Soil vapor samples not be collected; and
- A technical report be prepared to formally document investigation activities and results.

Limitations


Allterra prepared this document for the use of Mr. Manwel and Mrs. Samira Shuwayhat and ACEH in evaluating site conditions at selected on-site locations at the time of this study. Statements, conclusions, and recommendations in this document are based solely on the field observations and analytical results related to work performed by Allterra and there is no warranty, expressed or implied. Site conditions and data can change over time; therefore, data presented in this report is only applicable to the timeframe of this study. Allterra’s services have been performed in accordance with environmental principles generally accepted at this time and location.

Should you have any questions, please contact Allterra at (831) 425-2608.

Sincerely,
Allterra Environmental, Inc.



James Allen, R.E.A.
Project Manager

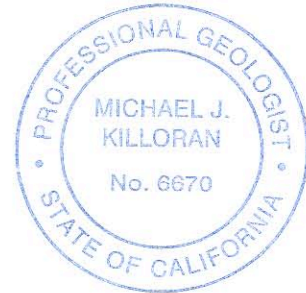


Michael Killoran, P.G. 6670
Senior Geologist

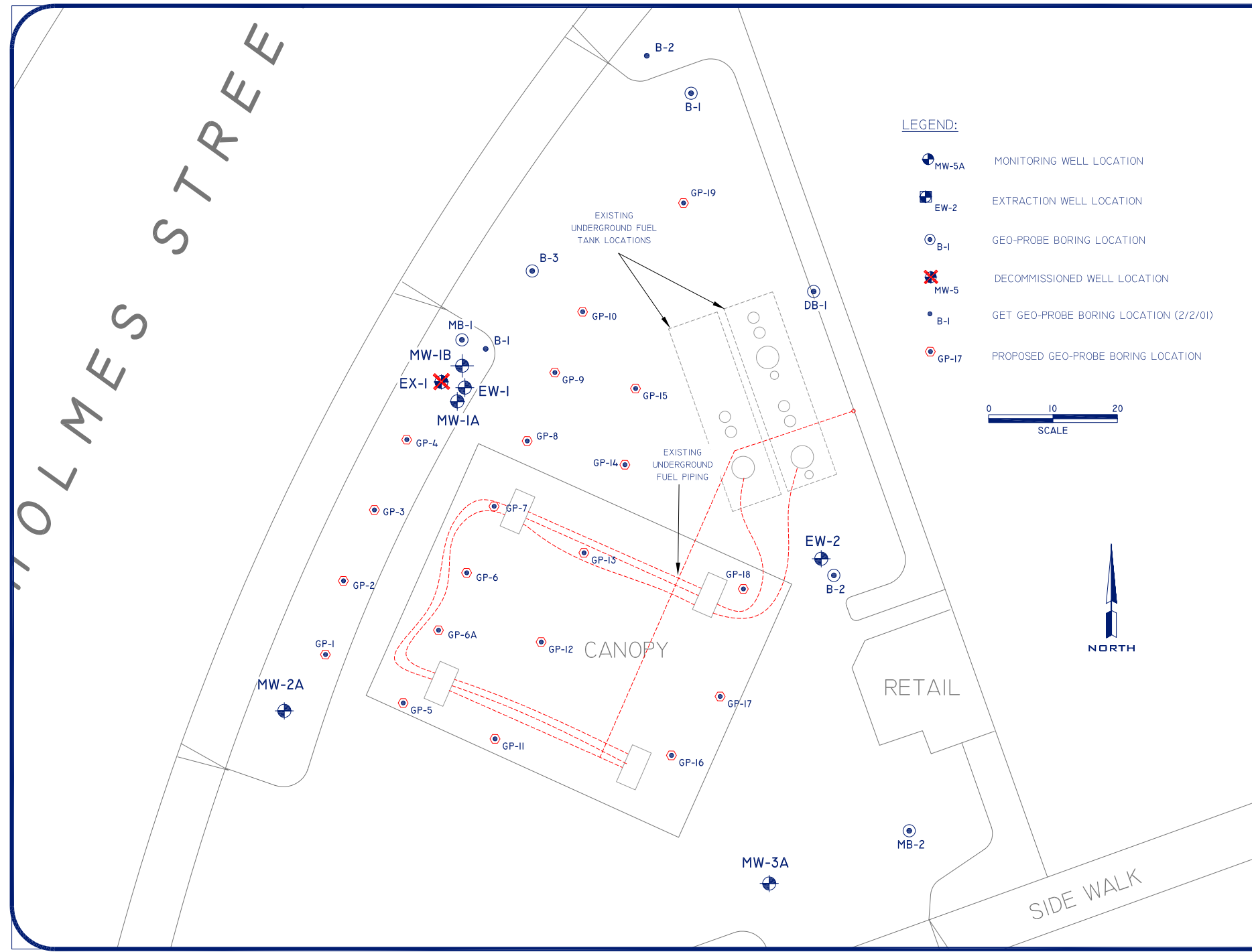
Attachments:

- Figure 3, Geoprobe Locations
- Table 1, Preliminary Soil Analytical Results
- Table 2, Preliminary Groundwater Analytical Results

cc: Mr. Jerry Wickham, ACEH

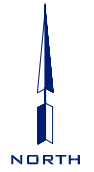
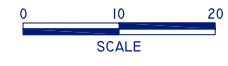


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LEGEND:

- MW-5A MONITORING WELL LOCATION
- EW-2 EXTRACTION WELL LOCATION
- B-1 GEO-PROBE BORING LOCATION
- MW-5 DECOMMISSIONED WELL LOCATION
- B-1 GET GEO-PROBE BORING LOCATION (2/2/01)
- GP-17 PROPOSED GEO-PROBE BORING LOCATION



General Notes		
STAMP		
<p>160 HOLMES STREET SOIL AND GROUNDWATER INVESTIGATION AND REMEDIATION PROJECT</p> <p style="text-align: right; font-weight: bold; font-size: small;">PREPARED BY: ALLTERRA</p>		
0	DRAFT/REVIEW	1/22
No.	Revision/Issue	Date
<p>Firm Name and Address</p> <p>ALLTERRA ENVIRONMENTAL, INC. 849 ALMAR AVE., SUITE C, No. 281 SANTA CRUZ, CALIFORNIA 831-425-2608 FAX 831-425-2609 WWW.ALLTERRAENV.COM</p>		
<p>Sheet Name and Address</p> <p>GEOPROBE LOCATIONS 160 HOLMES STREET LIVERMORE, CALIFORNIA</p>		
Project	015-01-022	Sheet
Date	1-22-07	FIGURE
Scale	SEE DRAWING	1

Table 1
Preliminary Soil Analytical Results
160 Holmes Street, Livermore, California

Sample ID (Field Point)	Sample Depth (feet)	Sample Date	TPHg	TPHd	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE
GP-1	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-1	24	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-1	28	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-2	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-2	24	1/10/07	51	--	<0.050	<0.050	0.13	0.20	<0.50
GP-3	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-3	24	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-3	28	1/10/07	100	--	<0.050	0.40	2.1	3.2	2.6
GP-4	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-4	16	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-4	28	1/10/07	13	--	0.021	0.096	0.24	0.32	4.4
GP-5	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-5	20	1/10/07	5.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-5	28	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-6	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	0.090
GP-6	18	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-6	24	1/10/07	<1.0	--	<0.005	<0.005	<0.005	0.013	0.11
GP-6	28	1/10/07	23	--	0.0057	0.021	0.052	0.16	0.056
GP-6A	4	1/11/07	11	--	<0.005	<0.005	0.0081	<0.005	<0.10
GP-6A	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	0.011	<0.10
GP-6A	16	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-6A	20	1/11/07	1.6	--	<0.005	<0.005	0.0052	0.0065	0.066
GP-6A	24	1/11/07	2.0	--	<0.005	0.013	0.0062	0.015	0.44
GP-6A	28	1/11/07	17	--	<0.010	<0.010	0.40	0.028	0.34
GP-7	4	1/11/07	2.0	--	<0.005	0.014	0.0080	0.092	0.086
GP-7	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-7	14	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	0.062
GP-8	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-8	24	1/10/07	30	--	0.030	0.19	0.46	2.4	9.6
GP-9	8	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-9	12	1/10/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-9	24	1/10/07	110	--	0.27	1.2	1.6	9.5	22
GP-10	21	1/10/07	35	--	0.033	0.35	0.56	3.6	1.5
GP-10	24	1/10/07	2.2	--	0.0081	0.011	0.023	0.12	3.9
GP-11	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-11	24	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-11	28	1/11/07	3.7	--	<0.005	<0.005	<0.005	<0.005	0.057

Table 1
Preliminary Soil Analytical Results
160 Holmes Street, Livermore, California

