



76 Broadway  
Sacramento, California 95818

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1:13 pm, Nov 02, 2007

Alameda County  
Environmental Health

October 29, 2007

Mr. Jerry Wickham  
Alameda County Health Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Re: **Quarterly Summary Report – Third Quarter 2007  
And Sensitive Receptor Survey**

76 Service Station No. 4186  
1771 First Street  
Livermore, California

Dear Mr. Wickham,

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

If you have any questions or need additional information, please contact me at (916) 558-7612.

Sincerely,

Bill Borgh  
Site Manager – Risk Management and Remediation

Attachment

October 31, 2007

Mr. Jerry Wickham  
Alameda County Health Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

**Re: Quarterly Summary Report – Third Quarter 2007  
And Sensitive Receptor Survey**  
Delta Project Number: C1Q-4186-603



Dear Mr. Wickham:

On behalf of ConocoPhillips Company (COP), Delta Environmental Consultants, Inc. (Delta) is submitting the Quarterly Summary Report – Third Quarter 2007 and forwarding a copy of TRC's *Quarterly Monitoring Report, July through September 2007*, dated October 12, 2007, for the following location:

**Service Station**

76 Service Station No. 4186

**Location**

1771 First Street  
Livermore, California

Sincerely,  
**Delta Consultants, Inc.**

Dennis S. Dettloff, P.G.  
Senior Project Manager  
California Registered Professional Geologist No. 7480



cc: Mr. William Borgh, ConocoPhillips (electronic copy)

**QUARTERLY SUMMARY REPORT**  
**Sensitive Receptor Survey**  
**Third Quarter 2007**  
**76 Station No. 4186**  
**1771 First Street**  
**Livermore, California**

**SITE DESCRIPTION**

This site is an operating Union 76 service station located on First Street between N Street and O Street in Livermore, California. The facility property contains the station building, four product dispenser islands, and two gasoline underground storage tanks (USTs).

**PREVIOUS ASSESSMENT**

On June 6, 1996, six soil samples were collected from beneath the fuel dispensers and product delivery lines during dispenser and piping replacement activities. Analytical data indicated that total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethyl-benzene, and total xylenes (BTEX) were below the laboratories indicated reporting limits for each sample collected beneath the dispenser islands and product delivery lines.

On September 10, 1997, a soil gas survey was conducted as part of a baseline site evaluation associated with transfer of the property from Unocal Corporation to Tosco. Six soil gas probes were advanced and samples collected at 3 or 15 feet below ground surface (bgs) in the vicinity of the UST complex, dispenser islands, and product lines. Analytical data from the gas probes indicated that TPHg was present at concentrations ranging from 41 to 4,500 parts per billion by volume (ppb-v), benzene was present at concentrations ranging from below the laboratories indicated reporting limits to 110 ppb-v, and methyl tertiary butyl ether (MTBE) was present at concentrations ranging from below the laboratories indicated reporting limits to 8,000 ppb-v. The area of highest soil vapor concentration was localized around the UST complex.

On April 8, 1998, the Alameda County Zone 7 Water Agency files were reviewed to identify water supply wells located within a one-half mile radius from the site. Two municipal wells were identified approximately 1,500 feet and 1,800 feet northwest of the site, and two domestic wells were located approximately 1,900 feet southwest and 2,800 feet west of the site, respectively.

On June 16, 1998, three 2-inch diameter groundwater monitor wells (U-1 through U-3) were installed. The monitoring wells were each constructed to a depth of approximately 34 feet bgs. Soil samples collected from the three well borings indicated that TPHg, benzene, and MTBE were not present above the laboratories indicated reporting limits.

In May 2000, a site conceptual model (SCM) was completed for the site. In the SCM, groundwater flow velocity was calculated to determine the plume travel time to the nearest receptor. Ground water velocity was calculated at 46 feet per year. The SCM concluded that hydrocarbon impact to groundwater appears to fluctuate with the rise and fall of the groundwater surface beneath the site.

On February 21, 2001, two 2-inch diameter off-site groundwater monitor wells (U-4 and U-5) were installed. The monitoring wells were constructed to depths of approximately 47 feet bgs. Analytical data from soil samples collected for analysis indicated that TPHg, BTEX, and MTBE were not present in above the laboratories indicated reporting limits. Analytical data indicated that TPHg and benzene were below the laboratories indicated reporting limits in the groundwater samples analyzed from monitoring wells U-4 and U-5. Analytical data from the groundwater samples collected from monitoring wells U-4 and U-5 indicated that MTBE was present at concentrations of 38.2 micrograms per liter ( $\mu\text{g/L}$ ) and 55.4  $\mu\text{g/L}$ , respectively. The other fuel oxygenates were reported at or below laboratories indicated reporting limits. Groundwater monitoring and sampling of the monitoring wells was initiated in July 1998 and has continued on a quarterly basis to the present time. Historically, groundwater flow directions have varied from north to southwest. Depth to groundwater has varied from approximately 23 to 46 feet below top of casing.

On December 5 through 7, 2001, two monitoring wells (U-6 and U-7) and eight ozone microsparge points (SP-1 through SP-8) were installed. The monitor wells were constructed to a depth of 46 feet bgs. Borings SP-1 through SP-8 were completed as sparge wells with the installation of 2-inch diameter KVA sparge points attached to  $\frac{3}{4}$ -inch diameter blank schedule 80 PVC casing through the hollow-stem augers. The sparge points are composed of 30-inch long microporous plastic. Sparge points SP-1 through SP-4 were constructed to depths of 45 feet bgs. Sparge points SP-6S and SP-7S were constructed to depths of 25 feet bgs. The remaining two sparge locations contain nested sparge points (SP-5, SP-5S, SP-8 and SP-8S) constructed to 25 and 45 feet bgs in each boring. Upon completion of the sparge point installation, an interim remediation system was installed consisting of a K-V Associates, Inc. (KVA) "C-Sparge" ozone microsparge system.

On April 19 through 26, 2006 seven soil borings (B-1 through B-7) were advanced. Three boreholes were advanced for each soil boring location. The initial borehole was advanced to record a cone penetrometer (CPT) log of subsurface lithology. The second borehole was advanced for the purpose of collecting soil samples for identification and laboratory analysis, and to collect a depth-discrete groundwater samples at depths of approximately 38 feet to 44 feet bgs. The third borehole was advanced to collect a depth-discrete groundwater sample at approximately 57 feet to 65 feet bgs. Three general stratigraphic zones were identified – An upper zone from 36 to 43 feet bgs, a middle clay zone from 43 to 55 feet bgs, and a lower zone from 55 to the maximum depths of 65.5 feet bgs explored.

Soil samples from selected depths were submitted for analysis. Soil analytical results were as follows: Gasoline range organics (GRO) was reported in five upper zone, six clay zone, and three lower zone samples. MTBE was reported in three upper zone, three clay zone, and two lower zone samples. Benzene was reported in three clay zone samples.

Groundwater analytical results were as follows: GRO was reported in each of the 14 groundwater samples. Benzene was reported in five upper zone, and six lower zone samples. MTBE was reported in four upper zone, and six lower zone samples.

On March 13 through 16, 2007 three soil borings (B-8 through B-10) were advanced, two on-site and one off-site. Three boreholes were advanced for each soil boring location. The borings were advanced to a lower clay unit at the base of the lowermost sand and gravel unit (or until refused) using CPT technology. Depth discrete grab groundwater samples were collected from each borehole within the lower sand and gravel unit at the contact with the underlying clay unit. Soil and groundwater samples were collected and submitted for laboratory analysis.

Soil samples from selected depths were submitted for analysis from off-site boring B-10 only. Soil analytical results were as follows: TPHg and BTEX were not reported above the laboratories indicated reporting limits. MTBE was reported in two upper zone samples submitted for analysis.

Groundwater analytical results were as follows: TPHg was reported in boring B-8 at a depth of 79-83 feet bgs. BTEX and MTBE were also reported at low levels in the groundwater samples collected from borings B-8 and B-10.

In addition, an oxygen injection test was conducted using sparge wells SP-5/5S and SP-6S to evaluate the radius of influence (ROI) in underlying stratigraphic units. Data collected during the oxygen injection test indicated that the average ROI from these sparge wells is approximately 10 to 15 feet, however lithologic heterogeneities result in a range of ROI values for individual wells.

## **SENSITIVE RECEPTORS**

2006 – A survey entailing a visit to the DWR office in Sacramento was conducted to examine well log records and to identify domestic wells within the survey area. The DWR survey provided 53 potential receptors within one mile of the site; eleven municipal wells, five irrigation wells, two domestic wells, one domestic/irrigation well, and seventeen with an unknown well type. Seventeen additional potential receptors were identified although the specific addresses could not be located.

The 2006 sensitive receptor survey data are presented as Attachment A.

## **MONITORING AND SAMPLING**

Groundwater is currently monitored and sampled on a quarterly basis. During the September 23, 2007 monitoring and sampling event, depth to groundwater ranged from 31.40 feet (U-2) to 44.05 feet (U-7) below top of casing (TOC). During the third quarter monitoring and sampling event, cars were parked over monitoring wells U-4 and U-5 and therefore these wells were not sampled. In addition, monitoring wells U-1 and U-7 did not contain sufficient water for sample collection and monitoring well U-6 was dry. The groundwater flow direction was interpreted to be to the north, west, and south with a gradient of 0.15 foot per foot (ft/ft). Historic groundwater flow directions are shown on a rose diagram presented as Attachment B.

**Contaminants of Concern:**

- **TPHg:** TPHg was reported above the laboratories indicated reporting limit in monitoring well U-3 at 1,600 µg/L during the current event.
- **Benzene:** Benzene was reported above the laboratories indicated reporting limit in monitoring well U-3 at 16 µg/L) during the current event.
- **MTBE:** MTBE was reported above the laboratories indicated reporting limit in monitoring well U-3 at 170 µg/L during the current event.

Additionally, toluene was reported above the laboratories indicated reporting limit in monitoring well U-3 0.61 at µg/L. Ethyl-benzene and total xylenes were reported above the laboratories indicated reporting limit in monitoring well U-3 at 2.7 µg/L and 3.7 µg/L, respectively. Tertiary butyl alcohol (TBA) was reported above the laboratories indicated reporting limits in monitoring wells U-2 at 69 µg/L and U-7 at 19,000 µg/L. All other fuel oxygenates tested were below the laboratories indicated reporting limits during the current event.

**REMEDIATION STATUS**

The ozone sparge system, manufactured by KVA, was placed into operation on December 19, 2001. Remediation system operation and maintenance is conducted by Environ Strategy Consultants, Inc. (ES) under direct contract to ConocoPhillips.

During the Second Quarter 2007, the ozone system was shut down, to evaluate whether dissolved gasoline concentrations would rebound or remain stable in the absence of ozone injection with the current well and system configuration.

Based on existing groundwater monitoring data it appears the ozone injection is effective in reducing the petroleum hydrocarbon impact to the groundwater in the vicinity of monitoring well U-3. It also appears based on the data collected during the recent oxygen injection test that ozone injection at the site would be effective in reducing the petroleum hydrocarbon impact to the groundwater at the site. However, the configuration of the current system is being evaluated and a workplan will be prepared and submitted to the Alameda County Health Agency (ACHA) during the third quarter 2007 recommending changes to the current system, including the placement of new wells and/or re-screening existing well locations, as appropriate based on soil types and areas requiring further remediation.

**CHARACTERIZATION STATUS**

The furthest up-gradient monitor well, U-3, contained 88 µg/L MTBE and 1,600 µg/L TPHg during the third quarter 2007 sampling event. The furthest off-site down-gradient monitoring well, U-5, was inaccessible during the third quarter 2007 monitoring and sampling event but contained 30 µg/L of MTBE during the second quarter 2007 monitoring and sampling event.

## **RECENT CORRESPONDENCE**

On August 29 2007 the ACHA submitted a letter to COP requesting a work plan addendum for the installation of additional oxygen injection wells and groundwater monitoring wells at the site.

## **THIS QUARTER ACTIVITIES (Third Quarter 2007)**

1. TRC conducted the quarterly monitoring and sampling at the site.

## **WASTE DISPOSAL SUMMARY**

June 1996 - A total of 25 cubic yards of soils was excavated and disposed.

April 2006 - A total of 2.2 cubic yards of soil cuttings generated during a soil investigation was disposed of from the site.

## **NEXT QUARTER ACTIVITIES (Fourth Quarter 2007)**

1. TRC will conduct quarterly groundwater monitoring and sampling at the site.
2. Delta will prepare and submit a work plan addendum to the ACHA, as requested above, for the installation of additional ozone injection wells and additional groundwater monitoring wells at the site.

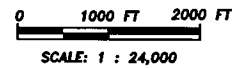
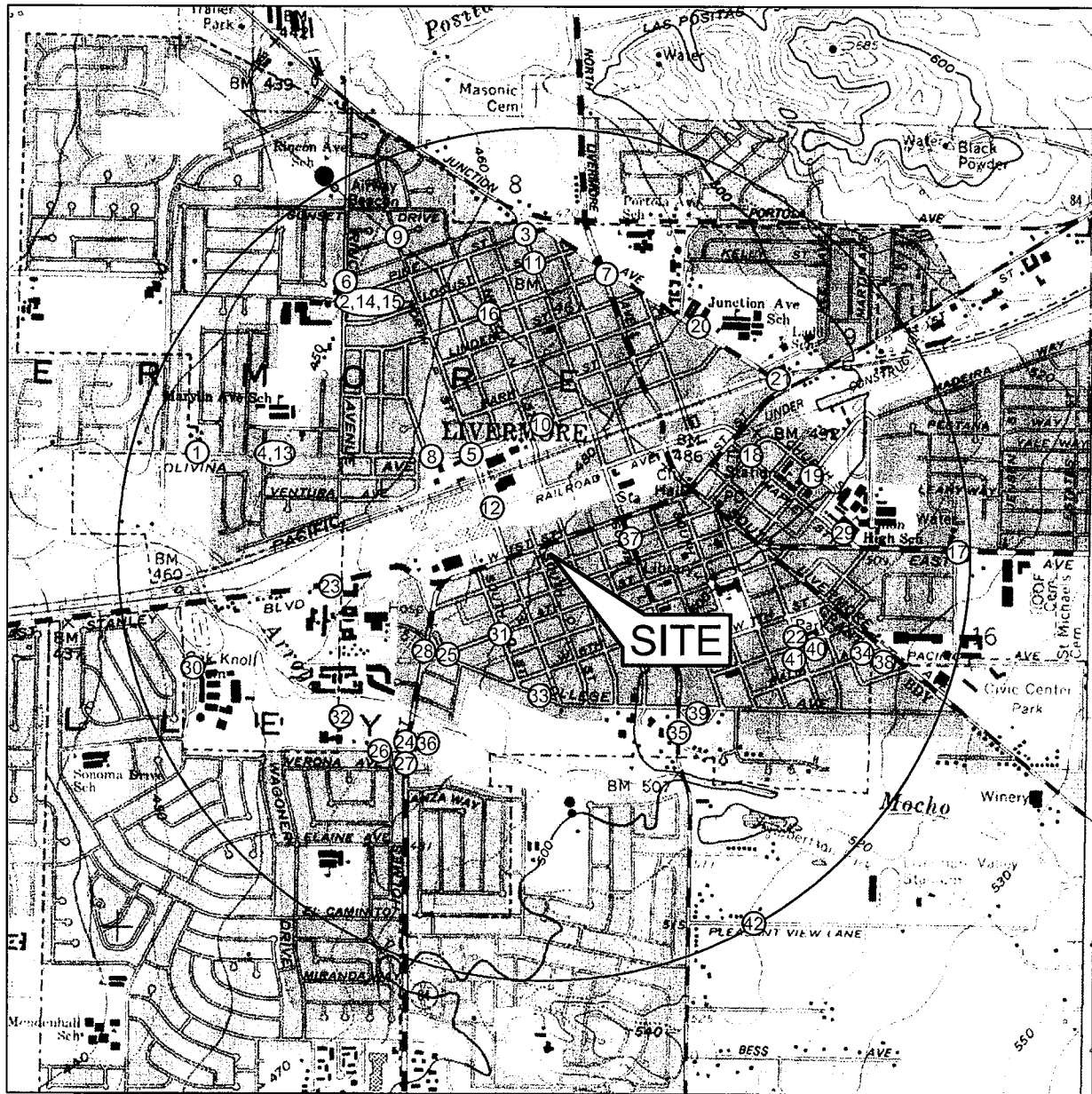
**CONSULTANT:** Delta Consultants, Inc.

Attachment A – Sensitive Receptor Survey Data

Attachment B – Historic Groundwater Flow Directions

**Attachment A**  
**Sensitive Receptor Survey Data**





SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, CALABASAS QUADRANGLE, 1967

**FIGURE 1**  
**SITE LOCATOR SENSITIVE RECEPTOR**  
**MAP**

76 STATION NO. 4186  
 1771 FIRST STREET  
 LIVERMORE, CA

PROJECT NO. C104-186	DRAWN BY JH 12/13/06
FILE NO. Site Locator 4186	PREPARED BY JH
REVISION NO.	REVIEWED BY

**Table 1**  
 One-Mile Agency Receptor Survey  
 ConocoPhillips Station No.4186  
 1771 First Street, Livermore, California

DWR <sup>1</sup> Well No.	Address	City	State	Zip	Owner	Well Type	Distance from Site (miles)	Direction Relative to Site
1-3S/2E-7R3	732 Olivina Avenue	Livermore	CA		California Water Service Co.	Public/Production Well	0.9	NW
2-3S/2E-8E80?	Pine St. at Rincon Ave.	Livermore	CA		City of Livermore		0.8	NW
3-3S/2E-8F1?	Pine Street at Arroyo Road	Livermore	CA		California Water Service Co.	Municipal	0.7	NW
4-3S/2E-8N2?	40' south of Olivina St., 200' west of Albatross	Livermore	CA		California Water Service Co.		0.8	NW
5-3S/2E-2P1	sw of corner of Olivina and P st.	Livermore	CA		California Water Service Co.		0.3	NW
6-3S/2E-8E1	951 Rincon Ave	Livermore	CA		City of Livermore		0.8	NW
7-3S/2E-8H1	sw of North Livermore Avenue at Elm Street	Livermore	CA		California Water Service Co.	Municipal	0.7	NE
8-3S/2E-8P1	se of Olivina Avenue at Adelle Street	Livermore	CA		California Water Service Co.		0.3	NW
9-3S/2E-8F1?	sw of Juniper Street at N P Street	Livermore	CA		California Water Service Co.	Municipal	0.8	NW
10-3S/2E-8K1	1830 Chestnut St.	Livermore	CA		PG&E	Cathodic protection	0.3	N
11-3S/2E-8G2	L St. at Locust St.	Livermore	CA		PG&E	Cathodic protection	0.7	N
12-3S/2E-8P2	sw of N P St. at Railroad Avenue	Livermore	CA		California Water Service Co.	Municipal	0.3	NW
13-3S/2E-8N2	se of Olivina Avenue at Albatross Avenue	Livermore	CA		California Water Service Co.	Municipal	0.7	NW
14-3S/2E-8E9	899 Rincon Avenue	Livermore	CA		ARCO Products, Co.	Recovery Well	0.8	NW
15-3S/2E-8E10	899 Rincon Avenue	Livermore	CA		ARCO Products, Co.	Vapor Extraction	0.8	NW
16-3S/2E-8G1	sw of Elm Street at N N Street	Livermore	CA		California Water Service Co.	Municipal	0.6	NW
17-3S/2E-9Q1	north of East Avenue at Dolores Street	Livermore	CA		California Water Service Co.	Domestic/Municipal	1.0	E
18-3S/2E-9P	Maple Street at Second Street	Livermore	CA		PG&E	Cathodic protection	0.5	SW
19-3S/2E-9P1	2778 Fourth Street	Livermore	CA		California Water Service Co.	Municipal	0.7	NE
20-3S/2E-9M1	403 Junction	Livermore	CA		Victor Baldi	Irrigation	0.6	NE
21-3S/2E-9L1	south side of First St. at Junction Ave.	Livermore	CA		California Water Service Co.	Municipal	0.7	NE
22-3S/2E-18C81	811 South H.	Livermore	CA		Leslie Holm		0.6	SE
23-3S/2E-17C1	985 E. Stanley Blvd.	Livermore	CA		Fred Holdener		0.5	SW
24-3S/2E-17E1	south side Mocho Street, 0.3 mi west of Vallecitos Road	Livermore	CA		W. J. Wagoner		0.8	SW
25-3S/32E-17F1	0.2 mi west of Holmes St. at College Ave.	Livermore	CA		U.S. Veterans Hospital		0.6	SW
26-3S/2E-17L2	0.2 mi west of Vallecitos Rd. on Mocho St, 10' south of Mocho	Livermore	CA		W. J. Wagoner		0.7	SW
27-3S/2E-17P1?	0.45 mi south of Mocho St on east side of Vallecitos Rd.	Livermore	CA		Adele Coldweih (formerly C.A. Smith)		1.0	SW
28-3S/2E-17B1	Fourth St. at College Ave.	Livermore	CA		California Water Service Co.		0.4	SW
29-3S/2E-17E5	Livermore High School, 600 Maple St.	Livermore	CA		Livermore School District	Domestic/ Irrigation	0.7-0.8	NE
30-3S/2E-17E4	Granada High School, 400 Wall St.	Livermore	CA		Livermore Valley School District	Irrigation/Test Well	0.7-1.0	SW
31-3S/2E-17B3	4th St. at Q St.	Livermore	CA		PG&E	Cathodic protection	0.3	SW
32-3S/2E-17J?	1000' west of Arroyo Rd., 150' south of Arroyo Mocho Creek	Livermore	CA		R. A. Hansen	Irrigation	0.6	SE
33-3S/2E-17?	1531 College Ave.	Livermore	CA		Don Benton	Domestic	0.4	SW
34-3S/2E-16B1	Palm Ave. between Livermore and Almond	Livermore	CA		California Water Service Co.		0.6-0.8	SE
35-3S/2E-16E1	954 South L. St.	Livermore	CA		Livermore Sanitarium		0.5	SE
36-3S/2E-16E2	300' east of Arroyo Rd., 150' north of Mocho Creek	Livermore	CA		Livermore Sanitarium		0.6	SE
37-3S/2E-16?	Ferrario Winery, 2nd St. and L St.	Livermore	CA		Ferrario Winery		0.2	E
38-3S/2E-16B1	sw of Palm Avenue and South Livermore Avenue	Livermore	CA		California Water Service Co.		0.8	SE
39-3S/2E-16E6	300' se of College St. at L St.	Livermore	CA		First Baptist Church	Irrigation	0.6	SE
40-3S/2E-16C3	Eighth St. at S H St.	Livermore	CA		PG&E	Cathodic protection	0.6	SE
41-3S/2E-16C1	787 S H Street	Livermore	CA		Ben F. Mingoa	Municipal	0.6	SE
42-3S/2E-1681?	2486 Pleasant View Lane	Livermore	CA		George Sharp	Domestic	1.0	SE

**Table 1**  
 One-Mile Agency Receptor Survey  
 ConocoPhillips Station No.4186  
 1771 First Street, Livermore, California

DWR <sup>1</sup> Well No.	Address	City	State	Zip	Owner	Well Type	Distance from Site (miles)	Direction Relative to Site
43- 3S/2E-17D81	near Ventura Ct.	Livermore	CA		Richard Woelffel	Irrigation	0.6	W
<sup>2</sup> 44- 3S/2E-16A80	East Ave (former Rasmussen property)	Livermore	CA		L. Oddon	Domestic		
<sup>2</sup> 45- 3S/2E-7?	Dow Airport, Highway 50 between Livermore and Dublin	Livermore	CA		Conrad Molt	Domestic		
<sup>2</sup> 46- 3S/2E-7N1	0.5 mi south of Kittyhawk at Las Positas, west of Livermore		CA		Alameda County Flood Control	Test Well/Other		
<sup>2</sup> 47- 3S/2E-7P2	west end of Olivina Road	Livermore	CA		Herb Hageman			
<sup>2</sup> 48- 3S/2E-8B1	Joesrilli?	Livermore	CA		A.P. Caratti			
<sup>2</sup> 49- 3S/2E-8M80	1936 Olivina Ave.	Livermore	CA		Jean Eyherabide			
<sup>2</sup> 50- 3S/2E-8N1	Star Route 5	Pleasanton	CA		John Fenrich	Irrigation		
<sup>2</sup> 51- 3S/2E-9Q80	East Avenue	Livermore	CA		Frydendel	Domestic		
<sup>2</sup> 52- 3S/2E-18R	Vallecitos Road	Livermore	CA		W. J. Wagoner			
<sup>2</sup> 53- 3S/2E-18A1	Elsie Johnson Ranch	Livermore	CA		Richard Woelefel			
<sup>2</sup> 54- 3S/2E-17B2	West Fourth Street	Livermore	CA		R. A. Hansen	Domestic		
<sup>2</sup> 55- 3S/2E-17?	Kaiser Site	Livermore	CA		Veterans Administration Hospital	Domestic		
<sup>2</sup> 56- 3S/2E-17J1	Creek Bank Ranch	Livermore	CA		R. A. Hansen			
<sup>2</sup> 57- 3S/2E-17R1	Creek Bank Ranch	Livermore	CA		R. A. Hansen			
<sup>2</sup> 58- 3S/2E-17F2	Vallecitos Road	Livermore	CA		W. J. Wagoner			
<sup>2</sup> 59- 3S/2E-16A5	East Avenue	Livermore	CA		St. Michael's Cemetary	Irrigation		
<sup>2</sup> 60- 3S/2E-16?	Church St. and L Street	Livermore	CA		Livermore Sanitarium	Domestic/Irrigation		
<sup>2</sup> 61- 3S/2E-16R2	Wente at Stadium Way	Livermore	CA		Gene A. Matyevich	Domestic		

DWR: Department of Water Resources

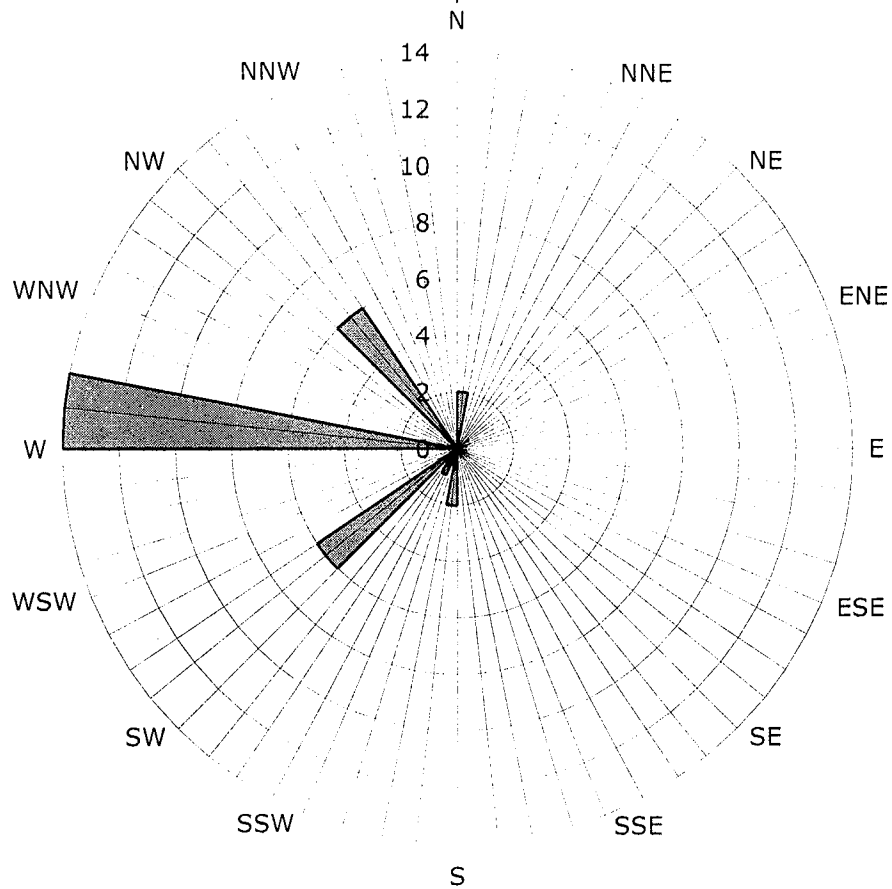
<sup>1</sup> Well Locations shown on Figure 1.

<sup>2</sup> Specific address cannot be located on map.

**Attachment B**  
**Historic Groundwater Flow Directions**

**Historic Groundwater Flow Directions  
ConocoPhillips Site No. 4186**

1771 First Street  
Livermore, California



■ Groundwater Flow Direction

Legend  
Concentric circles represent  
quarterly monitoring events  
Fourth Quarter 2000 through  
Second Quarter 2007  
27 data points shown



21 Technology Drive  
Irvine, CA 92618

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949.727.7399 FAX

www.TRCSolutions.com

DATE: October 15, 2007

TO: ConocoPhillips Company  
76 Broadway  
Sacramento, California 95818

ATTN: MR. BILL BORGH

SITE: 76 STATION 4186  
1771 FIRST STREET  
LIVERMORE, CALIFORNIA

RE: QUARTERLY MONITORING REPORT  
JULY THROUGH SEPTEMBER 2007

Dear Mr. Borgh:

Please find enclosed our Quarterly Monitoring Report for 76 Station 4186, located 1771 First Street, Livermore, California. If you have any questions regarding this report, please call us at (949) 727-9336.

Sincerely,

TRC

A handwritten signature in black ink, appearing to read "Anju Farfan".

Anju Farfan  
Groundwater Program Operations Manager

CC: Mr. Dennis Dettloff, Delta Environmental Consultants, Inc. (1 copy)

**QUARTERLY MONITORING REPORT  
JULY THROUGH SEPTEMBER 2007**

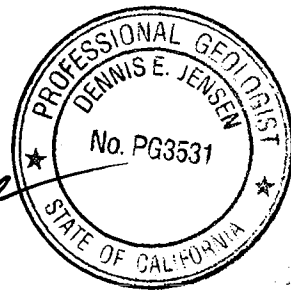
76 STATION 4186  
1771 First Street  
Livermore, California

Prepared For:

Mr. Bill Borgh  
CONOCOPHILLIPS COMPANY  
76 Broadway  
Sacramento, California 95818

By:

*Dennis E. Jensen*



Senior Project Geologist, Irvine Operations

Date: *10/12/07*



### LIST OF ATTACHMENTS

Summary Sheet	Summary of Gauging and Sampling Activities
Tables	Table Key Contents of Tables Table 1: Current Fluid Levels and Selected Analytical Results Table 1a: Additional Current Analytical Results Table 2: Historic Fluid Levels and Selected Analytical Results Table 2a: Additional Historic Analytical Results
Figures	Figure 1: Vicinity Map Figure 2: Groundwater Elevation Contour Map Figure 3: Dissolved-Phase TPH-G (GC/MS) Concentration Map Figure 4: Dissolved-Phase Benzene Concentration Map Figure 5: Dissolved-Phase MTBE Concentration Map
Graphs	Groundwater Elevations vs. Time Benzene Concentrations vs. Time
Field Activities	General Field Procedures Field Monitoring Data Sheet - 09/23/07 Groundwater Sampling Field Notes - 09/23/07 Statement of Non-Completion - 09/23/07
Laboratory Reports	Official Laboratory Reports Quality Control Reports Chain of Custody Records
Statements	Purge Water Disposal Limitations



**Summary of Gauging and Sampling Activities**  
**July 2007 through September 2007**  
**76 Station 4186**  
**1771 First Street**  
**Livermore, CA**

Project Coordinator: **Bill Borgh**  
Telephone: **916-558-7612**

Water Sampling Contractor: **TRC**  
Compiled by: **Christina Carrillo**

Date(s) of Gauging/Sampling Event: **09/23/07**

**Sample Points**

Groundwater wells: **5** onsite, **2** offsite      Wells gauged: **5**      Wells sampled: **2**  
Purging method: **Bailer**  
Purge water disposal: **Onyx/Rodeo Unit 100**  
Other Sample Points: **0**      Type: **n/a**

**Liquid Phase Hydrocarbons (LPH)**

Wells with LPH: **0**      Maximum thickness (feet): **n/a**  
LPH removal frequency: **n/a**      Method: **n/a**  
Treatment or disposal of water/LPH: **n/a**

**Hydrogeologic Parameters**

Depth to groundwater (below TOC):      Minimum: **31.4 feet**      Maximum: **44.05 feet**  
Average groundwater elevation (relative to available local datum): **443.15 feet**  
Average change in groundwater elevation since previous event: **-4.27 feet**  
Interpreted groundwater gradient and flow direction:  
    Current event: **0.15 ft/ft, north, west and south**  
    Previous event: **0.06 ft/ft, north, west and south (06/27/07)**

**Selected Laboratory Results**

Wells with detected **Benzene**: **1**      Wells above MCL (1.0 µg/l): **1**  
    Maximum reported benzene concentration: **16 µg/l (U-3)**  
Wells with **TPH-G by GC/MS** **1**      Maximum: **1,600 µg/l (U-3)**  
Wells with **MTBE 8260B** **1**      Maximum: **88 µg/l (U-3)**

**Notes:**

Field Dissolved Oxygen (DO) measurements were reported in percent saturation instead of mg/l and are not included in tables for this report.  
U-1=Not enough water to sample, U-4=Car parked over well, U-5=Car parked over well, U-6=Dry well, U-7=Not enough water to sample,

# TABLES

## TABLE KEY

### STANDARD ABBREVIATIONS

--	=	not analyzed, measured, or collected
LPH	=	liquid-phase hydrocarbons
Trace	=	less than 0.01 foot of LPH in well
µg/l	=	micrograms per liter (approx. equivalent to parts per billion, ppb)
mg/l	=	milligrams per liter (approx. equivalent to parts per million, ppm)
ND <	=	not detected at or above laboratory detection limit
TOC	=	top of casing (surveyed reference elevation)

### ANALYTES

BTEX	=	benzene, toluene, ethylbenzene, and (total) xylenes
DIPE	=	di-isopropyl ether
ETBE	=	ethyl tertiary butyl ether
MTBE	=	methyl tertiary butyl ether
PCB	=	polychlorinated biphenyls
PCE	=	tetrachloroethene
TBA	=	tertiary butyl alcohol
TCA	=	trichloroethane
TCE	=	trichloroethene
TPH-G	=	total petroleum hydrocarbons with gasoline distinction
TPH-G (GC/MS)	=	total petroleum hydrocarbons with gasoline distinction utilizing EPA Method 8260B
TPH-D	=	total petroleum hydrocarbons with diesel distinction
TRPH	=	total recoverable petroleum hydrocarbons
TAME	=	tertiary amyl methyl ether
1,1-DCA	=	1,1-dichloroethane
1,2-DCA	=	1,2-dichloroethane (same as EDC, ethylene dichloride)
1,1-DCE	=	1,1-dichloroethene
1,2-DCE	=	1,2-dichloroethene (cis- and trans-)

### NOTES

1. Elevations are in feet above mean sea level. Depths are in feet below surveyed top-of-casing.
2. Groundwater elevations for wells with LPH are calculated as:  $\text{Surface Elevation} - \text{Measured Depth to Water} + (\text{Dp} \times \text{LPH Thickness})$ , where Dp is the density of the LPH, if known. A value of 0.75 is used for gasoline and when the density is not known. A value of 0.83 is used for diesel.
3. Wells with LPH are generally not sampled for laboratory analysis (see General Field Procedures).
4. Comments shown on tables are general. Additional explanations may be included in field notes and laboratory reports, both of which are included as part of this report.
5. A "J" flag indicates that a reported analytical result is an estimated concentration value between the method detection limit (MDL) and the practical quantification limit (PQL) specified by the laboratory.
6. Other laboratory flags (qualifiers) may have been reported. See the official laboratory report (attached) for a complete list of laboratory flags.
7. Concentration graphs based on tables (presented following Figures) show non-detect results prior to the Second Quarter 2000 plotted at fixed values for graphical display. Non-detect results reported since that time are plotted at reporting limits stated in the official laboratory report.
8. Groundwater vs. Time graphs may be corrected for apparent level changes due to re-survey.