Sample ID (Field Point)	Sample Depth (feet)	Sample Date	TPHg	TPHd	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE
GP-12	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	0.072
GP-12	24	1/11/07	15	--	<0.005	<0.005	0.13	0.14	0.092
GP-12	28	1/11/07	11	--	0.0061	<0.005	0.47	0.014	0.36
GP-13	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-13	24	1/11/07	9.1	--	<0.005	<0.005	<0.005	0.014	<0.05
GP-13	28	1/11/07	100	--	0.17	0.39	2.6	6.7	8.9
GP-14	8	1/11/07	6.4	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-14	12	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-14	16	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-14	24	1/11/07	320	--	0.43	14	7.0	40	50
GP-14	28	1/11/07	120	--	0.47	3.3	2.0	11	140
GP-15	12	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	0.078
GP-15	19	1/11/07	1.5	--	<0.005	0.012	0.026	0.054	0.49
GP-15	24	1/11/07	1.6	--	<0.005	0.0077	0.015	0.11	0.40
GP-15	28	1/11/07	6.7	--	0.047	0.24	0.13	0.72	9.5
GP-16	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	0.061
GP-16	24	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	0.10
GP-16	28	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-17	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-17	24	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-17	28	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-18	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-18	16	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	0.070
GP-18	24	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-18	28	1/11/07	110	--	<0.010	0.16	0.37	1.3	0.20
GP-19	8	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-19	21	1/11/07	<1.0	--	<0.005	<0.005	<0.005	<0.005	<0.05
GP-19	24	1/11/07	5.8	--	<0.005	0.0072	0.12	0.23	0.074

Notes:

-- : not analyzed

All results are in milligrams per kilogram (mg/kg)

TPHg was analyzed by EPA Method 8015CM

Benzene, toluene, ethylbenzene, xylenes, and MTBE were analyzed by EPA Method 8021B

TPHg: Total Petroleum Hydrocarbons as gasoline

MTBE = methyl tertiary butyl ether



Table 2
Preliminary Groundwater Analytical Results
 160 Holmes Street, Livermore, California

Sample ID	Approximate Sample Depth (feet)	Date Collected	Total Petroleum Hydrocarbons (µg/L)		Aromatic Volatile Organic Compounds (µg/L)				Oxygenated Volatile Organics (µg/L)							Lead Scavengers (µg/L)		
			Gasoline	Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE (8021B)	TAME	TBA	DIPE	ETBE	MTBE	ethanol	methanol	EDB	1,2-DCA
GP-1	28	1/10/07	270	--	<0.5	<0.5	2.6	0.85	61	--	--	--	--	--	--	--	--	--
GP-2	28	1/10/07	2,000	--	61	46	93	280	2,600	--	--	--	--	--	--	--	--	--
GP-3	28	1/10/07	11,000	--	38	27	1,100	980	37,000	--	--	--	--	--	--	--	--	--
GP-4	28	1/10/07	20,000	--	820	260	1,400	3,200	35,000	--	--	--	--	--	--	--	--	--
GP-5	28	1/10/07	4,100	--	64	6.6	13	550	780	--	--	--	--	--	--	--	--	--
GP-6A	28	1/11/07	11,000	--	360	150	1,500	480	6,100	--	--	--	--	--	--	--	--	--
GP-8	28	1/10/07	61,000	--	2,800	490	2,600	4,400	190,000	--	--	--	--	--	--	--	--	--
GP-9	28	1/10/07	100,000	--	5,600	3,400	3,500	24,000	260,000	--	--	--	--	--	--	--	--	--
GP-10	28	1/10/07	44,000	--	2,400	590	3,600	3,300	92,000	--	--	--	--	--	--	--	--	--
GP-11	28	1/11/07	550	--	1.4	1.3	2.1	36	110	--	--	--	--	--	--	--	--	--
GP-12	28	1/11/07	15,000	--	68	20	1,800	94	6,600	--	--	--	--	--	--	--	--	--
GP-13	28	1/11/07	88,000	--	5,100	<50	5,500	7,400	87,000	--	--	--	--	--	--	--	--	--
GP-14	28	1/11/07	210,000	--	11,000	26,000	4,600	21,000	1,500,000	--	--	--	--	--	--	--	--	--
GP-16	28	1/11/07	160	--	5.2	3.2	18	7.5	210	--	--	--	--	--	--	--	--	--
GP-17	28	1/11/07	460	--	7.7	4.8	8.0	7.4	790	--	--	--	--	--	--	--	--	--
GP18	28	1/11/07	35,000	--	250	72	2,800	380	13,000	--	--	--	--	--	--	--	--	--

Notes:

TPHg was analyzed by EPA Method 8015CM

Benzene, toluene, ethylbenzene, xylenes, and MTBE were analyzed by EPA Method 8021B

µg/L = micrograms per liter

-- = not analyzed

MTBE = methyl tertiary butyl ether

DIPE = Di-isopropyl Ether

TAME - tert-Amyl Methyl Ether

TBA = tert-Butanol

1,2-DCA = 1,2-dichloroethane

EDB = 1,2-dibromoethane

ETBE = Ethyl tert-Butyl Ether