### REFERENCE

TRC began groundwater monitoring and sampling for 76 Station 4186 in October 2003. Historical data compiled prior to that time were provided by Gettler-Ryan Inc.

**Contents of Tables 1 and 2**  
**Site: 76 Station 4186**

**Current Event**

<b>Table 1</b>	Well/ Date	Depth to Water	LPH Thickness	Ground- water Elevation	Change in Elevation	TPH-G (8015M)	TPH-G (GC/MS)	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE (8021B)	MTBE (8260B)	Comments
<b>Table 1a</b>	Well/ Date	TBA	Ethanol (8260B)	Ethylene- dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Pre-purge ORP	Post-purge ORP				

**Historic Data**

<b>Table 2</b>	Well/ Date	Depth to Water	LPH Thickness	Ground- water Elevation	Change in Elevation	TPH-G (8015M)	TPH-G (GC/MS)	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE (8021B)	MTBE (8260B)	Comments
<b>Table 2a</b>	Well/ Date	TBA	Ethanol (8260B)	Ethylene- dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP		

**Table 1**  
**CURRENT FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**September 23, 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
		<b>(Screen Interval in feet: 14.0-34.0)</b>												
U-1	09/23/07	478.27	33.17	0.00	445.10	-2.39	--	--	--	--	--	--	--	Not enough water to sample
		<b>(Screen Interval in feet: 13.0-34.0)</b>												
U-2	09/23/07	477.44	31.40	0.00	446.04	-3.03	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50
		<b>(Screen Interval in feet: 14.0-34.0)</b>												
U-3	09/23/07	478.46	31.70	0.00	446.76	-4.19	--	1600	16	0.61	2.7	3.7	--	88
		<b>(Screen Interval in feet: 35.0-45.0)</b>												
U-4	09/23/07	476.93	--	--	--	--	--	--	--	--	--	--	--	Car parked over well
		<b>(Screen Interval in feet: 37.0-47.0)</b>												
U-5	09/23/07	476.51	--	--	--	--	--	--	--	--	--	--	--	Car parked over well
		<b>(Screen Interval in feet: DNA)</b>												
U-6	09/23/07	478.38	--	--	--	--	--	--	--	--	--	--	--	Dry well
		<b>(Screen Interval in feet: DNA)</b>												
U-7	09/23/07	478.74	44.05	0.00	434.69	-7.46	--	--	--	--	--	--	--	Not enough water to sample

**Table 1 a**  
**ADDITIONAL CURRENT ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene- dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mV)
<b>U-2</b>									
09/23/07	69	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	-133	-48
<b>U-3</b>									
09/23/07	19000	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	-114	-88

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-1 (Screen Interval in feet: 14.0-34.0)</b>														
07/13/98	478.27	23.28	0.00	454.99	--	ND	--	ND	ND	ND	ND	ND	--	
10/07/98	478.27	26.43	0.00	451.84	-3.15	ND	--	ND	ND	ND	ND	ND	--	
01/15/99	478.27	30.42	0.00	447.85	-3.99	ND	--	ND	ND	ND	1.1	7.3	--	
04/14/99	478.27	24.21	0.00	454.06	6.21	ND	--	ND	ND	ND	ND	160	--	
07/19/99	478.27	27.10	0.00	451.17	-2.89	ND	--	ND	ND	ND	ND	92	--	
10/12/99	478.27	29.40	0.00	448.87	-2.30	ND	--	ND	ND	ND	ND	37	--	
01/24/00	478.27	27.90	0.00	450.37	1.50	ND	--	ND	ND	ND	ND	28	--	
04/10/00	478.27	26.16	0.00	452.11	1.74	ND	--	ND	0.930	ND	ND	ND	--	
07/17/00	478.27	28.04	0.00	450.23	-1.88	ND	--	ND	ND	ND	ND	160	--	
10/02/00	478.27	28.41	0.00	449.86	-0.37	ND	--	ND	ND	ND	ND	120	--	
01/08/01	478.27	28.68	0.00	449.59	-0.27	ND	--	ND	ND	ND	ND	103	--	
04/03/01	478.27	25.74	0.00	452.53	2.94	ND	--	ND	ND	ND	ND	55.1	--	
07/02/01	478.27	30.67	0.00	447.60	-4.93	ND	--	ND	ND	ND	ND	ND	--	
10/08/01	478.27	33.13	0.00	445.14	-2.46	ND<50	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<5.0	--	
01/03/02	478.27	27.67	0.00	450.60	5.46	160	--	ND<0.50	0.51	ND<0.50	0.69	31	--	
04/05/02	478.27	29.40	0.00	448.87	-1.73	ND<50	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	60	--	
07/02/02	478.27	31.17	0.00	447.10	-1.77	--	1100	ND<0.50	1.7	0.73	130	--	35	
10/01/02	478.27	33.00	0.00	445.27	-1.83	--	120	ND<0.50	ND<0.50	ND<0.50	8.8	--	28	
12/30/02	478.27	22.03	0.00	456.24	10.97	--	ND<50	ND<0.50	ND<0.50	ND<0.50	1.2	--	90	
05/02/03	478.27	24.13	0.00	454.14	-2.10	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	50	
07/01/03	478.27	25.35	0.00	452.92	-1.22	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<2.0	
10/03/03	478.27	27.24	0.00	451.03	-1.89	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<2.0	
01/08/04	478.27	22.67	0.00	455.60	4.57	--	54	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	5.5	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-1 continued</b>														
04/15/04	478.27	25.33	0.00	452.94	-2.66	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
07/15/04	478.27	26.47	0.00	451.80	-1.14	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
12/08/04	478.27	31.17	0.00	447.10	-4.70	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
03/23/05	478.27	22.47	0.00	455.80	8.70	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
06/28/05	478.27	25.37	0.00	452.90	-2.90	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
09/23/05	478.27	29.15	0.00	449.12	-3.78	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
12/30/05	478.27	23.69	0.00	454.58	5.46	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
03/24/06	478.27	22.54	0.00	455.73	1.15	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1.6	
06/26/06	478.27	24.99	0.00	453.28	-2.45	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
09/26/06	478.27	30.19	0.00	448.08	-5.20	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
11/21/06	478.27	28.27	0.00	450.00	1.92	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
03/26/07	478.27	26.92	0.00	451.35	1.35	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
06/27/07	478.27	30.78	0.00	447.49	-3.86	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
09/23/07	478.27	33.17	0.00	445.10	-2.39	--	--	--	--	--	--	--	--	Not enough water to sample
<b>U-2</b>	<b>(Screen Interval in feet: 13.0-34.0)</b>													
07/13/98	477.44	23.52	0.00	453.92	--	1200	--	130	12	62	180	1100	--	
10/07/98	477.44	25.31	0.00	452.13	-1.79	ND	--	ND	ND	ND	ND	160	--	
01/15/99	477.44	30.22	0.00	447.22	-4.91	ND	--	ND	ND	ND	ND	280	--	
04/14/99	477.44	24.50	0.00	452.94	5.72	ND	--	ND	ND	ND	ND	460	--	
07/19/99	477.44	28.54	0.00	448.90	-4.04	ND	--	ND	ND	ND	ND	220	--	
10/12/99	477.44	30.48	0.00	446.96	-1.94	ND	--	ND	ND	ND	ND	160	--	
01/24/00	477.44	24.52	0.00	452.92	5.96	ND	--	ND	ND	ND	ND	150	--	
04/10/00	477.44	23.68	0.00	453.76	0.84	ND	--	ND	ND	ND	ND	177	--	
07/17/00	477.44	28.35	0.00	449.09	-4.67	ND	--	ND	ND	ND	ND	62.7	--	



**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-2 continued</b>														
10/02/00	477.44	28.72	0.00	448.72	-0.37	ND	--	ND	ND	ND	ND	52	--	
01/08/01	477.44	29.11	0.00	448.33	-0.39	ND	--	ND	ND	ND	ND	57.3	--	
04/03/01	477.44	25.95	0.00	451.49	3.16	ND	--	ND	ND	ND	ND	30.2	--	
07/02/01	477.44	29.01	0.00	448.43	-3.06	ND	--	ND	ND	ND	ND	16	--	
10/08/01	477.44	30.94	0.00	446.50	-1.93	ND<50	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	82	--	
01/03/02	477.44	27.33	0.00	450.11	3.61	260	--	7.7	11	1.7	15	42	--	
04/05/02	477.44	30.02	0.00	447.42	-2.69	ND<50	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	25	--	
07/02/02	477.44	31.23	0.00	446.21	-1.21	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
10/01/02	477.44	32.00	0.00	445.44	-0.77	--	ND<50	ND<0.50	0.62	ND<0.50	ND<1.0	--	ND<2.0	
12/30/02	477.44	22.32	0.00	455.12	9.68	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<2.0	
05/02/03	477.44	25.92	0.00	451.52	-3.60	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<2.0	
07/01/03	477.44	24.99	0.00	452.45	0.93	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<2.0	
10/03/03	477.44	25.31	0.00	452.13	-0.32	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<2.0	
01/08/04	477.44	21.94	0.00	455.50	3.37	--	ND<50	ND<0.50	ND<0.50	0.51	ND<1.0	--	ND<2.0	
04/15/04	477.44	25.20	0.00	452.24	-3.26	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
07/15/04	477.44	24.45	0.00	452.99	0.75	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
12/08/04	477.44	29.89	0.00	447.55	-5.44	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
03/23/05	477.44	22.00	0.00	455.44	7.89	--	ND<50	ND<0.50	ND<0.50	ND<0.50	1.1	--	ND<0.50	
06/28/05	477.44	25.30	0.00	452.14	-3.30	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
09/23/05	477.44	28.25	0.00	449.19	-2.95	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
12/30/05	477.44	24.33	0.00	453.11	3.92	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
03/24/06	477.44	22.34	0.00	455.10	1.99	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
06/26/06	477.44	23.15	0.00	454.29	-0.81	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
09/26/06	477.44	28.52	0.00	448.92	-5.37	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-2 continued</b>														
11/21/06	477.44	25.85	0.00	451.59	2.67	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
03/26/07	477.44	25.62	0.00	451.82	0.23	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
06/27/07	477.44	28.37	0.00	449.07	-2.75	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
09/23/07	477.44	31.40	0.00	446.04	-3.03	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
<b>U-3 (Screen Interval in feet: 14.0-34.0)</b>														
07/13/98	478.46	23.82	0.00	454.64	--	70000	--	3100	5500	2700	16000	7500	--	
10/07/98	478.46	25.64	0.00	452.82	-1.82	54000	--	5000	1100	3100	14000	6100	--	
01/15/99	478.46	30.92	0.00	447.54	-5.28	41000	--	3100	ND	1800	3800	15000	--	
04/14/99	478.46	24.48	0.00	453.98	6.44	33000	--	86	290	2200	7800	39000	--	
07/19/99	478.46	28.46	0.00	450.00	-3.98	48000	--	3900	2500	3600	14000	12000	16000	
10/12/99	478.46	30.39	0.00	448.07	-1.93	35000	--	4200	ND	2300	1800	22000	8300	
01/24/00	478.46	23.43	0.00	455.03	6.96	13000	--	260	ND	770	3200	53000	42000	
04/10/00	478.46	23.31	0.00	455.15	0.12	35200	--	1070	241	2820	8850	35600	40900	
07/17/00	478.46	27.53	0.00	450.93	-4.22	29000	--	3570	525	3180	5660	22500	21000	
10/02/00	478.46	28.19	0.00	450.27	-0.66	11000	--	2100	31	2000	780	25000	28000	
01/08/01	478.46	29.85	0.00	448.61	-1.66	33600	--	3060	427	3040	4190	24700	30900	
04/03/01	478.46	24.98	0.00	453.48	4.87	5390	--	660	10.8	304	356	15200	19300	
07/02/01	478.46	31.35	0.00	447.11	-6.37	13000	--	1200	58	1300	930	25000	26000	
10/08/01	478.46	32.69	0.00	445.77	-1.34	6100	--	500	ND<10	570	130	23000	22000	
01/03/02	478.46	23.73	0.00	454.73	8.96	9900	--	700	130	24	1000	14000	12000	
04/05/02	477.44	28.27	0.00	449.17	-5.56	9800	--	1100	180	220	1400	16000	30000	
07/02/02	478.46	29.71	0.00	448.75	-0.42	--	ND<25000	ND<250	ND<250	ND<250	ND<500	12000	12000	
10/01/02	478.46	31.18	0.00	447.28	-1.47	--	ND<25000	ND<250	ND<250	ND<250	ND<500	12000	12000	
12/30/02	478.46	21.62	0.00	456.84	9.56	--	23000	330	170	870	4900	18000	18000	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-3 continued</b>														
05/02/03	478.46	23.11	0.00	455.35	-1.49	--	19000	280	ND<50	880	1500	15000	15000	
07/01/03	478.46	24.89	0.00	453.57	-1.78	--	19000	120	ND<100	180	880	22000	22000	
10/03/03	478.46	26.59	0.00	451.87	-1.70	--	20000	170	ND<50	250	730	--	16000	
01/08/04	478.46	21.92	0.00	456.54	4.67	--	17000	250	ND<100	770	1500	--	9700	
04/15/04	478.46	23.59	0.00	454.87	-1.67	--	4600	ND<25	ND<25	36	100	--	3700	
07/15/04	478.46	24.80	0.00	453.66	-1.21	--	2700	ND<25	ND<25	ND<25	ND<50	--	3400	
12/08/04	478.46	29.13	0.00	449.33	-4.33	--	12000	ND<50	ND<50	250	140	--	13000	
03/23/05	478.46	21.64	0.00	456.82	7.49	--	21000	94	ND<50	630	1200	--	6200	
06/28/05	478.46	24.57	0.00	453.89	-2.93	--	6600	24	0.64	150	70	--	4700	
09/23/05	478.46	27.64	0.00	450.82	-3.07	--	6000	31	ND<25	150	ND<50	--	8900	
12/30/05	478.46	23.96	0.00	454.50	3.68	--	390	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	840	
03/24/06	478.46	22.52	0.00	455.94	1.44	--	2700	28	ND<5.0	57	120	--	690	
06/26/06	478.46	23.89	0.00	454.57	-1.37	--	2000	51	0.77	84	45	--	560	
09/26/06	478.46	28.08	0.00	450.38	-4.19	--	1200	20	ND<2.5	5.2	2.8	--	170	
11/21/06	478.46	27.23	0.00	451.23	0.85	--	1500	22	ND<5.0	5.8	ND<5.0	--	180	
03/26/07	478.46	25.27	0.00	453.19	1.96	--	3900	65	0.61	50	160	--	95	
06/27/07	478.46	27.51	0.00	450.95	-2.24	--	1400	29	ND<0.50	5.6	2.3	--	170	
09/23/07	478.46	31.70	0.00	446.76	-4.19	--	1600	16	0.61	2.7	3.7	--	88	
<b>U-4 (Screen Interval in feet: 35.0-45.0)</b>														
04/03/01	476.93	31.63	0.00	445.30	--	ND	--	ND	ND	ND	ND	37.8	38.2	
07/02/01	476.93	37.96	0.00	438.97	-6.33	ND	--	ND	ND	ND	ND	ND	5.3	
10/08/01	476.93	44.24	0.00	432.69	-6.28	--	--	--	--	--	--	--	--	Not enough water to sample
01/03/02	476.93	36.15	0.00	440.78	8.09	100	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	10	8.5	
04/05/02	476.93	37.64	0.00	439.29	-1.49	ND<50	--	0.50	ND<0.50	ND<0.50	ND<0.50	4.1	--	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-4 continued</b>														
07/02/02	476.93	36.85	0.00	440.08	0.79	--	67	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	12	
10/01/02	476.93	38.54	0.00	438.39	-1.69	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	9.8	
12/30/02	476.93	32.64	0.00	444.29	5.90	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	25	
05/02/03	476.93	31.40	0.00	445.53	1.24	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	4.1	
07/01/03	476.93	33.60	0.00	443.33	-2.20	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	2.1	
10/03/03	476.93	37.63	0.00	439.30	-4.03	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	9.1	
01/08/04	476.93	29.23	0.00	447.70	8.40	--	ND<50	0.55	ND<0.50	1.6	3.7	--	2.5	
04/15/04	476.93	29.80	0.00	447.13	-0.57	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	5.2	
07/15/04	476.93	35.05	0.00	441.88	-5.25	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	5.1	
12/08/04	476.93	35.10	0.00	441.83	-0.05	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	3.0	
03/23/05	476.93	25.38	0.00	451.55	9.72	--	ND<50	ND<0.50	ND<0.50	1.3	1.2	--	0.65	
06/28/05	476.93	28.67	0.00	448.26	-3.29	--	34J	ND<0.50	0.15J	ND<0.50	ND<1.0	--	0.23J	
09/23/05	476.93	32.25	0.00	444.68	-3.58	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	11	
12/30/05	476.93	31.02	0.00	445.91	1.23	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	17	
03/24/06	476.93	26.51	0.00	450.42	4.51	--	ND<50	ND<0.50	ND<0.50	ND<0.50	4.4	--	21	
06/26/06	476.93	27.98	0.00	448.95	-1.47	--	63	ND<0.50	ND<0.50	0.56	ND<1.0	--	11	
09/26/06	476.93	33.72	0.00	443.21	-5.74	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	13	
11/21/06	476.93	33.43	0.00	443.50	0.29	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
03/26/07	476.93	30.52	0.00	446.41	2.91	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
06/27/07	476.93	38.20	0.00	438.73	-7.68	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	0.78	
09/23/07	476.93	--	--	--	--	--	--	--	--	--	--	--	--	Car parked over well
<b>U-5 (Screen Interval in feet: 37.0-47.0)</b>														
04/03/01	476.51	31.75	0.00	444.76	--	ND	--	ND	0.728	ND	0.993	54.8	55.4	
07/02/01	476.51	38.68	0.00	437.83	-6.93	ND	--	ND	ND	ND	ND	88	94	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-5 continued</b>														
10/08/01	476.51	46.31	0.00	430.20	-7.63	ND<50	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	37	54	
01/03/02	476.51	36.55	0.00	439.96	9.76	ND<50	--	ND<0.50	0.59	ND<0.50	0.91	51	53	
04/05/02	476.51	37.83	0.00	438.68	-1.28	ND<50	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	37	--	
07/02/02	476.51	36.92	0.00	439.59	0.91	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	43	
10/01/02	476.51	--	--	--	--	--	--	--	--	--	--	--	--	Inaccessible - truck parked over well
12/30/02	476.51	--	--	--	--	--	--	--	--	--	--	--	--	Inaccessible - car parked over well
05/02/03	476.51	31.55	0.00	444.96	--	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	18	
07/01/03	476.51	33.83	0.00	442.68	-2.28	--	73	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	46	
10/03/03	476.51	37.72	0.00	438.79	-3.89	--	58	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	44	
01/08/04	476.51	29.21	0.00	447.30	8.51	--	ND<50	ND<0.50	ND<0.50	1.1	2.7	--	17	
04/15/04	476.51	30.05	0.00	446.46	-0.84	--	57	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	37	
07/15/04	476.51	35.15	0.00	441.36	-5.10	--	60	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	27	
12/08/04	476.51	35.33	0.00	441.18	-0.18	--	62	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	39	
03/23/05	476.51	25.45	0.00	451.06	9.88	--	ND<50	ND<0.50	ND<0.50	0.51	ND<1.0	--	4.5	
06/28/05	476.51	28.90	0.00	447.61	-3.45	--	73	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	40	
09/23/05	476.51	33.01	0.00	443.50	-4.11	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	53	
12/30/05	476.51	30.96	0.00	445.55	2.05	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	72	
03/24/06	476.51	22.42	0.00	454.09	8.54	--	2400	13	ND<5.0	48	58	--	54	
06/26/06	476.51	29.31	0.00	447.20	-6.89	--	72	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	82	
09/26/06	476.51	34.35	0.00	442.16	-5.04	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	51	
11/21/06	476.51	32.43	0.00	444.08	1.92	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	25	
03/26/07	476.51	31.20	0.00	445.31	1.23	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	29	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-5 continued</b>														
06/27/07	476.51	38.62	0.00	437.89	-7.42	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	30	
09/23/07	476.51	--	--	--	--	--	--	--	--	--	--	--	--	Car parked over well
<b>U-6 (Screen Interval in feet: DNA)</b>														
01/03/02	478.38	33.99	0.00	444.39	--	5000	--	36	ND<25	260	450	ND<250	ND<10	
04/05/02	478.38	36.18	0.00	442.20	-2.19	1300	--	16	ND<5.0	54	ND<5.0	ND<25	--	
07/02/02	478.38	36.33	0.00	442.05	-0.15	--	1100	1.4	ND<0.50	16	ND<1.0	--	0.94	
10/01/02	478.38	37.70	0.00	440.68	-1.37	--	2000	5.4	ND<0.50	62	ND<1.0	--	2.6	
12/30/02	478.38	31.63	0.00	446.75	6.07	--	130	ND<0.50	ND<0.50	2.3	ND<1.0	--	ND<2.0	
05/02/03	478.38	31.49	0.00	446.89	0.14	--	150	ND<0.50	ND<0.50	1.8	1.7	--	82	
07/01/03	478.38	32.88	0.00	445.50	-1.39	--	190	1.8	ND<0.50	9.4	8.7	--	36	
10/03/03	478.38	36.54	0.00	441.84	-3.66	--	ND<10000	140	ND<100	940	560	--	ND<400	
01/08/04	478.38	30.45	0.00	447.93	6.09	--	3500	29	32	90	89	--	27	
04/15/04	478.38	29.48	0.00	448.90	0.97	--	2400	19	ND<2.5	91	53	--	16	
07/15/04	478.38	34.30	0.00	444.08	-4.82	--	8500	150	5.7	970	560	--	24	
12/08/04	478.38	34.80	0.00	443.58	-0.50	--	2700	16	ND<2.5	28	ND<5.0	--	10	
03/23/05	478.38	25.08	0.00	453.30	9.72	--	960	2.7	ND<0.50	9.6	4.8	--	2.5	
06/28/05	478.38	28.75	0.00	449.63	-3.67	--	12000	120	4.9	930	780	--	21	
09/23/05	478.38	32.38	0.00	446.00	-3.63	--	5200	78	ND<25	540	230	--	34	
12/30/05	478.38	30.43	0.00	447.95	1.95	--	2400	15	0.67	99	12	--	3.5	
03/24/06	478.38	25.94	0.00	452.44	4.49	--	4300	52	ND<5.0	440	160	--	11	
06/26/06	478.38	28.07	0.00	450.31	-2.13	--	5300	59	ND<5.0	520	300	--	ND<5.0	
09/26/06	478.38	33.31	0.00	445.07	-5.24	--	7400	78	ND<5.0	490	160	--	6.4	
11/21/06	478.38	31.65	0.00	446.73	1.66	--	1500	5.5	ND<0.50	37	2.4	--	1.4	
03/26/07	478.38	29.25	0.00	449.13	2.40	--	480	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	0.50	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (8015M) (µg/l)	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
<b>U-6 continued</b>														
06/27/07	478.38	35.09	0.00	443.29	-5.84	--	110	1.2	ND<0.50	1.3	ND<0.50	--	0.86	
09/23/07	478.38	--	--	--	--	--	--	--	--	--	--	--	--	Dry well
<b>U-7 (Screen Interval in feet: DNA)</b>														
01/03/02	478.74	32.43	0.00	446.31	--	3100	--	93	ND<10	35	73	140	130	
04/05/02	478.74	34.06	0.00	444.68	-1.63	630	--	22	0.53	2.6	ND<0.50	45	--	
07/02/02	478.74	35.28	0.00	443.46	-1.22	--	1100	21	ND<0.50	6.9	ND<1.0	--	60	
10/01/02	478.74	37.70	0.00	441.04	-2.42	--	1700	11	ND<0.50	3.1	ND<1.0	--	25	
12/30/02	478.74	31.93	0.00	446.81	5.77	--	4600	41	5.3	32	13	--	34	
05/02/03	478.74	31.81	0.00	446.93	0.12	--	3000	17	2.7	14	5.1	--	42	
07/01/03	478.74	33.47	0.00	445.27	-1.66	--	2300	11	0.53	8.0	1.5	--	35	
10/03/03	478.74	35.84	0.00	442.90	-2.37	--	6500	30	ND<5.0	41	ND<10	--	53	
01/08/04	478.74	30.35	0.00	448.39	5.49	--	1600	4.0	ND<1.0	4.2	8.7	--	56	
04/15/04	478.74	29.03	0.00	449.71	1.32	--	3600	22	1.3	64	40	--	57	
07/15/04	478.74	33.52	0.00	445.22	-4.49	--	4700	15	1.2	59	57	--	50	
12/08/04	478.74	34.68	0.00	444.06	-1.16	--	5800	26	1.9	63	27	--	52	
03/23/05	478.74	24.49	0.00	454.25	10.19	--	5600	18	1.3	42	14	--	39	
06/28/05	478.74	28.83	0.00	449.91	-4.34	--	5400	16	1.1	35	10	--	45	
09/23/05	478.74	32.35	0.00	446.39	-3.52	--	2400	13	1.3	31	6.9	--	46	
12/30/05	478.74	30.18	0.00	448.56	2.17	--	2500	11	1.1	28	4.3	--	35	
03/24/06	478.74	25.06	0.00	453.68	5.12	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	32	
06/26/06	478.74	28.30	0.00	450.44	-3.24	--	2500	11	1.1	45	15	--	55	
09/26/06	478.74	33.47	0.00	445.27	-5.17	--	2300	7.8	0.84	17	2.1	--	61	
11/21/06	478.74	31.66	0.00	447.08	1.81	--	3000	15	1.1	26	2.2	--	69	
03/26/07	478.74	29.82	0.00	448.92	1.84	--	2200	1.2	ND<0.50	ND<0.50	ND<0.50	--	70	

**Table 2**  
**HISTORIC FLUID LEVELS AND SELECTED ANALYTICAL RESULTS**  
**July 1998 Through September 2007**  
**76 Station 4186**

Date Sampled	TOC Elevation	Depth to Water	LPH Thickness	Ground- water Elevation	Change in Elevation	TPH-G (8015M)	TPH-G (GC/MS)	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE (8021B)	MTBE (8260B)	Comments
(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	
<b>U-7 continued</b>														
06/27/07	478.74	36.59	0.00	442.15	-6.77	--	590	5.8	ND<0.50	3.3	0.94	--	100	
09/23/07	478.74	44.05	0.00	434.69	-7.46	--	--	--	--	--	--	--	--	Not enough water to sample



**Table 2 a**  
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene-dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)	(mg/l)	(µg/l)	(mV)
<b>U-1</b>											
10/02/00	ND	--	--	--	--	--	--	--	--	--	--
12/30/02	--	--	--	--	--	--	--	0.60	--	--	91
05/02/03	--	--	--	--	--	--	--	0.50	--	--	90
07/01/03	--	ND<500000	--	--	--	--	--	0.60	--	--	110
10/03/03	--	ND<500	--	--	--	--	--	3.79	--	--	329
01/08/04	--	ND<500	--	--	--	--	--	12.36	--	--	184
04/15/04	--	ND<50	--	--	--	--	--	10.56	--	--	213
07/15/04	--	ND<50	--	--	--	--	--	6.62	--	--	251
12/08/04	--	ND<50	--	--	--	--	--	2.66	--	--	68
03/23/05	--	ND<50	--	--	--	--	--	3.12	--	--	091
06/28/05	--	ND<1000	--	--	--	--	--	8.84	--	--	153
09/23/05	--	ND<1000	--	--	--	--	--	2.26	--	--	187
12/30/05	--	ND<250	--	--	--	--	--	7.74	--	--	159
03/24/06	--	ND<250	--	--	--	--	--	--	3.88	036	--
06/26/06	--	ND<250	--	--	--	--	--	--	5.50	008	--
09/26/06	--	ND<250	--	--	--	--	--	4.24	4.66	203	200
11/21/06	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	4.24	4.56	1.97	2.00
03/26/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	6.58	6.98	107	102
06/27/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	4.98	4.85	20	34
<b>U-2</b>											
10/02/00	ND	--	--	--	--	--	--	--	--	--	--
10/01/02	--	--	--	--	--	--	--	1.40	--	--	--
12/30/02	--	--	--	--	--	--	--	2.80	--	--	120
05/02/03	--	--	--	--	--	--	--	150.00	--	--	120
07/01/03	--	ND<500000	--	--	--	--	--	1.20	--	--	110
10/03/03	--	ND<500	--	--	--	--	--	5.61	--	--	321

**Table 2 a**  
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene-dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)	(mg/l)	(µg/l)	(mV)
<b>U-2 continued</b>											
01/08/04	--	ND<500	--	--	--	--	--	12.11	--	--	- 6
04/15/04	--	ND<50	--	--	--	--	--	11.39	--	--	259
07/15/04	--	ND<50	--	--	--	--	--	7.46	--	--	238
12/08/04	--	ND<50	--	--	--	--	--	3.57	--	--	132
03/23/05	--	730	--	--	--	--	--	4.57	--	--	024
06/28/05	--	ND<1000	--	--	--	--	--	8.08	--	--	230
09/23/05	--	ND<1000	--	--	--	--	--	5.47	--	--	188
12/30/05	--	ND<250	--	--	--	--	--	8.33	--	--	177
03/24/06	--	ND<250	--	--	--	--	--	--	6.20	-004	--
06/26/06	--	ND<250	--	--	--	--	--	--	4.51	040	--
09/26/06	--	ND<250	--	--	--	--	--	3.70	3.49	-31	-17
11/21/06	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	3.70	3.45	-29	-20
03/26/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	10.05	10.31	90	95
06/27/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	3.87	4.21	-63	-41
09/23/07	69	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	-133	-48
<b>U-3</b>											
10/02/00	63000	--	--	--	--	--	--	--	--	--	--
01/08/01	49300	ND	ND	ND	ND	ND	ND	--	--	--	--
04/03/01	22200	ND	ND	ND	ND	ND	ND	--	--	--	--
07/02/01	27000	ND	ND	ND	ND	ND	ND	--	--	--	--
10/08/01	33000	ND<140000000	ND<290	ND<290	ND<290	ND<290	ND<290	--	--	--	--
01/03/02	17000	ND<50000000	ND<100	ND<100	ND<100	ND<100	ND<100	--	--	--	--
04/05/02	66000	ND<25000000	ND<100	ND<100	ND<100	ND<100	ND<100	--	--	--	--
07/02/02	47000	ND<13000000	ND<250	ND<250	ND<500	ND<250	ND<250	--	--	--	--
10/01/02	ND<50000	ND<25000000	ND<1000	ND<1000	ND<1000	ND<1000	ND<1000	0.50	--	--	- 47
12/30/02	23000	ND<10000000	ND<400	ND<400	ND<400	ND<400	ND<400	0.20	--	--	106

**Table 2 a**  
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene-dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)	(mg/l)	(µg/l)	(mV)
<b>U-3 continued</b>											
05/02/03	25000	ND<5000000	ND<200	ND<200	ND<200	ND<200	ND<200	0.50	--	--	85
07/01/03	32000	ND<10000000	ND<400	ND<400	ND<400	ND<400	ND<400	0.50	--	--	90
10/03/03	39000	ND<50000	ND<200	ND<200	ND<2.0	ND<200	ND<200	3.80	--	--	-27
01/08/04	ND<20000	ND<100000	ND<400	ND<400	ND<400	ND<400	ND<400	12.82	--	--	133
04/15/04	18000	ND<2500	ND<0.5	ND<0.5	ND<1.0	ND<0.5	ND<0.5	3.11	--	--	24
07/15/04	15000	ND<2500	ND<25	ND<25	ND<50	ND<25	ND<25	1.90	--	--	53
12/08/04	34000	ND<5000	ND<50	ND<50	ND<100	ND<50	ND<50	1.30	--	--	-81
03/23/05	--	ND<5000	--	--	--	--	--	0.52	--	--	-087
06/28/05	--	ND<1000	--	--	--	--	--	1.47	--	--	-151
09/23/05	--	ND<50000	--	--	--	--	--	1.40	--	--	-80
12/30/05	2000	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.58	1.45	--	--	-068
03/24/06	--	ND<2500	--	--	--	--	--	--	.79	003	--
06/26/06	18000	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	3.56	015	--
09/26/06	--	ND<1200	--	--	--	--	--	1.06	1.10	-72	-95
11/21/06	33000	ND<2500	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	1.04	1.10	-83	-96
03/26/07	13000	ND<250	ND<0.50	0.95	ND<0.50	ND<0.50	ND<0.50	7.08	6.99	78	68
06/27/07	20000	ND<250	ND<0.50	0.79	ND<0.50	ND<0.50	ND<0.50	4.89	4.79	-79	-82
09/23/07	19000	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	-114	-88
<b>U-4</b>											
04/03/01	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
07/02/01	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
01/03/02	ND<20	ND<500000	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	--	--	--
10/01/02	--	--	--	--	--	--	--	1.00	--	--	83
12/30/02	--	--	--	--	--	--	--	0.40	--	--	126
05/02/03	--	--	--	--	--	--	--	0.70	--	--	120
07/01/03	--	ND<500000	--	--	--	--	--	0.60	--	--	130

**Table 2 a**  
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene-dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)	(mg/l)	(µg/l)	(mV)
<b>U-4 continued</b>											
10/03/03	--	ND<500	--	--	--	--	--	2.06	--	--	3.05
01/08/04	--	ND<500	--	--	--	--	--	11.90	--	--	76
04/15/04	--	ND<50	--	--	--	--	--	3.30	--	--	116
07/15/04	--	ND<50	--	--	--	--	--	2.50	--	--	32
12/08/04	--	ND<50	--	--	--	--	--	2.09	--	--	47
03/23/05	--	ND<50	--	--	--	--	--	0.04	--	--	021
06/28/05	--	ND<1000	--	--	--	--	--	2.24	--	--	120
09/23/05	--	ND<1000	--	--	--	--	--	3.01	--	--	176
12/30/05	--	ND<250	--	--	--	--	--	1.96	--	--	175
03/24/06	--	ND<250	--	--	--	--	--	--	1.48	015	--
06/26/06	--	ND<250	--	--	--	--	--	--	1.31	031	--
09/26/06	--	ND<250	--	--	--	--	--	1.38	1.23	-54	-7
11/21/06	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.38	1.13	-60	-10
03/26/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	7.09	7.28	14	25
06/27/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.82	2.62	82	73
<b>U-5</b>											
04/03/01	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
07/02/01	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
10/08/01	ND<100	ND<1000000	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	--	--	--	--
01/03/02	ND<20	ND<500000	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	--	--	--
05/02/03	--	--	--	--	--	--	--	0.60	--	--	120
07/01/03	--	ND<500	--	--	--	--	--	0.90	--	--	145
10/03/03	--	ND<500	--	--	--	--	--	2.21	--	--	3.13
01/08/04	--	ND<500	--	--	--	--	--	11.27	--	--	104
04/15/04	--	ND<50	--	--	--	--	--	3.35	--	--	65
07/15/04	--	ND<50	--	--	--	--	--	2.87	--	--	66

**Table 2 a**  
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene-dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)	(mg/l)	(µg/l)	(mV)
<b>U-5 continued</b>											
12/08/04	--	ND<50	--	--	--	--	--	1.67	--	--	102
03/23/05	--	ND<50	--	--	--	--	--	0.75	--	--	131
06/28/05	--	ND<1000	--	--	--	--	--	2.29	--	--	103
09/23/05	--	ND<1000	--	--	--	--	--	2.05	--	--	172
12/30/05	--	ND<250	--	--	--	--	--	1.39	--	--	171
03/24/06	--	ND<2500	--	--	--	--	--	--	.97	011	--
06/26/06	--	ND<250	--	--	--	--	--	--	7.23	091	--
09/26/06	--	ND<250	--	--	--	--	--	1.19	0.80	44	44
11/21/06	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.12	0.79	41	47
03/26/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	3.20	3.60	31	52
06/27/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.01	1.67	66	58
<b>U-6</b>											
01/03/02	ND<200	ND<5000000	ND<10	ND<10	ND<10	ND<10	ND<10	--	--	--	--
10/01/02	--	--	--	--	--	--	--	0.90	--	--	--
12/30/02	--	--	--	--	--	--	--	0.20	--	--	88
05/02/03	--	--	--	--	--	--	--	0.90	--	--	145
07/01/03	--	ND<500000	--	--	--	--	--	0.70	--	--	120
10/03/03	--	ND<100000	--	--	--	--	--	2.26	--	--	12
01/08/04	--	ND<5000	--	--	--	--	--	11.95	--	--	-37
04/15/04	--	ND<250	--	--	--	--	--	3.47	--	--	-20
07/15/04	--	ND<250	--	--	--	--	--	3.25	--	--	-43
12/08/04	--	ND<250	--	--	--	--	--	0.94	--	--	-91
03/23/05	--	ND<50	--	--	--	--	--	0.55	--	--	-077
06/28/05	--	ND<1000	--	--	--	--	--	0.86	--	--	-129
09/23/05	--	ND<50000	--	--	--	--	--	1.97	--	--	-82
12/30/05	--	ND<250	--	--	--	--	--	1.01	--	--	-66

**Table 2 a**  
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene-dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)	(mg/l)	(µg/l)	(mV)
<b>U-6 continued</b>											
03/24/06	--	ND<2500	--	--	--	--	--	--	1.25	011	--
06/26/06	--	ND<2500	--	--	--	--	--	--	5.48	015	--
09/26/06	--	ND<2500	--	--	--	--	--	6.97	7.05	-67	-69
11/21/06	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.83	1.05	-65	-69
03/26/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	6.40	6.26	15	9
06/27/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	3.51	3.20	-64	-54
<b>U-7</b>											
01/03/02	30	ND<500000	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	--	--	--
10/01/02	--	--	--	--	--	--	--	1.80	--	--	- 60
12/30/02	--	--	--	--	--	--	--	0.10	--	--	121
05/02/03	--	--	--	--	--	--	--	0.40	--	--	105
07/01/03	--	ND<500000	--	--	--	--	--	0.50	--	--	95
10/03/03	--	ND<5000	--	--	--	--	--	2.91	--	--	- 21
01/08/04	--	ND<1000	--	--	--	--	--	11.85	--	--	- 51
04/15/04	--	ND<100	--	--	--	--	--	4.68	--	--	- 16
07/15/04	--	ND<100	--	--	--	--	--	2.55	--	--	- 52
12/08/04	--	ND<100	--	--	--	--	--	1.20	--	--	-88
03/23/05	--	ND<100	--	--	--	--	--	0.21	--	--	-088
06/28/05	--	ND<1000	--	--	--	--	--	1.32	--	--	-160
09/23/05	--	ND<1000	--	--	--	--	--	2.25	--	--	108
12/30/05	--	ND<250	--	--	--	--	--	1.12	--	--	105
03/24/06	--	ND<250	--	--	--	--	--	--	.99	008	--
06/26/06	--	ND<250	--	--	--	--	--	--	1.27	025	--
09/26/06	--	ND<250	--	--	--	--	--	0.78	1.02	-47	-63
11/21/06	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.88	0.98	-43	-59
03/26/07	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	5.85	6.00	14	8

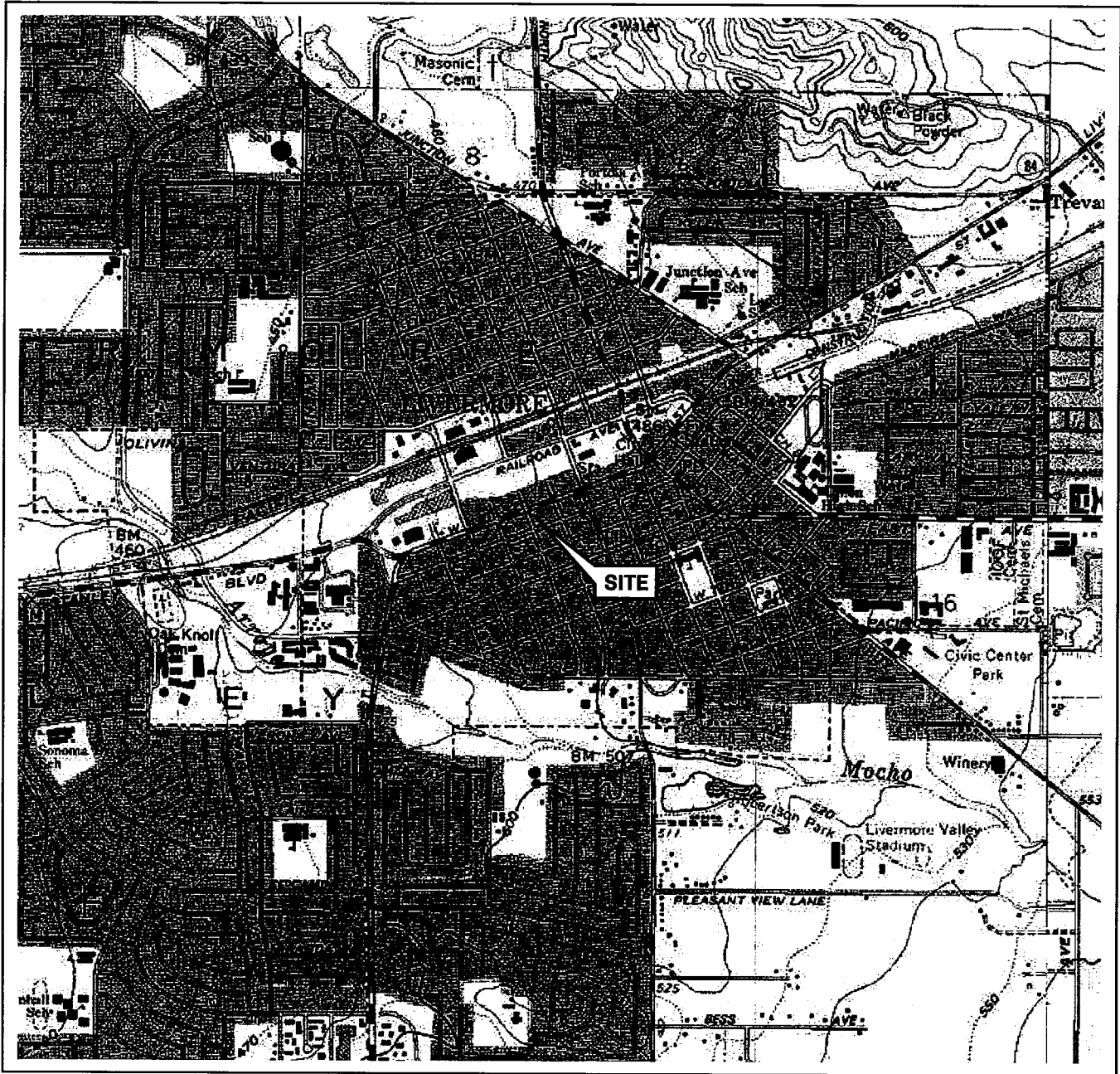
**Table 2 a**  
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**  
**76 Station 4186**

Date Sampled	TBA	Ethanol (8260B)	Ethylene-dibromide (EDB)	1,2-DCA (EDC)	DIPE	ETBE	TAME	Post-purge Dissolved Oxygen	Pre-purge Dissolved Oxygen	Pre-purge ORP	Post-purge ORP
	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)	(mg/l)	(µg/l)	(mV)
<b>U-7 continued</b>											
06/27/07	14	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.98	2.60	-90	-102

# FIGURES

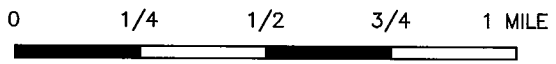


PS=1:1 L:\QMS VICINITY MAP SD4186vm.DWG Jul 11, 2007 -- 6:09pm bschmidt

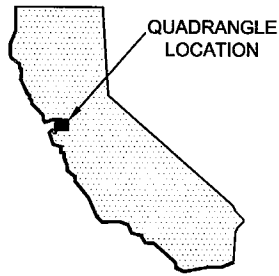


SOURCE:

United States Geological Survey  
7.5 Minute Topographic Map:  
Livermore Quadrangle



SCALE 1:24,000



QUADRANGLE LOCATION



PROJECT: 125703

FACILITY:

76 STATION 4186  
1771 FIRST STREET  
LIVERMORE, CALIFORNIA

VICINITY MAP

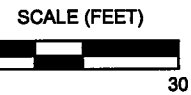
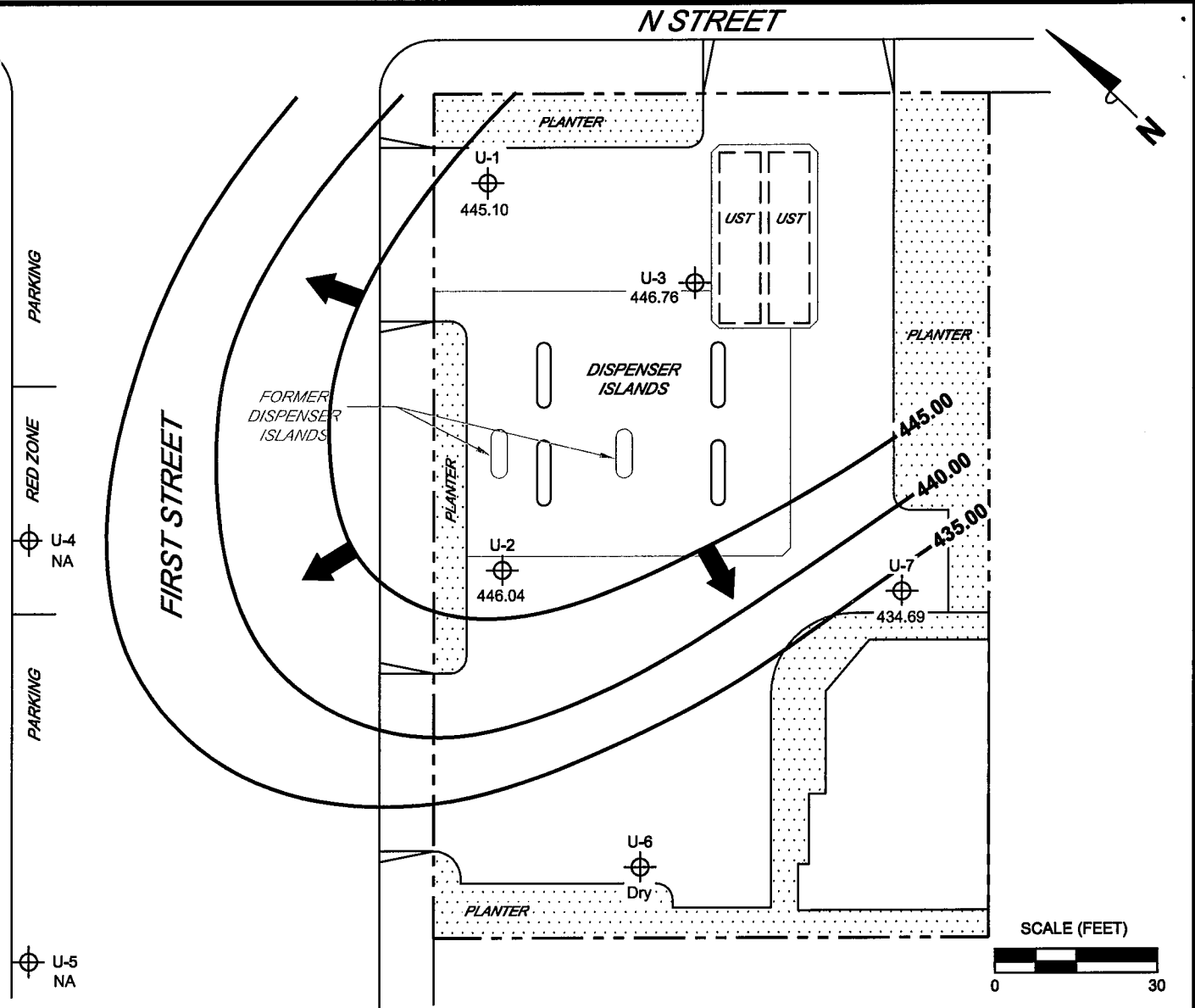
FIGURE 1

**LEGEND**

U-7  Monitoring Well with Groundwater Elevation (feet)

445.00  Groundwater Elevation Contour

 General Direction of Groundwater Flow



**NOTES:**

Contour lines are interpretive and based on fluid levels measured in monitoring wells. Elevations are in feet above mean sea level. NA = not analyzed, measured, or collected. UST = underground storage tank.




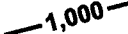
PROJECT: 125703

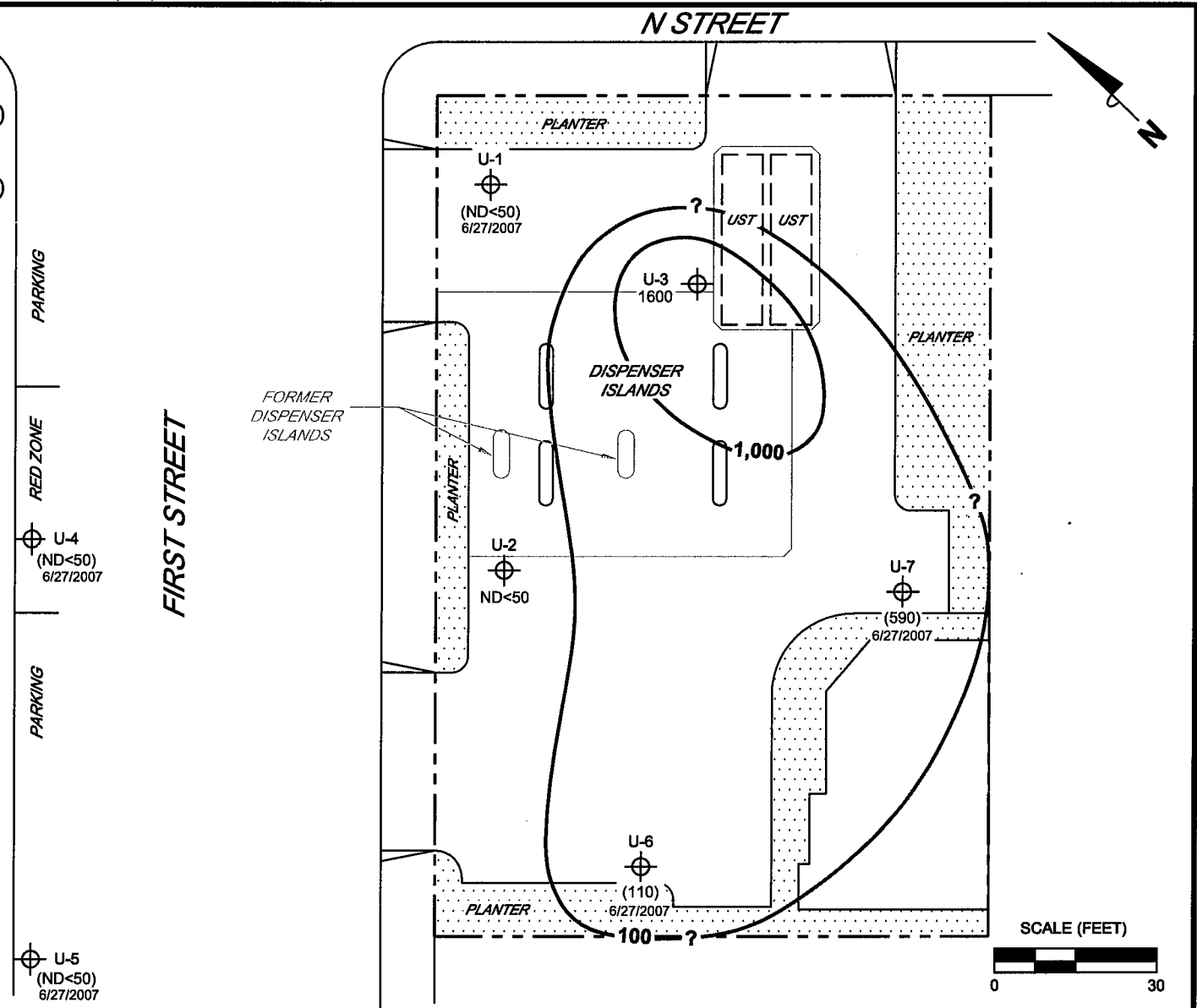
FACILITY:  
76 STATION 4186  
1771 FIRST STREET  
LIVERMORE, CALIFORNIA

**GROUNDWATER ELEVATION  
CONTOUR MAP  
September 23, 2007**

**FIGURE 2**

**LEGEND**

- U-7  Monitoring Well with Dissolved-Phase TPH-G (GC/MS) Concentration ( $\mu\text{g/l}$ )
-  1,000 Dissolved-Phase TPH-G (GC/MS) Contour ( $\mu\text{g/l}$ )



**NOTES:**

Contour lines are interpretive and based on laboratory analysis results of groundwater samples.  
 TPH-G (GC/MS) = total petroleum hydrocarbons with gasoline distinction utilizing EPA Method 8260B.  
 $\mu\text{g/l}$  = micrograms per liter. ND = not detected at limit indicated on official laboratory report.  
 UST = underground storage tank. ( ) = representative historical value.





PROJECT: **125703**

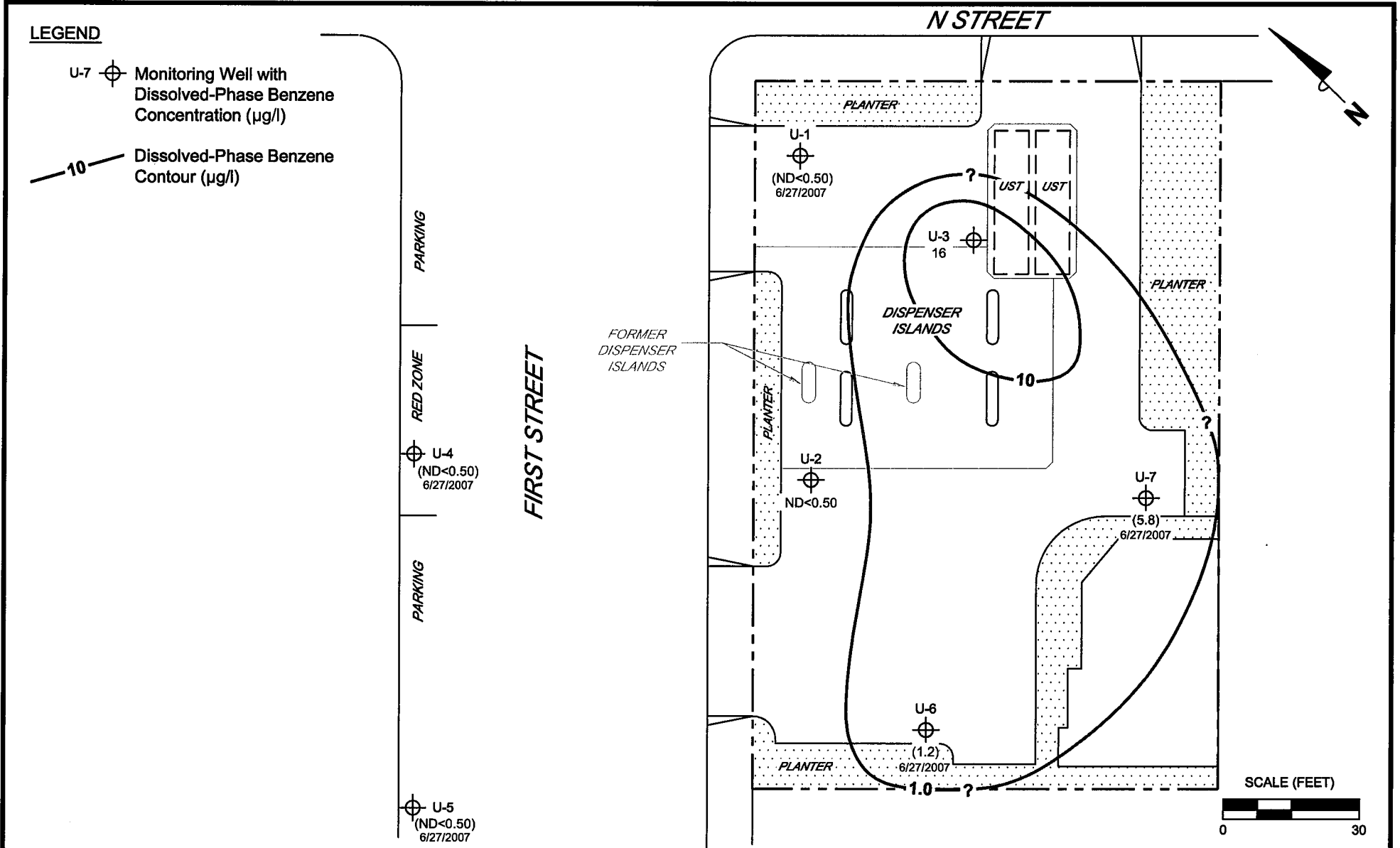
FACILITY:  
 76 STATION 4186  
 1771 FIRST STREET  
 LIVERMORE, CALIFORNIA

**DISSOLVED-PHASE TPH-G (GC/MS)  
 CONCENTRATION MAP  
 September 23, 2007**

**FIGURE 3**

**LEGEND**

- U-7  Monitoring Well with Dissolved-Phase Benzene Concentration ( $\mu\text{g/l}$ )
-  Dissolved-Phase Benzene Contour ( $\mu\text{g/l}$ )



**NOTES:**

Contour lines are interpretive and based on laboratory analysis results of groundwater samples.  
 $\mu\text{g/l}$  = micrograms per liter. ND = not detected at limit indicated on official laboratory report.  
 UST = underground storage tank. ( ) = representative historical value.



PROJECT: **125703**

FACILITY:  
 76 STATION 4186  
 1771 FIRST STREET  
 LIVERMORE, CALIFORNIA

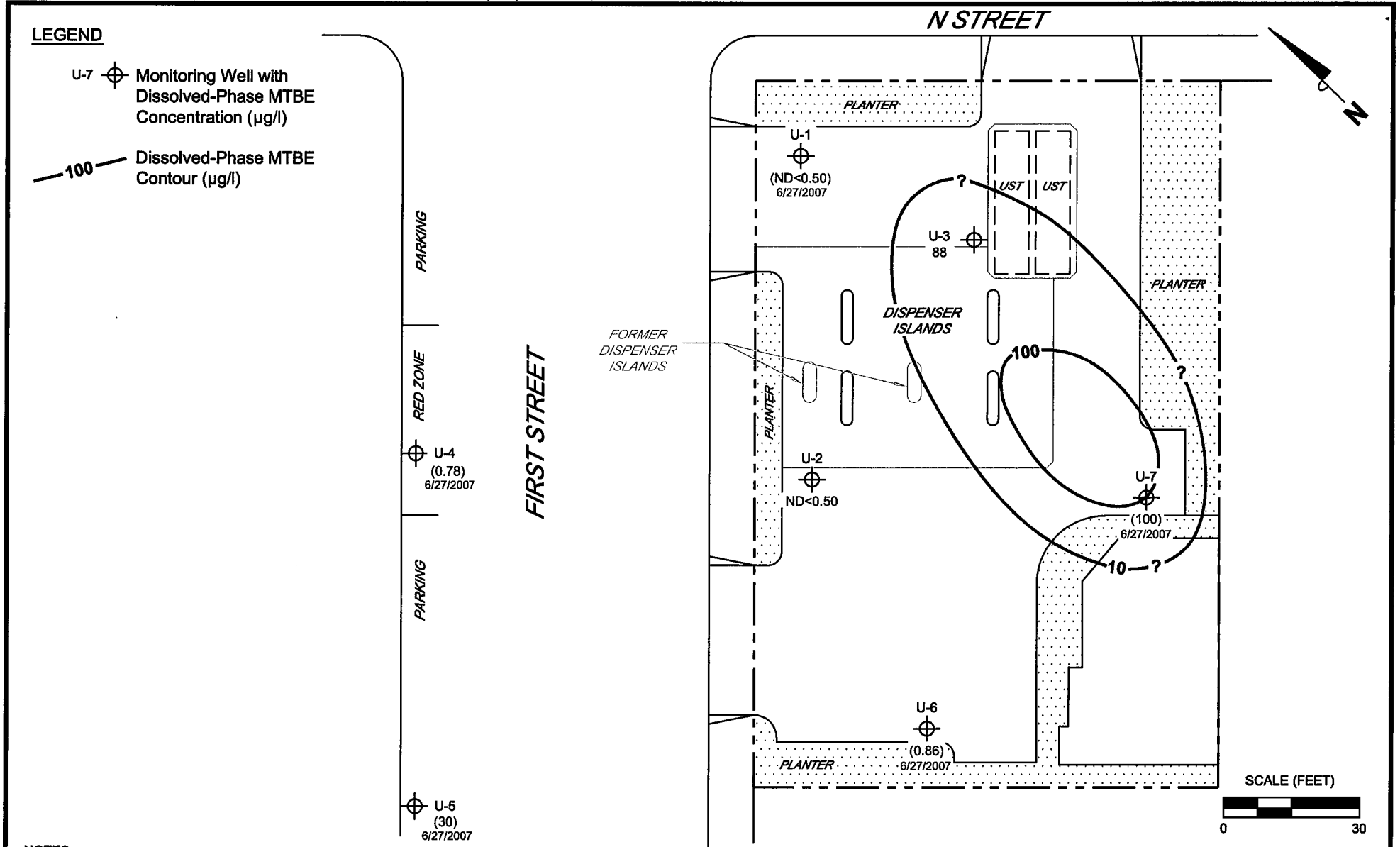
**DISSOLVED-PHASE BENZENE  
 CONCENTRATION MAP  
 September 23, 2007**

**FIGURE 4**

**LEGEND**

U-7  Monitoring Well with Dissolved-Phase MTBE Concentration (µg/l)

 100 Dissolved-Phase MTBE Contour (µg/l)



**NOTES:**

Contour lines are interpretive and based on laboratory analysis results of groundwater samples. MTBE = methyl tertiary butyl ether. µg/l = micrograms per liter. ND = not detected at limit indicated on official laboratory report. UST = underground storage tank. ( ) = representative historical value. Results obtained using EPA Method 8260B.



PROJECT: **125703**

FACILITY:

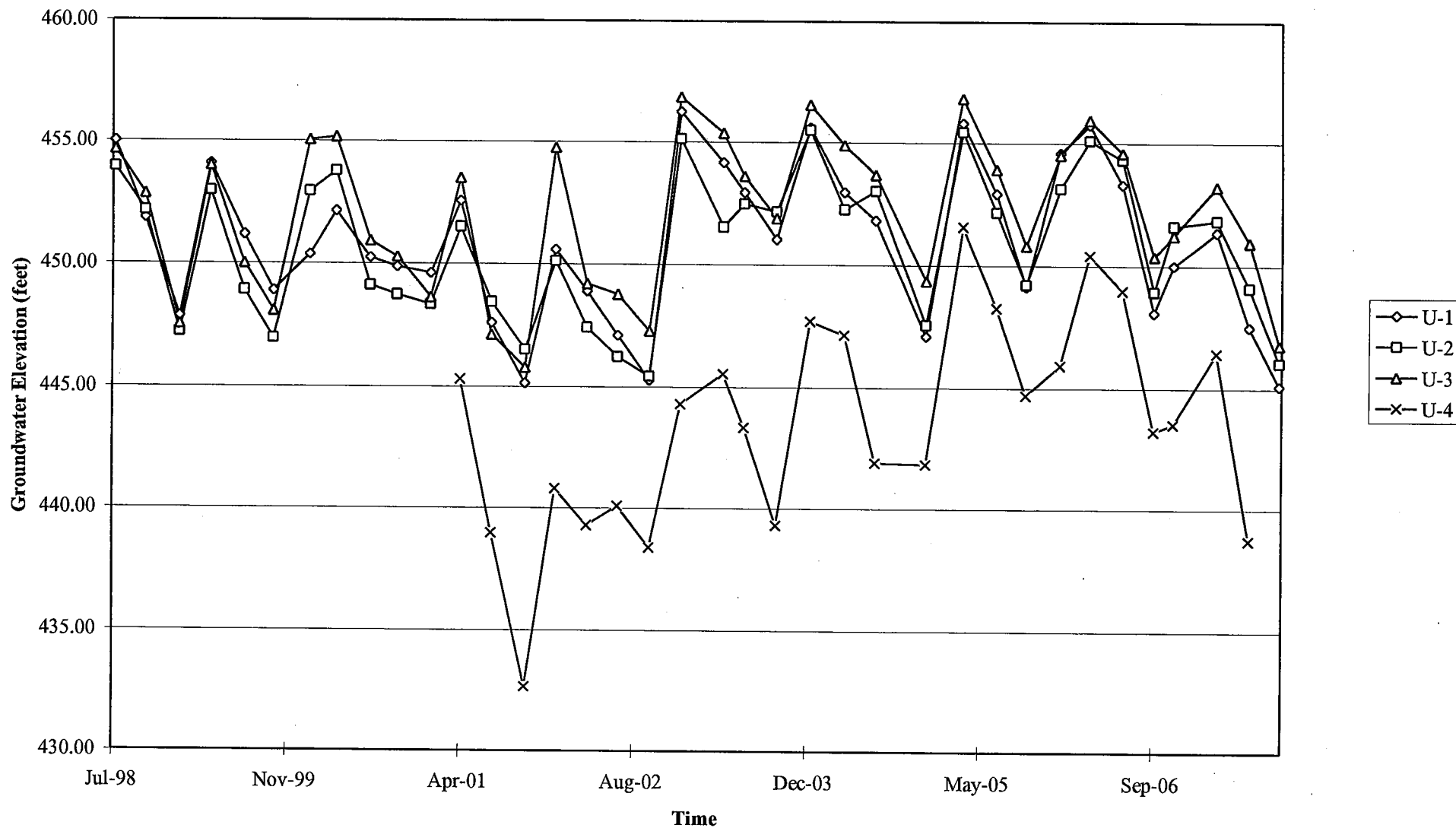
76 STATION 4186  
1771 FIRST STREET  
LIVERMORE, CALIFORNIA

**DISSOLVED-PHASE MTBE  
CONCENTRATION MAP  
September 23, 2007**

**FIGURE 5**

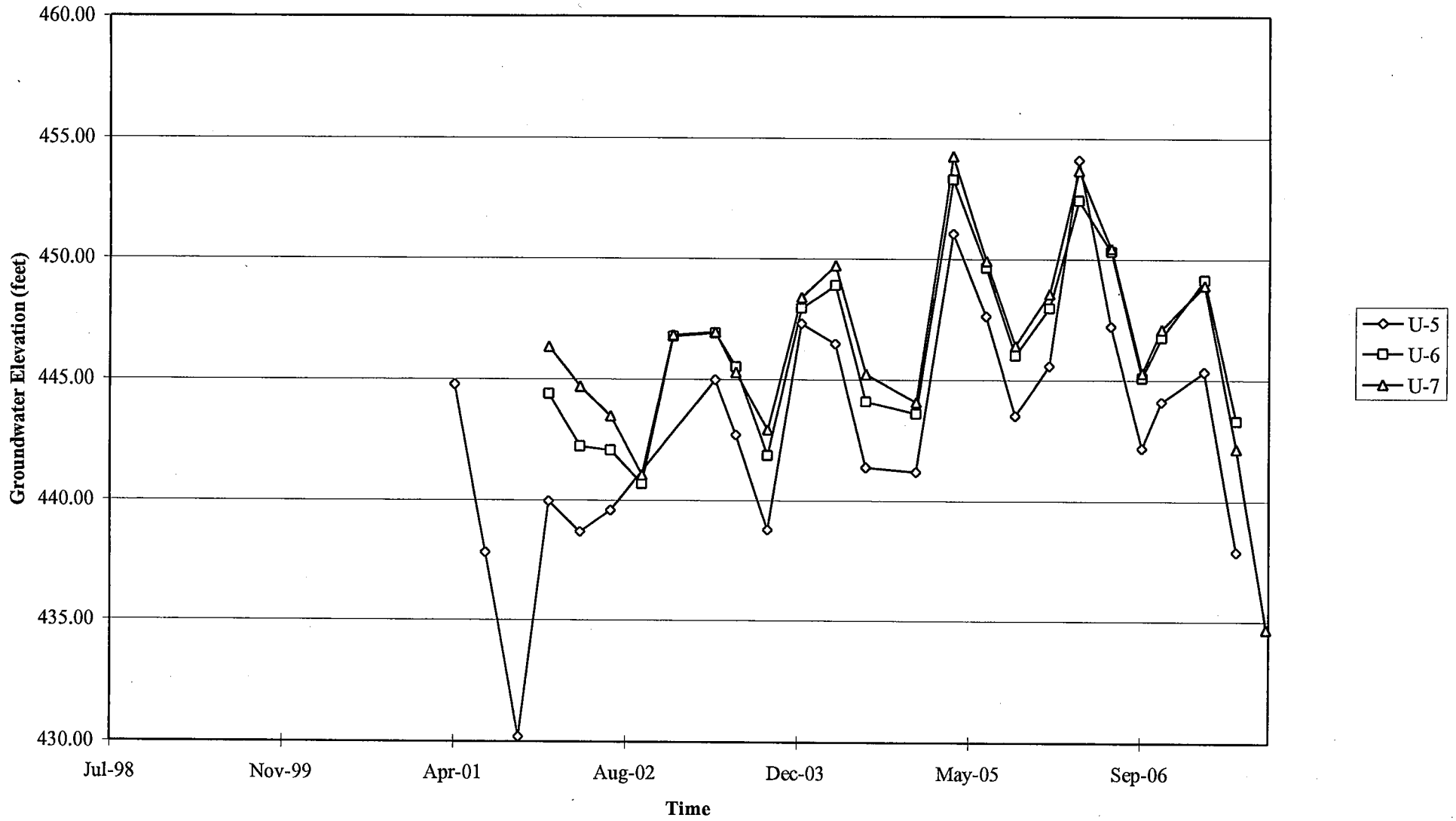
# GRAPHS

Groundwater Elevations vs. Time  
76 Station 4186



Elevations may have been corrected for apparent changes due to resurvey

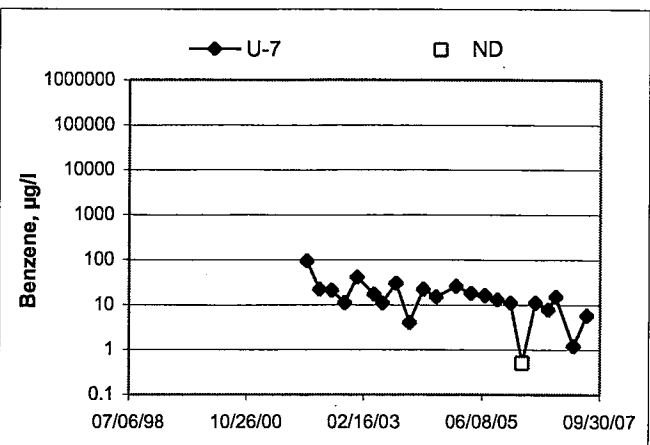
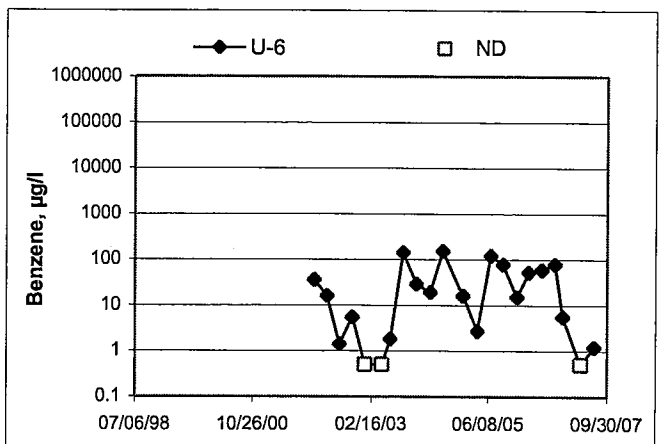
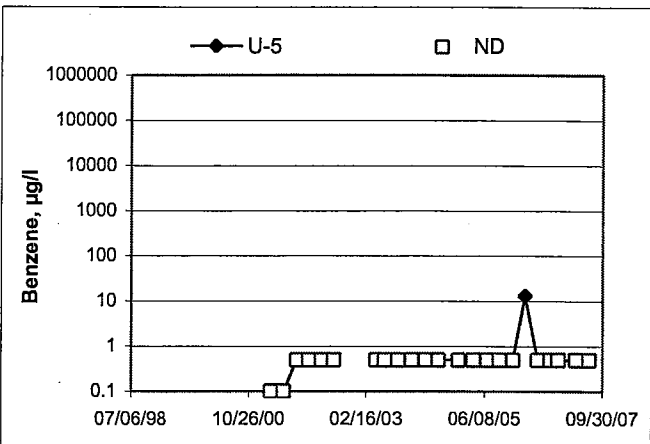
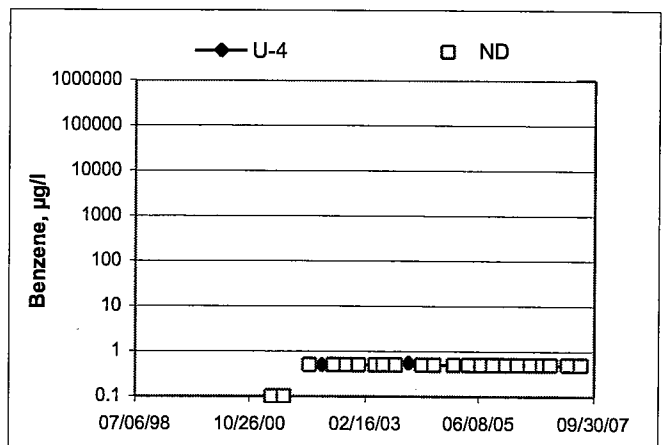
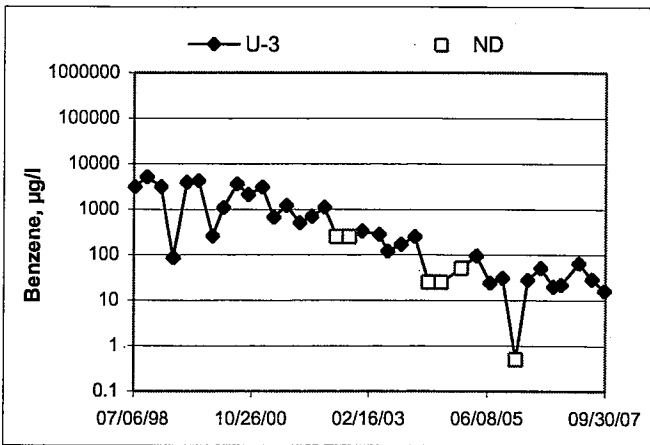
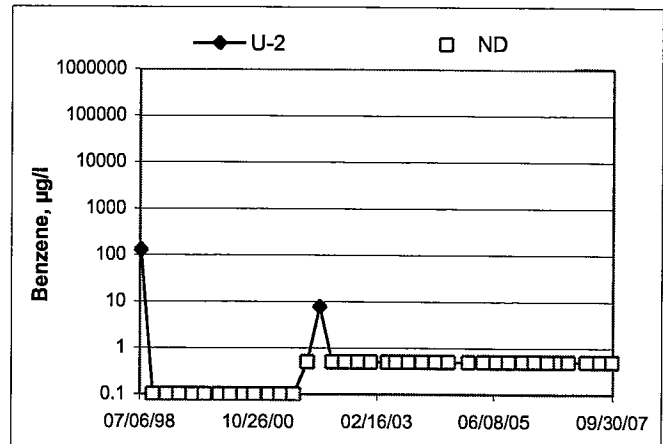
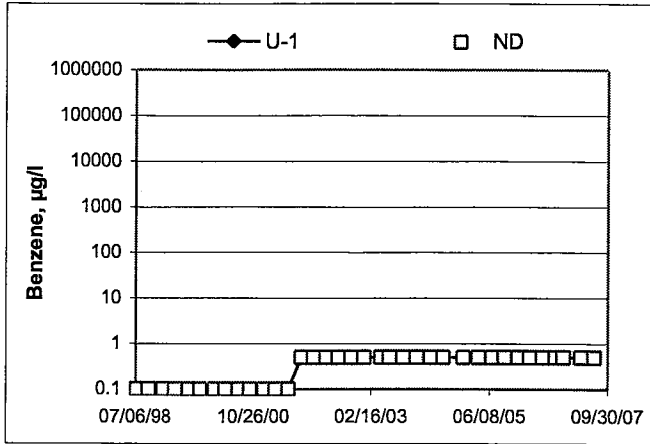
Groundwater Elevations vs. Time  
76 Station 4186



Elevations may have been corrected for apparent changes due to resurvey



Benzene Concentrations vs Time  
76 Station 4186



# GENERAL FIELD PROCEDURES

## **Groundwater Monitoring and Sampling Assignments**

For each site, TRC technicians are provided with a Technical Service Request (TSR) that specifies activities required to complete the groundwater monitoring and sampling assignment for the site. TSRs are based on client directives, instructions from the primary environmental consultant for the site, regulatory requirements, and TRC's previous experience with the site.

## **Fluid Level Measurements**

Initial site activities include determination of well locations based on a site map provided with the TSR. Well boxes are opened and caps are removed. Indications of well or well box damage or of pressure buildup in the well are noted.

Fluid levels in each well are measured using a coated cloth tape equipped with an electronic interface probe, which distinguishes between liquid phase hydrocarbon (LPH) and water. The depth to LPH (if it is present), to water, and to the bottom of the well are measured from the top of the well casing (surveyors mark or notch if present) to the nearest 0.01 foot. Unless otherwise instructed, a well with less than 0.67 foot between the measured top of water and the measured bottom of the well casing is considered dry, and is not sampled. If the well contains 0.67 foot or more of water, an attempt is made to bail and/or sample as specified on the TSR.

Wells that are found to contain LPH are not purged or sampled. Instead, one casing volume of fluid is bailed from the well and the well is re-sealed. Bailed fluids are placed in a container separate from normal purge water, and properly disposed.

## **Purging and Groundwater Parameter Measurement**

TSR instructions may specify that a well not be purged (no-purge sampling), be purged using low-flow methods, or be purged using conventional pump and/or bail methods. Conventional purging generally consists of pumping or bailing until a minimum of three casing volumes of water have been removed or until the well has been pumped dry. Pumping is generally accomplished using submersible electric or pneumatic diaphragm pumps.

During conventional purging, three groundwater parameters (temperature, pH, and conductivity) are measured after removal of each casing volume. Stabilization of these parameters, to within 10 percent, confirm that sufficient purging has been completed. In some cases, the TSR indicates that other parameters are also to be measured during purging. TRC commonly measures dissolved oxygen (DO), oxidation-reduction potential (ORP), and/or turbidity. Instruments used for groundwater parameter measurements are calibrated daily according to manufacturer's instructions.

Low-flow purging utilizes a bladder or peristaltic pump to remove water from the well at a low rate. Groundwater parameters specified by the TSR are measured continuously until they become stable in general accordance with EPA guidelines.

Purge water is generally collected in labeled drums for disposal. Drums may be left on site for disposal by others, or transported to a collection location for eventual transfer to a licensed treatment or recycling facility. In some cases, purge water may be collected directly from the site by a licensed vacuum truck company, or may be treated on site by an active remediation system, if so directed.

## **Groundwater Sample Collection**

After wells are purged, or not purged, according to TSR instructions, samples are collected for laboratory analysis. For wells that have been purged using conventional pump or bail methods, sampling is conducted after the well has recovered to 80 percent of its original volume or after two hours if the well does not recover to at least 80 percent. If there is insufficient recharge of water in the well after two hours, the well is not sampled.

Samples are collected by lowering a new, disposable, ½-inch to 4-inch polyethylene bottom-fill bailer to just below the water level in the well. The bailer is retrieved and the water sample is carefully transferred to containers specified for the laboratory analytical methods indicated by the TSR. Particular care is given to containers for volatile organic analysis (VOAs) which require filling to zero headspace and fitting with Teflon-sealed caps.

After filling, all containers are labeled with project number (or site number), well designation, sample date, sample time, and the sampler's initials, and placed in an insulated chest with ice. Samples remain chilled prior to and during transport to a state-certified laboratory for analysis. Sample container descriptions and requested analyses are entered onto a chain-of-custody form in order to provide instructions to the laboratory. The chain-of-custody form accompanies the samples during transportation to provide a continuous record of possession from the field to the laboratory. If a freight or overnight carrier transports the samples, the carrier is noted on the form.

For wells that have been purged using low-flow methods, sample containers are filled from the effluent stream of the bladder or peristaltic pump. In some cases, if so specified by the TSR, samples are taken from the sample ports of actively pumping remediation wells.

## **Sequence of Gauging, Purging and Sampling**

The sequence in which monitoring activities are conducted are specified on the TSR. In general, wells are gauged beginning with the least affected well and ending with the well that has the highest concentration based on previous analytic results. After all gauging for the site is completed, wells are purged and/or sampled from the least-affected to the most-affected well.

## **Decontamination**

In order to reduce the possibility of cross contamination between wells, strict isolation and decontamination procedures are observed. Portable pumps are not used in wells with LPH. Technicians wear nitrile gloves during all gauging, purging and sampling activities. Gloves are changed between wells and more often if warranted. Any equipment that could come in contact with fluids are either dedicated to a particular wells, decontaminated prior to each use, or discarded after a single use. Decontamination consists of washing in a solution of Liqui-nox and water and rinsing twice. The final rinse is in deionized water.

## **Exceptions**

Additional tasks or non-standard procedures, if any, that may be requested or required for a particular site, and noted on the site TSR, are documented in field notes on the following pages.



## GROUNDWATER SAMPLING FIELD NOTES

Technician: DAMIAN

Site: 4186

Project No.: 135703

Date: 9/23/07

Well No. U-2

Purge Method: H.B.

Depth to Water (feet): 31.40

Depth to Product (feet):                     

Total Depth (feet) 33.41

LPH & Water Recovered (gallons):                     

Water Column (feet): 1.74

Casing Diameter (Inches): 2"

80% Recharge Depth(feet): 31.74

1 Well Volume (gallons): 0.2

Time Start	Time Stop	Depth to Water (feet)	Volume Purged (gallons)	Conductivity (uS/cm)	Temperature (F, C)	pH	D.O.	ORP	Turbidity
1307			0.2	1001	23.7	8.93	18.1	-133	
			0.4	1004	23.8	7.81	25.5	-35	
	1308		0.6	996.5	22.8	7.67	33.8	-48	
Static at Time Sampled			Total Gallons Purged		Sample Time				
31.53			0.6		1311				
Comments:									

Well No. U-3

Purge Method: H.B.

Depth to Water (feet): 31.70

Depth to Product (feet):                     

Total Depth (feet) 33.45

LPH & Water Recovered (gallons):                     

Water Column (feet): 1.75

Casing Diameter (Inches): 2"

80% Recharge Depth(feet): 32.05

1 Well Volume (gallons): 0.2

Time Start	Time Stop	Depth to Water (feet)	Volume Purged (gallons)	Conductivity (uS/cm)	Temperature (F, C)	pH	D.O.	ORP	Turbidity
1318			0.2	1108	22.4	7.92	0.85	-114	
			0.4	1127	21.4	7.05	0.53	-93	
	1320		0.8	1142	21.5	6.68	0.51	-88	
Static at Time Sampled			Total Gallons Purged		Sample Time				
31.98			0.8		1324				
Comments:									

# STATEMENT OF NON-COMPLETION OF JOB

DATE OF EVENT: 7/23/07 STATION NUMBER: 4186

NAME OF TECH: DAMIAN CALLED GORDON: NO

CALLED PM: 1335 NAME OF PM CALLED: ADRIENNE

WELL NUMBER: U-1 STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

WATER LEVEL TO LOW UNABLE TO SAMPLE

059

WELL NUMBER: U-6 STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

WELL WAS DRY

WELL NUMBER: U-7 STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

WATER LEVEL WAS TO LOW UNABLE

TO SAMPLE 038

WELL NUMBER: U-4 STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

WELL HAD CAR PARKED OVER IT I WAS

NOT ABLE TO LOCATE OWNER

# STATEMENT OF NON-COMPLETION OF JOB

DATE OF EVENT: \_\_\_\_\_ STATION NUMBER: \_\_\_\_\_

NAME OF TECH: \_\_\_\_\_ CALLED GORDON: \_\_\_\_\_

CALLED PM: \_\_\_\_\_ NAME OF PM CALLED: \_\_\_\_\_

WELL NUMBER: U-5. STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

CAR PARKED OVER WELL I WAS UNABLE  
TO LOCATE OWNER.

WELL NUMBER: \_\_\_\_\_ STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

WELL NUMBER: \_\_\_\_\_ STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

WELL NUMBER: \_\_\_\_\_ STATEMENT FROM PM \_\_\_\_\_ OR TECH \_\_\_\_\_

Date of Report: 10/08/2007

Anju Farfan

TRC Alton Geoscience  
21 Technology Drive  
Irvine, CA 92618-2302

RE: 4186

BC Work Order: 0711333

Enclosed are the results of analyses for samples received by the laboratory on 09/26/2007 21:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

*Molly Meyers*

Contact Person: Molly Meyers  
Client Service Rep



Authorized Signature



TRC Alton Geoscience  
 21 Technology Drive  
 Irvine, CA 92618-2302

Project: 4186  
 Project Number: [none]  
 Project Manager: Anju Farfan

Reported: 10/08/2007 16:22

### Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			Receive Date:	Sampling Date:	Sample Depth:	Sample Matrix:	Delivery Work Order:	Global ID:	Matrix:	Sample QC Type (SACode):	Cooler ID:
0711333-01	COC Number:	---		09/26/2007 21:15	09/23/2007 13:11	---	Water		T0600101777	W	CS	
	Project Number:	4186										
	Sampling Location:	U-2										
	Sampling Point:	U-2										
	Sampled By:	TRCI										
0711333-02	COC Number:	---		09/26/2007 21:15	09/23/2007 13:24	---	Water		T0600101777	W	CS	
	Project Number:	4186										
	Sampling Location:	U-3										
	Sampling Point:	U-3										
	Sampled By:	TRCI										

TRC Alton Geoscience  
21 Technology Drive  
Irvine, CA 92618-2302

Project: 4186  
Project Number: [none]  
Project Manager: Anju Farfan

Reported: 10/08/2007 16:22

## Volatile Organic Analysis (EPA Method 8260)

BCL Sample ID: 0711333-01      Client Sample Name: 4186, U-2, U-2, 9/23/2007 1:11:00PM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Benzene	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
1,2-Dibromoethane	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
1,2-Dichloroethane	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Ethylbenzene	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Methyl t-butyl ether	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Toluene	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Total Xylenes	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
t-Amyl Methyl ether	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
t-Butyl alcohol	69	ug/L	10		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Diisopropyl ether	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Ethanol	ND	ug/L	250		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Ethyl t-butyl ether	ND	ug/L	0.50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
Total Purgeable Petroleum Hydrocarbons	ND	ug/L	50		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042	ND	
1,2-Dichloroethane-d4 (Surrogate)	102	%	76 - 114 (LCL - UCL)		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042		
Toluene-d8 (Surrogate)	96.2	%	88 - 110 (LCL - UCL)		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042		
4-Bromofluorobenzene (Surrogate)	101	%	86 - 115 (LCL - UCL)		EPA-8260	10/01/07	10/03/07 00:12	MRR	MS-V12	1	BQJ0042		

TRC Alton Geoscience  
 21 Technology Drive  
 Irvine, CA 92618-2302

 Project: 4186  
 Project Number: [none]  
 Project Manager: Anju Farfan

Reported: 10/08/2007 16:22

## Volatile Organic Analysis (EPA Method 8260)

BCL Sample ID:	0711333-02		Client Sample Name:	4186, U-3, U-3, 9/23/2007 1:24:00PM									
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Benzene	16	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
1,2-Dibromoethane	ND	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
1,2-Dichloroethane	ND	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
Ethylbenzene	2.7	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
Methyl t-butyl ether	88	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
Toluene	0.61	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
Total Xylenes	3.7	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
t-Amyl Methyl ether	ND	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
t-Butyl alcohol	19000	ug/L	50		EPA-8260	10/01/07	10/03/07 13:30	MRR	MS-V12	5	BQJ0042	ND	A01
Diisopropyl ether	ND	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
Ethanol	ND	ug/L	250		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
Ethyl t-butyl ether	ND	ug/L	0.50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
Total Purgeable Petroleum Hydrocarbons	1600	ug/L	50		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042	ND	
1,2-Dichloroethane-d4 (Surrogate)	101	%	76 - 114 (LCL - UCL)		EPA-8260	10/01/07	10/03/07 13:30	MRR	MS-V12	5	BQJ0042		
1,2-Dichloroethane-d4 (Surrogate)	94.8	%	76 - 114 (LCL - UCL)		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042		
Toluene-d8 (Surrogate)	98.4	%	88 - 110 (LCL - UCL)		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042		
Toluene-d8 (Surrogate)	95.6	%	88 - 110 (LCL - UCL)		EPA-8260	10/01/07	10/03/07 13:30	MRR	MS-V12	5	BQJ0042		
4-Bromofluorobenzene (Surrogate)	98.0	%	86 - 115 (LCL - UCL)		EPA-8260	10/01/07	10/02/07 23:47	MRR	MS-V12	1	BQJ0042		
4-Bromofluorobenzene (Surrogate)	101	%	86 - 115 (LCL - UCL)		EPA-8260	10/01/07	10/03/07 13:30	MRR	MS-V12	5	BQJ0042		

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 Irvine, CA 92618-2302

 Project: 4186  
 Project Number: [none]  
 Project Manager: Anju Farfan

Reported: 10/08/2007 16:22

## Volatile Organic Analysis (EPA Method 8260)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits	
										RPD	Percent Recovery Lab Quals
Benzene	BQJ0042	Matrix Spike	0711135-02	0	23.880	25.000	ug/L		95.5		70 - 130
		Matrix Spike Duplicate	0711135-02	0	21.010	25.000	ug/L	12.8	84.0	20	70 - 130
Toluene	BQJ0042	Matrix Spike	0711135-02	0	21.310	25.000	ug/L		85.2		70 - 130
		Matrix Spike Duplicate	0711135-02	0	18.820	25.000	ug/L	12.3	75.3	20	70 - 130
1,2-Dichloroethane-d4 (Surrogate)	BQJ0042	Matrix Spike	0711135-02	ND	9.9900	10.000	ug/L		99.9		76 - 114
		Matrix Spike Duplicate	0711135-02	ND	10.300	10.000	ug/L		103		76 - 114
Toluene-d8 (Surrogate)	BQJ0042	Matrix Spike	0711135-02	ND	9.8600	10.000	ug/L		98.6		88 - 110
		Matrix Spike Duplicate	0711135-02	ND	9.8600	10.000	ug/L		98.6		88 - 110
4-Bromofluorobenzene (Surrogate)	BQJ0042	Matrix Spike	0711135-02	ND	10.040	10.000	ug/L		100		86 - 115
		Matrix Spike Duplicate	0711135-02	ND	9.7400	10.000	ug/L		97.4		86 - 115

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 Irvine, CA 92618-2302

Project: 4186  
 Project Number: [none]  
 Project Manager: Anju Farfan

Reported: 10/08/2007 16:22

## Volatile Organic Analysis (EPA Method 8260)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits		Lab Quals
										Percent Recovery	RPD	
Benzene	BQJ0042	BQJ0042-BS1	LCS	25.110	25.000	0.50	ug/L	100		70 - 130		
Toluene	BQJ0042	BQJ0042-BS1	LCS	22.330	25.000	0.50	ug/L	89.3		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	BQJ0042	BQJ0042-BS1	LCS	10.070	10.000		ug/L	101		76 - 114		
Toluene-d8 (Surrogate)	BQJ0042	BQJ0042-BS1	LCS	10.000	10.000		ug/L	100		88 - 110		
4-Bromofluorobenzene (Surrogate)	BQJ0042	BQJ0042-BS1	LCS	9.7800	10.000		ug/L	97.8		86 - 115		

TRC Alton Geoscience  
 21 Technology Drive  
 Irvine, CA 92618-2302

 Project: 4186  
 Project Number: [none]  
 Project Manager: Anju Farfan

Reported: 10/08/2007 16:22

## Volatile Organic Analysis (EPA Method 8260)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Benzene	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
1,2-Dibromoethane	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
1,2-Dichloroethane	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
Ethylbenzene	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
Methyl t-butyl ether	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
Toluene	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
Total Xylenes	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
t-Amyl Methyl ether	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
t-Butyl alcohol	BQJ0042	BQJ0042-BLK1	ND	ug/L	10		
Diisopropyl ether	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
Ethanol	BQJ0042	BQJ0042-BLK1	ND	ug/L	250		
Ethyl t-butyl ether	BQJ0042	BQJ0042-BLK1	ND	ug/L	0.50		
Total Purgeable Petroleum Hydrocarbons	BQJ0042	BQJ0042-BLK1	ND	ug/L	50		
1,2-Dichloroethane-d4 (Surrogate)	BQJ0042	BQJ0042-BLK1	98.7	%	76 - 114 (LCL - UCL)		
Toluene-d8 (Surrogate)	BQJ0042	BQJ0042-BLK1	99.5	%	88 - 110 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	BQJ0042	BQJ0042-BLK1	95.6	%	86 - 115 (LCL - UCL)		

TRC Alton Geoscience  
21 Technology Drive  
Irvine, CA 92618-2302

Project: 4186  
Project Number: [none]  
Project Manager: Anju Farfan

Reported: 10/08/2007 16:22

### Notes And Definitions

MDL Method Detection Limit  
ND Analyte Not Detected at or above the reporting limit  
PQL Practical Quantitation Limit  
RPD Relative Percent Difference  
A01 PQL's and MDL's are raised due to sample dilution.

Submission #: 07-11333

Project Code:                   

TB Batch #                   

SHIPPING INFORMATION

Federal Express  UPS  Hand Delivery   
BC Lab Field Service  Other  (Specify)                   

SHIPPING CONTAINER

Ice Chest  None   
Box  Other  (Specify)                   

Refrigerant: Ice  Blue Ice  None  Other  Comments:                   

Custody Seals Ice Chest  Containers  None  Comments:                   

All samples received? Yes  No  All samples containers intact? Yes  No  Description(s) match COC? Yes  No

COC Received  
 YES  NO

Ice Chest ID R/W  
Temperature: 5.9 °C  
Thermometer ID: #41P

Emissivity 0.95  
Container Other

Date/Time 9/26/07  
Analyst Init OTO

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL PHYSICAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
100ml TOTAL ORGANIC CARBON										
QT TOX										
PT CHEMICAL OXYGEN DEMAND										
PTA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	A.2	A.3	( )	( )	( )	( )	( )	( )	( )	( )
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT QA/QC										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments:                     
Sample Numbering Completed By: OTO Date/Time: 9/27/07 1830



**BC LABORATORIES, INC.**


4100 Atlas Court □ Bakersfield, CA 93308  
(661) 327-4911 □ FAX (661) 327-1918

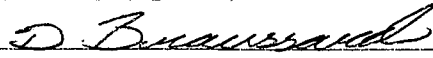



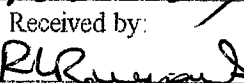
**CHAIN OF CUSTODY**


**07-11333**

**Analysis Requested**

Bill to: Conoco Phillips/ TRC		Consultant Firm: TRC		MATRIX (GW) Ground-water (S) Soil (WW) Waste-water (SL) Sludge	BTEX/MTBE by 8021B, Gas by 8015	TPH GAS by 8015M	TPH DIESEL by 8015	8260 full list w/ oxygenates	BTEX/MTBE/OXYS BY 8260B	ETHANOL by 8260B	TPH -G by GC/MS	ERPB/EDC BY 8260B	Turnaround Time Requested	
Address: <del>1186 DB</del> 1771 FIRST ST.		21 Techology Drive Irvine, CA 92618-2302 Attn: Anju Farfan												
City: LIVERMORE		4-digit site#: 4186												
State: CA Zip:		Workorder # 01237-4507897380												
Conoco Phillips Mgr: <sup>BELL</sup> BOREK		Project #: 125703 Sampler Name: DAMIAN												
Lab#	Sample Description	Field Point Name	Date & Time Sampled											
	51 U-2		9/23/07 1311	GW					X	X	X	X		STD
	-2 U-3		↓ 1324	↓					↓	↓	↓	↓		↓

CHECK BY  DISTRIBUTION  
 JWK      
 SUB-OUT

Comments:  GLOBAL ID: 70600101777	Relinquished by: (Signature) 	Received by: FRICE	Date & Time 9/23/07 1500
	Relinquished by: (Signature) 	Received by: 	Date & Time 9/26/07 1430
	Relinquished by: (Signature) 	Received by: 	Date & Time 9-26-07 1822

(A) = ANALYSIS (C) = CONTAINER (P) = PRESERVATIVE  
 R. L. ... 9-26-07 2115  9-26-07 2115

## **STATEMENTS**

### **Purge Water Disposal**

Non-hazardous groundwater produced during purging and sampling of monitoring wells was accumulated at TRC's groundwater monitoring facility at Concord, California, for transportation by a licensed carrier, to the ConocoPhillips Refinery at Rodeo, California. Disposal at the Rodeo facility was authorized by ConocoPhillips in accordance with "ESD Standard Operating Procedures – Water Quality and Compliance", as revised on February 7, 2003. Documentation of compliance with ConocoPhillips requirements is provided by an ESD Form R-149, which is on file at TRC's Concord Office. Purge water containing a significant amount of liquid-phase hydrocarbons was accumulated separately in drums for transportation and disposal by others.

### **Limitations**

The fluid level monitoring and groundwater sampling activities summarized in this report have been performed under the responsible charge of a California Registered Geologist or Registered Civil Engineer and have been conducted in accordance with current practice and the standard of care exercised by geologists and engineers performing similar tasks in this area. No warranty, express or implied, is made regarding the conclusions and professional opinions presented in this report. The conclusions are based solely upon an analysis of the observed conditions. If actual conditions differ from those described in this report, our office should be notified.